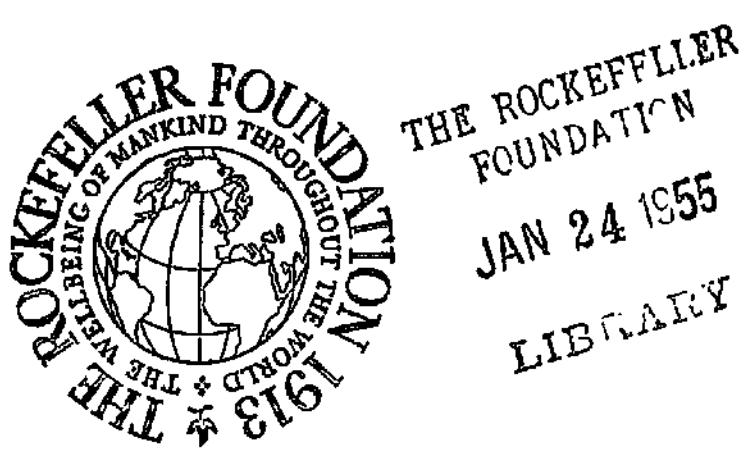


The Rockefeller Foundation

Annual Report, 1953



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CONTENTS

TRUSTEES, OFFICERS, AND COMMITTEES, 1953-1954	x
TRUSTEES, OFFICERS, AND COMMITTEES, 1954-1955	xii
LETTER OF TRANSMITTAL	xv
THE PRESIDENT'S REVIEW	
Introduction	3
<i>Part One. THE FOUNDATION AND PUBLIC POLICY</i>	
The Course of Investigation	4
On Being Investigated	5
Public Responsibility and Free Enterprise in Philanthropy	7
The Tax Exemption Privilege	11
Intellectual Surveillance	15
Foundation Support for Social Studies	18
Empirical Studies	22
Alleged Subversive Activities	26
The Foundation's International Interests	29
<i>Part Two. ". . . THE WELL-BEING OF MANKIND THROUGH- OUT THE WORLD."</i>	
Summary of Appropriations — 1953	32
Comments on a Foundation Program	32
Changing Conditions and Changing Program	34
Foundation Program and the Needs of Higher Education	38
Interdisciplinary Problems	43
Out-of-Program Grants	45
Centers of Foundation Interest in 1953	46

Part Three. ORGANIZATIONAL INFORMATION

Meetings	58
Applications Declined during 1953	58
Organizational Changes	58

ILLUSTRATIONS

following 62

DIVISION OF MEDICINE AND PUBLIC HEALTH

Introductory Statement	69
Professional Education	70
Medical Care	96
Investigation and Control of Specific Diseases and Deficiencies	104
Development of the Health Sciences	133

DIVISION OF NATURAL SCIENCES AND AGRICULTURE

Introductory Statement	153
Experimental Biology	
<i>Genetics</i>	155
<i>Growth and Metabolism</i>	161
<i>Bio-Molecular Structure</i>	170
<i>General Biology and Biochemistry</i>	174
<i>The Organism in Its Environment</i>	180
<i>General Scientific Support</i>	188
Agriculture	
<i>Operating Programs</i>	198
<i>Aid to Research and Teaching</i>	211
Special Projects	224

DIVISION OF SOCIAL SCIENCES

Introductory Statement	231
The Functioning and Management of the Economy	233
Human Behavior and Interpersonal and Intergroup Relations	248

Political Science and International Affairs	256
Legal, Political, and Social Theory and Philosophy	262
Development of Social Science Talent	266
Methodology	271
 DIVISION OF HUMANITIES	
Introductory Statement	279
Intercultural Studies	
<i>American Studies</i>	284
<i>Near Eastern Studies</i>	290
<i>South Asian Studies</i>	291
<i>Far Eastern Studies</i>	292
History	293
Philosophy	300
Literature	303
The Arts	306
General Education	313
Special Projects	316
OTHER APPROPRIATIONS	323
FELLOWSHIPS FOR 1953	329
REPORT OF THE TREASURER	345
GEOGRAPHICAL DISTRIBUTION OF GRANTS, 1953	429
INDEX	459

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The Rockefeller Foundation

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¹ Retired June 30, 1954.

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 years 1952 and 1953, together with detailed reports of the Treasurer of the Foundation and of the Directors for the Divisions of Medicine and Public Health, Natural Sciences and Agriculture, Social Sciences, and Humanities for the period January 1, 1953 to December 31, 1953.

Respectfully yours,
Dean Rusk
President

**THE
PRESIDENT'S REVIEW**

1952-1953

The President's Review

1952-1953

Introduction

THE PRESIDENT of the Foundation customarily comments upon a year's work at the time of the issuance of the Annual Report. The Report itself furnishes information upon the grants made; the President's Review attempts to look at these grants more broadly and to inform the public of the overall direction of Foundation interests and activities.

Having assumed office on July 1, 1952, the incumbent President did not provide a review for 1952. The latter half of that year was largely given over to intensive preparations for the hearings of the Cox Committee of the Eighty-Second Congress, hearings which were actually held in December of that year. The detailed study of 40 years of Foundation history which this entailed left little time for reflection upon its future.

This present review covers the year 1953, with some reference back to 1952. But, again, the period was one involving preparations for Congressional investigation, this time by the Reece Committee of the Eighty-Third Congress. Since we do not wish this review to be silent on the subject of investigation, it is divided into two main parts.

Part One discusses the Congressional investigations and some of the underlying principles which have been at issue. Much of this is taken from a longer Statement filed with the Reece Committee by The Rockefeller Foundation and General Education Board, a full text of which is available upon request.

Part Two contains comments upon the Foundation's program and major centers of interest in 1953 and serves to introduce the Annual Report which follows.

A brief Part Three covers certain formal and organizational information included for the purposes of record.

PART ONE

The Foundation and Public Policy

THE COURSE OF INVESTIGATION

The Eighty-Second Congress established in 1952 a House Select Committee to Investigate Tax Exempt Foundations and Comparable Organizations (the "Cox Committee"); its membership included the following Representatives: Eugene E. Cox (D-Ga.), Chairman until his death on December 24, 1952; Brooks Hays (D-Ark.); Donald L. O'Toole (D-N.Y.); Aime J. Forand (D-R.I.); Richard M. Simpson (R-Pa.); Angier L. Goodwin (R-Mass.); and B. Carroll Reece (R-Tenn.). After preliminary staff preparations under the direction of Harold M. Keele, General Counsel, the Committee conducted public hearings during the period November 18-December 30, 1952 and submitted its Report to the Congress on January 1, 1953. Both the Hearings and the Report were published by the Government Printing Office.

The Report of the Cox Committee was generally favorable to the work of the foundations, moderate and thoughtful in tone, and gratifyingly free of partisan considerations. Its two recommendations called for the requirement of a public accounting by all foundations (which The Rockefeller Foundation has furnished from the beginning) and for a reexamination of tax laws by the Ways and Means Committee to the end that a free enterprise system

may make gifts to "our free schools, colleges, churches, foundations, and other charitable institutions."

In July, 1953, the Eighty-Third Congress established, after a lively debate and with a vote of 209-163, a Special Committee to Investigate Tax Exempt Foundations. The resolution creating this Committee was introduced by Representative Reece, who had been a member of the Cox Committee and had signed that Committee's Report with a reservation pointing to the inadequacy of time for a thorough investigation. Mr. Reece was named Chairman of the Committee and the following Representatives were appointed to serve with him: Jesse P. Wolcott (R-Mich.); Angier L. Goodwin (R-Mass.); Wayne L. Hays (D-Ohio); and Gracie Pfost (D-Ida.).

The Reece Committee opened public hearings on May 10, 1954, in Washington, D.C. It had been understood that the Committee planned to hear a "bill of particulars" from its own staff, testimony adverse to the foundations from a number of witnesses, and then rebuttal testimony from the foundations themselves. After hearing only one witness in rebuttal testimony, Mr. Pendleton Herring of the Social Science Research Council, the Committee abruptly terminated public hearings on July 2, 1954, by a 3-2 vote. The foundations were invited to, and The Rockefeller Foundation did, submit sworn statements in reply to issues raised by Committee staff and other adverse witnesses. It was announced that the Committee would continue its work by means other than public hearings. As of the date of this writing, the Committee had not submitted a Report.

ON BEING INVESTIGATED

Thoughtful citizens will agree that tax exemption privileges should not be abused and that public authority which grants such exemptions should assure itself and the public that tax exempt organizations are entitled to that

status. Established educational, religious, and charitable institutions are interested that the public policy under which they operate be protected against the misconduct of those who would use tax exempt status for improper purposes.

The primary responsibility for applying the Federal laws regarding tax exempt institutions rests with the Internal Revenue Service of the Treasury Department. If any organization considers that it has received an unfair or improper ruling, it can test the issue in the courts. Thus, normal procedure would call for the enactment of legislation by the legislature, administration of the law by the executive branch, and adjudication by the courts of disputes over the constitutionality of laws or the legality of administration.

It is well recognized that the Congress, through its Committees, requires investigative procedures to obtain the information which it needs to meet intelligently its heavy legislative responsibility. Where tax exemption legislation is involved, for example, the House Ways and Means Committee and the Senate Finance Committee must assure themselves, the Congress, and the public that legislation represents considered public policy and is being administered with a minimum of abuse. And, indeed, if the Congress determines that it wishes a special Committee to look into tax exemption problems, our view is that we have an obligation to cooperate by furnishing the information desired.

Unfortunately, that is not the end of the matter; the validity of the investigative process is affected by the sense of responsibility with which it is used. Repetitious investigation imposes unnecessary burdens upon those under scrutiny and adds little, if anything, to the information of the Congress. Investigations which are basically accusatory in character may, in the absence of great care, exceed the proper role of legislative investigation and infringe the established rights and privileges of those being investigated.

Charges loosely framed or unsupported by facts offer no ascertainable issues on which to make reply and yet may damage reputable citizens and institutions. If fact-finding is distorted by partisan considerations, innocent bystanders are injured in the fray. If the same individuals act in both accusatory and adjudicative roles, injustice is the almost inevitable result.

That the Congress itself is concerned about investigative procedures is a hopeful sign that common sense and the traditional concepts of government by law will be sustained.

PUBLIC RESPONSIBILITY AND FREE ENTERPRISE IN PHILANTHROPY

The Rockefeller Foundation has always acknowledged that its funds are held as a public trust. Our Trustees recognize a heavy public responsibility, arising from the voluntary action of John D. Rockefeller in committing substantial private funds to a public purpose, from the policy and laws of the State of New York and of the United States which permit the Foundation to act corporately for a public purpose, and from the important privileges granted to educational, religious, and charitable institutions by certain Federal and State tax laws.

Though dedicated to the public interest, The Rockefeller Foundation retains many of the essential attributes of a private, independent organization. It is nonpolitical and nongovernmental in character. Its policies and decisions are in the hands of a Board of Trustees of responsible citizens, who contribute time and a lively interest to its activities and who select officers and professional staff to carry out their policies. The Foundation holds and invests its own funds and decides how to spend them for the purposes for which it was created. It is private in that it is not governmental; it is public in that its funds are held in trust for public rather than private purposes. As a social institution, it

reflects the application to philanthropy of the principles of private initiative and free enterprise, under public policies which have long recognized the benefits of such activity to a free society.

Most of the discussion of the free enterprise system in America has focused upon its accomplishments in lifting the figures of national production and the general standard of living to levels never before attained in any other country. With government controls limited, the release of the energies behind individual initiative has been given, we believe deservedly, a large measure of the credit for these extraordinary results. Less attention has been paid to the reliance we have placed upon the philanthropic impulse of private citizens. This has been left in large measure free from government control and has been given positive encouragement through the tax laws. The result has been an impressive, voluntary outpouring of wealth for charitable, educational, scientific, and religious purposes, transforming material wealth into opportunities for pursuing the enduring values of the mind and spirit.

The voluntary association of private citizens for the carrying out of public tasks is deeply rooted in our tradition and saves us from a dismal choice between leaving many tasks undone or handing them over to an all-pervasive government. It has been argued that the favored tax position of schools and colleges, foundations, and a large number of charitable activities rests upon the propositions that they do what government itself would otherwise have to do from public funds and that independent organizations can do many of these tasks better than could government. While there is evidence that such views have had a strong influence, a more fundamental basis for the public policy on the matter appears to us to be the importance, in a free society, of encouraging the widest diversity of individual and group effort in order that citizens may share directly in the privileges and responsibilities of free institutions.

President Eliot of Harvard, speaking in 1874, long before our Foundation was established, said:

. . . In England and the United States, the method of doing public work by means of endowments managed by private corporations, has been domesticated for several centuries; and these are the only two nations which have succeeded on a great scale in combining liberty with stability in free institutions. The connection of these two facts is not accidental. The citizens of a free State must be accustomed to associated action in a great variety of forms; they must have many local centers of common action, and many agencies and administrations for public objects, besides the central agency of government. . . . To abandon the method of fostering endowments, in favor of the method of direct government action, is to forego one of the great securities of public liberty.¹

These are among the basic considerations which have led the Congress, the legislatures of the 48 states, and the courts to shape the laws and public policy in such a way as to encourage private philanthropy. The principles involved were brought to our shores by the first settlers and have been reflected in official attitudes throughout our history. The Congress has affirmed its support of this policy by recent increases in the permissible deductions for charitable contributions made from individual and corporate incomes. One of the two recommendations of the Cox Committee was the following:

2. That the Ways and Means Committee take cognizance of our finding that the maintenance of private sources of funds is essential to the proper growth of our free schools, colleges, churches, foundations, and other charitable institutions. We respectfully suggest that the committee reexamine pertinent tax laws, to the end that they may be so drawn as to encourage the free-enterprise

¹ Charles W. Eliot. "Exemption from Taxation of Church Property and the Property of Educational, Literary and Charitable Institutions," *American Contributions to Civilization and Other Essays and Addresses* (New York: The Century Company, 1907), pp. 340-341.

system with its rewards from which private individuals may make gifts to these meritorious institutions.¹

We conclude that the underlying public policy is firmly established and represents not only a traditional attitude of long standing but the present policy of Federal and state governments.

We wish to emphasize that The Rockefeller Foundation has conformed to all applicable laws and authoritatively expressed public policies, and will continue to do so. This is our duty as citizens, and was clearly the wish of our founder. We shall be attentive to the views of responsible critics, but we do not expect to treat criticism as legislation or to accept the adverse witnesses who have testified before the Reece Committee as exponents of public policy. Our Trustees would violate their trust if they should fail to bring to bear upon its performance the full extent of their experience and judgment and should substitute therefor the least common denominator of divergent views from every quarter.

Where public interest and private initiative are subtly merged, as in the case of an endowed foundation, how is the public interest safeguarded? In the case of The Rockefeller Foundation, continuous effort is made to do so along several lines.

First, and most important, the Trustees and officers in the performance of their duties are infused with a deep sense of public obligation. Having been entrusted with decisions to spend funds for the public good, they bring to their tasks the best of their judgment and skills, a disinterested rather than a partial view, and as much imagination and insight as their capacities permit. Their decisions can not hope to win universal approval, and occasional mistakes may occur, for these are inevitable accompaniments of risk-bearing. In judging the record of these Trustees and officers, it is not reasonable or proper to use, as a test,

¹ U. S. Congress. 82d. 2d Sess. House. Select Committee to Investigate Foundations and Other Organizations, *Final Report . . .* (Washington, D.C.: U.S. Govt. Printing Office, 1953), p. 13.

one's agreement with each individual decision. The fair test is the seriousness and general competence of the attempt, on the part of Trustees and officers, to discharge faithfully their difficult duties.

Second, we appraise our own judgments through the advice and counsel of many others who can contribute the wisdom of experience and special knowledge. This is a continuous process, systematically pursued by the officers, involving consultation with hundreds who give generously of their time and thought to the problems presented. Some of it is reflected in a more formal arrangement when competent individuals are invited to serve the Foundation on boards of consultants on such matters as medicine and public health, agriculture, or legal and political philosophy.

Third, we respond fully to our obligation to conform to all relevant laws, to make regular reports to public authorities to whom such reports are due, and to use our best efforts to furnish information requested by any official body.

Fourth, The Rockefeller Foundation keeps the public informed as to its activities through regular publications which are given wide circulation.

THE TAX EXEMPTION PRIVILEGE

American governments, Federal and state, from their earliest days have used the tax laws as effective and versatile instruments for the encouragement of voluntary private philanthropy. This encouragement has taken a variety of forms: exemption of philanthropic enterprises from income tax, exemption of bequests to philanthropic organizations from estate and inheritance taxes, exemption of *inter vivos* gifts to such organizations from gift taxes, permission to deduct contributions to such organizations from income otherwise subject to tax.

Although tax privileges in one or more of these various forms doubtless have an important influence on the organization of foundations today, it should be noted that the tax element played no significant part in the creation of The Rockefeller Foundation and the General Education Board by John D. Rockefeller. In 1903, when the General Education Board was founded, there were neither income nor estate taxes, and although the Sixteenth Amendment, authorizing a Federal income tax, had become part of the Constitution before the incorporation of The Rockefeller Foundation in May 1913, the first income tax law under the new amendment was not enacted until the following October, and the tax which it imposed was at too low a rate to have an appreciable influence.

The statement was frequently repeated in the course of investigation that a large part (sometimes placed at 90 per cent) of the funds distributed by tax exempt foundations represents money which, but for the tax exemption privilege, would belong to the government. As to our Foundation this assertion is not correct. For example, the ordinary annual income of The Rockefeller Foundation in recent years has averaged around \$15,000,000. Dividends received from corporate stocks held by the Foundation account for 91 per cent of this amount and the rest is from other types of securities. We are advised that if the Federal income tax exemption were withdrawn, the tax payable by the Foundation on the basis of the above figures, under the present corporate income tax structure, would be about \$865,600, or at a rate of between 5 per cent and 6 per cent rather than 90 per cent. This is due in part to the 85 per cent dividend receipts credit, in part to the costs of operating the Foundation's programs in public health and agriculture, costs which would clearly be deductible in arriving at taxable income, and in part to the right to deduct, in any event, in arriving at taxable income, contributions made to other

tax exempt organizations not in excess of 5 per cent of the donor's net income. These figures do not take into account capital gains (as in 1952) or losses (as in 1951) resulting from the sale of investment securities.

Nor can it be supposed with any certainty that a repeal of the existing income tax exemption of foundations would result in any significant increase of the public revenues. True, a fund which had been distributing all, or the major part, of its income in grants might not be able to deduct more than a limited percentage of this total in computing its income subject to tax, though it might well be held that the usual limitation is inapplicable to a corporation whose sole authorized activities consist of charitable operations and grants. In any event, the removal of the exemption might serve to influence some boards of trustees, as a matter of provident discharge of their trust, to discontinue grants and substitute direct operations in such fields as scientific research, health, or public welfare, on such a scale that the clearly deductible costs of operation would exhaust the income, leaving nothing against which the tax could be assessed. Although the benefits which could be derived from such direct operations might be of great significance, there would be a corresponding loss of flexible and strategic financial reserves available for the support of research and scholarship in established institutions of learning — particularly where uncommitted funds are needed to follow up on promising new leads in scientific and scholarly investigation. Even though it would be possible to discourage the grant-making function of foundations by changes in existing tax laws, these changes would not insure additional funds for the public treasury and might, in fact, work against the public interest.

It should further be noted that under their present status the funds of The Rockefeller Foundation and the General Education Board are a part of the general stream of enter-

prise which produces taxation for the support of the public treasury. As has been indicated, their funds are invested largely in corporate stocks and other types of securities. The Rockefeller Foundation pays substantial taxes through the corporations whose stocks it holds. We are advised that during 1952 the Foundation's share of corporate taxes, based upon its own holdings of corporate stocks, amounted to approximately \$12,785,000. Our two foundations also pay other taxes; for example, the transportation tax on the travel of staff, the tax included in rent and on supplies, and social security taxes on payroll, to name a few. When the Foundation or Board makes a philanthropic gift, such funds or the income therefrom go quickly into the payment of salaries and travel, the purchase of equipment and supplies, and a wide range of similar uses which are tax-yielding in character. Apart from money which goes directly into the public treasury as taxes, both The Rockefeller Foundation and the General Education Board have contributed substantially (over \$75 million) to tax-supported institutions and agencies, such as state universities, public boards of education and boards of health. These contributions have been much larger than any income tax we might have paid had we not been tax exempt.

In broader terms, the activities of such agencies as endowed foundations make an important contribution to the economic structure upon which government finance must rest. If, for example, the support of economic research makes it possible for both business leadership and government to understand more clearly and more accurately the surging processes of our productive system and, on the basis of such knowledge, to make decisions which level off the peaks and troughs of the business cycle and sustain a high and steady national production, the benefit to the public purse is obvious. It is even more obvious that the virtual elimination of yellow fever, the sharp reduction in malaria

and hookworm, have direct economic benefits as well as those which are measured in terms of the physical welfare of human beings.

The Rockefeller Foundation and General Education Board are large net contributors to, and not charges upon, our national wealth and public treasury. We believe that we clearly pay our way.

What has been said is not intended to depreciate the value of the exemption from Federal and state income tax of activities of a charitable, educational, or religious nature. The need for more, rather than less, private enterprise in such fields adds importance to the encouragement which legislatures have given through such exemptions to the prospective donor. The importance of the exemption should not, however, be unduly exaggerated in terms of dollars, nor should the fact of exemption be made an excuse for characterizing foundation funds as government funds, or for restricting such funds to fields in which government itself operates, or for projecting government into fields which are better left to the private citizens of our richly diverse society.

INTELLECTUAL SURVEILLANCE

Much of the testimony heard in the course of Congressional investigation bears directly or indirectly upon a fundamental and sensitive problem of foundation activity — that of foundation control over studies aided by foundation funds.

The implied premise of much of the criticism of foundations to be found in the testimony is that foundations should be held responsible for the views expressed by those who receive foundation grants. This, in turn, rests upon the premise that the power of the purse means control over the product. The criticism fails because of the errors in its premises.

The product to be expected from a foundation grant of the type so frequently criticized in testimony is an intellectual product. The exercise of control would frustrate the principal object of the grant, namely the unimpaired thinking of the scientist or scholar. If the answer were to be determined in advance, there would be no need to make the grant or conduct the study.

Under our general practice, we consider that our responsibility is to make a sound judgment at the time a grant is made, a judgment which encompasses the importance of the purpose for which the grant is requested and the capacity and character of the individuals and institutions who are to make use of it. But having made the basic judgment that the recipient has the capacity and character to carry out the study, we exercise a minimum of further control. Ordinary prudence and the obligations of our trust require that we insist upon financial accounting, to assure ourselves that funds are used for the purposes for which they were appropriated. Where a second grant to a particular undertaking is up for consideration, some assessment of the work done under the first grant is necessarily involved. Frequently, those who are working under Foundation grants are visited by one or more officers of the Foundation while the grant is still current, primarily to keep us informed as to what is going on in the field. If the Foundation should discover that an improper use were being made of its funds, such as for subversive activities, the Foundation would undoubtedly intervene.

Subject to the foregoing, it has been our consistent policy not to attempt to censor or modify the findings of scholars and scientists whose work we are supporting financially. This long-standing policy, which we believe to be wise, rests both upon principle and upon very practical considerations.

The following are among the more important of these:

1. For the Foundation to exercise intellectual supervision over its grantees would require the Foundation itself to formulate an officially approved body of doctrine in almost

every field of human knowledge. This is not our role, and is quite beyond our intentions or our capacities.

2. In most cases, the Foundation could make itself responsible for scholarly or scientific conclusions only if it, with its own staff, substantially repeated the studies in question as a basis for its own finding. This, too, we could not undertake except where our own staff is engaged in research, as in virus diseases and agriculture.

3. The role of surveillance would add enormously to the staff and overhead costs of the Foundation and consume philanthropic funds for unnecessary and socially undesirable functions.

4. The Foundation is almost never the sole contributor to the recipient of a grant; in fact, in the vast majority of cases it is a minority contributor. We see no basis in principle for the Foundation to assert a right of control taking precedence over national governments, state legislatures, departments of education, boards of trustees of colleges and universities, faculties, other private donors, publishers, etc. For foundations to attempt to exert such authority would lead to the confusion of responsibility.

5. No institution, scholar, or scientist of character would accept a grant which is conditioned upon intellectual control. To any scholar worthy of the name, nothing is more important than his intellectual freedom.

6. The Foundation necessarily makes a grant before the results of the studies financed by the grant can be known. It is difficult to see how this order of procedure could be reversed.

The considerations outlined above seem to be conclusive against the exercise of intellectual control by a private foundation over the recipients of its grants. We believe that a free society grows in strength and in moral and intellectual capacity on the basis of free and responsible research and scholarship. We shall continue to support vigorously this concept which lies at the heart of free institutions and we will oppose

any effort by government to use the tax exempt status to accomplish indirectly what could not be done directly under the Constitution.

FOUNDATION SUPPORT FOR SOCIAL STUDIES

In a formal sense, The Rockefeller Foundation undertook financial support for social studies when, in 1929, it was consolidated with The Laura Spelman Rockefeller Memorial and continued an interest already well developed by the latter philanthropy.

In much broader terms, the Foundation came to believe that its commitment to promote "the well-being of mankind throughout the world" compelled it to give attention to the baffling complexities of human relations — to the processes by which men earn a living and the difficulties they encounter in working out tolerable relations among individuals, groups, and nations.

From the beginning the Foundation never considered that it had or should have solutions to social problems behind which it should throw its funds and influence. It has had no nostrums to sell. Its approach rested upon a faith that the moral and rational nature of man would convert an extension of knowledge into an extension of virtue, and that he could make better decisions if his understanding could be widened and deepened.

The experiences of World War I and the painful uncertainties of the postwar and depression period seemed to reflect a growing and menacing gap between man's technical and scientific capacity and his apparent inability to deal with his own affairs on a rational basis. In any event, it did not appear that we could escape fundamental political, economic, moral, and social problems by concentrating upon "safe" scientific subjects. Successes in public health were to mean rapidly falling death rates and increased population pressures upon resources. The study of nuclear physics, at

first only a brilliant extension of man's intellectual curiosity, was to lead to hydrogen weapons.

There was no illusion about the rudimentary character of the so-called social sciences or about the severe limitations which are encountered in attempting to apply the methods of the physical sciences to man's own behavior. Nevertheless, it was felt that there might be sufficient regularity about human behavior to permit fruitful study, and that a scientific approach might evolve methods of study which, if not a direct application of techniques developed in the older sciences, might lead to surer bases of knowledge than we now have. In any event, the possibility was worth the effort and the very attempt might uncover promising leads which would increase our knowledge to a constructive degree.

A further impulse behind the interest in social studies was a conviction that the strengthening of our own free institutions required a better understanding of the processes of a free society and the framework within which a citizen enjoys the privileges and bears the responsibilities of liberty itself. At a period when free institutions came under challenge from totalitarian ideology of both the left and the right, it was felt that penetrating studies of our own free economic and political institutions would help them to withstand assault.

It was fully appreciated that social studies would involve controversial subjects. It was felt, however, that a private foundation could, without itself taking sides on controversial issues, make a contribution by supporting objective studies which might illuminate such issues and reduce contention.

Three brief excerpts from our records throw light upon the way in which the Foundation has approached the support of the social sciences. The first is a memorandum prepared by the Executive Committee of The Laura Spelman Rockefeller Memorial in 1924, the gist of which is quoted in Mr. Fosdick's history of the Foundation:

The present memorandum proposes to indicate principles which affect the ability of the Memorial to become associated with projects in the field of social science. Certain principles would seem to make association undesirable. It appears advisable:

1. Not to contribute to organizations whose purposes and activities are centered largely in the procurement of legislation.
2. Not to attempt directly under the Memorial to secure any social, economic, or political reform.
3. Not to contribute more than a conservative proportion toward the current expense of organizations engaged in direct activity for social welfare.
4. Not to carry on investigations and research directly under the Memorial, except for the guidance of the Memorial.
5. Not to attempt to influence the findings or conclusions of research and investigations through the designation of either personnel, specific problems to be attacked, or methods of inquiry to be adopted; or through indirect influence in giving inadequate assurances of continuity of support.
6. Not to concentrate too narrowly on particular research institutions, incurring thereby the danger of institutional bias.

Certain principles would seem to make assistance from the Memorial desirable. It appears appropriate:

1. To offer fellowships to students of competence and maturity for study and research under the supervision of responsible educational and scientific institutions.
2. To contribute to agencies which may advance in indirect ways scientific activity in the social field.
3. To make possible the publication of scientific investigations sponsored by responsible institutions or organizations through general appropriations to be administered in detail by the sponsoring agency.

4. To contribute toward the expenses of conferences of scientific men for scientific purposes.
5. To make possible, under the auspices of scientific institutions, governmental agencies or voluntary organizations, demonstrations which may serve to test, to illustrate or to lead to more general adoption of measures of a social, economic or governmental character which have been devised, studied and recommended by responsible agencies.
6. To support scientific research on social, economic and governmental questions when responsible educational or scientific institutions initiate the request, sponsor the research and assume responsibility for the selection and competence of the staff and the scientific spirit of the investigations.¹

The second quotation is a brief statement on controversy adopted by the Trustees of The Laura Spelman Rockefeller Memorial and subsequently by the Trustees of The Rockefeller Foundation, following the merger in 1929 of the two philanthropies:

Subjects of a controversial nature cannot be avoided if the program is to concern itself with the more important aspects of modern social life. In fact, successful treatment of issues of a controversial sort would be so important a contribution to the fundamental objectives of the program that the existence of militant differences of opinion cannot be thought to preclude the promotion of inquiry under appropriate auspices.²

The last is taken from a memorandum prepared by the Director of the Division of Social Sciences of the Foundation in 1944:

1. Though the degree of social need is always pressing toward grandiosity, modest work will, in the long run, be most effective.

¹ Raymond B. Fosdick, *The Story of The Rockefeller Foundation* (New York: Harper and Brothers, 1952), pp. 200-201.
² *Ibid.* p. 202.

2. In recommending grants officers should try to anticipate the future — never merely ride the coat-tails of an already discernible trend.
3. The Social Sciences division has no "nostrums" to sell. In choosing the objects of grants the guiding tendency should be not to pronounce answers but to discover truth — not to manipulate new forces but to understand them — not to choose society's path but to illuminate it.¹

EMPIRICAL STUDIES

It has been suggested to the Reece Committee that foundations have had an adverse effect on scholarship and research through an undue emphasis on empiricism and "a premature effort to reduce our meager knowledge of social phenomena to the level of applied science."

The history of the intellectual processes by which man has accumulated knowledge shows that observation, experimentation, induction, deduction, and verification have each had an important role to play and that it is by their skillful and imaginative combined use that we have been able to push back the frontiers of knowledge. Without empirical examination, general propositions fail to establish and maintain contact with reality; without general concepts, fact finding becomes aimless wandering and produces helter-skelter collections of unrelated bits and pieces. By observation and experimentation man refines his ideas about the world in which he lives; by other rational processes he reduces his masses of fact and impression to a degree of order, and gives them meaning. After enough regularity has been exposed to justify the construction of a general theory, then and only then can occur the crucial test of verification. Throughout this process the questions "What is it?" and "How does it happen?" are among the tools man uses while

¹ *Ibid.* pp. 211-212.

seeking an answer to the underlying question, "What does it mean?"

The interplay of observation, experimentation and theorizing has produced brilliant results in the natural sciences, enabling man to fight back at disease, to harness new forms of power, and to wrest a more abundant living from his environment. But even in the case of the natural sciences, the path he has travelled has been a tortuous one, filled with false leads, imperfect observation, inexact experiment, theories which claimed too much, and contradictory facts for which he could find no adequate explanation. New ideas have had to run a gantlet of prejudice and entrenched opinion. Today's firmly held truth is modified by tomorrow's fresh discovery. And still today, as man looks out from peaks of knowledge which he dared not hope to scale, he sees still higher peaks on the distant horizon and vast fields of ignorance still to be explored. The process continues—with new findings, new mistakes, new instruments, new techniques, and most important of all, new concepts and fresh imagination.

It was inevitable that an attempt would be made to apply the methods of the natural sciences to human affairs. Chemical and physical approaches to the subtle problems of living matter—once considered dominated by mysterious "vital forces"—had striking and promising successes. It was wholly natural to attempt to apply similar analytical and quantitative techniques to social problems. It should not be surprising that this attempt would encounter major obstacles—as did the efforts of those who first tried to apply Newton's physics and Lavoisier's chemistry to biology and medicine. The techniques appropriate to the laboratory were insufficient for the study of man in his social environment; the circumstances of study were different in fundamental respects; conditions could not be readily controlled so as to study one factor at a time, as the physical scientist often does. The basic equipment of the scientist was never-

theless required: careful examination of the evidence, an objective approach to data, a lively and fertile imagination in the construction of hypotheses to be tested, and, throughout, a clear recognition that there must be a *joint* emphasis on speculation and experience. Beyond that, techniques had to be revised and improved; the danger of seeing too much had to be avoided; and the disconcerting influences of undetected factors had to be faced. Although his problems of procedure were difficult enough, the social scientist also faced the resistance and even hostility of man himself, with his personal or group interests affected and his emotions and traditional patterns upset by new knowledge.

The social scientist persists in his effort to learn more about human behavior, despite the modest beginnings and the challenging complexity of his task. He believes that he is beginning to know something, even though he is sure that he does not know everything. He is in position to throw some light on some situations, knowing better than most where his present limitations are. For example, we know a great deal more now than we did twenty years ago about the processes by which we make a living in a free enterprise economy — more about capital growth, the labor force, the market, rates of productivity, prices; and this knowledge is becoming more accessible to the tens and hundreds of thousands whose decisions determine the ebb and flow of our economic life. We know more about the consumer, his plans and prospective demands, his liquid assets, his preferences. We know more about personnel selection and training, the motivations which affect productivity, the techniques of management. We know more about the processes of normal development, the way in which people learn. We can be quite accurate about short-range population predictions affecting such matters as our requirements for schools and teachers or our pool of manpower for military service. We at least know something about what new knowledge we need to extend these predictions over a longer range.

These few examples are given to illustrate that our knowledge about human affairs is increasing, even if slowly and imperfectly, and that such knowledge as we have can contribute practical benefits while the search continues. If there are claims being made which seem overreaching, if social scientists are in disagreement among themselves and with the layman, if there are many questions which can not be answered, all this is entirely normal. If there are errors and a danger that we shall be misled by errors, the safeguard is the classic and traditional one: free debate, the empirical testing of opposing views, and a standing invitation to confront error with truth. Our society is deeply in debt to the best of the social scientists. They are among the most important of today's pioneers.

As far as The Rockefeller Foundation is concerned, we attach no particular importance to the argument about whether the term "social science" is properly used. Some of those who object to it probably overestimate the certainties of the natural sciences. Some who use it may claim too much for our knowledge of man. It is our view that much more can be known about man than we now do and that knowledge is to be preferred to superstition or prejudice. If a little knowledge is a dangerous thing, the remedy is to advance further into the unknown and seek out its mysteries, not to retreat into enforced ignorance.

The Foundation has provided funds for promising studies of an empirical character in the social sciences, largely in the fields of economics and human behavior, and we take genuine satisfaction from them. These studies have been, for the most part, much more than mere fact-finding; they have been accompanied by a sensitive interest in generalization and underlying principle. It has been our impression that those who are engaged in such studies are much aware of the importance of general concepts and are the first to recognize the inadequacies of the tentative generalizations thus far reached. That "final" answers have not been found

is a reason for continuing the effort rather than for abandoning the approach.

It should not be surprising that, on a comparative dollar basis, foundation funds might seem to be more heavily concentrated in empirical studies. They represent a relatively new field for academic development and reflect, as the President of the Social Science Research Council has pointed out, the pragmatic element in the American experience. Further, they are expensive and are often beyond the reach of ordinary college and university budgets. Under these conditions, foundation support is required if significant advances are to be made.

Alongside of empirical studies, The Rockefeller Foundation has been interested in philosophy and theory and has made many grants for the more speculative fields. We have an active interest in moral, political, and legal philosophy, in moral and spiritual values, in the philosophy of history and the theoretical aspects of economics and international relations. If the amounts have not been large in total, it is partly because large amounts are not needed, as contrasted with empirical studies. A further reason is that the special combination of interest and speculative capacity is somewhat rare, professional opportunities are limited, and large numbers of scholars in these fields do not come forward. Finally, it is not at all clear just how a foundation interest is best expressed; perhaps what is most needed is fellowship or grant-in-aid opportunities for younger scholars and a certain amount of free time for older scholars in widely diverse fields who wish to "philosophize" about their experience and get their thoughts into more systematic form. These are questions to which we are giving continuing attention.

ALLEGED SUBVERSIVE ACTIVITIES

There have been allegations that the foundations have promoted "un-American" or "subversive" action. The

Rockefeller Foundation would never knowingly participate in or support un-American or subversive activity. No grant has ever been made by the Foundation to a recipient organization whose name appears on the Attorney General's list of subversives.

The Foundation refrains as a matter of policy from making grants to known Communists. This rests upon two elements, the clearly expressed public policies of the United States, within which we operate, and the increasing assaults by Communism upon science and scholarship which would lead us, on intellectual grounds alone, to withhold support.

We recognize the necessity for government to seek out and deal with subversive activity from any quarter. In this, government is entitled to the sympathetic assistance of all responsible citizens. Where freedom and security are balanced against each other and it becomes necessary to locate the line which separates permitted and prohibited conduct, difficult decisions have to be made which reach into the fundamentals of our society. For example, the definition of subversion is a matter of extreme difficulty.

On broad grounds of public policy, we believe that private citizens and organizations should approach unofficial definitions of subversion with the greatest caution. This is not merely because the task is difficult, as the Congress has found it to be on the official plane. If private organizations and associations should produce their own definitions of "subversion" and should act toward their fellow citizens on the basis of such private definitions rather than of those furnished by duly constituted authority, the mutual confidence and trust which are the cement of our democratic society would rapidly crumble away. The presumption of innocence is more than a luxury to be enjoyed in settled times; it is a vital element in a society of free men who work together by consent and not by force. Under the American system, tyranny in government can be struck down at the ballot box, but it is far more difficult to hold private organiza-

tions to proper standards if these organizations intrude upon security activities which are at the heart of the governmental function.

A private citizen or organization can properly look to government for guidance in matters affecting loyalty and subversion. When one turns to public laws and to official declarations of public policy for a definition of the term subversive, one finds a lack of precision which itself may reflect differences about what constitutes wise policy in this field as well as possible concern about the impact of applicable constitutional provisions. For such constitutional provisions as those concerning treason, bills of attainder, free speech, free press and due process of law enjoin caution upon government lest the voice of the opposition be silenced by public authority and fair differences of opinion lead to the persecution of those with whom we do not agree.

We attempt to set standards for our activities and appropriations which go far beyond any definition of subversion. We believe objective scholarship to be inconsistent with attitudes predetermined by a totalitarian ideology or with conclusions which are reached to conform to a dictated pattern. The search for the highest quality, for scholars and scientists of complete integrity, for men and women of fine character and acknowledged capacity for leadership necessarily means that questions of loyalty arise only in the rarest instances.

But we have always kept in mind the importance of the nonconformist in the advancement of human thought. This is not Communism — it is the antithesis of Communism, which regiments its followers and tolerates no dissent from the dogma of the Kremlin. Mistakes can and will be made and private organizations can not guarantee a perfect record, any more than can an intelligence agency of government itself. So long as there is alertness to the dangers involved, and reasonable effort to avoid them, we believe that the public interest will be adequately protected. It

would be gravely injurious to the public interest if fear should lead to such restrictive procedures as to impair seriously the work of the foundations at the frontiers of human knowledge.

We expect government, acting under the law and the Constitution, to identify what is "subversive." We expect that the standard of conduct thus defined will be applied by due process. We believe that private citizens and organizations are entitled to rely upon a man's reputation among his fellows for character, honesty, loyalty, and good citizenship, and that private citizens and organizations should not enter upon certain of the techniques of investigation appropriate only to government. We recognize that this is a field of infinite complexity and are prepared to cooperate in any reasonable way to take account of dangers from any source.

THE FOUNDATION'S INTERNATIONAL INTERESTS

The international character of the Foundation's work has been one of its major characteristics. Whether in medicine and public health, natural sciences, agriculture, social studies, or the humanities, the Foundation has sought the most fertile ideas, the most urgent needs, the most capable men, and the most promising institutions wherever they could be found. There are a number of considerations which support this attitude.

First, Mr. Rockefeller's philanthropic interest was world-wide in scope, and was rooted in the sympathetic concern which Americans have shown throughout our history for the needs of people in other lands.

Second, an attack upon certain types of problems, such as yellow fever, malaria, or wheat stem rust, compels a pursuit of the problem across national boundaries.

Third, the general body of knowledge, scientific or otherwise, is an international heritage and grows through the labor of scientists and scholars in many centers of learning, in many laboratories, in many countries. The most cursory

glance at the list of Nobel Prize winners and the most elementary understanding of the history of our culture make it clear that this is so.

Fourth, any philanthropy which is committed to an interest in the well-being of mankind throughout the world can not reasonably ignore the vast problems which are comprised in the term "international relations." If this was true in earlier decades, it is underscored with fateful emphasis by the statement of the American Secretary of State at the 1953 meeting of the General Assembly of the United Nations that "Physical scientists have now found means which, if they are developed, can wipe life off the surface of this planet."¹

We accept as an established fact that the United States is involved in international affairs and that this involvement produces an impact upon every home and every citizen. It is as much a part of the environment in which we live as is the air we breathe.

This recognition does not mean that The Rockefeller Foundation has any formula of its own as to just how the problems of international relations should be resolved. We have no corporate position on such questions as World Government, Atlantic Union, the role of the United Nations, international trade policies, regulation of armaments, security alliances, and so forth. We believe that problems of relations among peoples and governments are proper subjects of examination and study, that knowledge about them is to be preferred to ignorance, and that reliable information will put men into position to make wiser decisions.

In the field of international relations, the Foundation has pioneered in what has come to be called technical assistance, primarily in such fields as medicine, public health, and agriculture. In addition, it has provided support for studies or for creative work in such fields as international

¹ *The Dept. of State Bulletin*, Vol. XXIX, No. 744, Publication 5196 (Washington, D. C.: U.S. Govt. Printing Office, Sept. 28, 1953), p. 404.

economics, international law, comparative government, history, creative arts and the so-called "area studies," i.e., studies which cut across cultural boundaries and establish a bridge of information and understanding despite differences in language, race, creed, or cultural tradition.

We have attempted to be helpful and cooperative in our attitude toward existing machinery of international cooperation, whether the League of Nations, the United Nations, the World Health Organization, the Food and Agriculture Organization, etc. Where an international body is undertaking work in which the Foundation has an interest, an occasional grant has been made by the Foundation to support such work. On other occasions officers and staff of the Foundation have been loaned to international organizations for particular jobs, as in the field of medicine and public health. In working with international organizations, or with foreign governments, the Foundation does not enter into the political discussions and decisions which might be made by those bodies. Our collaboration rests upon a joint interest in activities appropriate to philanthropy.

PART TWO

"... the well-being of mankind throughout the world."

SUMMARY OF APPROPRIATIONS — 1953

The Rockefeller Foundation appropriated \$16,771,582 during 1953. Of this amount \$3,819,585 went to the support of work in Medicine and Public Health; \$5,428,832 to Natural Sciences and Agriculture; \$3,597,285 to Social Sciences; \$1,763,490 to Humanities; and \$151,500 to proposals which were not readily classified under the above headings. In addition, \$2,010,890 was appropriated for administration and the support of the Foundation's field offices.

The unallocated capital funds of the Foundation had a market value of \$318,228,633 as of December 31, 1953.

A financial statement for the year 1953 appears on pages 325-428 of the Annual Report. Descriptions of grants are to be found in the sections of the Annual Report devoted to the work of the several divisions.

COMMENTS ON A FOUNDATION PROGRAM

One of the purposes to be served by the publications of The Rockefeller Foundation is to make known the main lines of its interests and the considerations which lead the Foundation in some directions and not in others. More often than not, applicants for grants from The Rockefeller Foundation receive the disappointing answer that their proposals must be declined as lying outside its program. Undoubtedly many applications never reach the Foundation because such an answer is reasonably predictable from a reading of its published reports. But what is a "program?" Why is it necessary for an endowed foundation with broad freedom of action to

limit voluntarily the scope of its interests? Is there not some contradiction between a program and the flexibility which characterizes such funds?

A moment's reflection will show that a foundation established to promote the well-being of mankind throughout the world must make choices, for the simple reason that its resources are limited and man's needs are infinitely vast. Further, many undertakings require concentrated and persistent effort if significant results are to be achieved, and such concentration prohibits the dispersion of limited financial and human resources over a wide range of miscellaneous activity.

The determination of the main lines of interest of a general purpose foundation is the principal burden of its trusteeship. The process follows no simple rule of thumb; although experience develops lessons and maxims which carry weight, even these need continuous review. Program evolves against a background of complex and sometimes contradictory factors; judgments as to the most urgent needs and the practical possibilities of advancing upon them; the appraisal of the real capacity of the available funds; the need for sustained effort; the need for adjustment to change; the strengthening of established ideas and institutions; the exploration of new ideas; the need to extend basic knowledge; the need to make existing knowledge more generally available; the existence of trained leadership in a particular field; to name a few. It should cause no surprise that the trustees and officers of the many philanthropic funds find a wide variety of answers; indeed, their freedom to choose is a guaranty of the diversity of approach and technique which enriches a free society.

The Rockefeller Foundation has never attempted to locate the boundaries of the key phrase in its charter purpose — the well-being of mankind. The attempt would appear presumptuous and, in any event, would have little value in giving direction to the Foundation's work. The central ques-

tion is not what would or would not contribute in some way to man's well-being, but which of many worth-while possibilities should claim the Foundation's attention. As a practical matter, choices have to be made, and the fabric woven of these choices is what is known as program.

CHANGING CONDITIONS AND CHANGING PROGRAM

A foundation program necessarily responds to changes in the contemporary scene. The wisdom of the founder in conferring a maximum of freedom upon the Trustees of The Rockefeller Foundation is confirmed by a backward glance over the turbulent events of the four decades of its corporate life. The years since 1913 have been disturbed by two world wars and several lesser conflicts, by violent and non-violent revolution, by inflations and depressions, and by breathtaking scientific and technical development. Surely it is not historical myopia to suppose that these have been decades of unusually significant change in patterns of life and habits of thinking in every continent.

For the Foundation, as for everyone else, these great events have produced uncertainty and a need for readjustment. Undertakings of promise have been engulfed, scientists and scholars have been diverted or driven from their tasks, laboratories and libraries destroyed. As Raymond B. Fosdick put it, the Foundation "has carried on its work under a leaking roof, and in retrospect much of its activity seems to have been a patch-and-repair job." But the period also challenged private philanthropy with exceptional opportunity; the times demanded the utmost of man's intellectual and moral resources and men responded brilliantly, if unevenly, in pushing back the frontiers of knowledge. To build is usually more difficult than to tear down, whether the structure is a growing science, a viable economy, a stable peace, free institutions, or deeper understanding among peoples of different cultures. A foundation is fortunate in its freedom to consult man's hopes

for the future rather than his disappointments of the past; and to bring to the task of building what Wallace Buttrick called "tenacity of patience and purpose."

Even in the brief period since the close of World War II, larger events have affected the activities of The Rockefeller Foundation in important ways. Because of rifts among the victorious powers, hopes for an enduring peace were being discounted even before the fighting had stopped. The rifts have now widened and deepened into cold war, with nuclear conflict as a terrible danger in the background. The resultant tension threatens to distort the entire spectrum of human life; divisive influences are accentuated by fear; and attention is diverted from the underlying common interests upon which peace might rest. Resources and energies desperately needed for the enrichment of human life are sacrificed to the harsh necessities of security.

The Rockefeller Foundation, a nonpolitical and non-governmental philanthropy, has not presumed to propose a formula for peace. It believes, however, that scholarship can make an important contribution through the dispassionate examination of ideas and problems involved in international relations. It believes, further, that "the infinity of threads that bind peace together" must include many of a private character, strengthening and deepening knowledge and understanding across national and cultural boundaries. For its part, the Foundation continues substantial support for inter-cultural studies on a broad basis and for scientific and scholarly exchange.

Further, it is evident that the totalitarian challenge to personal liberty and intellectual freedom survived World War II in virulent form. Thoughtful men have searched for centuries for an acceptable balance between freedom and authority, but each generation is compelled to find, often through struggle, its own approximate answer. Now, more than ever, the processes of freedom need perceptive examination by competent scholars, both as to the intellectual and

moral concepts in which they are rooted and as to the practical arrangements by which liberty is to be maintained. Such an examination must of necessity enlist the aid of legal, political and moral philosophy, for the increased support of which the Foundation is seeking appropriate opportunity.

Again, a foundation whose activity is not limited to a single country is affected by the appearance, since World War II, of a considerable number of newly independent nations as full members of the world community. Freed now from supervision by others and with full responsibility for their own affairs, these nations face the task of erecting, as promptly as possible, viable political and economic systems of their own. Though such generalizations are hazardous, these new states are burdened with low living standards, rapidly increasing populations, and resources too limited to assure rapid and substantial improvement in real per capita income. They lack sufficient numbers of trained personnel in almost every field, nor do they have the educational facilities to meet their scholarly, scientific, and technical requirements. They themselves now have not only the problem of interpreting their rich cultures to others, but also that of increasing their own understanding of other lands and peoples. In such situations there are challenging opportunities for private philanthropy. The Rockefeller Foundation, which has worked in most of these countries for many years on a cordial and disinterested basis, is considering carefully what its present contribution can be.

If changes in the world scene such as these affect the program of the Foundation, so does the impressive increase in funds which have recently become available from other sources for the type of work in which the Foundation has long been active. National governments and international and regional organizations now devote substantial resources to public health, scientific and cultural exchange, technical assistance, scientific research, demonstration projects, education, and a wide range of similar activity. Business corpora-

tions are spending large sums for research in connection with their own enterprises and are increasing their contributions to educational and research institutions on a broadening basis. American universities are establishing cooperative relations with universities abroad, with mutual benefit. Finally, many new foundations have recently appeared in the United States in response to public policies and tax laws which encourage their formation, and some of them have substantial resources.

These developments create no problem of "competition" among those who have philanthropic funds in charge, for needs and opportunities leave room for all. It is but natural, however, that a particular foundation will wish to use its funds to the best advantage in relation to its charter purpose; to do so it must be attentive to what others are doing. The situation emphasizes anew the peculiar advantages of a private foundation: its flexibility, its capacity to make commitments over considerable periods of time, its comparative freedom from political complications, and its ability to support the search for knowledge without undue regard to short-term practical results.

In later sections of this review are to be found brief discussions of some of the principal centers of interest of The Rockefeller Foundation in 1953. For reasons already suggested, its program is not static but in motion, with trailing as well as leading edges. For example, The Rockefeller Foundation is now inclined to leave to other agencies the conduct of field operations in public health. Public health techniques have become widely familiar; other and much larger resources are being committed by governments and international organizations. The Foundation has, therefore, largely concluded its own role in such operations. But adequate medical and public health services require highly trained personnel — doctors, nurses, engineers, administrators. Rapidly increasing demands for improved health care and the growing complexity of the health sciences themselves create major prob-

lems in medical education. The need for larger resources and better facilities for the advanced training of medical personnel is general, but it is especially marked in the less highly developed countries where an effort is being made to move into what is for many of them a new era in health standards. The Foundation, meanwhile, continues to pursue its virus research program, both in its own laboratory and field stations and through grants to support significant research elsewhere. The first instance — public health operations — reflects a withdrawal of Foundation support; the second — professional medical education — some intensification of interest; and the third — virus research — continued persistence in an endeavor in which many years and substantial sums have been invested.

As adjustments in its program go forward, the Foundation recognizes a responsibility to consider carefully the effects of changes upon the educational and research institutions and the fields of investigation involved. Even though its own role may be small in relation to a large field, a foundation can create a certain amount of confusion if it moves fitfully from one task to another. The ability to persist is an important asset, but so is the ability to move in new directions. To balance these assets in the public interest is a matter of art and judgment, to which officers and Trustees give constant attention and upon which responsible outside advice is regularly sought.

FOUNDATION PROGRAM AND THE NEEDS OF HIGHER EDUCATION

A substantial portion (54 per cent) of the grants made by The Rockefeller Foundation in 1953, as in earlier years, went to institutions of higher education in the United States and abroad. This occurred despite the fact that the Foundation's charter does not direct it specifically to support education, as was the case with the General Education Board.

Indeed, the prior existence of the Board, also established and endowed by Mr. John D. Rockefeller, strongly suggested that "the well-being of mankind throughout the world" might lead the Foundation outside the field of education.

With a wide range of choices open to it, the Foundation has placed the larger part of its funds in the hands of colleges and universities. Why? The record suggests three principal reasons. First, the support of higher education in itself makes a powerful and attractive claim upon a foundation seeking to promote general well-being. Second, at an early stage the Trustees of the Foundation saw that its funds would be dissipated without enduring benefit if they were applied at the consumer level of human need, i.e., by trying to alleviate distress through relief to individuals or selected groups. The search for "root causes" and a concentration upon the extension of knowledge, activities with high intellectual, aesthetic, and moral value *per se*, also opened the possibility that limited funds might make a significant contribution to the welfare of mankind as a whole. But the extension of knowledge and its imaginative application to human affairs are among the great concerns of the colleges and universities. Third, major advances in human welfare, whether in health, food production, or intercultural understanding, require the leadership and insight of highly trained minds. The limiting factor in much of what is called technical assistance is the shortage of qualified personnel; the pace at which a particular effort can proceed is often determined by the time required for training. And, again, institutions of higher education are the training centers from which such leadership must come.

Hard-pressed college and university administrators are calling attention to trends in the financing of higher education which pose troublesome and complex problems for the campus, and which have caused The Rockefeller Foundation to give fresh attention to the relation between the grants it makes and the longer-range needs of the recipient institution. Though the Foundation and the campus have broad ob-

jectives in common and have benefited from several decades of fruitful collaboration, there is enough difference in their respective roles to give rise to a divergence of view on certain points of financial and administrative policy. A foundation may wish to stretch its limited funds as far as possible; a university gives high priority to basic and firm support for its central task of providing a well-balanced educational program of high quality for its students. A foundation may wish to give new ideas and new techniques a chance to make their way; the university will also be concerned with its ability to occupy and consolidate the frontier thus opened up. A foundation hopes that a college or university will fully explore other possible sources of support, but the campus feels that it would benefit from a measure of relief from the pressure of fund-raising. Most colleges and universities urgently need endowment and capital plant, a need accentuated by the larger enrollments on the near horizon; but large capital grants for more than a few institutions would be beyond the financial capabilities of a single fund.

These are among the many financial problems discussed in the Report of the Commission on Financing Higher Education,¹ which appeared in 1952 and to the preparation of which The Rockefeller Foundation contributed support. One of its accompanying volumes, *Financing Higher Education in the United States*,² contains more detailed discussion and much valuable information. The distinguished Commission called attention to the hazards of temporary financing and the educational losses which result from the lack of adequate long-range support, and made an eloquent plea for such support from all who can provide it.

There can be little doubt about the validity of the Commission's concern. The increasing reliance upon student fees, annual giving, governmental and corporation contracts, and

¹ Commission on Financing Higher Education, *Nature and Needs of Higher Education* (New York: Columbia University Press, 1952).

² John D. Millett, *Financing Higher Education in the United States*, staff report of the Commission on Financing Higher Education (New York: Columbia University Press, 1952).

short-term foundation projects limits the ability to plan an orderly development over a period of years and to draw to the campus a body of scholars and teachers who can be assured the status and funds they need. Anyone who is in frequent contact with the campus will understand why presidents warn of "projectitis," will confirm the fact that scientists and scholars in charge of departments or laboratories are too often required to take time from their professional work to maintain the flow of short-term support, and will know that tenure in faculty appointments is frequently withheld because an institution can not risk a long-term commitment for work being supported by short-term contracts or projects. And in the background is the danger that the educational and research program of a particular campus will come to reflect not the considered best judgment of its own trustees and educational leadership, but an accidental constellation of activities resulting from short-term earmarked support from a wide variety of sources.

The Rockefeller Foundation has been considering ways and means of reducing the impact of such problems, insofar as its own grants are concerned. Thus far, it has taken modest steps in two directions. First, it has extended the time period and the amounts of grants to a few activities to which it had previously made short-term appropriations. These grants provide more freedom and stability for the recipient and, incidentally, effect a saving to the Foundation in time and administration.

More importantly, the Foundation has experimented with grants in the middle range between projects and endowment in a number of cases where the work is closely related to the Foundation's program, where considerable development was in process on the basis of short-term contract or project support, and where there was an urgent need for some type of stabilization. In these cases, the Foundation provided funds to be available over a long period which could be used or conserved depending upon the regularity

of short-term support, and which would permit those in charge to plan more freely and to make commitments to personnel on an assured basis. Such a grant was made in 1952 to the Massachusetts Institute of Technology for research in biology and was discussed in the Foundation's Annual Report for that year. In 1953 other grants of the same general type, with slight variations, were made to the California Institute of Technology for chemical biology, Cornell University for biochemistry, Stanford University for biology, the University of Wisconsin for biochemistry, and Stanford University for the Food Research Institute, among others. Details of each grant will be found in the accompanying Annual Report.

While the Foundation continues to examine the nature of its grants in relation to the needs of the campus for stable funds, it continues to believe that there is a place for relatively small, short-term appropriations. This is particularly true where the emphasis is upon the professional advancement of an individual scholar or scientist, where a new idea or new technique is being tried out, or where the small increment from the Foundation makes up the difference between the need and other available resources. The matching grant, as well, retains its usefulness, for it brings to the support of higher education funds which might not otherwise come to its assistance and makes it possible for the Foundation to assist where the entire need would be beyond its reach. The remarkable growth of our colleges and universities and their multiple legitimate needs make it clear that financial support must come from the widest variety of sources which, taken together, must make it possible for these institutions to preserve, enrich, and transmit our intellectual and cultural heritage. As the Commission on Financing Higher Education put it:

The connection between institutional finance and educational purpose is so close that the variety of institutional types will be reflected in the variety of their methods

of finance. Out of this variety comes the flexibility, the freedom, and the originality which have contributed to the unique achievements of American colleges and universities. If the quality of higher education is to be maintained, many sources must continue to supply its funds. The need for more money must not jeopardize that quality. It will do so unless a large-scale effort can raise more money from many contributors. The solution of the financial problem by such an effort is not the easy one. But it is the right one.¹

INTERDISCIPLINARY PROBLEMS

The four Divisions of The Rockefeller Foundation, i.e., Medicine and Public Health, Natural Sciences and Agriculture, Social Sciences, and Humanities, reflect a familiar grouping of certain scientific and scholarly disciplines. Although Foundation grants and activities are ordinarily reported under divisional headings in the Annual Report, the boundaries between divisions and disciplines are only approximate, marked not by fences but by interlocking relationships.

In the concluding section of this brief review, attention is drawn to the major centers of Foundation interest and activity in 1953. It will be apparent that each of these involves several disciplines and, in most cases, more than one of the Foundation's Divisions. The individual research scholar knows that to advance in his own field he often needs the help of others, and that his own fresh discoveries may have important effects outside his own discipline, sometimes in unexpected ways. The stubborn refusal of intellectual or human problems to fit snugly into watertight compartments can be illustrated in many ways. Advances in biology and medicine open the way for improved public health and falling death rates; these in turn frequently mean rising popula-

¹ *Nature and Needs of Higher Education*, pp. 185-186.

tions and, in some places, pressures on available foodstuffs and raw materials; they may also mean political conflict arising from the gap between enlarged demand and limited supply. The effort to improve the health, the education, or the economy of a community or region often demonstrates how the three are inseparably linked and move together. What began as a brilliant intellectual expedition into nuclear physics opened up new horizons in medicine, gave new research tools to almost every scientific discipline, introduced a new source of harnessed power, and confronted man with weapons of mass destruction. There is almost no phase of human life now untouched by $E = mc^2$.

If specialization and division of labor are no less essential and productive in the intellectual field than in business or government, there goes with them the need to surmount any artificial barriers thereby erected and to keep in view the whole made up of inseparable parts. The need is particularly important for an institution like a foundation, which attempts to relate advancing knowledge to human well-being.

The Rockefeller Foundation is giving increased attention to the mutual support which various aspects of its program can render to each other. Medical education in an underdeveloped area is related to population studies and to attempts to find a basis for increased food production. Fundamental research on important food crops such as wheat and corn is part of a broader effort which includes increased support for the examination of the potential resources of the sea, of the use of microorganisms for food, and of the mysteries of photosynthesis. The attack of the natural scientists upon the food problem is accompanied by a continued interest in economics, and particularly agricultural economics.

It seems unlikely that the investigation of a complex of questions will show a uniform advance across a broad front. Significant gains will turn upon fresh insight at particular points, upon success in following up promising leads, and upon the capacity of individuals or institutions to open up

new horizons. Here, Foundation funds are a flexible and strategic reserve, to be employed in support of a breakthrough for the benefit of the total effort.

In some fields, fruitful collaboration among disciplines is far advanced, as that among the biologist, the chemist, and the physicist in investigating the life processes. In others, such as the study of international relations, scholars are searching for an effective way to relate the many separate disciplines whose contributions are needed by the central core of international politics. Whatever the field, the Foundation believes that the main impetus toward collaboration must come from scholars who are driven to it by their own necessities rather than from the artificial stimulus of grants made on the thesis that all interdisciplinary effort is worthwhile. Both in its own arrangements and activities and in the grants it makes, the Foundation will try to be alert to opportunities for focusing a variety of points of view and specialties upon major problems. It has no single formula for doing so and does not expect to find one where experimentation and continuing adjustment are indicated. Specifically, it does not take a theoretical position on the utility of group research as contrasted with the single scholar. Each has its value and the technique is best determined by the scholars themselves.

OUT-OF-PROGRAM GRANTS

General remarks about program must include a reference to the occasional out-of-program grant. While the Trustees of The Rockefeller Foundation have recognized the necessity for selecting fields of general interest, they have always been willing to consider unusual items which lie beyond the current program. Otherwise, the vital asset of flexibility would be voluntarily surrendered. On occasion, therefore, the Trustees have made grants when a unique and highly promising proposal is involved, when there is little likelihood

of support from other sources, and when a basic contribution to knowledge of far-reaching importance, or some equally compelling factor, may be involved.

CENTERS OF FOUNDATION INTEREST IN 1953

The activities and grants of The Rockefeller Foundation are described in detail in the Annual Report which follows immediately. They group themselves about easily discernible centers of interest, briefly identified in the following summary:

Professional Medical Education

Continuing interest in the improvement of medical education carries forward a part of the Foundation's program to which it has committed substantial resources over a period of four decades. Grants are made in this field in the United States and Western Europe, but total grants for 1953 reflect a marked emphasis upon improved medical training in the underdeveloped countries. This special attention to such countries recognizes the serious shortages in trained personnel which now limit their capacity to improve rapidly their health and medical services, and their need, in the long run, to have strong institutions and faculties to meet their large training requirement. During the year, Dr. M. C. Balfour was posted to New Delhi and Dr. Robert B. Watson to Rio de Janeiro with broad responsibilities for keeping in touch with developments in medical education in South Asia and Latin America, respectively. With Trustee appropriations liberally supplemented by grant-in-aid and fellowship funds, the program in medical education in 1953 involved more than 18 countries in Latin America, the Middle East, Africa, South and Southeast Asia, and the Pacific.

Virus Research

The Foundation considers that its primary contribution to the investigation of specific diseases is its virus research

program, carried on by its own professional staff under the scientific direction of Dr. Max Theiler, director of its New York laboratory and Nobel laureate of 1951. The work of the laboratory is complemented and strengthened by that of field stations abroad, which reached four in number by the end of 1953. These included two additions: one established in Port of Spain, Trinidad, in cooperation with the Government of Trinidad and the Colonial Medical Research Service, and under the direction of Dr. Wilber G. Downs; the other located in Johannesburg, Union of South Africa, in cooperation with the South African Institute of Medical Research, and under the direction of Dr. Kenneth C. Smithburn.

An extensive account of the virus program is to be found at pages 104-131 below. Under intensive investigation are a group of lesser-known arthropod-borne viruses which have not yet, so far as is now known, made severely damaging attacks upon the human race. It is known, however, that man is subject to infection by these viruses, and it is suspected that changes in the genetic or environmental situation might expose man to serious attack from this quarter. Apart from a prudential interest in knowing a great deal more about these viruses and their potentialities, the virus program offers an opportunity to develop techniques of virus research of promising utility to virologists in general. An example of the latter is the adaptation of the hemagglutination-inhibition test, referred to in the portion of the Annual Report cited above, which reduces from two or three weeks to less than one day the time required to determine the presence in blood samples of antibodies to the viruses.

Medical Care

The past two decades have seen a remarkable growth in the demand for organizational and financial arrangements within which adequate medical service can be furnished to

all major segments of the population. In the United States, where there is a traditional misgiving about vastly increased governmental responsibility in such matters, there has been a rapid development of medical and hospital insurance, industrial and union medical programs, prepayment plans, clinic and group practice, as well as significant increases in the roles of local, state, and federal governments. Where large resources are being committed to a great variety of arrangements looking toward improved medical care, the Foundation believes that its own limited funds can be used to best advantage in supporting well-selected studies aimed at developing information and ideas of general usefulness. Thus, grants were made during 1953 to the American Psychiatric Association for the establishment of a permanent consultation service in mental hospital architecture, in co-operation with the American Institute of Architects; to the University of North Carolina for a survey of general medical practice in that state, specifically to throw light upon the training of doctors for family practice in rural areas; to the Commission on Chronic Illness, for a Conference on Care of the Long-Term Patient. Similarly, a grant was made toward a new Center of Public Health in Soissons, France, where the French Ministry of Public Health and Population is seeking to demonstrate an efficient medical care operation applicable to the country as a whole. The possibility of Foundation support turns upon the promise of general benefit from the information or experience for which funds are requested; its limited funds can not be used for improving services on a local or community basis.

Human Behavior

Although the term Human Behavior encompasses a wide range of disciplines and interests, grants made by the Foundation in 1953 have concentrated on two approaches to the field. The first is represented by a number of grants recommended by the Division of Medicine and Public

Health looking toward the further elucidation of the relation between physiological factors and behavior.¹ These grants are based upon the expectation that the biochemist, physiologist, neurologist, endocrinologist, geneticist, and their colleagues in closely related fields can throw important light upon behavior, whether or not they are able to tell the whole story. The second approach is indicated by grants to support the work of psychologists, sociologists, and anthropologists in the examination of groups, and behavior as it is manifested in and influenced by group situations.²

Agricultural Program

In essence, the Foundation's agricultural program assists the exploration of the potentialities of basic food production for the world's rapidly growing population. It includes an active program of research, training, and demonstration by members of its own professional staff, working primarily in collaboration with the Governments of Mexico, Colombia, and Central America. In addition, grants are made to support significant research in other institutions. At present, attention is being given to the means by which gains in basic knowledge and new techniques may be made more generally available; these include the training of agricultural scientists in the Foundation's own program, fellowship opportunities for selected candidates for advanced study, visits by Foundation staff to consult on agricultural research problems in other countries, prompt publication of the results of its own research, and cooperation with such agencies as the Corn Germ Plasm Bank sponsored by the National Research Council, the Central American Cooperative Corn Improvement Project, the International Cooperative Wheat Rust Nurseries, the Late Blight Committee of the American Potato Association, and the Barley Improvement Program of the Department of Agriculture.

¹ See under heading "Development of the Health Sciences," page 133, below.

² See under heading "Human Behavior and Interpersonal and Intergroup Relations," page 248, below.

Typical of Foundation interest in the increase in productivity of conventional agriculture were grants made in 1953 to the University of Minnesota for a study of the pathogens of wheat; to Cornell University for a study of maximum yields of food crops; to the Institute of Agronomy, Campinas, Brazil, for research in microclimatology; and to the California Institute of Technology for the study of the water relations of plants.

The Foundation is also alert to promising possibilities for adding to man's food supply through means not ordinarily included within the scope of conventional agriculture. Examples of such grants are those to the Tokugawa Institute for Biological Research in Japan for experimentation in the mass cultivation of microorganisms, to the Scripps Institution of Oceanography and to the University of Miami for research in marine resources, and to the University of Uppsala and the University of Paris for research in photosynthesis. Assistance in the reconnaissance of less conventional opportunities was given through the grant made in 1953 to The Conservation Foundation toward its studies in the utilization of natural resources.

Basic Research in the Life Sciences

The Rockefeller Foundation recognizes that major advances in the application of knowledge to such human needs as health and food require a strong base of fundamental research in the life sciences, and that support for the latter should not be contingent upon guarantees of immediately practical results. On pages 155-197 of the Annual Report are described a rich variety of grants in 1953 made as investments in this all-important "intellectual capital"; these include support for work in genetics, on the processes of growth and metabolism, on molecular structures, in biochemistry, and in micro- and radiobiology, among others. The international community of basic scientific research is well illustrated by the fact that such grants were made in the

United States, Canada, the United Kingdom, France, the Netherlands, Sweden, Brazil, and Chile. A special problem posed for the Foundation is to determine what its own role should be in relation to the substantial sums being made available from other sources for this type of research. By and large, the more fundamental the research, the less likelihood there is of support from governmental or corporate funds; the Foundation finds its own best role in the encouragement of research at the outer edges of man's intellectual horizon.

Population Studies

A great deal of the Foundation's work has a direct bearing upon the complex of problems frequently discussed under the general heading of Population. Obviously, the improvement of health is directly involved — as is an increase in food production. Although there is a narrow sense in which demography might be thought of as a discrete scientific and scholarly discipline, changes in human population and the effect of such changes upon man's adjustment to his natural environment and upon his social and political arrangements ramify into almost every important field of investigation. In this broader sense, a concern about population gives a vantage point from which to look at many old problems from a different point of view in the hope that new relationships can be discerned, new insights obtained, and fruitful collaboration begun among some who have worked independently of each other. Such a vantage point gives useful notice that success at one point (public health) might create very severe problems at another (food), and that some of these problems can be anticipated and taken into account.

During 1953 grants were made to the School of Public Health of Harvard University, in association with the Christian Medical College of Ludhiana, Punjab State, and the Government of India, for studies in population dynamics in Indian villages; and to Princeton University for its Office of Population Research. In addition, several closely

related grants were made, such as those to Stanford University for its Food Research Institute and to The Conservation Foundation, already mentioned.

The Functioning of Free Societies

Since the early 1930's the Foundation has provided financial support to studies in politics and economics which throw light upon the functioning of free institutions. In 1953 the larger number of these grants went toward studies of the economies of the United States and Western Europe (see pages 233-245, below). It has been said that important new tools have been furnished to the American economy during the past two decades — improved statistical services, more detailed facts about the operation of the economy, and more precise techniques of analysis which make it possible for both private enterprise and government to take timely action to level off the peaks and valleys of the business cycle and to effect a greater stability than hitherto known. If this be true, it results from the meticulous and patient work of many research workers in colleges and universities, in independent research organizations, in business, trade unions, and government, who have constructed new tools of great power and utility. The Foundation's role has been that of a modest participant in a very large total effort, but it has no doubt about the value of the effort.

An understanding of free institutions is deepened by comparative studies of societies which seem to act upon different underlying assumptions — hence the grants in 1953 to the National Bureau of Economic Research for a study of Soviet economic growth and to the Institute for Political Science in Berlin for studies in the rise of National Socialism.

For reasons suggested earlier, the Foundation decided in 1953 to explore the possibilities of strengthening work in legal and political philosophy. In accordance with its usual practice, the Foundation sought the advice of leadership in the field as to what action might be helpful and what might

be merely confusing. The result has been the provision of modest funds for fellowships and grants to younger scholars who show both interest in and talent for theoretical and speculative pursuits, and the examination of other types of grants as opportunities arise. The very nature of the field imposes limits upon what can be done by an endowed fund, but there seems to be a consensus that a stand-by interest on the part of a foundation might serve a most useful purpose.

International Relations

The records of the Foundation show many grants aimed at the reduction of international tensions and the strengthening of the processes of international cooperation. A foundation chartered to promote the well-being of mankind throughout the world can not yield to the pessimism suggested by the past four decades of war and destruction; the search must continue for constructive steps to a more rational international life.

Research and scholarship have by no means exhausted their capacity to contribute to a resolution of the issues of war and peace. For example, the baffling complexity and disconcerting pace of major events on the current world scene underscore the need for more adequate intellectual tools if such events are to be understood or, even more important, brought under some control. There is need for modest grants toward the discussion of the theory (or theories) of international politics, toward the examination of the decision-making processes which operate among the principal powers, toward the analysis of the logical processes by which man can think of inseparable galaxies of issues made up of infinite variables. On such matters there is need for the intellectual discipline of the competent scholar associated with the experience of the trained practitioner in foreign affairs. Again, the scholar contributes substantially through a dispassionate examination of "middle-distance"

problems, including both those which are behind us and those which loom on the mid-horizon. In the one case, a careful study of an important recent experience can throw considerable light upon the nature of international politics; illustrative is the grant made in 1953 to the Fletcher School of Law and Diplomacy for a study of United States commercial policy during the period 1933-1954. In the other case, thoughtful analysis of emerging issues and situations can bring the tools of scholarship to bear before the stage of political crisis is reached and can provide background information for a more responsible and timely discussion of developing trends; illustrative here are the grants made in 1953 to the National Bureau of Economic Research for a study of Soviet economic growth, to the Council on Foreign Relations for a study of the sterling area, and to the University of Toronto for studies in problems of Canadian economic development. Much remains to be done in the improvement of techniques in technical assistance and in international administration. Similarly, there are unresolved questions about the proper scope and content of international relations as a college and university discipline. The above are merely indicative of lines which appear to need further exploration and do not imply that the scholar should divert himself from his study and teaching in order to "solve" current political issues in foreign affairs. Nor does the Foundation consider itself a tactical headquarters for the study of international relations; it welcomes the fact that there are wide diversities of approach and that funds are potentially available from many sources for opportunities of significant promise.

Intercultural Understanding

This interest might have been discussed under the heading of international relations. It is treated separately, however, in order to emphasize the importance of understanding across cultural frontiers quite apart from political

considerations. Here again, the Annual Report will show many activities and grants which contribute directly or indirectly to the objectives subsumed under the above heading, e.g., the large number of fellowships and travel grants in support of intellectual exchange. Specifically, the Foundation has been interested in the encouragement of (1) studies in the United States of the major cultural traditions elsewhere; (2) American studies in other countries; and (3) cross-cultural studies elsewhere, where the United States is not involved. Illustrative are 1953 grants to The Royal Institute of International Affairs, London, for studies on the Middle East, Southeast and East Asia, and the North Atlantic Community; to a cooperative program in American studies conducted by Kyoto University, Doshisha University, and the University of Illinois; to the University of Ankara for American studies; to Occidental College for Southwestern and Mexican studies; and a number of modest grants for Near Eastern, South Asian, and Far Eastern studies in the United States.

The Arts, Literature, History, and Philosophy

Potentially, one of the most important interests of the Foundation has to do with the intellectual, aesthetic, and moral values which give meaning to man's struggle with his natural environment and his efforts to work out tolerable relations with his fellows on the social and political plane. The richness of man's cultural heritage and the unlimited scope for creativeness make it difficult to define fields of interest in narrow terms. A perusal of the Annual Report will show some emphasis upon contemporary and world history and upon creative work in the arts and literature. This emphasis does not represent a rigid program, however, and opportunities are considered in the light of the flexibility which characterizes Foundation funds. Typical grants during 1953 were those made to The Royal Institute of International Affairs in further support of the work of

Professor and Mrs. Arnold Toynbee; to the Indian Council on World Affairs for a study in recent Indian history; to the State University of Iowa, the University of the South, and the Mexican-American Cultural Institute for creative writing and criticism; to the Louisville Philharmonic Society toward new works by living composers; to the City Center of Music and Drama, New York, for new opera and ballet productions; and to the University of Wisconsin for reviewing its program in community arts.

The Development of Individual Capacity

It would be difficult to exaggerate the importance which the Foundation attaches to the encouragement of individual talent, whether in science, scholarship, or the arts. In fact, success or failure in making effective moves under any parts of the Foundation's program turns upon the opening up of opportunity for men and women of capacity and character to accomplish what they might not otherwise be able to do. This concern for individuals is expressed in many ways — through fellowships awarded directly by the Foundation or with funds supplied to other institutions; in travel grants; in small research grants designed to encourage the maximum performance of the scientist or scholar; in funds to bring individuals of common interests into touch with each other; in funds to include a training feature in connection with major research institutions. In 1953, Foundation fellowships were held by 321 individuals from 43 different countries; these range from 33 awarded in Brazil, 32 in Japan, and 29 in India, to one each in Costa Rica, Egypt, Guatemala, Honduras, and Jamaica. In addition, 196 fellowships were awarded or administered during 1953 by other agencies with funds provided by The Rockefeller Foundation; these agencies include the National Research Council, the Social Science Research Council, the Canadian Social Science Research Council, the American Council of Learned Societies, the National Theater Conference, and the British Medical Research Council. A

careful reading of the Annual Report will show the variety of ways in which the Foundation has related individual training to all aspects of its program. In retrospect, few activities of the Foundation appear of more general and enduring value than the funds devoted to this purpose.

It may now be apparent why the headings used in the preceding discussion of Foundation activity in 1953 were referred to as centers of interest. They are not self-sufficient independent compartments, marked by divisional or disciplinary lines, but are closely intertwined in mutual support. It is also to be noted that the Foundation does not attempt to move evenly across a broad front; if its funds are to serve the function of a flexible and strategic reserve, they are best employed at what appear to be the most promising points for advance. Fortunately, there are many such funds and a wholesome variety of approach and judgment among those who have them in charge—a guarantee that the public interest will be effectively served in a manner peculiarly appropriate to a free society.

PART THREE

Organizational Information

MEETINGS

During 1953 regular meetings of The Rockefeller Foundation were held on April 1, and December 1 and 2. Six meetings of the Executive Committee were held in 1953 to take actions within general policies approved by the Trustees.

APPLICATIONS DECLINED DURING 1953

The Foundation, as may be expected, receives many more applications for aid than it can provide. Among the proposals which it finds necessary to decline are some concerned with projects within the Foundation's fields of interest but which do not meet the required standard of organization and personnel, or which appear less promising than others under consideration. By far the greater number of applications, however, are declined because they are outside the program upon which the Foundation is at present concentrating.

The Foundation does not make gifts or loans to individuals; finance patents or altruistic movements involving private profit; contribute to the building or maintenance of local hospitals, churches, schools, libraries, or welfare agencies; subsidize cures or inventions; or support campaigns to influence public opinion.

ORGANIZATION CHANGES

Three new Trustees were elected to the Board of Trustees of The Rockefeller Foundation at their meeting on April 1, 1953. Mr. John R. Kimberly, President of the Kimberly-Clark Corporation, was elected to fill the vacancy created by the resignation in January, 1953, of Mr. Robert T. Stevens when he became Secretary of the Army. Mr.

Kimberly was also elected to the Executive Committee of the Board. Mr. John J. McCloy, Chairman of the Board of the Chase National Bank, became a Trustee on April 1, 1953. He had served formerly as a Trustee from April, 1946, to June 11, 1949, when he resigned to accept an appointment as the United States High Commissioner for Germany. He was also elected to serve on the Finance Committee. Dr. Detlev W. Bronk replaces on the Board Mr. John Foster Dulles, who resigned in 1952 following his designation by President Eisenhower as Secretary of State. Dr. Bronk became President of The Rockefeller Institute for Medical Research on July 1, 1953.

Mr. Karl T. Compton retired on June 30, 1953, after having served with distinction for thirteen years as a Trustee of the Foundation. His death on June 22, 1954, was a profound loss to his many friends and to the world of scholarship and science.

The retirement of Mr. George J. Beal as Comptroller, after 36 years of service with the Foundation, occurred on June 30, 1953. Mr. H. Malcolm Gillette, formerly Assistant Comptroller, was elected to succeed him, and Mr. George E. Van Dyke of the staff of George Washington University was appointed Assistant Comptroller effective August 1, 1953.

With deep regret we report the death on November 26, 1953, of Edward Emerson, who had been Assistant Treasurer of the Foundation for more than ten years. The interim appointment of Miss Janet M. Paine as Assistant Treasurer was made at the meeting of the Trustees on December 2, 1953.¹

Two new members were appointed to the Board of Consultants for Medicine and Public Health: Dr. Herman E. Hilleboe, State Commissioner of Health for New York; and Dr. Robert A. Moore, Dean, Washington University School of Medicine.² They succeed Dr. Dean A. Clark and Dr. Hugh Morgan.

¹ Appointment terminated on May 15, 1954, when Mr. Robert Letort became Assistant Treasurer.

² Now Vice-Chancellor, Schools of Health Professions, University of Pittsburgh.

Dr. George C. Payne retired as Assistant Director of the Division of Medicine and Public Health on June 30, and Dr. Rolla B. Hill, a member of the Division's field staff, was appointed to succeed him. Members of the Division's field staff who retired during 1953 were Dr. George Bevier, Dr. John E. Elmendorf, Jr., Dr. John L. Hydrick, Dr. D. Bruce Wilson, and Dr. Richard M. Taylor. Dr. Robert H. Koker-
not became a temporary staff member of the Division in August, 1953.

In the Division of Natural Sciences and Agriculture, Mr. Gerard R. Pomerat, Assistant Director, was appointed Associate Director at the meeting of the Trustees on April 1, 1953. Professor E. C. Stakman of the University of Minnesota, a member of the Board of Consultants for Agriculture, was appointed a special consultant to the Division as of July 1, 1953, and at the same time terminated his service as a member of the Board of Consultants. Professor Richard Bradfield remained a member of the Board through March, 1953, and was later appointed a Special Temporary Scientific Aide to the Division. One new member was appointed to the staff of the Mexican Agricultural Program, Mr. Roderic E. Buller, as Assistant Animal Husbandryman. Mr. Neil Byron MacLellan and Mr. Lowell S. Gleason were appointed staff members in training for the Mexican Agricultural Program and designated as Field Photographer and Assistant Plant Physiologist, respectively. Mr. Donald L. Smith was appointed Assistant Geneticist on the staff of the Colombian Program.

Two consultants were added to the staff of the Division of Social Sciences during 1953. Mr. John B. Stewart of the faculty of Barnard College was appointed a consultant in the field of legal and political philosophy, and Mr. Kenneth W. Thompson of Northwestern University, consultant in international relations.

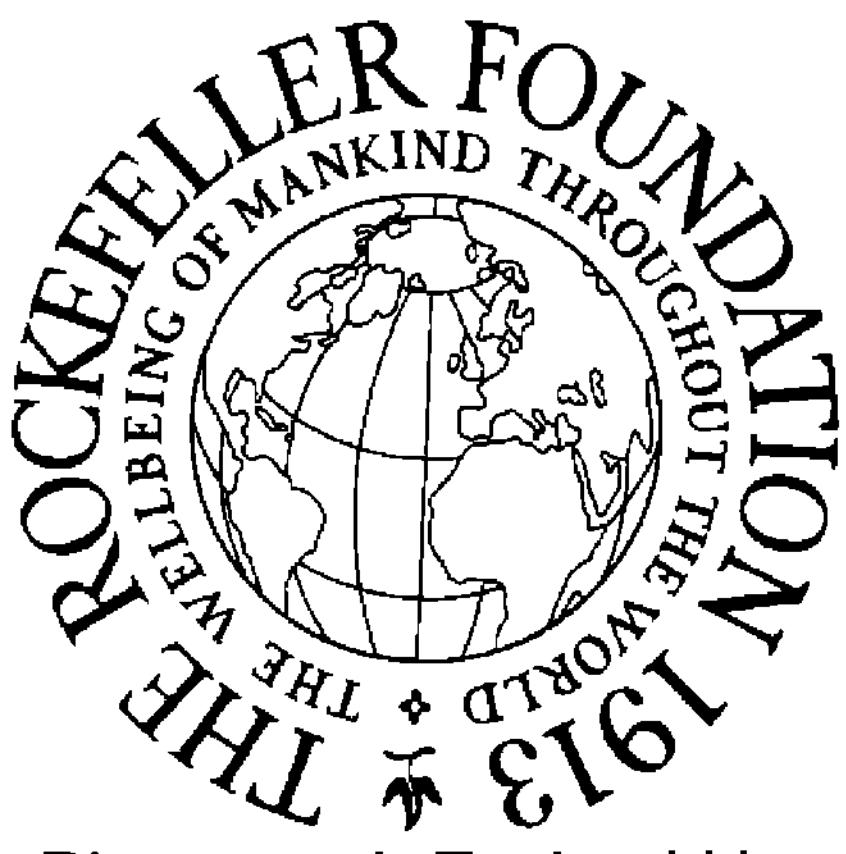
During 1953 Dr. Richard G. Hahn resigned from the field staff of the Division of Medicine and Public Health and

Mr. G. Mallory Boush from the field staff of the Division of Natural Sciences and Agriculture.

Mr. Henry B. van Wesep, who had served with the Foundation since 1916 as head of the Office of Publications, retired on October 1, 1953. He was succeeded by Mr. William C. Cobb, formerly of Houghton Mifflin Company, publishers. Mr. Floyd Lyle, head of the Travel and Fellowship Service since 1927, retired on May 31, 1953, and was succeeded by Mr. John H. Greenfieldt, formerly on the staff of Union Carbide and Carbon Corporation.

Illustrations

*Selected views of activities for which grants were
awarded in 1953*



Photograph Excised Here

The Louisville Orchestra: Recording "A Parable of Death" by Lukas Foss.



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Photograph Excised Here

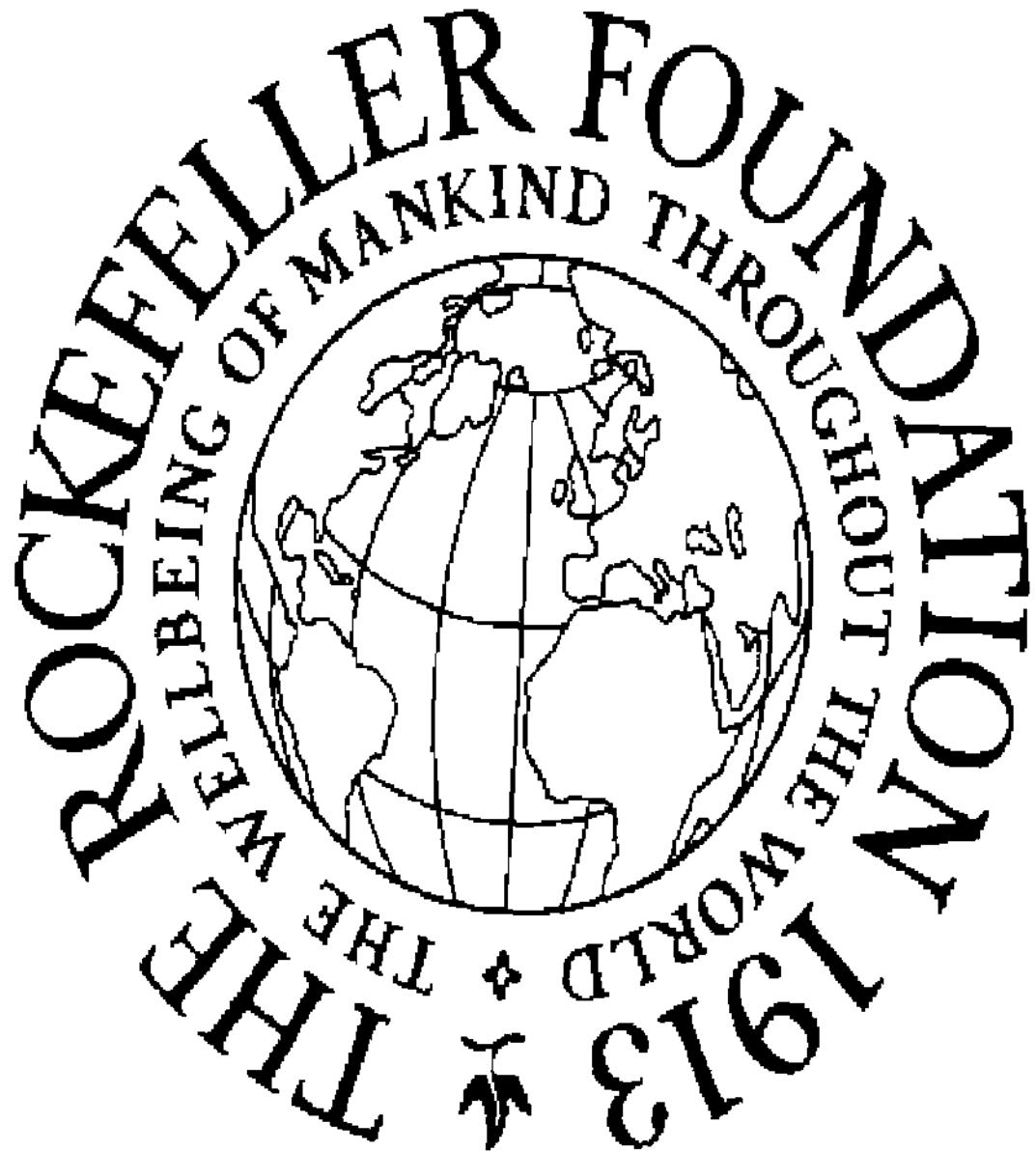
Soissons Public Health Center, France:
Home care in a Soissons worker's family.

Division of Health Affairs, University of North Carolina:
An observer accompanying a general practitioner on one of his calls.



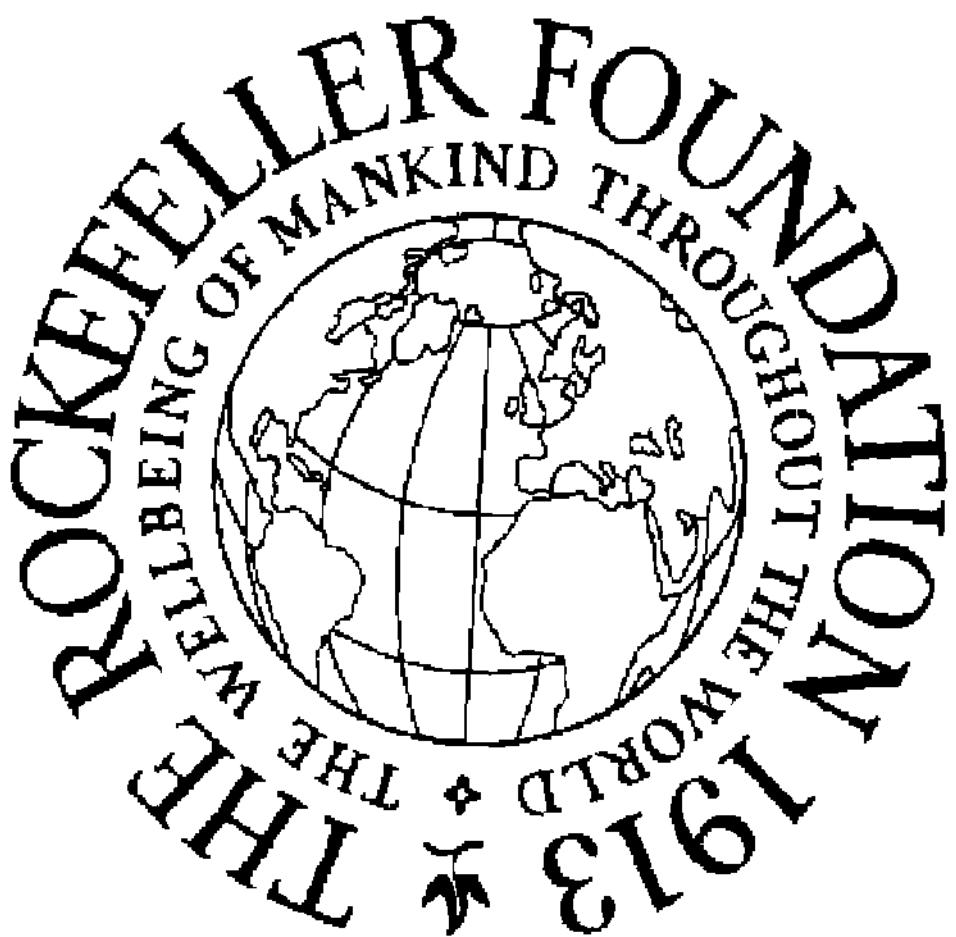
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Marine Laboratory, University of Miami, Florida:
Attaching the "mousetrap," a device for simultaneously recording depth below the surface and horizontal distance traveled.



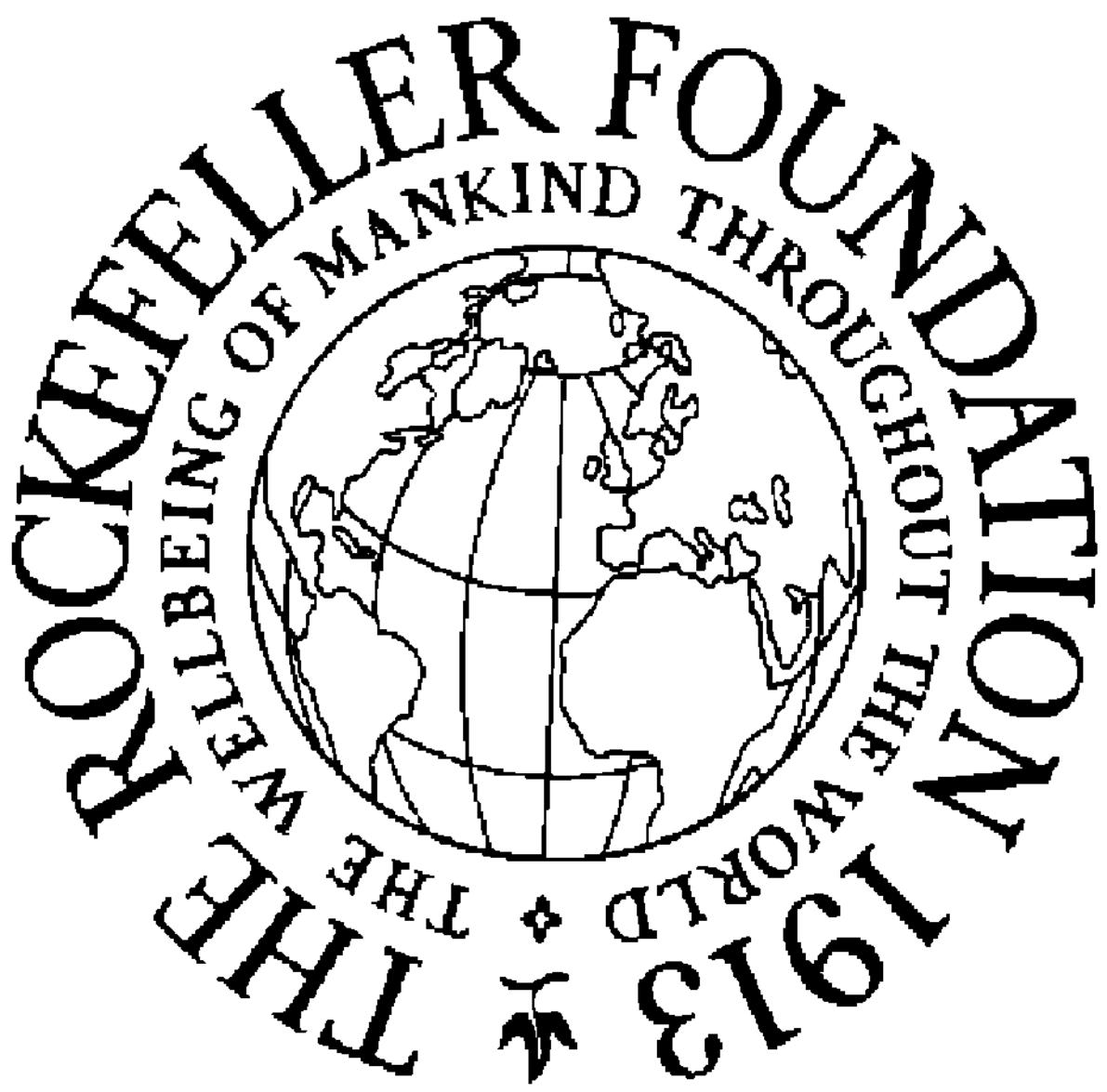
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*Departments of Plant Pathology and Botany and of Agronomy
and Plant Genetics, University of Minnesota; Dr. W. M. Myers
(left) and Dr. J. J. Christensen studying the reaction of some of
the newer varieties of wheat to physiologic races of stem rust.*



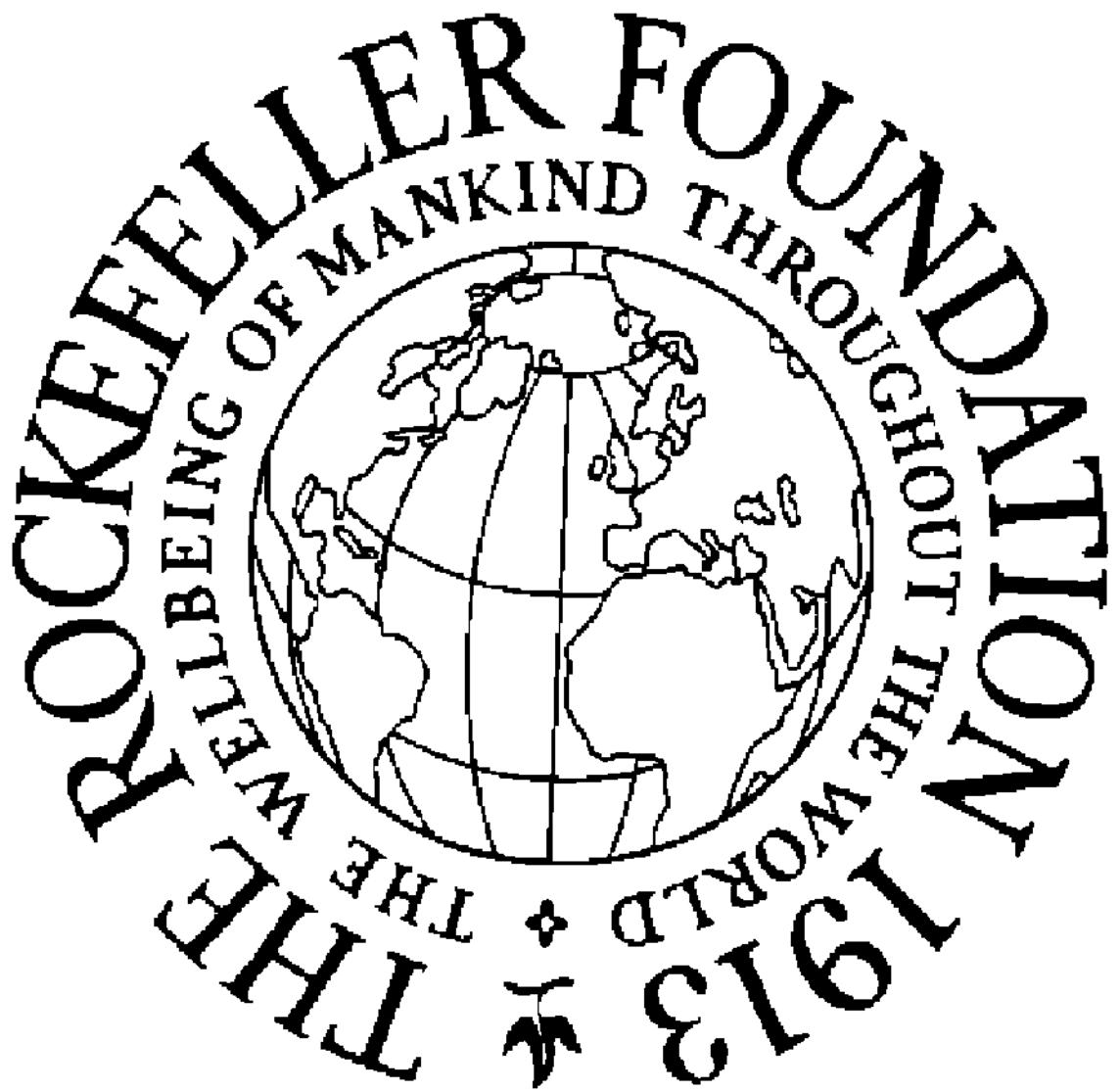
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Christian Medical College, Vellore, India: A class in histopathology.



Photograph Excised Here

University of Helsinki, Finland: A histological lecture room.



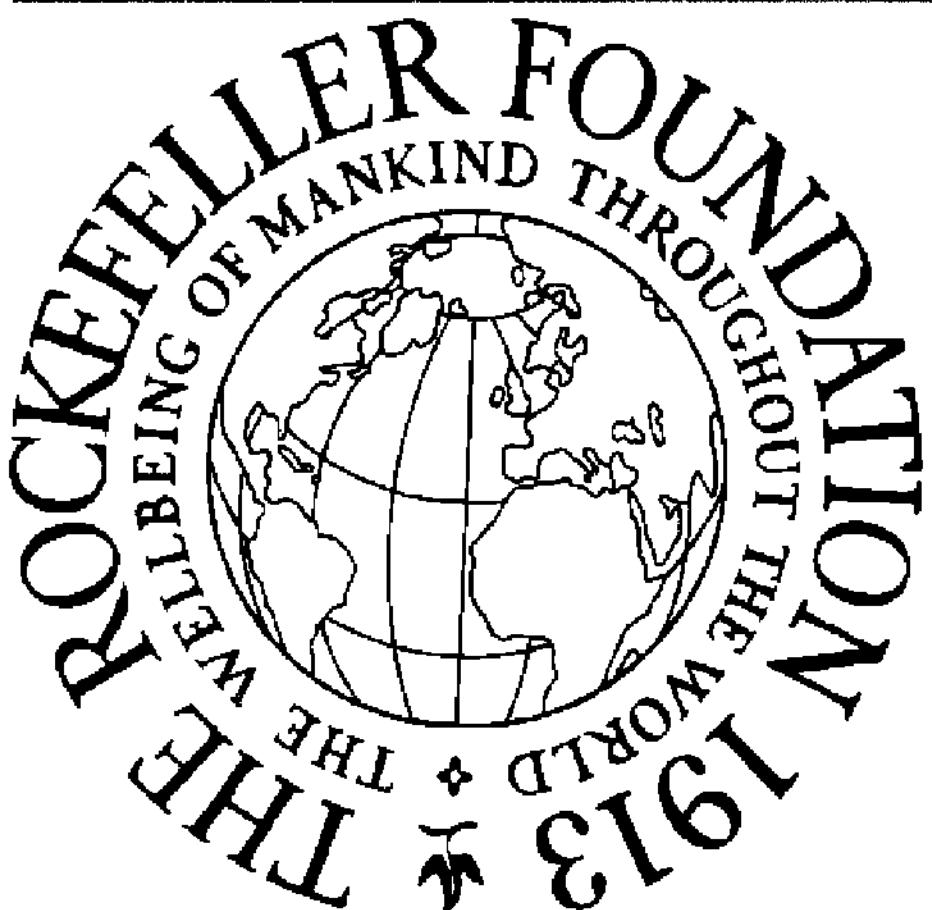
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The American University of Beirut, Lebanon:
Part of the medical buildings, looking north-west from the newly completed hospital wing.

University of Stockholm, Sweden:
Professor George Hevesy, Nobel Prize winner, in his laboratory.

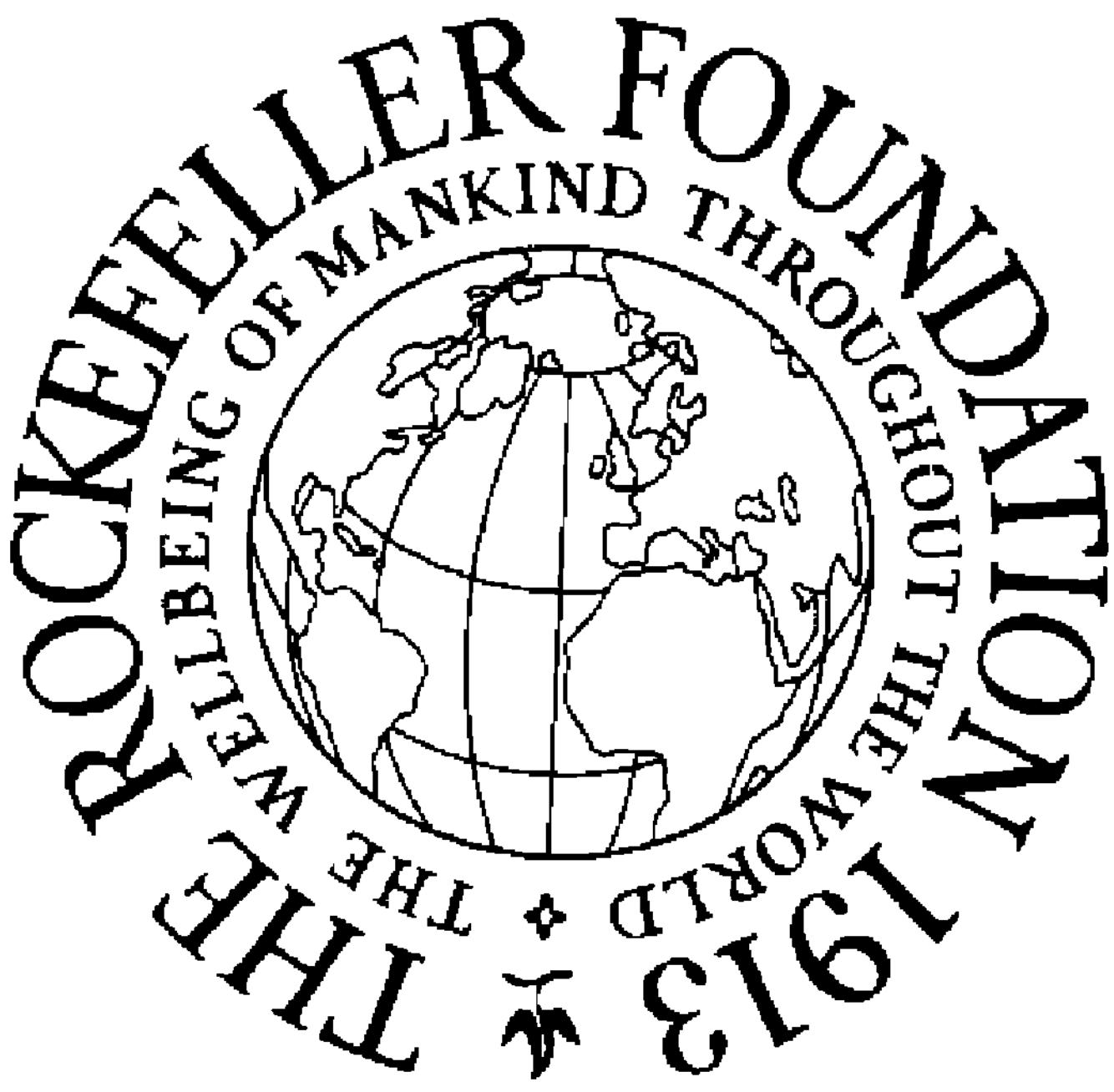


*Neuropsychiatric
Research Centre,
Whitchurch Hos-
pital, Cardiff,
Wales: Preparing
a new type of
memory-storage
unit.*

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Photograph Excised Here



Photograph Excised Here

U. S. Naval Medical Research Unit No. 3, Cairo, Egypt
(Above) An Egyptian Ministry of Public Health doctor, associated with NAMRU-3, obtains a blood sample from an Arab in Gaza; (Left) Testing sera by complement-fixation test.



Photograph Excised Here

*Mexican Agricultural Program: A yield test of different varieties of potatoes
at the experiment station Santa Elena in the valley of Toluca.*



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Photograph Excised Here

Mexican Agricultural Program: A field day for farmers at the Program's tropical breeding station in the State of Veracruz held in cooperation with the National Corn Commission.

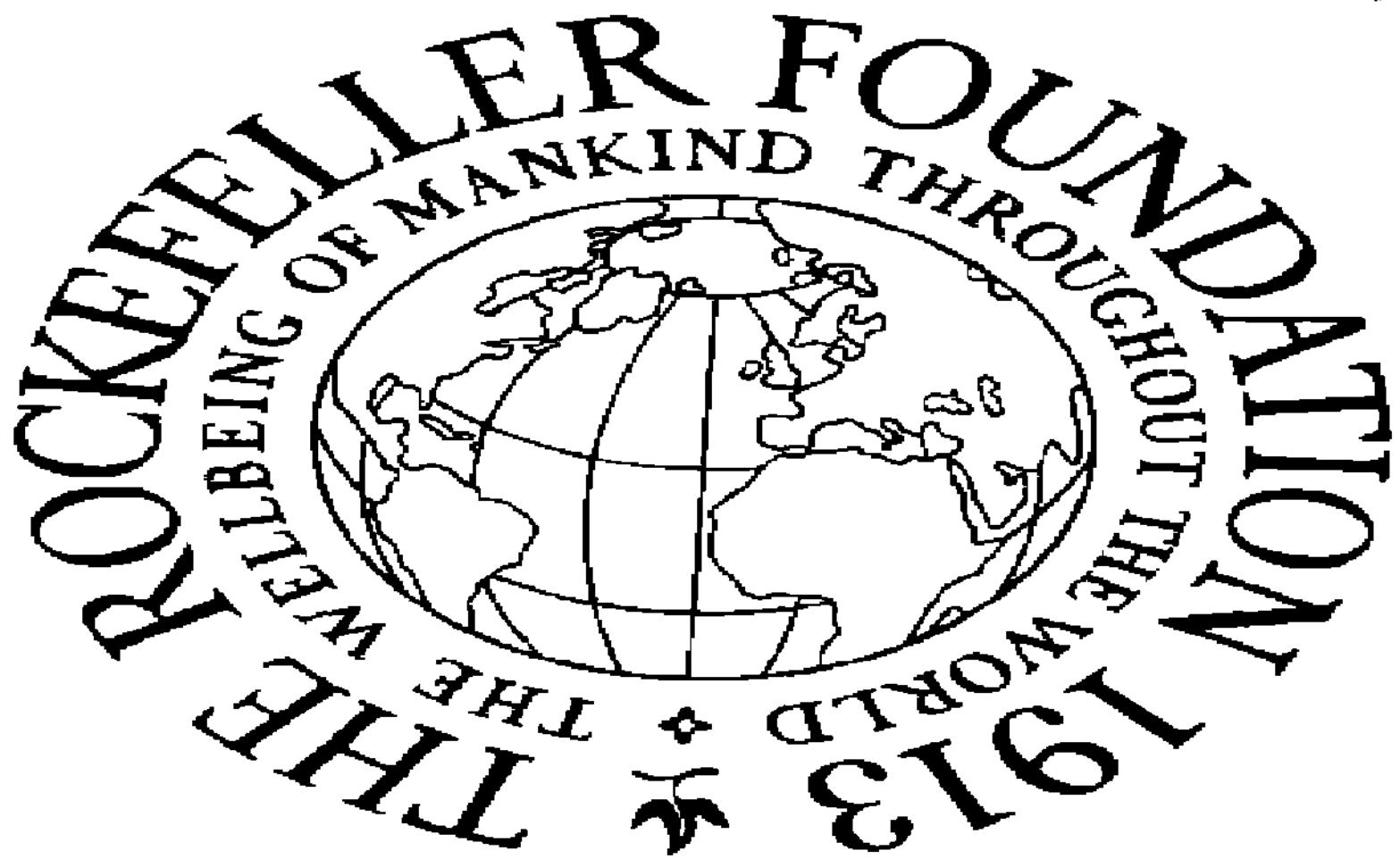


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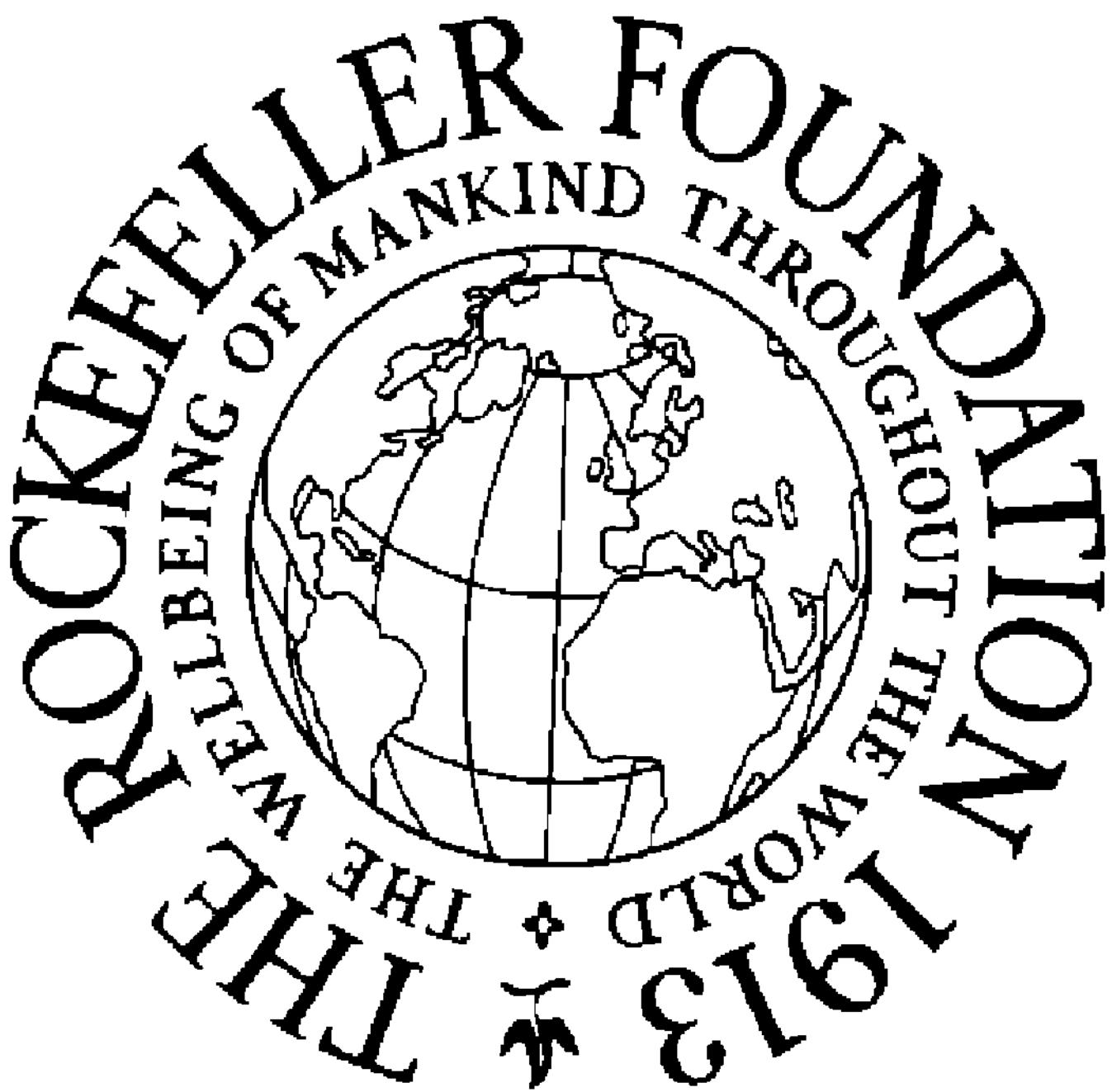
The National Bureau of Economic Research, New York:

Since 1921 the National Bureau has issued nearly 175 monographs and reports, among them studies in business cycles, 14 volumes; studies in price research, 4 volumes; studies in income and wealth, 15 volumes; studies in financial research, 29 volumes; and over 45 technical papers.

Middle East scholars meeting in Bhamdoun, Lebanon,
to discuss a proposed conference on interpretation of
Arab tradition, thought, and outlook.



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*Institute of Sanitary Engineering, Technical Institute,
Stuttgart, Germany. Studying the flow through sedimentation tanks by means of radio-active tracers.*



Photograph Excised Here

*Department of Human Anatomy, Oxford University,
England: Taking skin temperature during experiment
to determine the threshold of temperature sensation.*



Photograph Excised Here

Colombian Agricultural Program:
Staff member Dr. U. J. Grant explaining the corn improvement program to General Arturo Chary, Minister of Agriculture, Ing. Gustavo Cock, head of extension for the State of Antioquia, and Dr. J. G. Harrar of the Foundation.



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Colombian Agricultural Program:
Eight hundred tons of the new improved wheat variety "Menkemen" ready for distribution to farmers.



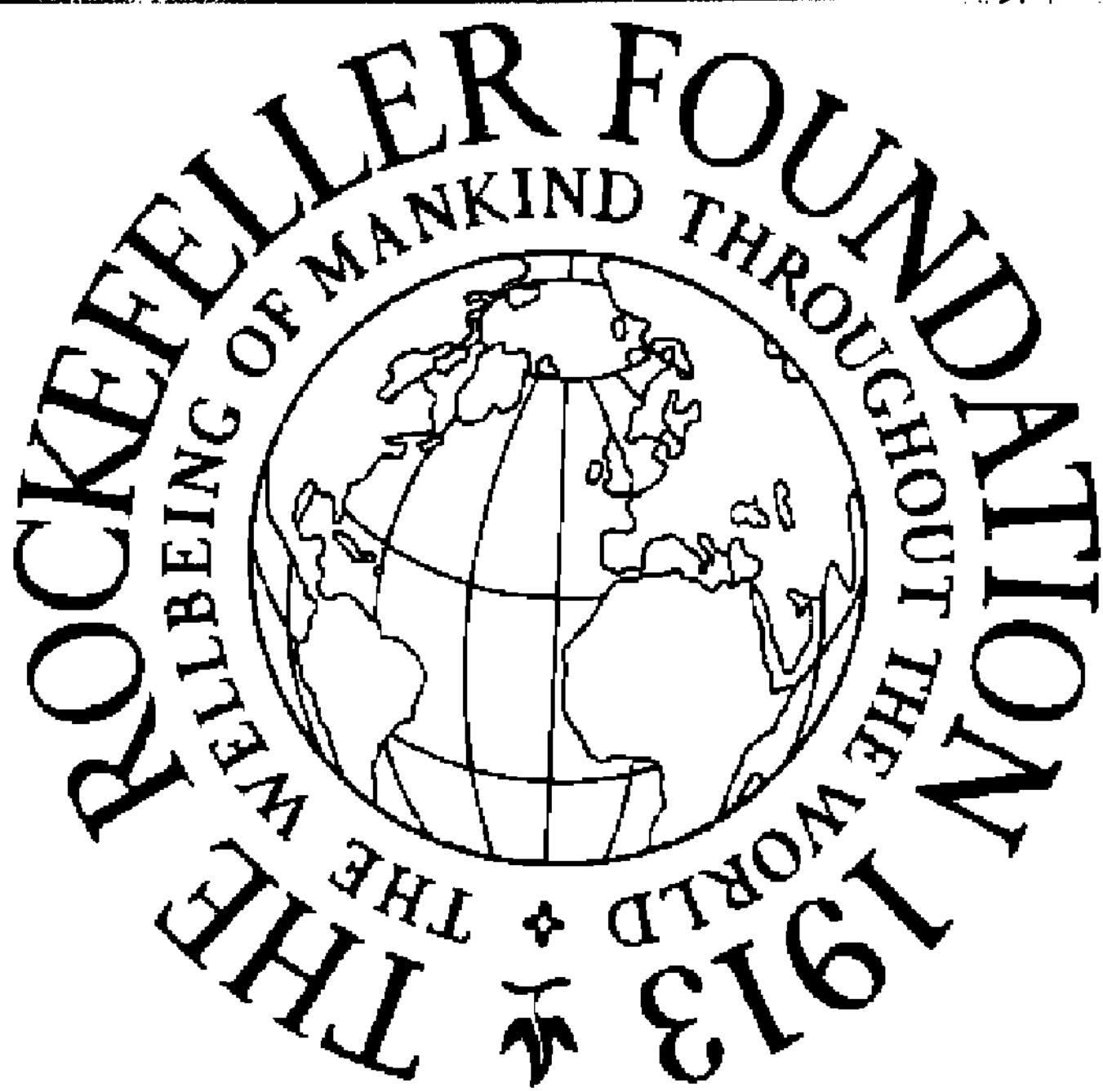
Photograph Excised Here

*Department of Experimental Psychiatry, Birmingham
University, England: Recording the effect of drugs on
the electrical activity of the brain.*



Photograph Excised Here

Institute of Personality Assessment and Research, University of California: Apparatus for measuring accuracy of perception of the vertical. Measures obtained give information on inner stability of person tested.



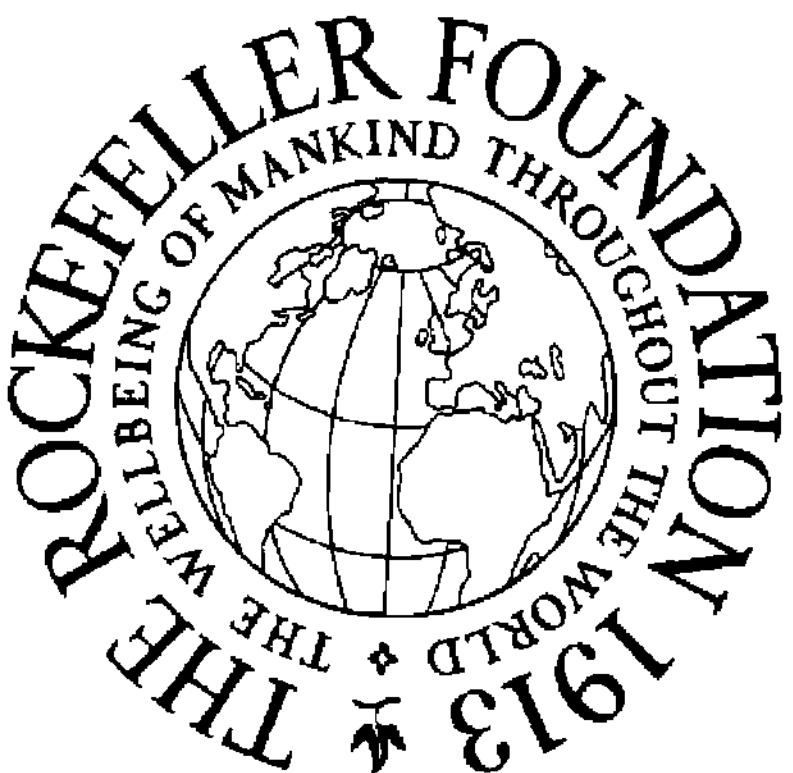
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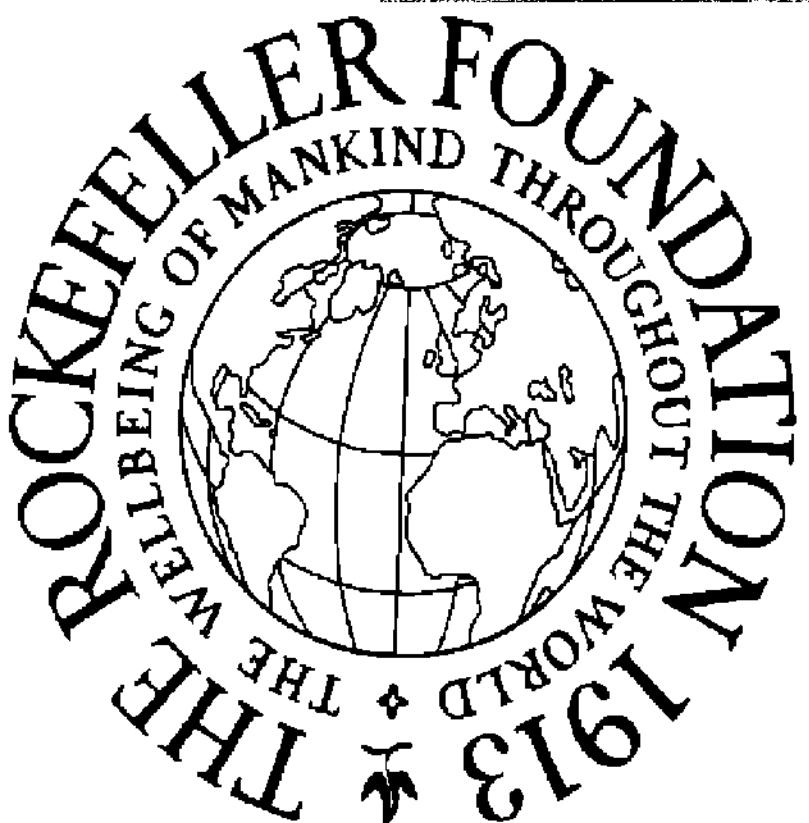
*Department of Biochemistry, University of Washington: Making
a chromatographic analysis of protein hydrolyzates.*

*Earhart Plant Research Laboratory, California Institute
of Technology: Taking data on water loss by a tomato plant.*



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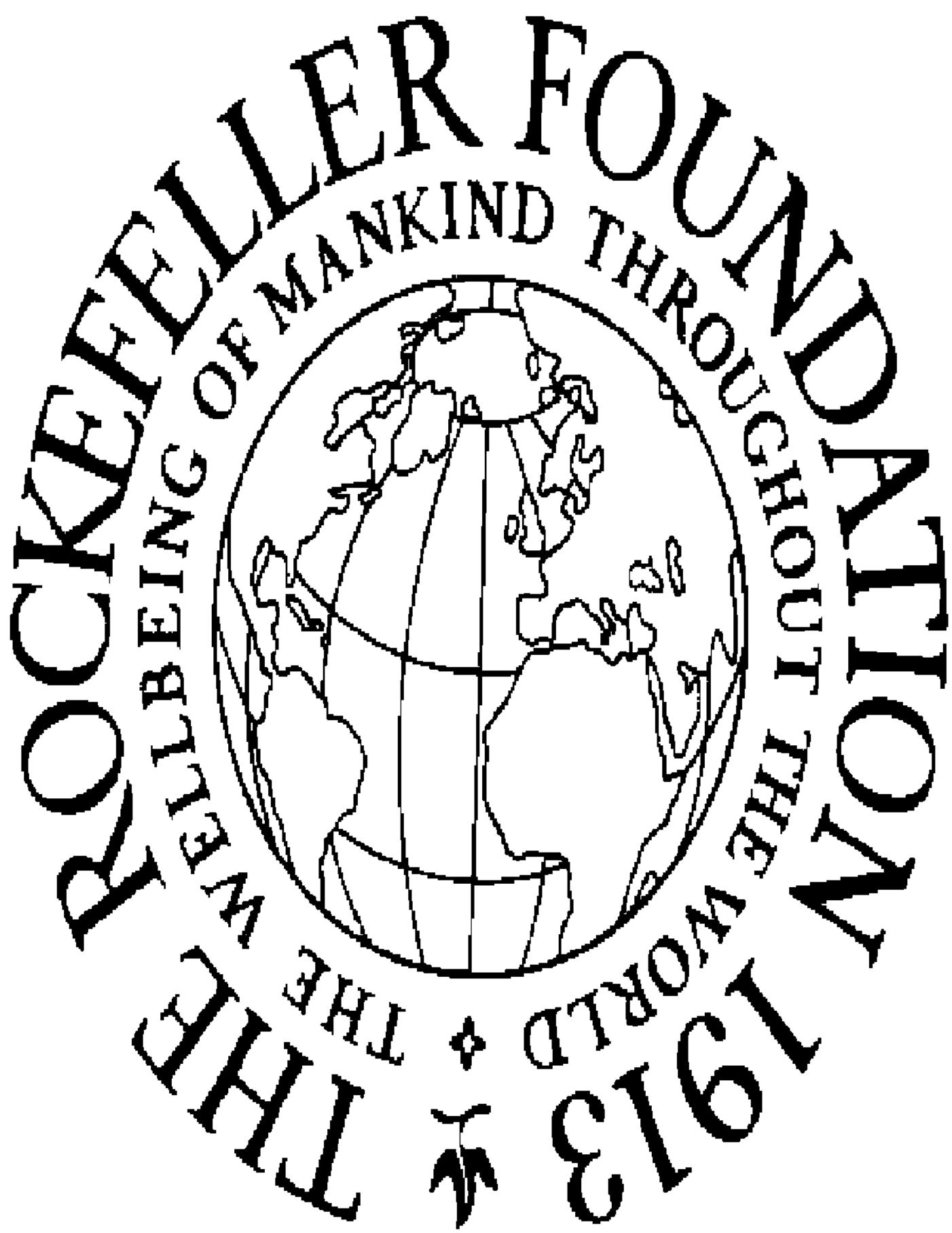
City Center of Music and Drama, Inc., New York: Drawing by Rouben Ter-Arutunian of set for "The Trial."



Photograph Excised Here

Mexican Agricultural Program:

(Above) Inoculating wheat to determine resistance of different lines to prevailing races of black stem rust in Mexico; (Right) Dr. E. C. Stakman, Consultant to the Foundation's Division of Natural Sciences and Agriculture, at wheat plots in Chapingo.

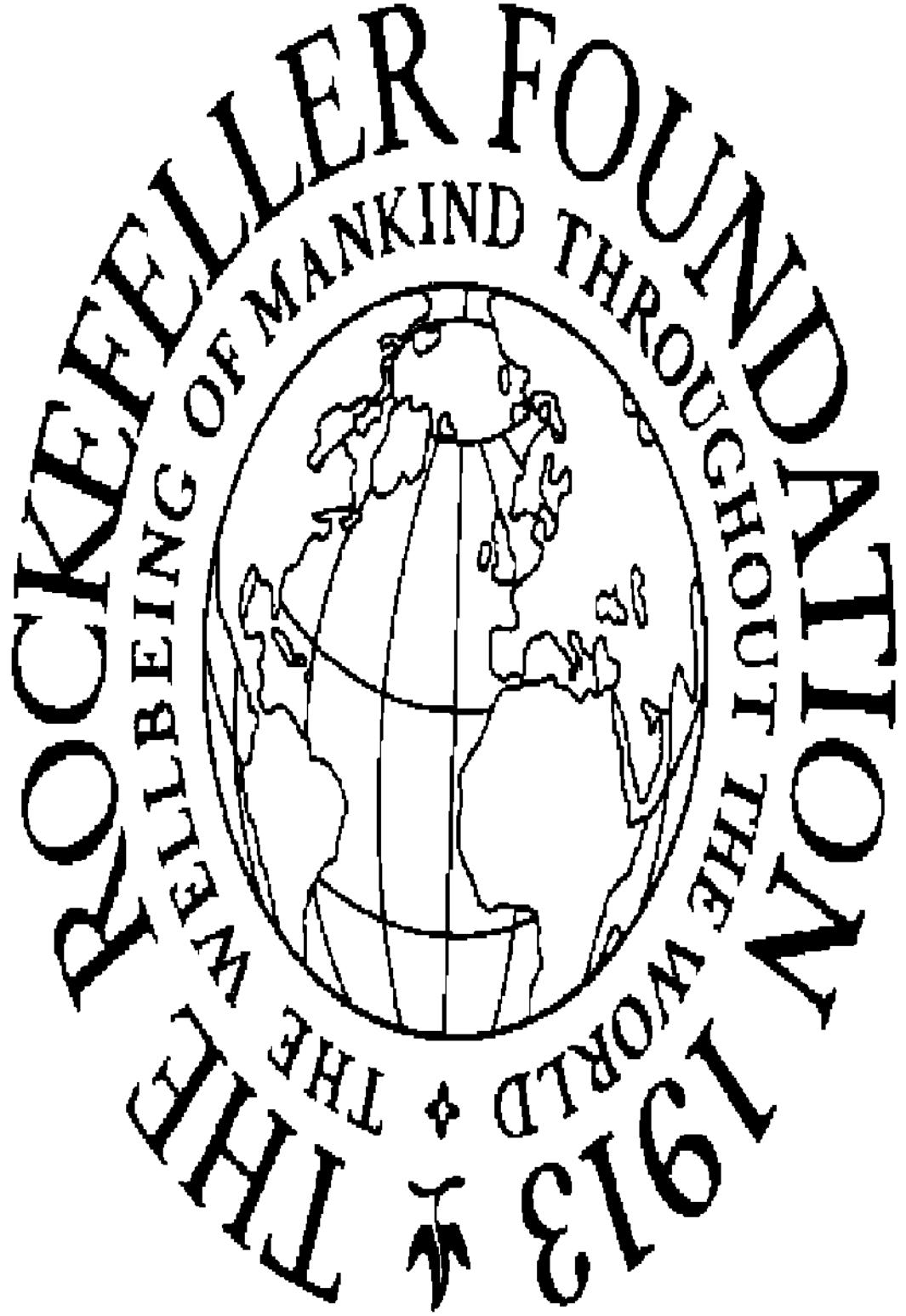


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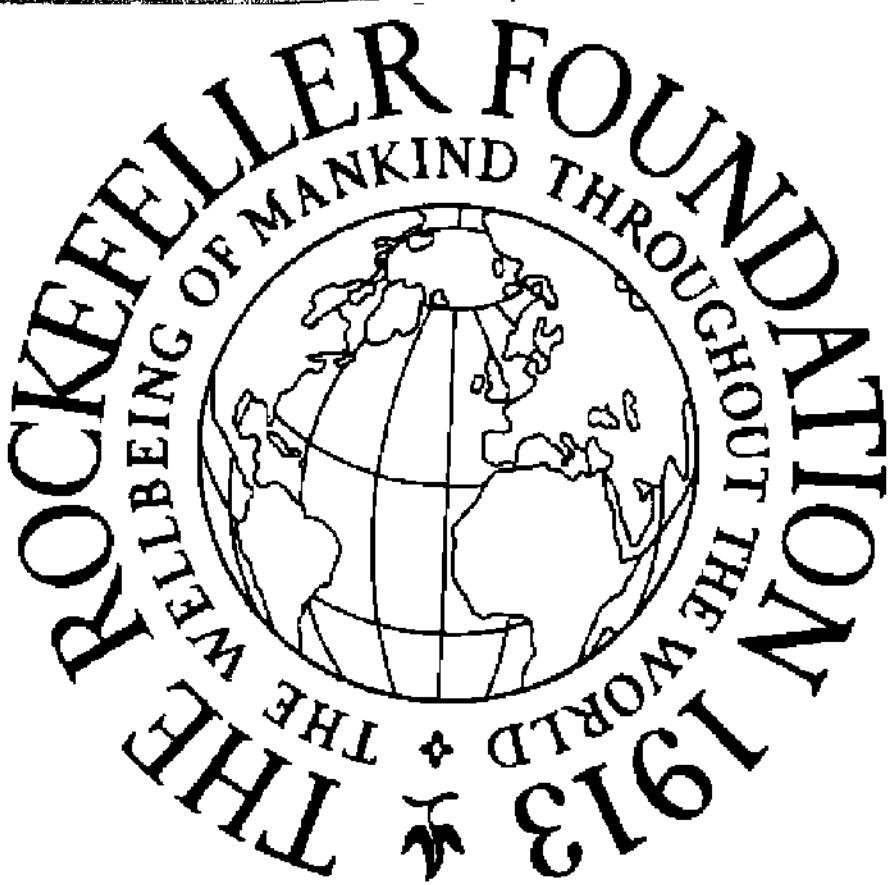
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Department of Sociology and Anthropology, Cornell University:
Member of Cornell-Peru action-research program showing
peon how to operate modern water pump.



Photograph Excised Here

Christian Medical College, Vellore, India:
Technician adjusting auto-technicon used
in processing tissues.



Photograph Excised Here

McCollum-Pratt
Institute, Johns
Hopkins Univer-
sity: Demonstra-
tion of effect of
trace element defi-
ciencies on growth
of tomato plants.

**Division of
Medicine and Public Health**

DIVISION OF
Medicine and Public Health

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DIVISION OF Medicine and Public Health

INTRODUCTORY STATEMENT	69
PROFESSIONAL EDUCATION	
Johns Hopkins University: Institute of the History of Medicine	70
American University of Beirut: Medical Faculty	71
Technical Institute at Stuttgart: Sanitary Engineering	73
University of Helsinki: Basic Medical Sciences	74
Indian Council of Medical Research: Medical Fellowships	75
Simmons College: Public Health Nursing	76
Institute of Public Health, Tokyo: Training Facilities and Equipment	78
Johns Hopkins University and University of the Philippines: Exchange of Faculty in Public Health	79
London School of Hygiene and Tropical Medicine: Experiment Area in Public Health Practice	80
University of Naples: Sanitary Engineering	82
Health Authority of the Free Hanseatic City of Hamburg: Hamburg Academy of Public Health	83
Catholic University of Chile: Department of Neurosurgery	84
Sawai Man Singh Medical College, India: Research Equipment	84
Araraquara Rural Health Training Center, Brazil: Demonstration Equipment	86
Vanderbilt University and Karolinska Institute, Stockholm: International Exchange in Pediatrics	87
<i>Grants in Aid</i>	87
MEDICAL CARE	
American Psychiatric Association: Mental Hospital Architecture	97
Association d'Hygiène Sociale de l'Aisne: Soissons Public Health Center	98
University of North Carolina: Survey of General Medical Practice	101
Commission on Chronic Illness: Conference on Care of the Long-Term Patient—Preparatory Expenses	102
<i>Grants in Aid</i>	103

INVESTIGATION AND CONTROL OF SPECIFIC DISEASES AND DEFICIENCIES

The Virus Research Program of the Division of Medicine and Public Health:

Diseases Caused by Arthropod-Borne Viruses	106
The Laboratory Studies	113
Field Stations	123
Tennessee Department of Public Health: Williamson County Tuberculosis Study	131
<i>Grants in Aid</i>	133

DEVELOPMENT OF THE HEALTH SCIENCES

University of London: Institute of Psychiatry, Maudsley Hospital	133
University of Heidelberg: Institute of Psychosomatic Medicine	135
University of California: Personality Assessment	135
Roscoe B. Jackson Memorial Laboratory: Genetics and Social Behavior	138
Duke University: Parapsychology	139
Harvard University: Studies in Population Dynamics in India	140
Welsh Regional Hospital Board: Neuropsychiatric Research Centre, Cardiff	140
Birmingham University: Department of Experimental Psychiatry	141
University of Lund: Endocrinology	143
Oxford University: Peripheral Nerve Studies	143
Princeton University: Psychology of Perception	145
<i>Grants in Aid</i>	146

DIVISION OF MEDICINE AND PUBLIC HEALTH

THE PAST YEAR brought further development of the Foundation's interest in improving health and well-being in underdeveloped countries. In contrast with earlier efforts, which concentrated on the direct control or elimination of specific plagues like yellow fever, malaria, or hookworm, the present program adopts an indirect approach. Its immediate purpose is the development of local institutions for the training of personnel and the prosecution of research, which in turn may bring permanent benefits to the areas concerned. The early results of such a program are far less spectacular than the immediate effects of campaigns against specific diseases, but success, if and when it comes, is expected to be much broader and more permanent. An assistance program which depends upon the continuous importation of trained technicians and materials necessarily implies a continuous dependency of the underdeveloped regions of the world. If all countries are ever to become free and equal in anything other than a technical political sense, they must be helped to establish their own "capital plant" for the production of their own trained personnel and techniques most appropriate to local conditions.

Several of the grants listed under the heading Professional Education are illustrative of a policy of long-term investment in overseas production of trained personnel and new techniques. For some years to come, Europe and the

United States seem likely to continue to be principal contributors to the pool of knowledge shared by the Western world. This is especially true with respect to basic discoveries in the sciences related to health. The relatively high concentration of trained talent and developed research facilities in these areas continues to attract a large portion of the Foundation's funds devoted to the Development of the Health Sciences. As will be seen in the following pages, a considerable share has gone for work in behavior and other studies related to mental illness, a field which for various reasons still attracts far less financial support than is warranted by its importance for public health and human welfare.

Under the heading Medical Care, support has been given for selected studies bearing on the problem of how to provide for everyone the high standards of medical service now available in a few metropolitan centers.

Professional Education

JOHNS HOPKINS UNIVERSITY

INSTITUTE OF THE HISTORY OF MEDICINE

The Institute of the History of Medicine at Johns Hopkins University, from its beginnings in 1926, has had the distinguished leadership, first of William H. Welch, then for 16 years, of Henry Sigerist, and now of Richard Shryock, a social historian whose specialty is American medical history.

The functions of the institute are both teaching and research, with particular reference to the role of medicine as a social institution. To its basic courses in the history of medicine and public health, it has in recent years added special history lectures in the physical and natural sciences. With the collaboration of other medical institutions at Johns Hopkins, Professor Shryock is also expanding the work in medical economics and medical care.

As might be expected, the Hopkins institute welcomes the opportunity to train fellows for research and teaching posts elsewhere. Almost all the 18 fellows who have been associated with it thus far continue to give a large proportion of their time to work in medical history. Of the six full-time teaching posts in medical history now existing in American universities, five are occupied by former members of the Hopkins institute.

Research interests of the institute cover a broad field. Associate Professor Owsei Temkin devotes his principal attention to the ancient history of medicine, but a review of the 525 publications of the institute reveals that other members of the staff have given almost equal emphasis to the Medieval and Arabic periods. Professor Shryock is currently directing a research project on American Colonial ideas of disease and treatment. As an adjunct to research, the institute publishes the *Bulletin of the History of Medicine*, official organ of the American Association of the History of Medicine.

During the quarter century of its existence, the Institute of the History of Medicine has been almost wholly subsidized by Rockefeller boards. With two General Education Board endowment gifts in 1926 and 1930, totaling \$450,000, Johns Hopkins established the first chair in the history of medicine in the United States. The budget of the institute has been provided by the income from these endowments, as well as by grants from the Board and, beginning in 1935, from The Rockefeller Foundation. As a final contribution, to provide for at least the next ten years, the Foundation in 1953 approved a grant of \$200,000, to be released as the university obtains additional budgetary funds.

AMERICAN UNIVERSITY OF BEIRUT

MEDICAL FACULTY

For nearly a century the American University of Beirut in Lebanon has offered opportunities for training in Western

science and culture to the peoples of the Near East. Started as a Christian missionary endeavor, the university has gradually become nonsectarian, receiving its support largely from American philanthropy. Its student body, numbering some 1,500, is about one-third Muslem and one-third Christian, the remaining third comprising students of various other beliefs. Representation by country is equally varied, though by far the greatest numbers of students originate in Lebanon, Syria, and Transjordan.

The Medical Faculty, in particular, has a distinguished history. Though small in size, it has assumed leadership in medicine for the Near East. Its faculty and graduates have made notable contributions to the health and welfare of the region. The present directors of health in Lebanon and Transjordan, as well as the previous director in Syria, are American University of Beirut graduates. Other physicians trained at Beirut hold important posts in the Lebanese Public Health Association, the Society for Crippled Children, the Red Crescent, and regional tuberculosis sanitaria.

With the Arab world's increasing concern over medicine and public health, the task confronting the Medical Faculty has grown in scope and complexity. Since the war, however, costs have risen much faster than income, and the faculty has encountered difficulties in attracting and keeping high-caliber teaching and research staff. The progress of medicine, moreover, has brought more expensive methods of diagnosis and therapy; research requires more intricate apparatus.

As part of a ten-million-dollar program for developing the university over the next ten years, outlined by Dr. Stephen Penrose, president of the university, and Harold Hoskins, president of the board of trustees, the Medical Faculty this year embarked on a threefold plan of modernization. The first step, to cost about \$250,000 a year, will bring an increase in the salary scale and the creation of an additional full-time position in each of eight preclinical and four clinical departments. Later steps call for new capital

equipment and the establishment of professorships in several clinical specialties. Toward this plan, primarily for the first step of faculty development, The Rockefeller Foundation in 1953 appropriated \$500,000 to be available as the university raises funds totaling \$1,000,000 from other sources over the next five years. This grant brings the total of Foundation appropriations to medical education at Beirut over a 30-year period to over two and one-half million dollars.

Recognition of the American University's important role in the Near East is also coming currently from the Technical Cooperation Administration, which in the last two years has allocated \$315,000 for training public health personnel there. The Ford Foundation has supplied over \$1,000,000 for developments in agriculture and in the arts and sciences.

TECHNICAL INSTITUTE AT STUTTGART

SANITARY ENGINEERING

While Germany has a long history of technological leadership, the engineering approach to environmental sanitation is still fairly new in that country. One of the institutions that is taking the lead in the development of this field is the Technical Institute at Stuttgart. Professor Franz Pöpel, who succeeded to the institute's chair of sanitary engineering after the war, is taking vigorous steps to create a full-fledged research and teaching department. With the increasing industrial development and the influx of millions of refugees into Western Germany, Professor Pöpel is keenly aware of the need for intensive management of the environment. The sanitary engineer trained to think in terms of community services can make an important contribution to both health and conservation programs.

In planning the department, Professor Pöpel has drawn upon his prewar experience as European chief engineer of a large American sanitary firm, as well as upon subsequent observation trips in the United States. He has as his prin-

cipal assistant Bernd Dieterich, who has just returned from two years of study at Harvard University on a Rockefeller Foundation fellowship. The institute at present consists of three major divisions of engineering, chemistry, and biology, with an enrollment of some 50 students studying sanitary engineering.

The research plans of the department, bearing on the utilization of treated wastes for industrial and agricultural development, have aroused considerable interest on the part of public authorities. The city of Stuttgart has made a field laboratory available so that hydraulic and biochemical tests can be conducted on a pilot plant scale. In addition, the Ministry of Economics has contributed toward the cost of building research laboratories for the study of water supply.

To aid the new department in developing its teaching and research plans, The Rockefeller Foundation in 1953 appropriated 200,000 German marks and \$20,000 (about \$72,000) to the Technical Institute at Stuttgart for three years. With these funds, Professor Pöpel hopes to add agricultural and public health specialists to his teaching staff and to enlist the services of a research professor of biochemistry. A substantial part of the grant will be needed, however, to equip teaching and research laboratories and to furnish travel funds for staff members.

UNIVERSITY OF HELSINKI

BASIC MEDICAL SCIENCES

To aid the Medical School of the University of Helsinki in its efforts to develop a trained cadre of younger faculty members for the basic science departments, The Rockefeller Foundation in 1953 provided a five-year grant of 13,500,000 Finnish marks (about \$67,500).

The University of Helsinki, which has conducted the only medical school in Finland until the recent opening of a

small institution in Turku, maintains a high standard of performance both in training and research. As in most other European universities, however, salaries for positions below the rank of full or associate professor at Helsinki are modest. Junior posts, or "assistantships," are usually half-time, so that the younger men can supplement their salaries by outside work. As a consequence, these men have little opportunity to concentrate on research. This is a serious problem, especially in the basic science departments, because the outside work of a young instructor in anatomy or pathology may be entirely unrelated to his specialty.

The Foundation grant has permitted the university to establish one full-time salaried assistantship in each of the six basic science departments, that is, anatomy-histology, pathology, bacteriology, pharmacology, physiology, and biochemistry. As economic conditions improve, the university hopes to extend the pattern of full-time positions to other departments of the medical school.

INDIAN COUNCIL OF MEDICAL RESEARCH MEDICAL FELLOWSHIPS

In the five years since India attained independence, the number of Indian medical colleges has doubled. The Ministry of Health, which is constitutionally responsible for medical education throughout the country, has not only raised the standards in some schools to bring them up to the approved level but also has created entirely new institutions. This expansion to a total of 30 medical colleges has created a demand for teachers that is nearly impossible to meet.

In reviewing the problems of adequate staffing for the medical colleges, the ministry concluded that a major difficulty is the fact that the average Indian teacher cannot afford the cost of postgraduate study. The added circumstance that advancement depends upon postgraduate qualifications deters many potential candidates from electing a

teaching career. At the present time, a number of junior posts are unfilled or are held by temporary, often not highly qualified, personnel.

Both the Ministry of Health and the Indian Council of Medical Research are trying to remedy this situation as rapidly as possible. The ministry is strengthening several medical colleges so that they can be approved for graduate study and proposes to establish a training center in Delhi, to be known as the All-India Medical Institute.

On its side, the Council of Medical Research is gradually expanding its fellowship program to help supply teachers for the Indian training centers. Since 1950 the council has supported approximately 26 trainees per year. With the aid of a grant of 550,000 rupees (about \$121,000) for the next three years from The Rockefeller Foundation, the council has now further stepped up this program. By the new plan a total of 50 fellows will be in training at any one time. Ordinarily each fellow will undertake a two-year period of study and be assured of a teaching post on his return. Candidates will be selected by a special board and placed for training by the secretary of the Indian Council of Medical Research.

SIMMONS COLLEGE

PUBLIC HEALTH NURSING

Health authorities in all parts of the country are generally agreed that one of the acute problems in the nursing field is the shortage of public health nurses qualified for positions as teachers and administrators. In several areas important community health projects are being delayed by this shortage.

A recent survey of the graduate programs currently available for the training of public health nurses in the United States revealed several weaknesses both in the numbers of programs and in the design of courses. Basically, the

weaknesses stem from the fact that the majority of nurses do not receive public health nursing preparation during their undergraduate training. Consequently, the university schools of nursing have found it difficult to offer advanced training in public health nursing, as they have been obliged to design their graduate courses principally for the preparation of nurses as first-level practitioners. Advanced training in public health nursing has devolved mainly on schools of education and schools of public health.

To help meet the pressing demand for a leadership group in public health nursing, Simmons College in Boston has designed a new graduate program to be offered jointly by the Simmons College School of Nursing, the Harvard University School of Public Health, and the Simmons College School of Social Work. The precedent for a joint educational program between Simmons College and the Harvard School of Public Health had already been established in the training of public health nutritionists. The new program, which will draw on the curriculum resources of both the Harvard School of Public Health and Simmons College, will be tailored to provide the best possible preparation for the specific area in which the individual nurse expects to practice. Candidates must be approved by the admissions committee of the Harvard School of Public Health and must fulfill the entrance requirements for graduate study at Simmons. The program comprises two semesters and a summer session leading to the master of science degree from Simmons College.

As a contribution toward the establishment of this program, The Rockefeller Foundation has made a five-year grant of \$40,000 to Simmons College. Simmons plans to use a substantial portion of the grant to offer scholarships to well-qualified candidates selected with special concern for geographic areas that are especially in need of qualified directive personnel. Also to receive special consideration are candidates with exceptional records who may be trained to fill critical vacancies in already well-established agencies.

INSTITUTE OF PUBLIC HEALTH, TOKYO

TRAINING FACILITIES AND EQUIPMENT

The Institute of Public Health in Tokyo, the leading Japanese institution for postgraduate instruction in public health subjects, was established 15 years ago with the aid of a \$1,000,000 grant for building and equipment from The Rockefeller Foundation. In spite of the adversities of the postwar period, it has made rapid progress in the re-establishment of its teaching activities, and since its reactivation by the Occupation authorities in 1947 has provided a minimum of two months' training to no less than 6,000 persons employed in the Japanese health services. Of these, perhaps 170 are medical officers, instructors in public health nursing, veterinarians, and pharmacists who received longer periods of training in preparation for positions of leadership.

The institute is now anxious to supplement its present program of theoretical instruction with additional practice field training facilities. While students at the institute have access to several health centers in the Tokyo vicinity, Director Yoshio Koya feels that they will benefit from close working arrangements with the new Takatsu health center in the Tokyo suburb of Kawasaki. The Takatsu center, only 40 minutes by train from Tokyo, reaches a semirural population of 71,811. Kawasaki health officials are cooperating in this plan by offering part-time appointments to institute staff and have provided extra space in the new health center building nearing completion. The institute staff have been invited to participate in the regular work of the center and to use the area for special surveys, as well as student training.

To aid the Tokyo institute in carrying out this and other teaching activities, The Rockefeller Foundation has appropriated the sum of \$42,050, available until July 1, 1956. Another \$30,000 has been set aside for the cost of reinstalling

a central heating system in the institute proper. The original system went out of commission during the war years. This part of the grant is contingent on an equal amount to be contributed by the Government of Japan.

JOHNS HOPKINS UNIVERSITY AND
UNIVERSITY OF THE PHILIPPINES
EXCHANGE OF FACULTY IN PUBLIC HEALTH

A program of exchange professorships and fellowships between the School of Hygiene and Public Health of Johns Hopkins University and the Institute of Hygiene of the University of the Philippines was made possible last year through the cooperation of the two universities, the World Health Organization, and The Rockefeller Foundation. The program was worked out primarily to provide advanced training for the younger teachers in the Philippine Institute of Hygiene.

By the terms of the cooperative agreement, two senior professors from Johns Hopkins will spend three months a year and two junior staff members nine months a year, for the next three years, as visiting teachers at the Philippine institute. Concurrently two junior members of the institute will spend an academic year at Johns Hopkins on World Health Organization fellowships. The fellowships will be granted in fields corresponding to those of the Johns Hopkins visiting staff, so arranged that the fellow may have two years of association with his American counterpart, one year in the Philippines and the other at Johns Hopkins. In addition to fellowship grants, the World Health Organization will provide international travel expenses and certain allowances for the Johns Hopkins staff. Johns Hopkins University will continue the salaries of staff assigned to the Philippines, and the University of the Philippines will provide equipment and supplies, lecture rooms, laboratories, and offices.

The Rockefeller Foundation, while not a signatory to

the agreement, has made contributions both to the University of the Philippines and to Johns Hopkins. The first grant of \$18,300 enables the Institute of Hygiene to supply housing allowances and travel expenses within the Philippines for the visiting staff from Johns Hopkins. The second grant of \$12,000 is for the use of the School of Hygiene and Public Health of Johns Hopkins University in paying salaries of staff replacements for regular faculty members assigned to the Philippines.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

EXPERIMENT AREA IN PUBLIC HEALTH PRACTICE

When the British National Health Service went into operation in 1948, it was divided into three administratively separate branches: hospital, general practitioner, and local authority health services. Because the functions of these services necessarily overlap, one of the major tasks that British health personnel face at present is to work out a good liaison at local level among the three administrations. Both the health services and, from a training point of view, the schools of public health encounter difficulties of adjustment in this transition period.

To help clarify some of the new problems, the London School of Hygiene and Tropical Medicine in the past year has established a field research station. Located in the vicinity of Watford, in the southwest division of Hertfordshire, the field station reaches a mixed urban and rural population of 150,000 persons. This includes 4,000 families resettled on a housing estate by the London County Council.

One of the purposes of the field station is to afford facilities for graduate training in public health and medical care research. Its other important function is to serve as a testing ground for new public health programs and for investigation of the problems arising out of the tripartite organization of the National Health Service.

Dr. James M. Mackintosh, head of the school's Department of Public Health, is in charge of the Watford project. Taking up an issue of immediate interest to the medical personnel of the health services in the area, Dr. Mackintosh has started a long-term study of the use made by the local population of the three components of the health service. He is especially concerned with the housing estate families, whose health experience as a unit of newcomers to the area may be profitably compared with that of the established population. Similar studies on hospitalized patients and on patients treated by the local authority health services are being organized. Analysis of these records, representing the three branches of the health service, will aid local health authorities in estimating the degree of overlapping that exists; it may also be possible to define the conditions leading to overuse and underuse of the services.

Another subject of importance to the National Health Service, already under investigation by the London school research staff, is the care for the aged. A study on hospitalization of the aged chronic sick has already been completed, and further studies are being made of their care at home by general practitioners or by the local authority health services.

Cooperating in these studies are staff members of the Departments of Public Health, of Statistics and Epidemiology, and of Nutrition. Since the Watford survey touches on social situations, including attitudes and motivations affecting the demands made on the Health Service, the London school expects to add to the staff during the next three years a sociologist and an additional medical research worker.

The Rockefeller Foundation contributed \$10,000 to help establish the Watford field station two years ago and is continuing its aid for the experimental program with a new grant of £20,640 (about \$61,920) to be used over the next three years. Most of this sum has been set aside for the salaries of additional staff.

UNIVERSITY OF NAPLES
SANITARY ENGINEERING

A small group of engineers at the University of Naples has been among the first to establish the specialty of sanitary engineering in Italy. The man in charge of the new course is Professor Girolamo Ippolito, an internationally recognized expert in water power and supply. He and his group are well known for their substantial investigative work and for their designs of water and sewerage systems for a number of Italian communities.

In both its teaching and research programs the sanitary engineering group is closely associated with government development plans in the parched regions of southern Italy, Sicily, and Sardinia. Since 1951 a national training station has been provided for personnel needed to staff the developmental projects of the Casa del Mezzogiorno, the public authority responsible for the provision of water for domestic and agricultural use, for land reclamation, and for treatment of wastes. Each year the Casa asks the Naples group to select and train 25 graduate engineers. It is anticipated that 250 sanitary engineers will have received specialized preparation by 1962.

In the current research program Professor Ippolito and his associates have been working on the problem of disposal of wastes in rural communities. They now propose to extend this research to the main environmental health problems of underdeveloped Italian areas. This plan complements the program for health and conservation of natural resources undertaken by the Casa del Mezzogiorno and also affords an opportunity to train selected graduate sanitary engineers in research methods.

To aid the University of Naples in expanding both its research and teaching program in sanitary engineering, The Rockefeller Foundation in 1953 made an appropriation of \$35,000 and 6,000,000 lire (about \$45,800). These funds,

available over a five-year period, will enable the university to purchase needed research equipment, offer a few local fellowships, and provide travel funds for senior faculty members.

HEALTH AUTHORITY OF THE
FREE HANSEATIC CITY OF HAMBURG
HAMBURG ACADEMY OF PUBLIC HEALTH

The Hamburg Academy of Public Health, one of four such institutions in Germany, has as its chief function the provision of postgraduate training toward the state diploma in public health. It is supported by the five Länder of Hamburg, Berlin, Bremen, Schleswig-Holstein, and Niedersachsen under the financial control of the Health Authority of the Free Hanseatic City of Hamburg. Course requirements are set up by a board of trustees composed of the five deputy ministers of health of the five lands.

Dr. Hans Harmsen, director of the academy and professor of hygiene at the University of Hamburg, proposes to modify both the curriculum content and the method of instruction in the graduate course in public health. A major aim is to decrease the emphasis on legal processes and forensic medicine in favor of work in epidemiology, biostatistics, and practical field training. In collaboration with health authorities, he is also revising the schedule for health officers.

In support of Dr. Harmsen's teaching program at the Academy of Public Health over the next five years, The Rockefeller Foundation has appropriated 140,000 German marks (about \$35,000) to the Health Authority of the Free Hanseatic City of Hamburg. Last year a Foundation grant in aid made it possible for Dr. Harmsen to spend some time in England and North America observing recent developments in public health and the social aspects of medical education.

He plans to use the new grant for salaries of additional

scientific and teaching assistants, for several local fellowships, and for field research equipment.

CATHOLIC UNIVERSITY OF CHILE

DEPARTMENT OF NEUROSURGERY

The Catholic University of Chile in Santiago is currently developing a Department of Neurosurgery in its Medical School on the principle of a full-time staff to be available primarily for teaching purposes. The head of the department is Dr. Juan Ricardo Olivares, who returned to Chile in the early part of 1953 after a period of study with Dr. Herbert Olivecrona at the Serafimerlasarettet in Stockholm, with Drs. James L. Poppen and Gilbert Horrax at the Lahey Clinic in Boston, and with Dr. Wilder Penfield in Montreal.

A grant of \$11,100 from The Rockefeller Foundation will help the university to retain the full-time services of Dr. Olivares over the first three years and to purchase important apparatus for the department. The Gildemeister Foundation, a local philanthropic organization which has already done much for the progress of the Medical School, has provided other necessary equipment; it is also financing the construction of a new wing for the university hospital which will accommodate a neurosurgery unit of 30 beds.

SAWAI MAN SINGH MEDICAL COLLEGE, INDIA

RESEARCH EQUIPMENT

Sawai Man Singh Medical College, one of India's newest medical schools, located in Jaipur in the northwest part of the country, faces heavy responsibilities in the development of its educational and service facilities. It is the only medical school in Rajasthan, second largest state in India, with an area of 128,424 square miles and a population of more than 15,000,000.

In spite of the difficulties inherent in establishing a new

medical center, Sawai Man Singh already possesses the basic essentials for undergraduate teaching and in 1952 graduated its first class of 31 men and 7 women. With the help of the Rajasthan government, it has increased the capacity of its teaching hospital, formerly the city hospital, from 385 to 550 beds and is developing specialized services. A new out-patient department is under construction.

Foundation officers have been much interested in the developments at Sawai Man Singh, and in 1953 a grant of \$15,032 and 33,240 rupees (about \$22,345) was made to help the college expand its facilities, especially for graduate training and research. The most pressing needs are for equipment in the Departments of Pharmacology, Biochemistry, and Pathology, and for an experimental animal breeding house. The dollar portion of the grant enables the college to make purchases in the United States.

Dr. S. K. Menon, principal of the college, reports that the new animal house is designed on the theory of forced draft ventilation and evaporative cooling. Because of the intense heat of the north Indian summer, it has always been very difficult to maintain a constant supply of health laboratory animals without expensive refrigerated air conditioning. With the new design, Dr. Menon hopes to demonstrate the effectiveness of a simple desert-cooler type of air conditioning.

The Department of Pharmacology is headed by Dr. R. B. Arora, who received some of his training on a Foundation fellowship at Harvard University. Dr. Arora anticipates that with the new equipment his department will be approved as an all-India graduate training center. He himself is developing the research on native Indian drugs that he started at Harvard.

Equipment for the Departments of Biochemistry and Pathology will help to improve both teaching and service functions, as well as assist research. The Department of Pathology has an active program in fungus research.

ARARAQUARA RURAL HEALTH TRAINING CENTER, BRAZIL

DEMONSTRATION EQUIPMENT

Since 1947 public health and university authorities in the State of São Paulo, Brazil, have devoted intensive efforts to the creation of a model health center in the rural County of Araraquara. A joint enterprise of the State, the University of São Paulo, and the County of Araraquara, the center serves a dual purpose by demonstrating the value of full-time community health services and by providing a rural practice field for public health students.

The headquarters and the central clinic are in the county seat of Araraquara, a provincial city of some 36,000 population. With each year, however, there is a steady expansion of the services into the surrounding countryside—an area largely given over to coffee and sugar plantations, and to rice, corn, and cotton fields. There are now several branch units, one of them initiated by popular demand. The center and its outposts are staffed by 10 physicians, 16 nurses, a sanitary engineer, a veterinarian, and about 75 auxiliary workers. To these may be added the student physicians, nurses, and others, who serve actively in the program as part of their training. Director José Pericles Freire reports that last year the center received 122 trainees, 28 from the Faculty of Hygiene in São Paulo, 47 from nurse training centers, 46 from the State Department of Health, and one from the Malaria Control Service.

In 1952 the health program was extended to include home demonstrations and a county agent as a part of an enlarged program in nutrition. This has proved so successful that it has gained the support of the state and national agricultural departments, as well as various local organizations. To encourage better crop production, farm machinery is lent out to the farmers in exchange for milk, corn, and other produce. Some of the branch units, moreover, plant a kitchen garden to demonstrate good horticultural methods and to promote a more diversified diet.

The Foundation has supplied advisory services and modest financial aid toward the development of the Ara-raquara center, but so great is the project's success and backing that it derives almost all its funds from public agencies. The total budget amounted to about \$200,000 last year. Local enthusiasm is reflected in a campaign by which the people in one district collected money and materials to erect their own health unit building. The Foundation's contribution was \$5,000 for 1953, and a new appropriation of \$10,000 provides similar aid for 1954 and 1955. This money is used mainly to purchase equipment that must be paid for in dollars.

VANDERBILT UNIVERSITY AND
KAROLINSKA INSTITUTE, STOCKHOLM
INTERNATIONAL EXCHANGE IN PEDIATRICS

A program for the exchange of senior assistants in pediatrics between Vanderbilt University, in Nashville, and the Karolinska Institute, in Stockholm, is now in its fourth year. The program began after Dr. Arvid Wallgren, head of the Pediatric Clinic at the Karolinska Institute, visited Vanderbilt as the Abraham Flexner Lecturer in 1949. During his lectureship he and Dr. Amos Christie, head of the Vanderbilt Department of Pediatrics, discussed the possibilities of exchanging assistants, and a program was set up in the following year, with modest aid from The Rockefeller Foundation. The exchanges have been mutually advantageous in stimulating new ideas, as well as in broadening the training of the senior assistants. A 1953 grant of \$3,000 from The Rockefeller Foundation will facilitate the program for another three years.

GRANTS IN AID

Dr. J. Garth Johnson, Albany Medical College, New York; \$900 to visit medical schools in the United States to study the outstand-

ing features of instruction in preventive medicine and the introduction of medical students to the environmental and social factors concerned in illness;

Dr. Riad A. Tabbara, associate professor of medicine, American University of Beirut; \$1,300 to observe recent advances in the methods of cardiac diagnosis and research in the United States;

Dr. Yudhveer Sachdeva, Medical College, Amritsar, East Punjab, India; \$4,000 to observe thoracic surgery work in the United States and Canada;

Anatomical Society of India; \$2,000 to assist the society in holding a meeting to discuss teaching and research in Indian medical colleges;

Dr. Alberto Hurtado, research director for the Institute of Andean Biology, Lima; \$575 for travel expenses to visit centers of high altitude research in Europe;

Professor Frank John Fenner, professor of microbiology, Australian National University, Canberra; \$1,850 to visit virus laboratories and the Biological Laboratory at Cold Spring Harbor, over a period of three months;

University of Valle, Cali, Colombia; \$9,000 for the purchase of medical source books for the medical library of the Faculty of Medicine;

Catholic University of Chile, Santiago, Medical School:

\$5,850 for the purchase of equipment for the Department of Anatomy to be used by Dr. Juan Vial;

\$725 for Professor Hector Croxatto, head, Department of Physiology, toward the costs of a visit to the United States to observe departments of physiology;

University of Chile, Santiago, Faculty of Medicine; \$7,500, in addition to a 1951 grant, to purchase equipment for the Department of Internal Medicine for the use of Professor Hernan Alessandri;

Dr. Victor Ayub-Hauva, National Health Services of Chile, Santiago; \$4,200 to study the integration of the preventive and cura-

tive phases of medical care in the United States, Canada, Great Britain, and the Scandinavian countries;

Department of Parasitology, University of Chile, Santiago; \$1,200 for air travel from Chicago to Chile for Dr. William H. Taliaferro, chairman of the Department of Bacteriology and Parasitology of the University of Chicago, to serve as visiting professor;

Christian Medical College, Ludhiana, India; \$3,000 for the Department of Preventive Medicine, for the work of Dr. Carl E. Taylor;

Christian Medical College, Vellore, India:

\$10,000 for equipment and other facilities necessary for upgrading the pathology department;

Dr. Jacob Chandy, professor and head, Department of Neurosurgery and Neurology; \$4,000 to visit centers of neurosurgery and to observe new methods of medical education in Europe, the United States, and Canada;

Dr. Max Schneider, director, Institute of Physiology, University of Cologne, Germany; \$2,250 to visit centers of neurophysiology and neurology in the United States and Canada;

Columbia University, New York, College of Physicians and Surgeons; \$10,000 for travel expenses of a group of American scientists to attend International Neurochemical Symposia in Europe;

Dr. Howard Nelson Willard, Cornell University Medical College, New York; \$1,850 to observe medical care and teaching in Europe;

Dr. Kaj Henning Backer, adviser, National Health Service of Denmark, Copenhagen; \$2,000 to observe methods of medical care and rehabilitation in the United States;

Professor Charles Frederic William Illingworth, Regius Professor of Surgery, University of Glasgow, Scotland; \$850 for travel and living expenses, to visit centers of surgical research in the United States and Canada;

Dr. Leslie George Eddey, director, Medical Services of the Gold Coast, Accra; \$2,200 to observe methods of public health adminis-

tration and the teaching of sanitary engineering in the United States and Canada;

University of Guadalajara, Jalisco, Mexico; \$2,000 for the purchase of equipment for the Department of Physiology and Pharmacology of the Faculty of Medicine;

Dr. Richard Ford, Harvard Medical School, Boston, Massachusetts; \$2,075 to visit various medicolegal centers in Europe;

Harvard University, Cambridge, Massachusetts; \$7,500 to assist the Postgraduate Medical Institute of the Massachusetts Medical Society in its program of continuing education for the practicing physician;

Professor Hans Opitz, professor of pediatrics, University Hospital, and chairman of the executive board, Heidelberg University School of Nursing, Germany; \$550 to observe schools of nursing in Europe;

Olof Anders Forsander, chief, Pediatric Research Laboratories, Children's Clinic, University of Helsinki, Finland; \$1,525 to study recent developments and new techniques in enzyme chemistry, in Denmark;

Niilo Pesonen, professor of anatomy and histology, and dean, Medical Faculty, University of Helsinki, Finland; \$2,000 to observe methods of medical teaching, curriculum organization, and related subjects, in the United States;

Indian Council of Medical Research:

\$3,500 for the purchase of equipment to be allocated to the Seth Gordhandas Sunderdas Medical College, Bombay, for establishment of an experimental surgery unit under Dr. P. K. Sen;

\$2,000 for the purchase of research equipment for pharmaceutical research for allocation to one of the medical colleges in Madras for the use of Dr. M. N. Guruswami;

\$950 for the purchase of equipment and supplies for allocation to the Lady Hardinge Medical College, Delhi, for the use of Dr. B. K. Anand, professor of physiology;

Keio University, Tokyo, Japan:

\$7,500 to provide scholarships under the auspices of the Japanese Medical Library Association, to enable librarians in Japanese medical schools to attend the year's course in library science offered at the Japan Library School at Keio University;

\$3,000 to permit Dr. Susumu Harashima of the Medical School to observe the teaching of preventive medicine and industrial hygiene in the United States and Canada;

Kyushu University Medical School, Fukuoka, Japan; \$9,440 to provide equipment for the Laboratory of Clinical Physiology;

Professor Roderic Alfred Gregory, head, Department of Physiology, University of Liverpool, England; \$575 for travel and living expenses, to visit physiological laboratories in the United States;

Dr. John Forrest Goodwin, lecturer in medicine, Postgraduate Medical School of London; \$2,400 to visit clinical medicine centers in the United States and Canada;

University College, University of London; £308 (about \$924) to purchase recording apparatus for the use of Dr. M. J. Abercrombie of the Department of Anatomy;

\$5,000 for the purchase of books in the general field of environmental sanitation for distribution to selected medical libraries in Europe and the Near East;

Dr. Bimal Chandra Bose, professor of pharmacology, Mahatma Gandhi Memorial Medical College, Indore, Madhya Bharat, India; \$3,500 to observe recent developments in the United States in pharmacology and in medical education and administration;

Professor Herwig Hamperl, director, Pathological Institute, Marburg University, Germany; \$2,275 to visit pathological institutes and medical schools in the United States and Canada;

Mr. James Austin Heady, senior statistician, Medical Research Council, London; \$2,200 to observe research and teaching work in vital statistics and morbidity surveys in the United States and Canada;

Dr. Sydney Sunderland, dean, Faculty of Medicine and professor of anatomy, University of Melbourne, Victoria, Australia; \$1,150 to

observe methods of psychiatric teaching in the United States and Canada;

Dr. Thomas Francis, Jr., chairman, Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor; \$1,125 to visit virus research centers in the United Kingdom and Western Europe;

Dr. William F. Floyd, Middlesex Hospital Medical School, London; \$1,825 to visit physiological laboratories and research institutions in the United States and Canada;

Professor Franco Cambi, director, Institute of Sanitary Engineering, Institute of Technology, Milan; \$2,400 for travel and living expenses, to visit centers in sanitary engineering in the United States;

Dr. Thomas J. Brooks, Jr., chairman, Department of Preventive Medicine, School of Medicine, University of Mississippi, University; \$1,400 to observe the teaching of preventive medicine in the United States;

Dr. Thure von Uexküll, chief assistant in internal medicine, University of Munich; \$2,400 to visit centers of research in psychosomatic medicine in the United States;

Dr. Govind Lal Sharma, dean, Medical College and Hospital, Nagpur, Madhya Pradesh, India; \$3,700 to observe modern trends in medical education in Beirut, Lebanon, the United States, and Canada;

University of Naples; \$540 for the purchase of apparatus and supplies for the studies of Dr. Flaminio Fidanza, Institute of Biological Chemistry;

Miss Helen Bayne, librarian, New York University-Bellevue Medical Center, New York; \$500 for travel and living expenses while visiting medical libraries in Great Britain, Ireland, the Scandinavian countries, and Paris;

Dr. Murray McGeorge, Dunedin Hospital, University of Otago, Dunedin, New Zealand; \$2,250 to observe pediatric instruction and the operation of pediatric hospitals in the United States and Canada;

Dr. Shankar Karunakar Menon, dean, Faculty of Medicine, University of Rajputana and principal, Sawai Man Singh Medical College, Jaipur, India; \$3,575 to visit medical centers in the United States to observe methods of medical education and medical school and hospital administration;

Miss Edith Whetnall, director, Audiology Unit, Royal National Throat, Nose, and Ear Hospital and the Institute of Laryngology and Otology, London; \$2,400 to visit centers in audiology in the United States;

Albert Denton Ogden, chairman, Royal Sanitary Institute, London, and chief sanitary inspector, Chelmsford Rural District, England; \$900 to visit public health and sanitary engineering centers in the United States and Canada;

St. Luke's College of Nursing, Tokyo; \$4,200 for teaching aids, equipment, and furniture required to establish its educational program in the present temporary headquarters of the college;

University of San Luis Potosi, Mexico; \$2,000 for the purchase of equipment and supplies for the Department of Physiology, Faculty of Medicine;

University of San Marcos, Lima, Peru; \$9,000 for the purchase of essential apparatus, instruments, accessories, and supplies for nutritional studies by Dr. Emilio Picon, Institute of Andean Biology;

Seth Gordhandas Sunderdas Medical College, Bombay; \$5,800 for equipment and supplies necessary to supply the Department of Pharmacology with minimum facilities for recognition as a graduate training center;

Dr. Mahalingam Thangavelu, Travancore-Cochin Medical College, Travancore-Cochin State, South India; \$2,300 to observe teaching and laboratory developments in pathology in the United States and Canada;

William John Edward Jessop, professor of social medicine, Trinity College, Dublin, Ireland; \$1,175, to visit medical teaching centers in the United States and Canada;

Medical College, Trivandrum, South India; \$1,800 for the purchase

of essential apparatus, instruments, accessories, and supplies for the Department of Anatomy;

Miss Esma Deniz, president, Turkish Nurses Association and assistant director, Admiral Bristol Hospital School of Nursing, Istanbul, Turkey; \$1,275 to observe nursing schools and nursing service institutions in the United States;

University of Turku, Finland; £600 (about \$1,800) for the purchase, in England, of a centrifugal freeze dryer for the Institute of Bacteriology;

Mrs. Eileen R. Cunningham, librarian, Vanderbilt University School of Medicine Library, Nashville, Tennessee; \$600 for travel to Paris to participate in conferences on the organization of medical libraries;

University College of the West Indies, Jamaica; \$10,000 to bring a senior laboratory technician from the United Kingdom to train technicians in the Medical School;

Yen-seng Ching, Department of Education, Provincial Government of Taiwan, Taipeh; \$4,550 for travel and living expenses to study school health work and health education in the United States;

Dr. Gerrit Bras, senior lecturer in morbid anatomy, University College of the West Indies, Jamaica; \$1,900 for travel and living expenses to visit departments of physiology and pathological anatomy in the United States;

Dr. Coluther Gopalan, deputy director, Nutrition Research Institute, Indian Council of Medical Research, Coonoor, South India; \$950 for travel and living expenses to observe nutrition research and training in the United States and Canada;

Dr. Hermann Lehmann, senior lecturer in pathology, St. Bartholomew's Hospital Medical School, London; \$2,505 to visit centers of sickleemia research in the United States;

Dr. Ignacio Matte, director, Psychiatric Institute, University of Chile Medical School, Santiago; \$3,312 to observe recent developments in psychiatry in medical centers of the United States and Canada;

University of Bordeaux, France, Faculty of Medicine and Pharmacology; \$1,200 for the purchase of equipment for the Laboratory of Cardiology, to be used by Dr. Robert Castaing under the direction of Professor P. Broustet;

Dr. Mohamed Abdo Abbasy, professor of hygiene and preventive medicine, Faculty of Medicine, University of Alexandria, Egypt; \$2,900 for travel and living expenses to observe present trends in medical education and the teaching of preventive medicine in Great Britain, Puerto Rico, the United States, and Canada;

Indian Cancer Research Center, Parel, Bombay; 10,262 rupees (about \$2,300) for air conditioning equipment and a Sernette low temperature cabinet for the Tissue Culture Laboratory, under the direction of Dr. Kamal J. Ranadive;

Dr. Harwood Seymour Belding, professor of environmental physiology, Graduate School of Public Health, University of Pittsburgh, Pennsylvania; \$2,300 for travel and living expenses during a visit to centers of environmental physiology in the United Kingdom, Europe, and the Scandinavian countries;

James Herbert Francis Smith, inspector of factories, Factory Department, Ministry of Labor and National Service, London; \$2,350 for travel and living expenses to visit laboratories, training centers, and industrial hygiene departments in the United States and Canada;

Dr. Robert Murray, H.M. Medical Inspector of Factories, East Lancashire Division, Factory Department, Ministry of Labor and National Service, England; \$2,350 for travel and living expenses to visit occupational health and industrial hygiene centers in the United States and Canada;

Medical College, Indore, India; \$5,000 for the purchase of equipment for the Anatomy Department, directed by Dr. R. P. Singh;

Miss Greta Dahlstrom, Karolinska Hospital, Stockholm; \$3,150 to observe programs in administration of nursing service and nursing education in the United States and Canada;

University College, Ibadan, Nigeria, West Africa; \$10,000 for the purchase of equipment and for expenses of Medical Faculty staff

members during field visits in West Africa to study medical problems and field services;

Government General Hospital, Madras, India; \$2,000 for purchase of equipment and supplies for the Neurosurgery Unit under the direction of Dr. B. Ramamurthi;

Japanese Red Cross Central Hospital School of Nursing, Tokyo; \$8,200 for teaching aids and equipment;

George Lloyd Ackers, chief sanitary engineer, Ministry of Works, England; \$2,150 to visit training and research centers in the field of public health engineering in the United States and Canada;

Dr. Bärbel Inhelder, professor of child psychology, Institut des Sciences de l'Education, University of Geneva; \$2,550 to visit institutes of psychology and research centers interested in child psychology in the United States and Canada;

Japanese Nursing Association, Tokyo; \$4,685 for the purchase of equipment and supplies for the library of its Tokyo headquarters;

King George's Medical College, Lucknow University, India:

\$7,500 for the purchase of equipment for the Pharmacology Department;

\$3,525 to permit Dr. Vanmali Sharan Mangalik, dean, Faculty of Medicine and head, Department of Pathology, to observe modern trends in medical education in Lebanon, the United States and Canada;

\$3,475 to permit Dr. Dharam Narayan, professor of anatomy, to observe modern trends in medical education and in anatomy research in the United States and England.

Medical Care

The Trustees' Commission on Review of the International Health Division stated in 1951 "The Commission therefore urges the Foundation . . . to support . . . ob-

jective studies . . . in Medical Care and particularly to support well designed experimental projects . . . and aid in developing sound methods for the distribution of Medical Care." The projects reported below are among those to which the Foundation has given support during the past year in this area.

AMERICAN PSYCHIATRIC ASSOCIATION

MENTAL HOSPITAL ARCHITECTURE

In the spring of 1952, psychiatrists and architects met together for the first time in a conference to discuss the problems of mental hospital design. Reporting on the conference, which had been sponsored by the American Psychiatric Association, Dr. Daniel Blain, the association's medical director, stated: "During these two days, we planned no great hospitals. We made no significant discoveries about size, design, or equipment. But we did confirm our mutual awareness of the desperate and growing need for the exchange of information between the men who build these hospitals and the men who work in them."

A key note of the conference was the general concern over "humanization" of mental hospitals. As one outstanding psychiatrist expressed it: "A mental hospital is more than a building. It is a place where we treat sick people, whose very illness, in part, has been induced by abnormal living conditions . . . Hospital patients need a structured society which can only be created if the building itself contributes an atmosphere of hopefulness and progress."

Getting down to the hard realities about the inadequacy of mental hospital facilities in the United States and Canada, the conference considered the fact that some 40 per cent of the hospital space now occupied by mental patients is so old and in such bad repair that it should be condemned as obsolete. Seven hundred thousand of the total 1,577,000 hospital beds in North America are occupied by mental

patients; within the next generation thousands of additional beds will be needed to fill the necessities of the rising population. The fantastic figure of six billion dollars might usefully be spent in new hospital construction in the next decade, estimates the Division of Hospital Facilities of the American Public Health Service. While many states have programs in the draft stage and hundreds of millions of dollars have already been appropriated for hospital construction, virtually no planning is under way to ensure that this vast building program will result in modern functional buildings with the flexibility and beauty necessary to facilitate medical programs and patients' progress.

To bring to mental hospital design the best planning that the combined skills of medicine and architecture can supply, it was proposed that the American Psychiatric Association establish a permanent consultation service. Approached for aid in setting up this service, The Rockefeller Foundation in the spring of 1953 appropriated \$140,000 to the association for a study of mental hospital design, construction, and equipment over the next two years. In this enterprise the association has the hearty cooperation of the American Institute of Architects. The group carrying out the study will be composed of a physician, as director, an architect, an engineer, and a staff of six or eight draftsmen and secretaries. This group will give full time to studying the best available examples of mental hospital construction and in conferring with experienced hospital superintendents. They will draw up sample plans and provide a continuous advisory service to authorities responsible for new construction.

ASSOCIATION D'HYGIÈNE SOCIALE DE L'AISNE
SOISSONS PUBLIC HEALTH CENTER

At the new Center of Public Health in Soissons, 60 miles east of Paris, the French Ministry of Public Health and Population is sponsoring a comprehensive demonstration of

efficient medical care operation which may be applicable to the country as a whole. The main feature of the Soissons center is that it integrates at a community level all the various health services presently available through many different central agencies of the French government. Another aim is to bring general practitioners and hospitals into closer relationship with each other and with the health services.

While the Soissons center was not officially constituted until the end of 1951, the idea germinated in 1948, when representatives of the ministry, the Comité Américain de Secours Civil, and The Rockefeller Foundation visited the area to survey the possibilities for a health unit there. Foundation representatives were interested in a unit which could serve both for public health experiments and as a teaching area. The World Health Organization and the United Nations International Children's Emergency Fund subsequently became concerned in the plan, and by the end of 1949 several draft proposals had been accepted in principle by the Ministry of Health. In the meantime the Comité Américain made it possible for the ministry to send Dr. Louis Lataillade, now director of the center, to the United States for a year of study at Harvard University. On Dr. Lataillade's return in the fall of 1950, he established himself in Soissons to draw up a working plan for the experiment. Toward these preliminary studies The Rockefeller Foundation supplied a grant in aid of \$7,200 for 1951 and 1952. Also at this time, with the aid of Dr. Jenny Roudinesco, a well-known specialist in child psychiatry and head of the Association for the Mental Health of Children in Paris, Dr. Lataillade set up a training clinic in mental health and child guidance. In this latter enterprise the Foundation has helped by providing two fellowships. The fellows spent a year with Dr. Roudinesco in Paris and last year studied in Boston at the Harvard School of Public Health and Simmons College School of Social Work. In December 1951, at a gen-

eral organizational meeting of the interested agencies, the ministry designated the Association d'Hygiène Sociale de l'Aisne to administer the funds of the Soissons center. A technical advisory committee representing the major French health agencies concerned in the project was also set up at this time; to this committee the World Health Organization, the International Children's Center, and The Rockefeller Foundation were asked to appoint observers.

During the short time that the Soissons center has been in operation, Dr. Lataillade has made impressive beginnings in bringing about cooperation among hospital authorities, the medical profession, and health officials. In addition, he is gradually mobilizing facilities and staff to undertake medical care research and to provide field training facilities for public health personnel entering the government service. The center already receives students from five nursing schools, as well as foreign fellows in public health and medical care sponsored by the Ministry of Health. In the future the Soissons center is expected to accommodate both French and foreign students connected with the World Health Organization and the International Children's Center. Another important objective at Soissons is to provide continuing professional education for family practitioners, usually in conjunction with the regional hospital.

From the research point of view, one of the center's first activities was the introduction of a statistical unit to make quantitative evaluations of the health needs of the locality. The unit has already published natality and morbidity surveys broken down to show the influence of environmental and genetical factors.

In connection with a new sanitary engineering service under development in the Ministry of Public Health, the center has been asked also to provide a pilot area to work out methods of practice and training.

To support the Soissons Center of Public Health in its plans for expansion, The Rockefeller Foundation in 1953

appropriated \$133,000 to the Association d'Hygiène Sociale de l'Aisne. Of this amount \$28,000 is earmarked for equipment and for foreign travel and miscellaneous expenses of the staff. The rest, amounting to 35,000,000 French francs, is for general expenses over the next five years. Other funds are forthcoming from the interested international agencies.

UNIVERSITY OF NORTH CAROLINA

SURVEY OF GENERAL MEDICAL PRACTICE

The University of North Carolina's Division of Health Affairs is developing a series of studies on the existing health services and health personnel. Attention is being directed first to determining the number, distribution, and functions of the qualified physicians in the state. This year, on the basis of pilot observations showing that 60 per cent of the physicians are family practitioners, a two-year survey was started to find out more about the nature of general practice in North Carolina.

This subject is also of considerable interest to University of North Carolina medical school authorities, who have recently been asked to give particular attention to the training of more doctors for family practice in rural areas. In designing the curriculum they find that surprisingly little is known about what the family doctor is called upon to do. What does the patient need and expect from his family doctor? How well equipped is the doctor, and what are his problems in terms of specific diseases? Factual answers to these and other questions are necessary in order that the young family doctor may not face many problems for which he has received little preparation during his term in medical school and hospital training.

The North Carolina survey, now well under way, is based on a sample of 100 physicians, carefully chosen to reflect the various types of general practice in the state. The university has arranged for a qualified internist to spend a

week observing each physician as he goes about his daily tasks. During this period a random sampling of the patients in each practice is made, and whatever steps that may be necessary are taken to establish an accurate diagnosis. The physician supplies information on his medical training, reasons for selecting the location of his practice, hospital affiliations, income, equipment, and diagnostic and therapeutic procedures. Although most of the family practitioners are extremely busy, they have expressed great willingness to discuss their problems in detail with an intelligent observer.

Toward this two-year study of general practice, The Rockefeller Foundation has supplied a grant of \$45,000. Through a 1952 grant of \$56,250, the Foundation is also contributing toward the costs of research and general planning for the state-wide program. A member of the Foundation's field staff is cooperating closely with the North Carolina research team.

COMMISSION ON CHRONIC ILLNESS

CONFERENCE ON CARE OF THE LONG-TERM PATIENT

For most communities in the United States, the care of the chronically ill looms as a large and growing public health problem. Even with a very considerable increase in medical knowledge of such conditions as arthritis, arteriosclerosis, and neurological degeneration, health authorities know that there is little likelihood that the load of chronic disability can be greatly reduced in the foreseeable future. For a long time to come, the medical profession and society at large will need to find ways of minimizing inevitable incapacities and of caring efficiently for the large group of individuals who cannot look after themselves.

For the past four years a Commission on Chronic Illness has been carrying on intensive studies to obtain accurate information on the size and nature of this problem and to draft recommendations for wise planning of research, of

preventive programs, and of facilities for treatment and rehabilitation. The formation of this commission was spearheaded by the American Public Health Association in co-operation with the American Hospital Association, the American Medical Association, and the American Public Welfare Association. Mr. Leonard Mayo is chairman of the commission, and Dr. Dean W. Roberts, former assistant director of public health for Maryland, is its full-time director.

While the commission does not expect to complete its work until 1956, it has scheduled for March 1954 a Conference on Care of the Long-Term Patient. The conference will bring together several hundred experienced workers in the chronic disease field to discuss the reports of the commission's numerous study groups. Five major committees have already been appointed, one for each of the following topics: the patient at home, the patient in an institution, the integration of facilities and services, research, and finance. On the basis of this conference the commission hopes to crystallize its recommendations for the provision of rehabilitative and custodial services on the necessary scale. These recommendations will include suggestions as to the proper allocation of responsibility among private and public agencies operating in the field, as well as a discussion of costs and how to meet them.

Toward the preparatory expenses connected with the conference, The Rockefeller Foundation has contributed \$18,865. The conference itself is supported by the four founding organizations, together with the Josiah Macy, Jr. Foundation and seven insurance companies, at an estimated cost of \$88,000.

GRANTS IN AID

Birmingham University, England; £3,000 (about \$9,000) for the Department of Medical Statistics for the salary and travel

expenses of a research assistant working on the changes in age composition of the population of England;

Maryland State Planning Commission; \$5,000 to assist the Maryland Committee on Medical Care in carrying out studies and surveys on medical care problems in Maryland;

University of Michigan, Ann Arbor, School of Public Health, Bureau of Public Health Economics; \$8,500 for the continued employment of Charles Metzner, a formally trained social scientist in charge of biosocial research in medical care;

National Health Council, New York, New York; \$10,000 for the purchase and distribution of the report of The President's Commission on the Health Needs of the Nation;

Dr. Henry Toole Clark, Jr., administrator, Division of Health Affairs, University of North Carolina, Chapel Hill; \$1,450 to observe centers of medical care in the United States.

Investigation and Control of Specific Diseases and Deficiencies

THE VIRUS RESEARCH PROGRAM OF THE DIVISION OF MEDICINE AND PUBLIC HEALTH

The virus research program of the Division of Medicine and Public Health was marked in 1953 by two important advances: the opening of two new field stations, bringing to four the research outposts of the program; and, in the laboratory, the further adaptation of a test-tube test which simplifies the work of classifying the viruses being studied. In other respects as well, the year witnessed steady progress toward the primary objective of the program, which is to study the arthropod-borne viruses in the hope of developing better understanding of the importance and control of the diseases they cause.

One of the new field stations is in Port of Spain, Trini-

dad, established in collaboration with the Government of Trinidad and the Colonial Medical Research Service. The other is in Johannesburg, Union of South Africa, maintained cooperatively with the South African Institute of Medical Research.

The newly-adapted test — the hemagglutination-inhibition test — reduces from two or three weeks to less than one day the time required to determine the presence in blood samples of antibodies to the viruses, and thus may speed up the survey of the distribution of the diseases in question. The test depends on agglutination or "clumping" of red blood corpuscles when added to a fluid medium containing certain viruses, and on the inhibition of the clumping when the viruses are neutralized by the antibodies.

Like previous health programs of the Foundation, the virus research is a two-pronged attack, utilizing both field investigation and laboratory study. From the field investigators come information about the diseases as they occur in nature, and survey data which reveal their distribution. From the central laboratory comes information about the characteristics and relationships of the viruses, the insects which carry them, and the chemical processes which govern their behavior.

That the program may have values beyond its practical public health results is suggested by Sir Macfarland Burnett:

"As a by-product to the isolation of yellow fever virus from tropical mosquitoes no less than sixteen other viruses have been obtained. Some are known to produce occasional human disease, but the real importance of these new viruses may well be to offer clues to the general nature of virus evolution and perhaps hints as to how new virus diseases of man may appear in the future."

The present virus research program began in 1949, and represents one of the major interests of the Division since

that time. The sum of \$300,000 has been appropriated for the expenses of this work in 1954.

Diseases Caused by Arthropod-Borne Viruses

There are at least 20 different viruses found in arthropods such as mosquitoes, small flies, mites, ticks, and lice which may produce infection in man and his domestic animals. Traditionally these are classified, according to symptoms, as encephalitic and non-encephalitic. Among the former are such notorious agents as St. Louis encephalitis (sleeping sickness), Japanese "B" encephalitis, and Australian "X" disease. In this group also are the equine encephalomyelitis viruses. Epidemics of encephalitis among horses and mules have been known in the United States for over 75 years, though not until 1931 was it discovered that a virus was the cause and that it could also attack man. Three strains of the equine encephalitis virus are now known: Eastern, Western, and Venezuelan.

Not commonly regarded as encephalitic viruses are the better known, or at least more widely known insect-transmitted viruses of yellow fever, dengue, and Mediterranean three-day fever. Rift Valley fever could also be included here. That the classification by symptoms may not be a basic one is suggested by the fact that yellow fever and dengue show definite immunological relationships with some of the agents mentioned above — that is, antibodies of one of these viruses in the blood stream may protect or immunize also against one or more of the others. Furthermore, yellow fever, dengue, and Rift Valley fever viruses will cause an encephalitis when inoculated into the brains of mice.

During the course of yellow fever investigations conducted by the International Health Division, a number of "unknown" viruses were discovered and set aside for further study. This study has now advanced to a point where the outlines of their relationships can be seen, and a growing

amount of information begins to link them not only with each other but also with the previously known viruses. Seven of the new viruses isolated in Africa, and five found in South America, will produce an encephalitis in experimental animals, and there is recent evidence that at least some of them cause an encephalitis in man.

In attempting to present a description of the illnesses caused in humans by viruses of the arthropod-borne encephalitic group, there is risk of oversimplification. Investigations of virus diseases are peculiarly dependent on the laboratory. While the clinician can recognize certain broad characteristics, it is almost always necessary to call upon a specialized laboratory for precise diagnosis. For this reason, the less spectacular diseases caused by some of these viruses have not been accurately identified in traditional practice.

In all the infections which have been adequately studied in humans, the usual case is one of mild illness, with symptoms of fever, headache, aching joints and muscles, and sometimes stiff neck. Symptoms in the upper respiratory tract which are characteristic of infections with viruses of the influenza group and the common cold, are not prominent features of the illness. Such cases may receive any of a number of diagnoses, such as "fever of unknown origin," dengue, grippe, malaria, summer "flu," summer fever, and the like. The great majority of the cases go on to early and complete recovery.

In regions where malaria was prevalent, most fevers were generally attributed to that disease. The receding tide of malaria, resulting from the successful control campaigns of recent years, however, disclosed a large residue of febrile disease. Though the causes of these fevers are in large part unknown, some of the viruses being studied in the Division's program are implicated. Bwamba fever, West Nile, and Mengo viruses are known definitely to cause febrile illnesses in man, and immunity surveys show that others such as

Ilhéus, Semliki Forest, and Bunyamwera almost certainly cause widespread human ill health in tropical areas.

Severe outbreaks of the diseases, when they do occur, may be "fulminating and alarming indeed, with high morbidity and mortality rates" (in the language of the epidemiologist). In the outbreak of St. Louis encephalitis in 1933 in the middle United States, there were 1,130 cases of encephalitis reported in St. Louis County alone, with a high fatality rate. In the outbreak of Australian "X" disease in 1917-1918 (probably related to Japanese "B") there were 134 cases with 70 per cent mortality. In the 1941 outbreak of Western equine encephalitis in North Dakota, Minnesota, and neighboring provinces in Canada, over 3,000 persons were attacked, with a mortality rate of 8 to 15 per cent. In the 1938 outbreak of Eastern equine encephalitis in Massachusetts, there were 34 cases of which 24 were fatal. Explosive outbreaks of Japanese "B" encephalitis with high mortality rates have been described in Japan, Korea, and neighboring countries. Although infections of Venezuelan equine encephalitis have usually been mild, two confirmed fatal cases occurred in Trinidad in 1943. The recent outbreaks of West Nile fever in Israel to be mentioned below, were caused by one of the newly discovered viruses, West Nile, and were of impressive severity.

Most of the arthropod-borne viruses are probably adapted primarily to insects, birds, and the smaller animals, and affect man and his domestic animals to any important extent only when the ecological balance of nature has been disturbed. Thus Rift Valley fever was unknown until sheep raising was introduced to Kenya, the virus having been first isolated there from a sheep in 1930. Rift Valley fever has now been heard from in South Africa where during the past two or three years the sheep industry has suffered heavy damage from this infection. The introduction of large herds of sheep into close proximity to the forested areas of tropical Africa appears to be the factor bringing Rift Valley fever

into prominence. In both Kenya and South Africa, many human infections were reported along with the spread of the disease among sheep.

The outbreaks of West Nile virus infections, a dengue-like disease now called West Nile fever, in Israel in the summers of 1950, 1951, 1952, and 1953, illustrate the same principle. The outbreak can probably be attributed to the influx of a non-immune population into the area vacated by a substantially immune group.

DISTRIBUTION OF THE DISEASES

As knowledge of the distribution of the various neurotropic viruses increases, an interesting pattern begins to unfold. In the East, Japanese "B" encephalitis is known to extend from Manchuria down the islands and the mainland to Malaya and the Philippines. The recent extensive outbreaks of Murray Valley fever in Australia appear to be due to a virus very closely related but not identical to Japanese "B." In Africa and the Middle East, West Nile virus has been isolated from humans in Israel, Egypt, and Uganda. Indirect evidence by immunity surveys indicates a distribution of this virus from Central Africa to India.

While the general areas of distribution of a disease can be determined from the literature and from scattered reports, the detailed knowledge necessary for epidemiological research requires much more painstaking investigation. To make such surveys is one of the chief objectives of the field stations established as part of the Division's virus research program. The four stations already in operation — in India, Egypt, South Africa, and Trinidad — are in distinctly different zoogeographical areas of major importance. As the data from these stations accumulate and are correlated, a much more reliable picture of the distribution and importance of the virus diseases can be built up.

The immunity surveys in India thus far include too few samples to permit generalization, but it may be said that

West Nile infections seem to be heavy in India, though not so heavy as those for another virus, Dengue Type I, and at not so high a rate as in Egypt. The India data are not clear for another reason, which is that nearly half the samples show "plural protection." When a blood sample neutralizes two or more different viruses, it may mean that the same antibody protects against both or several viruses (immunological overlap), or it may mean that the patient from whom the sample was taken had more than one infection. It is significant that all the apparent overlap was confined to Group B viruses, mentioned below.

Preliminary results from the survey made in Trinidad by the field station established in 1953 indicate a high percentage of antibodies to Ilhéus virus. This agent was first isolated in Brazil during the yellow fever work.

HOW THE DISEASES SPREAD

Because more information has been obtained about West Nile than any of the other newly discovered viruses in the program, some of the facts concerning it will throw light on the extremely complex problems encountered in investigating these viruses.

West Nile was first isolated in 1937 from the blood of a mildly febrile native woman in the West Nile district of Uganda. At that time, there was no reason to think that it was the causative agent of geographically extensive human infection. In 1942, added significance and importance was attached to the discovery when studies revealed that West Nile is closely related to the St. Louis virus and to Japanese "B" virus. In the next decade, surveys showed that immunity to West Nile is widespread in Central Africa and Egypt. In 1952, West Nile was identified as the cause of the dengue-like disease which broke out in Israel during several summers, as already mentioned.

The work in Cairo, since its establishment in 1951, has been devoted in major part to West Nile virus, and especially

to identifying the animals and insects which might be suspected of harboring and transmitting it. In 1952, West Nile virus was recovered from a pool of *Culex* mosquitoes collected in Sindbis village.

A primary question concerns the method by which the virus is maintained in nature. Three factors are necessary for a virus disease to spread: a source of the virus; an agent (vector) to transmit it; and susceptible non-immune individuals to receive the infection. In Egypt during the spring and summer all three factors exist in generous numbers. Nestling birds and newly born animals, not to mention children, represent a supply of susceptible individuals among whom new infections are spread by mosquitoes and other vectors; the ill ones are also the source from which the vectors secure the virus. But where does the virus come from for the first infections in the spring? It cannot come from individuals, human or animal, infected the previous season, for the virus remains active in the blood stream only a relatively few days, and the victim then develops immunity. The virus for the first infections must come from some "reservoir" in nature where it is maintained in active state throughout the winter.

A number of guesses about the nature of this reservoir have been made. One is that migrating birds bring the virus from the tropics in the spring, but this only raises a second question: what is the reservoir in the tropics? Or it may be that in spite of appearances, enough active infections occur throughout the winter to maintain the virus. Another interesting lead, now being thoroughly explored, is that the ticks which abound in pigeon roosts and elsewhere in Egypt, may harbor the West Nile virus between seasons. Whatever the answer may prove to be, the problem is a complex one and until it is solved the epidemiology of West Nile and most of the other arthropod-borne virus diseases must remain incomplete.

Whatever the source of fresh virus at the beginning of the spring, the spring-summer reservoir from which the in-

fection, once begun, is rapidly spread, has been fairly well identified as the hooded crow. This bird, ubiquitous in Egypt, carries a highly potent virus content in its blood for quite a few days after infection. The same species of *Culex* mosquitoes which feed on man also feed on the crow. Other domestic animals and fowls can carry enough virus to account for the spread of infection even if the hooded crow does not prove to be the chief culprit. Incidentally, the ornithological study has shown that crows are great home lovers, with a normal range of less than ten miles, belying the old saying about distance "as the crow flies." This fact may aid in making future surveys of virus infections among humans, for the incidence among the crow population in a number of localities has been found highly correlated with incidence in the human population.

The short travel range of the crow confuses the issue of how West Nile virus is spread beyond small local regions. However, it appears quite probable that some of the arthropod-borne virus diseases are spread from country to country by migratory birds; among these are Japanese "B" encephalitis and Eastern equine encephalomyelitis. Though there seems to be no obvious sign of disease in the birds themselves, the virus appears in the blood and the period of activity may persist for several days. Considering the tremendous number of migratory birds and knowing that these birds are fed on by a great variety of mosquitoes and small flies, one may reasonably expect that they will become infected from time to time and carry such viruses from one region to another as they migrate with changing seasons.

The investigation of the arthropod-borne viruses and the diseases they produce, it is obvious, requires the concerted efforts of specialists in microbiology, biochemistry, entomology, ornithology, and mammalogy to study the diseases in all of their life cycles in the various hosts. Climatology, forestry, botany, and other sciences become important as they influence the abundance and habits of insects, birds,

and mammals that may carry virus infections. Now that all four field stations are well established, even though not yet fully staffed, the accumulation of information can proceed at an increasing pace. As the field stations are equipped to make their own laboratory analyses and identifications, the central laboratories in New York will be increasingly freed from service functions to pursue the fundamental studies upon which rest the improvement of methodology and the correlation of field results.

The Laboratory Studies

The prime objective of the Division's laboratories in New York is the systematic study of the characteristics of the arthropod-borne viruses, with the hope that methods may be developed which will aid investigations in the field concerning the distribution (epidemiology) of diseases caused by these agents.

THE H-I TEST

The study of virus diseases is, in one respect, like detective work in criminology: the criminal can be caught red-handed in some rare instances, but usually he must be traced by indirect clues and circumstantial evidence. The virus agents themselves can be apprehended in human infections only during the active phase of the disease. At the field stations, therefore, every effort is made to secure the cooperation of local physicians and clinics in promptly reporting undiagnosed fevers, in order that blood specimens may be taken during the acute and the convalescent stages.

The main reliance in virus research is on indirect clues, the antibodies in the blood stream. The human organism reacts to protein infection (viruses are proteins) by building up counter-reactants in the blood called antibodies. The antibodies protect the organism from further infection by the same virus for varying periods, often for life. The antibodies are reliable clues, pointing not only to the fact that

infection has occurred, but also, in the usual case, indicating specifically the virus which produced the infection. The techniques of antibody detection and identification are obviously of basic importance in virus research.

Until recently, the principal method available for the detection of antibodies was the protection test in mice. Subject to many modifications, the procedure is as follows. Live virus is mixed with serum suspected of containing antibodies to this virus, and after a suitable interval, the mixture is inoculated into mice. If the animals survive, it is assumed that the serum neutralized the virus and possessed antibodies. If the animals die, it is assumed that the serum did not neutralize the virus and had no, or few, antibodies. Suitable controls must be included, and in caution it must be added that this is a simplified skeleton of a test which requires considerable technical skill to perform properly, and experience to interpret correctly.

During 1953, the hemagglutination test was adapted to a number of the viruses included in the program. This test-tube test depends on another characteristic of certain viruses, their agglutinating power. Certain of the viruses under study have the power of combining with red blood cells from chickens. This can readily be demonstrated, as the union of virus and blood cells causes the latter to stick together so that they settle to the bottom of the tube in clumps. The antibodies to the virus, on the other hand, prevent or inhibit the clumping of the cells -- hence the name of the test: the hemagglutination-inhibition test. A laboratory worker can make up several dozen tests in the morning and read the results in the afternoon — a tremendous gain in time, and saving in expense.

To summarize a vast amount of work, it was found that a considerable number of the viruses under study which cause the red blood cells to agglutinate could be divided into two groups, depending on the acidity and temperature of the solution in which the cells and virus were suspended. In

Group A are the Eastern, Western, and Venezuelan equine encephalitis viruses. In Group B are Japanese "B," St. Louis encephalitis, dengue, yellow fever, and of the newly discovered viruses, Ntaya, West Nile, and Uganda S. Another of the new viruses, Sindbis, reacts in an ambiguous way but is placed in Group A on other grounds.

The use of the inhibition of agglutination as a test for the presence of antibodies was first handicapped by the fact that the sera contained other substances besides the antibodies, which inhibited the clumping, and methods for removing these had to be developed. When this was accomplished, it was shown that hemagglutination could readily be inhibited by antibodies, by a technique essentially similar to that used in influenza virus research. This inhibition, it was soon found, was often not specific for any one virus; an immune serum prepared against one virus inhibited agglutination not only for that virus but also for others of the same group. That is, a serum prepared against Eastern equine encephalitis inhibited agglutination with that virus and also with Western and Venezuelan equine encephalitis, and also Sindbis. It would not react in this manner with any members of Group B.

PROTECTIVE ANTIBODIES

When the antibody produced by one virus also gives some protection or immunity against the action of another, the result is called an immunological overlap. For several years a systematic study has been in progress of the possible immunological overlaps between the groups of viruses under study by use of the protection test in mice. The results shown by these protection test studies are being compared with those obtained by the H-I tests. In general, most of the overlaps shown in the protection tests were between members of the Group B viruses, and none was demonstrated between the viruses of Group A. In general, the overlaps as shown by the protection tests were much less than those shown by

the H-I tests. A comparison of the results indicate that there is no clear-cut correlation. The two tests presumably measure two distinct antibodies.

The correlation of the results of the two tests for antibodies and of those for a third test (complement fixation) are receiving continued study by more refined methods which measure not only the presence of overlap but also its significance.

THE BIOCHEMICAL STUDIES

Biochemistry, the science in which chemistry meets the living organism, plays an important role in the study of viruses and occupies a significant position in the research program of the laboratories.

The objectives of the biochemical studies in the central laboratories are, first, to attempt to answer questions of fundamental importance to the program as a whole, such as 1) the development of in vitro (test tube) tests which will substitute for or supplement the tests requiring animals, and 2) the purification and concentration of virus.

Many of the viruses under study appear, on immunological grounds, to be interrelated, that is, to belong to definite families. One of the questions of fundamental importance to the program, which biochemistry may perhaps answer, is whether the significance of these similarities and differences can be better understood, and more definitely defined, by demonstrating similarities and differences in their chemical structure and behavior.

Another question of the same sort concerns the fact that these viruses, even when related, frequently differ in their capacity to produce disease and in the type of disease they produce. Can chemical differences be found which will explain this fact?

In the test which uses chicken red blood cells, it has been found that viruses which are related on immunological grounds also require a similar set of conditions of tempera-

ture and composition of the suspension medium to react with — agglutinate — the cells. If the related viruses are regarded as a family, it can be said that the members of one family require one set of conditions, while the members of another family require quite different conditions to react with the same blood cells. It would thus appear that a family characteristic is a definite property which is open to biochemical investigation.

One method of investigation has been through the use of ion-exchange resins. These substances are most familiar as water softeners, where they function by removing undesirable salts by the process of specific adsorption. They are now finding extensive use in the field of biochemistry as tools for the purification and concentration of a variety of substances which can be adsorbed onto and eluted from the resins.

In a number of virus research laboratories, including those of the Division, these resins have been found useful in partially cleaning and in concentrating various viruses. The resins, in the form of finely divided powder, are suspended in an appropriate solution in a glass tube, and the material under study is filtered through. Depending on the type of resin used and on other conditions, the resin adsorbs (not absorbs) the virus particles away from contaminating material, or adsorbs the contaminating material away from the virus particles. By this means, virus preparations of ten-fold concentration can be made, with 98 to 99 per cent of the contaminating materials removed.

In the past year, the Division's laboratory workers have been using the reaction itself between resins and viruses as a method of studying virus structure, and thus as a step in the direction of their further classification. The results, however, unlike those with chicken red blood cells, have not as yet shown that the various members of the same virus family react similarly with a given resin.

However, with one particular resin, it has been found

that when resin and virus are suspended in solutions of varying but controlled composition, different viruses, even within the same family, show characteristic and reproducible patterns of behavior in their adsorption on to that resin. These differences in behavior must, presumably, be attributed to specific differences in the chemical composition of the viruses.

Interestingly enough, the behavior of the viruses toward this resin does not seem to be related to their size, nor to the family to which they belong immunologically. What seems to be suggested by these studies is that the behavior of a virus toward this particular resin is related to the way in which the virus acts when it infects man or other animals.

Thus, the viruses of one family — the poliomyelitis group — attack quite different cells and produce an entirely different disease from the viruses of the arthropod-borne group. Correspondingly, the behavior of the poliomyelitis group toward the selected resin is markedly different from that of the insect-borne group.

The results with the selected resin indicate that the method will even differentiate between certain closely related viruses. Within one family, viruses which bear the close relationship of daughter to parent particle — modified strains of the same virus — may exhibit characteristic changes in behavior toward the resin, behavior which is correlated with the modification of the daughter particle as an infecting agent as compared with the parent particle. . . . Thus, the unmodified virus of yellow fever which attacks a variety of tissues, behaves in one way toward the resin, while a modified strain of the same virus adapted to grow more or less specifically in brain tissue, behaves in quite a different way toward the same resin. Still a third and quite distinct behavior toward the resin is shown by the mildly infective 17D strain of yellow fever used for vaccination.

These results suggest that it may be possible to use

biochemical methods to study the relationship between the structure of viruses and their potential as infecting agents. From a practical standpoint, the results suggest a method of seeking and selecting modified or weakened virus preparations for the production of living virus vaccines.

Another phase of the biochemical study relates to the property by which the viruses agglutinate the chicken red blood cells used in the hemagglutination-inhibition test. It is not yet known how this property, referred to as the agglutinin, is related to the power of the virus to cause infection. The agglutinin shows considerable differences in its stability from that of the infective virus. This may indicate that the agglutinin is associated with but not identical with the infective property of the virus. However, it must be kept in mind that with other viruses, such as influenza, the virus particles may be made to lose their infectivity without loss in agglutinating power.

The use of the hemagglutination test is affected by still another consideration, namely, that the clumping of the red blood corpuscles, and the inhibition of the clumping by the antibodies, is prevented by certain other substances. This part of the problem is also under study by the biochemical section of the central laboratories. The substances which inhibit the reaction between virus and blood corpuscle are present in rather large amounts in the brain tissue from which the virus agglutinin is prepared and also in the serum of all animals tested. These inhibitors are completely different from the specific antibodies which are produced from an infection.

Obviously it is of importance to know whether these inhibitors play any role in the disease process. However, at present there is no knowledge whatever of their significance other than as non-specific inhibitors, in the test tube, or red blood cell agglutination by the arthropod-borne viruses.

Considerable time and work have been devoted to the study of the best methods of removing these inhibitors from

the virus preparations without damage to the virus, and of removing them from serum without loss of the specific antibodies. Quite satisfactory methods have finally been developed for both purposes, so that agglutination and inhibition tests can be carried out easily. It is also possible now to make direct comparative studies of agglutinating and infective viruses, and to carry out further investigations of these inhibitors, such as their possible effect on other tests and their role, if any, in disease. So far it has been shown that the inhibitors in serum probably consist of a combination of lipids (fatty substances) and proteins.

The immunizing process is also under study, and at present the work is centered on the chemistry of the tests which reveal the presence of the immunizing antibodies. These tests, as mentioned before, are the mouse-protection test, the hemagglutination-inhibition test, and the complement-fixation test. Using the method of zone electrophoresis, the study seeks to determine whether the antibodies in the serum after infection can be separated one from another. Also being studied is the question whether the various component parts of the virus activity exist as discrete entities, that is, whether the infective particles can be separated from those which cause agglutination and complement fixation. Preliminary results suggest that two types of antibody — protective and agglutinating-inhibiting — may differ chemically to a sufficient degree to be separated.

The biochemical investigation has not been successful in developing a test-tube test based on the tagging of serum antibodies with a radioactive isotope.

MOSQUITO AND TICK STUDIES

The purpose of maintaining an insectory in the New York laboratories is to develop basic experimental techniques, and to explore the closer biological relationships between viruses and the arthropods which transmit them. As the field station laboratories and insectories become more

fully developed, a good deal of the work which has hitherto occupied the entomological staff of the central laboratories can be left to them. Among the problems which can be more expeditiously and efficiently handled in the field stations are those concerning the susceptibility of various species of mosquitoes and other arthropods to the viruses, and the role each plays in spreading them.

A question with which the central laboratories are now dealing is to determine how far the potential role of a mosquito as a vector of a virus can be indicated by inoculating the virus into the mosquito as compared with the results of ingestion by natural feeding. Some of the viruses under study do not circulate in sufficient quantities in laboratory animals to infect the mosquitoes which bite them; to inoculate the virus directly into the mosquito by-passes this difficulty. For the inoculation studies a technique patterned after the work of the plant pathologists has been adopted. The previous method was to dip a dissecting needle into the virus and with it to puncture the mosquito. In the new method a true inoculation is made by means of a microcapillary pipette. One of the advantages of the new method is that it gives greater control over the amount of virus injected into the mosquito.

In the preliminary studies, two viruses about which a good deal was known were tested on two mosquito species which had also been previously studied. In these experiments, the results of inoculation paralleled those of natural feeding: the mosquito species which was not infectable by one of the viruses by feeding, was equally refractory to the inoculation of this virus, and the susceptible species was equally so by both methods. However, it must be emphasized that there may be quantitative differences. Thus one species may be resistant to an amount of ingested virus which will infect a more susceptible species, and yet be equally infectable by inoculation.

Another question which had to be studied before the main investigation could proceed was whether passage

through mosquito tissue modifies the virus. In "passage," virus from one mosquito is inoculated into another; virus from the second is passed to a third; and so on. Quite a few serial passages of this kind have not, it seems, altered the power of most of the viruses to infect mice. There is some evidence, however, that one of the African viruses — Semliki Forest — has been modified, a result which needs further study.

A somewhat similar question is whether a virus already modified by passage through mice or mouse brain would infect mosquitoes by inoculation. For these studies, a yellow fever strain which affects the nervous system instead of the liver, and which had been passed consecutively more than 250 times through the brains of mice, was employed, together with a West Nile strain which had undergone only 20 passages through mouse brain. The results showed that adaptation had not apparently changed the capacity of the viruses to develop in mosquito tissue.

For some time the insectory in the central laboratories has maintained colonies of various species of *Anopheles* and *Aedes* mosquitoes. Because the viruses under study were isolated principally in Africa and South America, it seemed necessary to add colonies of *Culex* species. Species of *Culex* are of importance in the transmission of Western equine encephalomyelitis and St. Louis encephalitis in this country, and more recently have been shown to carry the West Nile and Sindbis viruses in Egypt. Unfortunately the *Culex* species do not feed as readily on laboratory animals as the others, nor have they been as long-lived, with the result that as yet relatively little information has been secured concerning their capacities as vectors.

Tentative results in the 1953 work indicate that the following viruses, for which no laboratory information has hitherto been available, have been found capable of multiplication in one or more species of mosquitoes: Semliki Forest, Bwamba, Ntaya, Bunyamwera, and Uganda S.

Certain of the viruses — West Nile, Semliki Forest, Bun-

yamwera, and probably Ilhéus — will develop in all three genera, *Anopheles*, *Aedes*, and *Culex*.

Ntaya will develop in *Aedes* and *Culex* but not in *Anopheles*, and three — yellow fever, Uganda S and Anopheles A — in *Aedes* only or poorly in *Anopheles* and *Culex*.

The capacity of certain viruses to develop in *Culex* mosquitoes is of potential significance, in so far as it may suggest that these viruses may have avian hosts in nature. As mentioned earlier, West Nile virus has been isolated from *Culex* mosquitoes in Egypt, and both it and Sindbis virus are currently being shown to have important bird-*Culex* relationships. Perhaps this will be shown to be true for Bunyamwera and Ntaya viruses also. The latter in particular is of interest. Ntaya does not seem to infect monkeys under normal circumstances, produces no circulating virus in baby mice, yet does infect one-day-old chicks. Is it possible that this is a truly avian virus?

Ticks are known to be natural vectors of several viral agents, including those causing Colorado tick fever, louping ill, Russian spring-summer encephalitis, and Nairobi sheep disease. In addition, they have been incriminated as laboratory vectors of Western equine encephalomyelitis and St. Louis encephalitis viruses. As a part of the central laboratories' entomological program, studies were initiated in 1953 on the relative susceptibility of three species of ticks to certain of the African viruses under investigation. In general, the questions concerning the role of ticks as vectors are the same as those which involve mosquitoes, but as yet the studies have not progressed to the point where even preliminary results seem to be suggested.

Field Stations

VIRUS RESEARCH CENTRE, POONA

The Virus Research Centre in Poona, India, was set up by the Indian Council of Medical Research, the Govern-

ment of Bombay, and The Rockefeller Foundation for the study of the arthropod-borne virus diseases of man and domestic animals in India. Housed in the former Pathology and Physiology Building of the B. J. Medical College, the Virus Research Centre was formally inaugurated on February 4, 1953, by the Honorable Rajkumari Amrit Kaur, Minister for Health of the Government of India.

The staff consists of one Indian and two American doctors, and 46 technicians and assistants. The main laboratory in Poona, about 125 miles inland from Bombay, is supplemented by a field station in the tropical evergreen jungle of Kanara district in southern Bombay State. In Bombay State it is possible to study wild life in a variety of environmental conditions such as the coastal marshlands, the deciduous and evergreen tropical forests of the Western ghats, the irrigated flatlands of the coastal lowland, and the Deccan plateau and the villages built near impounded water and rivers.

In the urban and rural regions of India, there are several factors which predispose to the breeding of mosquitoes which may carry virus diseases. The practice of keeping water in small containers in the house and allowing the accumulation of polluted waste water in houses, village streets, open sewers and cesspools produces favorable breeding conditions for a variety of mosquitoes. The impounding of water for irrigation and drinking purposes also furnishes a favorable environment. The small rock pools that are left in the streambeds of the rivers when the rains cease are the favorite breeding place of several species, and in the jungle the broken bamboo stems and the tree holes serve the same purpose for the forest mosquitoes.

The monsoon is the season for the arrival of migratory birds, some of which frequent waterholes and streams and others the jungle. They are thus exposed to a large variety of mosquitoes at a time when these insects are present in great abundance, increasing the likelihood of their leaving a

virus infection in mosquitoes. Once infected with a virus, a mosquito may remain infected for life, and so maintain the virus for long periods in the absence of other hosts. In animals and birds the virus is present in the blood for only a few days; the importance of the insect cycle is obvious. In other words, the viruses under study possibly remain most of the time as an infection of arthropods, although birds or mammals may be necessary for the maintenance of the cycle of infection.

With the onset of the monsoon in June, an active research program was started which consisted of a systematic attempt to isolate viruses, and which required the full attention of the entire research staff. Blood from 143 humans with unexplained fevers, and from 222 birds was tested, together with material from 290 pools of mosquitoes and other arthropods totaling nearly 22,000 individuals. Two strains of virus were isolated during the summer, both from birds, but they have not yet been classified by appropriate immunological methods. It is not possible, therefore, to say whether they are new viruses, or merely new strains of known ones.

The information about the apparent high incidence in India of antibodies to certain viruses, mentioned in an earlier section, rests on the results of neutralization tests done on 588 human sera, collected at 38 places in six states in Southern India in 1952. The tests were made against 15 different viruses, in the central laboratories of the Foundation in New York; preliminary results were included in the Annual Report for 1952. Dengue Type 1 antibodies appeared in 40 per cent of the sera tested, and West Nile in 35 per cent. Other significant results were the 20 per cent positives for Dengue Type 2 and smaller but significant figures for three of the African viruses. Also noteworthy were the completely negative results for yellow fever, and for two African viruses, Bunyamwera and Bwamba fever. The results of the entire series of tests were prepared for publication in 1953.

REGIONAL VIRUS LABORATORY, TRINIDAD

The Trinidad virus laboratory is one of the two new stations opened in 1953. The location in Port of Spain provides an excellent center for research in the South American and Caribbean area, one of the major tropical zoogeographical regions of the world. The island provides all the required modern facilities and occupies a strategic point on the airline network, making communications fast and convenient.

The laboratory is housed in a building furnished by the government of Trinidad and Tobago. Conversion of the building, a former U. S. Army barracks, began in January and was completed in July. The installation of laboratory equipment was almost finished in the fall, and the scientific program was under way before the end of the year.

Two Foundation staff members arrived in Trinidad to plan the remodeling, and in addition to supervising that process, began the selection and training of laboratory personnel. Because no technicians experienced in the required specialties were available, several promising graduates of local high schools were chosen for instruction. Some of these have already become adept in operations such as sterile techniques, processing of specimens, staining procedures, and care of experimental animals. A staff of 21, exclusive of the Foundation representatives, was on duty by the end of the year.

The scientific work of the station began with a survey of the climatic regions of the island and the distribution of immunity therein to the virus diseases prevalent. A considerable body of information had been gathered during the malaria study in Trinidad made in 1942-1945 by the International Health Division, and the present survey was based on the previous report.

Trinidad has three main climatic regions. An area with high rainfall, covered for the most part by tropical rain forest, but containing also commercial cocoa plantations,

spreads over the northern and central part of the island. Surrounding this to the west and south is a drier area merging into savannah-type terrain with grass and scattered trees and shrubs. Along the low-lying coast are many swamps, some small, but several covering many square miles. The prevalence of malaria varied roughly according to region, the previous survey showed, being high in the rain forest and coastal swamp areas, and lower in the drier region.

The preliminary data from the virus disease survey showed a mixed picture. The Ilhéus virus, of the insect-borne group, was detected in about 29 per cent of the samples. Ilhéus is so called because it was first isolated from mosquitoes taken near Ilhéus, Brazil, during the yellow fever studies in 1944, and there has been scattered evidence that it is fairly widespread in the South American-Caribbean area. The Trinidad data seem to show a marked geographical pattern, with a high percentage of positive reactions in the samples from the rain forest zone. These results are tentative, since only 1,842 samples were taken, of which only 381 have been tested in the New York laboratories.

Infections of dengue are indicated in 40 to 50 per cent of the samples tested, but no geographical differences appear in the data. Dengue is relatively little recognized as a disease entity in Trinidad and few clinicians make the diagnosis, yet the preliminary data indicate widespread human infection.

Many private physicians in the island are cooperating on another important phase of the survey, that of locating active cases of virus infection among their patients. Many of the viruses under study produce in humans a mild febrile illness of short duration, usually less than a week in all. The physicians are encouraged to refer cases of undiagnosed fever to the laboratory, and even in the short time the station has been in operation, 78 such cases have been referred. Acute and convalescent serum pairs are secured whenever possible, and the acute phase sera are inoculated into mice for the recovery of possible viral agents.

Another phase of the field work is the trapping of animals and birds to examine them for ectoparasites and virus infections. This part of the work had only begun as the year came to an end.

The survey of the mosquito population in Trinidad was aided by the use of an estate and 600 acres of heavily forested range, lent through the kindness of Dr. William Beebe of the New York Zoological Society. Here trappings of both day- and night-biting mosquitoes has begun, and a start has been made toward compiling a list of the mosquito fauna of the island. The mosquitoes, after identification, are processed in the laboratory to recover viral agents. From the 167 mosquito groups thus processed, comprising over 8,000 individuals, no recoveries had been made by the end of the year.

In the laboratory, the work has centered chiefly on training personnel, setting up the equipment, and building up the mouse colony. The mice are housed in two air-conditioned rooms which will accommodate ten or possibly twelve breeding sections, of which six are already in operation. At the end of the year, the basic colony contained 1,200 breeding females, and the total number of mice was about 3,200.

Work in virology has been started, but can come into full operation only slowly. The one virus isolated to date is from a wild-caught rat, and seems to be of the psittacosis group.

As to the future program at the station, the information thus far gathered points definitely to an intensive study of the Ilhéus virus as the primary concern, with the study of dengue an important but secondary interest. The excellent start made in the few months of operation gives promise of encouraging progress during the next year.

DEPARTMENT OF VIROLOGY, NAMRU-3, CAIRO

The Department of Virology of the United States Naval Medical Research Unit No. 3 (NAMRU-3) is collaboratively

operated by the United States Navy, the Ministry of Health of the Egyptian government, and The Rockefeller Foundation. The professional staff consists of seven doctors, of whom two are Egyptian, three from the Navy, and two from the Foundation. In addition, a staff of 27 technicians and assistants, most of whom are Egyptian, complete the unit. The station is located on the outskirts of Cairo.

In 1953 the work of the unit was facilitated by the completion of a new laboratory. From its establishment in 1951, the virology department used a converted Quonset hut as a laboratory and office headquarters. The new building is designed specifically for virology research and is constructed almost exclusively of Egyptian materials. The floor space is divided into working areas by half-partitions which allow air circulation, together with three closed cubicles for handling infectious material and a central area for records and files. The old laboratory has been remodeled for tissue culture work. The new building is conveniently located near the animal quarters, which occupy a third building, greatly increasing the efficiency and convenience with which the tremendously detailed "work flow" of virus research can be handled.

The purpose of the Department of Virology is to survey the viruses and rickettsiae of medical importance in Egypt, the Sudan, and the Middle East. More specifically, it comprises the search for these agents in man and other vertebrates, and in arthropods; the search for specific antibodies against these agents in the blood serum of man and lower animals; and the amount and distribution of the infections caused by these agents known to be present and of those which may be discovered. The results are reported in the scientific press, and twelve technical reports were published by the staff in 1953.

Some statistics may be of interest as indicating the scope of the operation. The staff, in 1953, collected 3,678 human blood specimens, and 839 from domestic and wild animals

and birds. In the study of arthropods, 601 pools of flies, mosquitoes, ticks, and other insects, comprising 28,704 individuals, were inoculated into mice. This material was collected on 46 field excursions totaling 164 man-days. For the study of the viruses, 103,000 mice were produced, and nearly 5,000 eggs were used. Since 1951, 103 viruses have been isolated, of which 47 are still unidentified.

As indicated in previous sections of this report, West Nile virus infection is practically universal in the rural Egyptian population. The study of this virus has, to date, received major emphasis from the staff of the department. Thirty-nine of the 103 viruses isolated have been identified as West Nile strains. As the magnitude of the problem of studying West Nile virus emerged from the preliminary studies, the attack was organized under thirteen headings or problems. These covered the various phases of the immunology of West Nile virus infections and its apparent correlation to immunity to other viruses; the correlation of immunity in human beings to incidence of immunity in other warm-blooded vertebrates in the same endemic area; the circulating hosts and vectors in nature, including the over-wintering reservoir of the virus; and the clinical importance of West Nile virus infection in human beings in Egypt. The outlines of the answers to these questions can now be seen, with the exception of the one concerning the over-wintering reservoir and certain details of some of the others.

The 47 unidentified viruses constitute an important problem to which increased emphasis will be given in 1954. Of these, 34 were isolated from human blood and 13 from arthropods. Most of these have the common characteristic of being pathogenic to infant but not to adult mice. It is suspected that some but not all the human strains may belong to the Coxsackie group of viruses. Information about the illnesses they produce is inadequate, but they appear to be associated with incapacitating febrile disorders.

The work of the department in 1953 was further marked

by the provisional identification of one of the newly isolated agents as a hitherto undescribed virus of the arthropod-borne group, the name Sindbis being assigned to it. This virus was isolated during the summer of 1952 from four different pools of *Culex* mosquitoes. In size it is intermediate between the large and the small groups into which the other African and South American viruses have been classified. Immunologically it also has apparently unique relationships, which imply that it is related to both the large- and the small-sized groups. Its importance as an infectious agent in man and lower vertebrates remains to be determined, but preliminary survey results seem to show that infection among humans in the older age group in Egypt is relatively common.

In addition to the work on viruses, the staff of the department also gave time to several other problems. During late 1952 and early 1953, an outbreak of influenza in the Sindbis area occurred, on which one of the staff members cooperated by identifying the influenza strain causing the infections. Information about a fatal case of rabies was secured and turned over to the Rabies Laboratory. In September a number of cases of suspected smallpox were reported among pilgrims from Mecca at a quarantine station; the department cooperated with the Ministry of Health by making a laboratory diagnosis which proved that the eruptive disease was not smallpox.

TENNESSEE DEPARTMENT OF PUBLIC HEALTH

WILLIAMSON COUNTY TUBERCULOSIS STUDY

The Williamson County Tuberculosis Study, sponsored 22 years ago by the Tennessee State Department of Public Health, has made noteworthy contributions to our knowledge of tuberculosis in the United States and also to the methodology of long-term studies of chronic disease. In addition, it has aided the state in analyzing the epidemiological features of the disease in a typical rural area of Tennessee and has

resulted in the development of a state-wide tuberculosis-control program.

One important accomplishment of the Tennessee study is the accumulation of new evidence on the significance of heredity as a factor in determining the development of tuberculosis. From long-term observation in Williamson County of some 700 households with a diagnosed case of tuberculosis, it appears that parents, children, and siblings of the tuberculous are subject to high tuberculosis attack rates. Although household exposure of some of these related persons may have been great, many develop the disease when separated from the family and without known household exposure. These findings indicate that both familial susceptibility and exposure to the tubercle bacilli must be taken into account in planning control programs. This knowledge has made possible the improvement in case-finding and control procedures.

The Williamson County group is also giving considerable attention to histoplasmosis, a fungus disease often confused with tuberculosis and until rather recently looked upon as a medical curiosity of little public health significance. In the mid-central states, where it is widespread, it has usually been described as a benign disease, but reports of several epidemics over past years indicate that the disease varies in severity.

For the Williamson County group, histoplasmosis proved a major complication in the diagnosis of tuberculosis. The lesions it causes so closely resemble those of pulmonary tuberculosis that a re-evaluation of previously diagnosed tuberculosis has become necessary, and intensive laboratory studies of new cases of pulmonary disease are needed to develop criteria for differentiating the two diseases.

From the epidemiological studies made thus far, it would seem that although man is one of the most frequently infected hosts, he does not transmit histoplasmosis to other human or animal contacts. Soil seems to be the most likely

source of the fungus in nature, and it is possible that further investigation will show that the organism's affinity for a particular type of soil accounts for the peculiar geographic distribution of the disease.

The Rockefeller Foundation has given support to the Williamson County Tuberculosis Study since its beginning in 1931. Including a 1953 grant of \$21,000, total appropriations amount to \$302,021. Major support of the program is now provided by the Tennessee Department of Public Health and the United States Public Health Service.

GRANTS IN AID

University of Naples; \$3,600 for continued support of a study on microcythemia and sickle-cell anemia, under the direction of Professor Giuseppe Montalenti, Institute of Genetics;

Peter Jaspar Mason, laboratory technician, Virus Research Institute, Entebbe, Uganda; \$2,200 toward travel and living expenses during a visit to leading virus research centers in the United States.

Development of the Health Sciences

UNIVERSITY OF LONDON

PSYCHOLOGICAL EFFECTS OF LOBOTOMY

New methods for assessing the psychological effects of frontal-lobe brain surgery are being developed under Professor H. J. Eysenck of the Institute of Psychiatry of the University of London. Frontal lobotomy, the most drastic physical treatment carried out in psychiatry, severs the main neural connections between the front of the brain and the thalamus. It may cause, among other things, permanent alterations in personality, temperament, character, and ability. The fact that this operation has until recently been restricted to hopeless psychotics has made it difficult to

assess the possible effects on normal psychological function.

For the past few years, Mrs. Asenath Petrie, a clinical psychologist on Professor Eysenck's staff, has been occupied in an investigation of severe neurotic patients before and after lobotomy. To this investigation she has applied a number of intellectual tests and also a series of objective personality tests developed by Professor Eysenck to achieve a quantitative analysis of individual performance. In 1952 Mrs. Petrie reported her findings on 70 patients, chiefly obsessional, depressive, hysterical, and anxiety neurotics, in a book entitled *Personality and the Frontal Lobes*. After lobotomy and by comparison with their previous condition, the patients exhibited a decrease in the strength of traits associated with neuroticism and with introversion, as well as a decrease in certain aspects of intelligence. They were less neurotic, less inclined to self-criticism, less concerned about their fate and achievements, and less concerned about social standards. They showed less regard and interest in other people and themselves seemed less vulnerable to psychic pain. In mental and manual tasks, they were quicker but less accurate. One new observation was that patients suffered a loss of time perception. Another was the finding of a disturbance of speech, characterized by a decrease in abstracting ability, in generalization, in vocabulary, and in discrimination in the choice of words.

To enable the Institute of Psychiatry to continue and extend these investigations to a larger number of cases and to different types of neuroses, The Rockefeller Foundation in 1953 approved a grant of £7,800 (about \$23,400) to the University of London, available over a three-year period. Future studies will cover a variety of circumscribed frontal-lobe operations in addition to the four types already under investigation. Mrs. Petrie is especially interested in checking on the relationship between the personality change and the actual site of surgical intervention.

UNIVERSITY OF HEIDELBERG
INSTITUTE OF PSYCHOSOMATIC MEDICINE

Although founded only four years ago, the Institute of Psychosomatic Medicine at the University of Heidelberg has made substantial progress. Under the directorship of Professor Alexander Mitscherlich, 15 young German physicians have been trained in dynamic psychology and psychotherapeutic methods. A staff of trained assistants has been built up, and treatment has been given to a large number of patients. A considerable degree of interest in psychosomatic medicine has developed, and the number of referrals has consistently increased.

The psychological investigation of the patients has resulted in the accumulation of a series of well-documented case histories. These can form the basis for an evaluation of the effectiveness of psychotherapy as an adjunct to the medical treatment of the conditions for which the patients were referred, which include essential hypertension, hyperthyroidism, peptic ulcer, and bronchial asthma. A new one-year grant from The Rockefeller Foundation amounting to 107,-360 German marks (about \$27,915) will be used in part for the support of the institute and in part for the publication of the case history material. The university and the City of Heidelberg continue to meet the other operating costs of the institute, including those for the hospitalization of patients, a cooperative arrangement undertaken at the time of the original Foundation grant in 1950.

UNIVERSITY OF CALIFORNIA
PERSONALITY ASSESSMENT

What criteria can be used to recognize the rare qualifications for success and to select from among hundreds of applicants the few who have the makings of topflight physicians, chemists, lawyers, businessmen, statesmen, or military

leaders? At a recent Social Science Research Council conference on non-intellective determinants of achievement, it was put this way: "Certainly the tradition has been to let talent appear where it will, to develop at its own pleasure, and to be rewarded only after it has proved and established itself. . . . This kind of complacency about the reservoirs of human talent in our country is beginning to be questioned, however . . . there has been a growing appreciation of the supply limitations, and of the need for a better distribution of talent across the various branches of science and scholarship, for example, than is at present being realized."

This statement was made by a member of the University of California's Institute of Personality Assessment and Research, set up in 1949 with the aid of a \$100,000 grant from The Rockefeller Foundation. The institute is one of the few research groups attempting to develop carefully controlled data on the structure and function of personality and to design quantitative techniques for analyzing the characteristics which make for excellence of functioning, personally and professionally, in individuals who are of particular importance to society.

With this as a long-range objective, the California Institute has started out with the immediate practical aim of improving the methods used in selecting applicants for medical and other graduate schools, officers of the armed forces, and candidates for specialized civil service positions. Dr. Donald W. MacKinnon, director of the institute, reports that two particular groups have been under close study for the past three years. One comprises 80 doctoral candidates in the sciences and humanities, and the other 80 graduating doctors of medicine.

By current methods of assessment, the individuals selected for study are subjected to a variety of appraisal procedures under conditions approximating a social weekend. In units of about ten, they gather in the institute headquarters to live with assessment staff for a few days. Here

they take several kinds of tests, participate in games and other competitions, engage in social conversation, and submit to organized interviews. Together, these procedures are designed to reveal each personality in action, how it reacts to another personality, and how it adjusts to the varying circumstances of a group situation.

The file built up on each individual includes: 1) a detailed history of his life, with particular reference to the influence of family and early environment; 2) an account of his social behavior during the days of assessment; 3) his scores on standardized tests of intelligence and perceptual abilities, emphasizing both power and originality of thinking; 4) a personality description, in terms of both surface traits and underlying dynamics, based on his response to several objective and projective tests; and 5) an account of his personal philosophy and values, with particular reference to the way in which his choice of profession fits in with his basic values and his outlook on life. This latter is essentially an attempt to understand how the individual's professional identity contributes to his sense of integrity as a person and as a member of the social community.

Only with time can a final evaluation be made of the new methods of assessment being developed at the California Institute. Arrangements have been made to follow the careers of all individuals assessed so that the criterion of professional achievement can be used to check early predictions. In the meantime, the findings are compared with the appraisals of teachers and close associates and with current performance in the classroom or on the job. It would appear that preliminary correlations between many of the test procedures and actual current performance show a good degree of reliability and validity.

In 1953 The Rockefeller Foundation made a final grant of \$50,000 to the University of California in support of the Institute of Personality Assessment and Research for the next two years. At the end of this time, the university expects

to take over full financing of the institute. As in the past, the income from contracts with business firms and industries and with federal agencies may be expected to defray part of the expenses of the work. At the present time, the institute is under contract to study some 500 psychological warfare and other officers in the United States Air Force.

ROSCOE B. JACKSON MEMORIAL LABORATORY

GENETICS AND SOCIAL BEHAVIOR

The Roscoe B. Jackson Memorial Laboratory, well known for its contributions to the genetics of malignant disease, eight years ago embarked on a long-range program to study heredity and behavior in mammals. Grants from The Rockefeller Foundation helped the laboratory to develop a new Division of Behavior Studies, with headquarters at a former stock farm near Bar Harbor, known as Hamilton Station.

Senior staff on the project are the director of the laboratory, C. C. Little, who is studying the genetics of physical characteristics; John P. Scott, chairman of the division and in charge of behavior studies; and John L. Fuller, whose primary interest is in physiological and emotional studies.

Rather early in the project, the research team decided to concentrate on five pure breeds of dogs representing an extreme range of behavior patterns. These were: African basenjis, beagles, cocker spaniels, Shetland sheepdogs, and wirehaired fox terriers. A number of standardized tests were developed to measure specific capacities such as learning, social behavior, and physiological and psychological reactions to stress. To minimize differences that might be caused by environment, all the animals experienced a standardized system of rearing, training, and testing. The most important conclusions so far are that it is very easy to find differences between breeds which can be attributed to emotional, motivational, and physiological processes, but rather difficult to find differences which might be called strictly mental.

Special breed abilities for retrieving, herding, pointing, and so on appear to be combinations of many independent, variable traits — among which emotional and motivational characteristics are usually prominent — rather than complex unit behavior patterns.

As further aid to an analysis of the genetic mechanisms underlying strain differences, it was decided to cross the two most different breeds: the cocker spaniels and the basenjis. Reciprocal crosses have now been made with some eight pairs of dogs born of the same two sets of parents, that is, eight animals born of a pair of cocker spaniels, and eight born of a pair of basenjis. These first generation animals are being backcrossed to the mothers of each pure breed, and second generation animals are being obtained from both crosses.

In the population of some 41 first-generation animals, which have now been tested, a variety of hereditary effects have already been identified. Further analysis of these first-generation crosses and the backcrossed animals now becoming available is planned for the next three years. Already, however, the studies have contributed to the growing body of information on how hereditary "traits" and environmental influences interact to produce a functioning biological organism.

The Rockefeller Foundation has already appropriated a total of some \$534,000 toward the studies of genetics and social behavior in mammals at the Roscoe B. Jackson Memorial Laboratory. A new 1953 grant of \$50,000 provides forward financing of the program until March 1956. In recent years the Foundation funds have been used at the rate of about \$50,000 a year.

DUKE UNIVERSITY

PARAPSYCHOLOGY

The Parapsychology Laboratory at Duke University was started in 1927 by Professor William McDougall, and

since 1940 has been under the direction of Dr. Joseph B. Rhine. In 1950 The Rockefeller Foundation contributed to the support of the laboratory by a three-year grant of \$30,000.

The work of the laboratory has received so much attention, both lay and expert, that a recapitulation here is unnecessary. A private foundation, it may be mentioned, however, is one of the very few organizations with sufficient freedom of action to permit support of scientifically unorthodox views. The Foundation has now appropriated another \$15,-000 as a flexible stabilizing fund to supplement other funds received by the laboratory for specific projects.

HARVARD UNIVERSITY

STUDIES IN POPULATION DYNAMICS IN INDIA

A long-term investigation of population dynamics in India, sponsored by three cooperating institutions, has been aided with two grants totaling \$68,450 by The Rockefeller Foundation.

The project will cover a ten-year period, and is planned in three stages: an exploratory pilot study to develop methodology and to train personnel; a main field investigation; and a period of follow-up observations. The project will be carried out in villages adjacent to Ludhiana in Punjab State. The cooperating agencies are the School of Public Health of Harvard University, the Christian Medical College of Ludhiana, Punjab State, and the Government of India.

The Foundation grants are to support only the exploratory pilot study.

WELSH REGIONAL HOSPITAL BOARD

NEUROPSYCHIATRIC RESEARCH CENTRE, CARDIFF

The Neuropsychiatric Research Centre in Cardiff, Wales, under the direction of Dr. Derek Richter, is engaged

in a long-term investigation of the relationship between the chemical metabolism of the brain and its functioning as revealed in terms of behavior. As might be expected, the most striking differences in the chemical events are found in the sharply contrasting physiological states of convulsions and anesthesia, but characteristic biochemical changes can also be correlated with such normal physiological variations as sleep or alertness. Dr. Richter's laboratory is one of an increasing number seeking to extend such observations to abnormal conditions brought on by drugs or major mental illness.

The Neuropsychiatric Research Centre, administered by the Welsh Regional Hospital Board under the terms of the National Health Act, is the principal unit of its kind in Wales. It is associated with the teaching of psychiatry in the National Welsh School of Medicine. Major expenses of research and operation of the center are defrayed by annual grants from the British Medical Research Council and the Welsh Regional Hospital Board. A 1953 Rockefeller Foundation grant of £7,000 and \$5,400 (about \$26,400) will aid Dr. Richter in maintaining his staff of trained investigators for the program in brain chemistry over the next five years. Dr. Richter also wishes to visit the United States and Canada to keep in touch with other research programs in his specialty. The dollar portion of the Foundation grant has been set aside for travel and other expenses of Dr. Richter and his staff.

BIRMINGHAM UNIVERSITY

DEPARTMENT OF EXPERIMENTAL PSYCHIATRY

In connection with its research program, the Department of Experimental Psychiatry of Birmingham University has made plans to cooperate in the activities of the new clinical center being set up by the West Midland Regional Hospital Board to treat early cases of mental disease.

At the new treatment center, which will serve primarily as an outpatient clinic and day hospital, Dr. J. Elkes, head of the department, and his colleagues will use the added facilities to extend their attack on the problems of mental and emotional disease. Not only will the center offer an opportunity to study various means of preventing deterioration in patients still in the early stages of mental disease, but it will also allow the collection of information on the genetic, environmental, psychological, and physiological factors which contribute to the production of neuroses and psychoses. With this quantitative information, Dr. Elkes hopes to work out techniques which will permit an objective evaluation of the factors leading to recovery. He and a colleague have begun by designing a rating scale to describe quantitatively the symptoms and emotional status of the patient at any given time.

Dr. Elkes and his associates for some years have conducted laboratory research on the biochemistry and pharmacology of the nervous system in animals and in normal and psychotic human beings. Research is in progress on the constitution of the lipoproteins of the nervous system, the distribution of certain enzyme systems in various regions of the brain, the electrical activity of cortical and subcortical regions of the brain, the detection of chemical changes in the body fluids of psychotic patients, and the effects of drugs on mental and somatic function.

The Department of Experimental Psychiatry, established in 1951, includes, in addition to Dr. Elkes, the head, Dr. A. Todrick, biochemistry; Dr. J. B. Finean, pharmacology; Drs. R. Pober and R. Baker, organic chemistry; and Dr. P. B. Bradley, electro-physiology.

Research and teaching facilities at the early-treatment center will be directed by the Department of Experimental Psychiatry; however, all the basic medical, nursing, and administrative services, as well as funds for remodeling the building, are being provided by the West Midland Regional

Hospital Board. The Rockefeller Foundation has appropriated £28,800 (about \$86,400) for the support of the research program during a five-year period.

UNIVERSITY OF LUND

ENDOCRINOLOGY

The work of the Department of Physiology of the University of Lund has developed steadily over the past fifteen years and is now organized in four major divisions — endocrinology, pharmacophysiology, neurophysiology, and aviation physiology. Each division is under the charge of a senior investigator, and the department as a whole is directed by Dr. Georg Kahlson, a former Foundation fellow.

The research in endocrinology conducted by Dr. Dora Jacobsohn, recently appointed head of the laboratory of experimental endocrinology, is principally concerned with the relationship of the pituitary and adrenal glands and their effects on the enzyme histaminase. It has been known for some time that this enzyme has the property of breaking down the substance histamine, which is released in allergic disorders. The effects on histamine metabolism of adrenal cortical hormones raises interesting possibilities for understanding the action of adrenal hormones in the treatment of allergic conditions.

Foundation support of the work in endocrinology began with a two-year grant for the period 1951-1952, and has been continued with a second grant of 63,200 Swedish crowns (about \$12,500) for the two-year period beginning January 1, 1953.

OXFORD UNIVERSITY

PERIPHERAL NERVE STUDIES

Professor Graham Weddell, working in the Department of Human Anatomy, under Professor Le Gros Clark, at

Oxford University, has uncovered important clues to a possible new theory of how skin sensations arise and are transmitted along nervous pathways.

After several years of study of the fine nerve endings on the surface of the body, Professor Weddell and the group of younger investigators that he directs have been able to demonstrate the form and structure of these endings much as they probably exist in the living state. These terminals originate the impulses that give rise to sensations of pain, touch, pressure, and temperature. By correlating anatomical observations with physiological and clinical findings, the group has thrown doubt upon the current theory of cutaneous sensibility.

The prevailing notion built up over many years was that the skin contained separate receptors for at least some of the sense modalities, including touch, pressure, heat, cold, and two sorts of pain. Impulses arising in these separate receptors were thought to run over separate nerve fibers to particular end stations in the brain, so that the quality of the final conscious sensation was a result of the place in the brain that was stimulated. Professor Weddell's observations show that some parts of the body have only one type of undifferentiating nerve ending but produce, nevertheless, all known types of sensations.

The Oxford Department of Human Anatomy is one of the distinguished centers in the field of neuroanatomy. In a period when understanding of physiological function seems to be outrunning knowledge of form, its fundamental studies on the finer elements of the nervous system have outstanding significance.

Enabling Professor Weddell and his group to continue to clarify their new hypotheses on skin sensibility, The Rockefeller Foundation has appropriated \$43,500 to Oxford University, available over the next five years. The new grant will also aid Professor Weddell's laboratory in its important function of training younger men. Over a dozen young neuro-

anatomists from many parts of the world have benefited from periods of training with this Oxford group.

PRINCETON UNIVERSITY
PSYCHOLOGY OF PERCEPTION

The work in visual perception in the Department of Psychology of Princeton University under the direction of Dr. Hadley Cantril stems in part from a number of interesting observations made between 1934 and 1941 by Adelbert Ames, Jr., then professor of physics at Dartmouth College. Dr. Ames, investigating phenomena in the border area between the physics and the physiology of optics, discovered, among other things, the visual disturbance called aniseikonia, in which the retinal images of the two eyes are of different dimensions. Dr. Ames also devised several ingenious demonstrations to illustrate the way in which various visual cues are organized by the observer into perceptions of the outside world. Since 1948 Dr. Ames has been collaborating with several investigators at Princeton who have since developed quantitative methods for experimenting with the effects which his studies had demonstrated.

The research by the Princeton group, aimed at understanding how experience and learning affect the visual processes, falls into three phases. One series of experiments deals with the development of visual perception during childhood. Another is concerned with measuring the difference between the way different individuals react to distortion of spatial configurations. A third attempts to analyze how an individual can learn to overcome or compensate for the distorted perceptions produced by many of the Ames demonstrations.

The work of the group has been supported by Princeton University, The Rockefeller Foundation, and by temporary grants and fellowships from a number of different sources. The Foundation has now appropriated \$75,000 as a stabiliz-

ing grant to enable the Department of Psychology to continue the work of the group without interruption until it is either brought to a conclusion or merged with the regular budget of the department.

GRANTS IN AID

University of Aarhus, Denmark; 48,000 Danish crowns (about \$7,200) for the purchase of research laboratory equipment and salaries of two chemists, over a three-year period;

Cambridge University, England; £1,000 (about \$3,000) for the Department of Human Ecology for a seminar on ecological problems arising from technical development of tropical and subtropical countries, with particular reference to Africa;

University of Chile, Santiago, Faculty of Medicine:

\$7,500 for the purchase of equipment and supplies for the Institute of Physiology, for the use of Dr. Osvaldo Cori;

\$4,800 for the salary of Alberto Villalón, medical librarian;

University of Freiburg i/Breisgau, Germany; \$925 for the purchase of equipment for the Department of Clinical Neurophysiology;

Harvard University, Cambridge, Massachusetts; \$5,000 in support of a study of the application of recently developed techniques of analysis to the behavior of psychotics, under the direction of Dr. B. F. Skinner, Department of Psychology, in cooperation with Dr. H. C. Solomon, Department of Psychiatry;

Hôtel Dieu de Montreal; C\$3,880 (about \$3,997) for the salary of Dr. Wojciech J. Nowaczynski, research chemist in the Department of Clinical Research;

Innsbruck University, Austria; \$7,000 to the Institute of Pharmacology for the purchase of equipment and supplies, and travel expenses;

Dr. Charles Norman Davies, Medical Research Council Environmental Hygiene Research Unit, London School of Hygiene and

Tropical Medicine; \$1,925 to visit research and training centers in the field of occupational health in the United States;

Dr. S. Ananthaswamy, Mysore State Public Health Department, India; \$1,200 to observe public health laboratory methods and research in leading laboratories in India;

For use of Lillian A. Johnson, of the Foundation staff, in connection with her assignment to the Trivandrum School of Nursing, India:

\$2,500 for the purchase of necessary equipment, supplies, books, periodicals, and other teaching materials;

\$7,500 for the purchase of additional necessary equipment and supplies;

For use of Frederick W. Knipe, of the Foundation staff, in connection with his assignment to the Malaria Institute of India, New Delhi; \$2,500 for the purchase of necessary equipment and supplies for the development of teaching materials;

Child Research Council of Denver, University of Colorado; \$5,000 for the support of a committee to review the work of the council and to evaluate the methodology of longitudinal studies;

Endemic Disease Control Service, Dominican Republic; \$2,000 as a terminating grant for the cooperative program with the Dominican government;

Rural Health and Nutrition Service, San Felipe, Aconcagua, Chile; \$1,000 for the purchase of equipment and supplies during 1954;

University of Illinois, Urbana; \$4,000 for the purchase of a special high-voltage portable X-ray unit for use by the Neuropsychiatric Institute of the university;

Dr. William Arthur Young, director, Medical Laboratories, Department of Public Health, Government of Western Australia, Perth; \$1,350 for travel and living expenses to observe public health laboratory methods in the United States;

University of California at Los Angeles; \$2,385 for the salary and travel of Visiting Professor Alfred E. Fessard, neurophysiologist

from the Collège de France. (Grant rescinded because of change in Dr. Fessard's schedule.)

OTHER

Fund totaling \$2,500 for grants of small amounts to cover equipment, consumable supplies, travel, and miscellaneous purposes, allotted under the supervision of the Director of the Division.

**Division of
Natural Sciences and Agriculture**

DIVISION OF
Natural Sciences and Agriculture

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DIVISION OF
Natural Sciences and Agriculture

INTRODUCTORY STATEMENT

153

EXPERIMENTAL BIOLOGY

GENETICS

State University of Iowa: Genetics of Sex Determination	155
University of Wisconsin: Bacterial Genetics	156
University of Brazil: <i>Drosophila</i> Genetics	157
University College, University of London: Mammalian Genetics	158
Smith College: Genetics Experiment Station	159
University of Wisconsin: Cytogenetics	159
<i>Grants in Aid</i>	160

GROWTH AND METABOLISM

University of Amsterdam: Experimental Embryology	161
University of Leiden: Experimental Histology	162
University of São Paulo: Cytochemistry	163
University of Chile: Experimental Cytology	163
Oxford University: Antibiotics and Lipids	164
University of Manchester: Organic Chemistry	165
Cambridge University: School of Biochemistry	165
Montreal General Hospital: Research Institute	166
Johns Hopkins University: Trace Elements	167
<i>Grants in Aid</i>	168

BIO-MOLECULAR STRUCTURE

Polytechnic Institute of Brooklyn: Determination of Protein Structure	170
Cambridge University: X-ray Crystallography	172
Massachusetts Institute of Technology: Structure Analysis	173
<i>Grants in Aid</i>	174

GENERAL BIOLOGY AND BIOCHEMISTRY

University of Illinois: Training in Microbiology	175
Collège de France: Biochemistry	176
Karolinska Institute: Molecular Biology	176
University of Stockholm: Radiobiology	177
University of Uppsala: Chemistry of Large Molecules	178
<i>Grants in Aid</i>	178

THE ORGANISM IN ITS ENVIRONMENT

University of Chicago: Population Ecology	181
University of Florida: Animal Ecology	181
University of Illinois: Insect Nutrition	182
University of Miami: Marine Resources	183
University of California: Scripps Institution of Oceanography	184
University of Uppsala: Photosynthetic Activity	185
University of Paris: Energy Transfer in Photosynthesis	186
<i>Grants in Aid</i>	187

GENERAL SCIENTIFIC SUPPORT

Stanford University: Biology	189
University of Pennsylvania: Research in Zoology	190
University of Washington: Biochemistry	191
California Institute of Technology: Chemical Biology	192
Cornell University: Biochemical Research	194
University of Wisconsin: Biochemistry	195
University of São Paulo	196
University of Rio Grande do Sul	197

AGRICULTURE

OPERATING PROGRAMS

Mexican Agricultural Program	198
Mexican Agricultural Program: Extension Service	203
Colombian Agricultural Program	204
Corn Improvement Project: Central America	208
Inter-American Society of Plant Breeders, Plant Pathologists, and Entomologists	209
<i>Grants in Aid</i>	210

AID TO RESEARCH AND TEACHING

University of Minnesota: Wheat and Its Pathogens	211
Cornell University: Maximum Yields of Food Crops	212
Institute of Agronomy, Campinas, Brazil: Microclimatology	213
California Institute of Technology: Water Relations of Plants	214
Tokugawa Institute for Biological Research: Mass Cultivation of Microorganisms	215
Society of American Foresters	217
Gammon Institute: College Farm	218
Government of Uttar Pradesh, India: Rural Research and Action Center	219
The Conservation Foundation: Utilization of Natural Resources	220
<i>Grants in Aid</i>	221

SPECIAL PROJECTS

<i>Grants in Aid</i>	224
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DIVISION OF NATURAL SCIENCES AND AGRICULTURE

FOR ABOUT TWENTY YEARS modern experimental biology received main emphasis in the program of this division of The Rockefeller Foundation. In fact, about 80 per cent of the financial support recommended over the period 1932-1952 was devoted to various aspects of modern biology. The remaining 20 per cent was divided about equally between support of science as a whole, and support of special projects outside the biological program, which were aided because of their unusual nature, outstanding quality, and special importance.

Over recent years, however, the Foundation has been developing an increasing interest in agriculture. Begun originally as an isolated experiment, involving activities in Mexico only, this agricultural interest has expanded in several respects. Geographically, the expansion first extended to Colombia; it now embraces, in one form or another, a large part of Central and South America. More recently, the agricultural work has included very restricted activities in India, and it has influenced substantially the programs in the United States and in Europe. Most recently of all, preliminary studies of agricultural opportunities in the Far East have been undertaken.

A generalization of the form of Foundation support to agriculture has also occurred. This work was begun in both Mexico and Colombia as a concrete and limited operating program, carried on by a staff composed partly of Foundation employees and partly of local scientists. By now, in addition to these operating activities, the Foundation's widening interest in agriculture has been manifested through scholarships and fellowships, grants in aid to individuals, and appropriations to groups or institutions.

The basic concepts of the agricultural program have also become generalized. Concerned originally with improvement of basic food crops and with modern scientific agriculture in its usual branches, the Foundation has now developed a broader interest in the food problem of mankind. This has led to support of studies in areas quite outside conventional agriculture. The problem of conversion and utilization of solar energy, the problem of purification of brackish or salt water for agricultural purposes, and the problems of cloud physics as they affect the possibility of influencing rainfall are instances of fields of research which, while clearly not "agriculture," may very well have an important influence on agricultural production and on production of food by less conventional means. Similarly, one is forced to consider the fact that the oceans cover more than seven-tenths of our planet; that at least as much photosynthesis occurs in the seas as on land; and that, nevertheless, man obtains only about one and one-fourth per cent of his total food supply from the sea. Another possible field for exploration, perhaps restricted to special areas or to be considered far in the future in its larger application, is the vastly increased utilization of the specialized chemical capacities of various microorganisms.

The expansion of the Foundation's interests in agriculture and in longer-range food problems has entailed some curtailment of other divisional activities. Support for projects in experimental biology within the United States is being

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The expansion of the Foundation's interests in agriculture and in longer-range food problems has entailed some curtailment of other divisional activities. Support for projects in experimental biology within the United States is being

substantially reduced, although the Foundation continues to have an active interest in advancing research in such fields as genetics, plant biochemistry, and plant physiology, which will be of ultimate value to agriculture.

Experimental Biology

GENETICS

The field of genetics has, for many years, constituted one of the large areas of activity in the program of Experimental Biology of The Rockefeller Foundation. Under the newer and expanding concern for agriculture, work in genetics takes on additional program interest, for basic advances in our knowledge of genetic processes and mechanisms, often if not always achieved through study of simpler forms of life, are bound eventually to have practical usefulness in connection with the improvement of crop plants.

STATE UNIVERSITY OF IOWA

GENETICS OF SEX DETERMINATION

In any attempt to explain the mechanisms of genic action, it is desirable to concentrate on materials in which the normal course of affairs can be made subject to experimental modification. The study of sex-determining genes offers virtually unique possibilities for the exploration of gene action, because the course of sex differentiation can be widely influenced by a variety of experimental factors.

Professor Emil Witschi of the Department of Zoology at the State University of Iowa has been active in this general field for a number of years. After work aimed at analyzing the mechanisms of genetic sex determination, Professor Witschi studied the physiology and endocrinology of sex development; he now proposes to utilize these earlier interests to

correlate his own and other research on sex inheritance in higher animals.

In his work with amphibians and birds, Professor Witschi has succeeded in obtaining partial or complete reversal of the normal course of sex differentiation by surgical intervention, by temperature factors, by altering conditions of maturity of the egg, and by administration of steroid hormones. All these diverse agents have a common trait: they intervene in the processes that start from hereditary constitution and end with the physiological manifestations of sex. Since enzymatic control of these processes is undoubtedly involved, Professor Witschi's next step will be to investigate both the enzymes and the basic chemical transformations they produce.

While studying mutation in brown frogs, Professor Witschi previously showed evidence of definite genic changes which must have arisen during the postglacial epoch, and which therefore suggest significant evolutionary changes within the past 20,000 years. It is known that thermal factors are somehow linked to the speed of the mutational process, and also that hormonal conditions may assume mutagenic qualities. The ultimate aim of the second phase of Professor Witschi's research is to gather information on the relationships between ontogenetic function and evolutionary mutation in the sex-determining genes.

The Foundation is furthering this work with a three-year grant of \$22,680.

UNIVERSITY OF WISCONSIN

BACTERIAL GENETICS

For many years bacteria were considered biologically exceptional organisms — similar to other forms of life, but with no nuclei, genes, or sexual characteristics. In the past decade, however, this entire concept has changed. Bacteria have been proved to possess genetic systems more or less analogous

to those of other life forms, in some cases even having true sexual mechanisms for the recombination of unit characters.

One of the researchers whose work has contributed to this reversal in understanding is Professor Joshua Lederberg of the Department of Genetics of the College of Agriculture at the University of Wisconsin. Through studies of *Escherichia coli*, the colon bacillus, he has been able to demonstrate the phenomenon of sex, or more accurately of gene transfer, between genetically different strains of bacteria. The hereditary units in bacteria have proved analogous to the genes of classically sexual organisms in the independence and randomness of their mutation, the effect of physical and chemical agents on their mutational frequency, and qualitatively in the types of biochemical and enzymatic effects of their mutation.

Professor Lederberg is now extending his studies with the intent of showing that sex phenomena among the bacteria are not unique to *E. coli*. He is currently analyzing the life habits of the paratyphoid bacillus; this work has already helped to explain how pathogenic bacteria develop new forms capable of resisting drugs or of initiating disease in previously immune hosts. It has also provided the theoretical background for laboratory breeding of special bacterial types for medical and other applications.

It is expected that bacteria will play an increasingly important role in studies of the comparative biology of sex. The Rockefeller Foundation, which has maintained an interest in Professor Lederberg's work since 1948, in 1953 contributed \$25,000 for his specialized research in bacterial genetics during the next four years.

UNIVERSITY OF BRAZIL

DROSOPHILA GENETICS

In Brazil during recent years there has been an unusually rapid development of genetic research centering principally

on studies of *Drosophila*, the common fruit fly. One of the laboratories contributing to this growth is the Center of Genetics Research of the Faculty of Philosophy of the University of Brazil. This group at Rio de Janeiro, which enjoys semi-autonomous status within the university, is one of the research teams in three universities which have branched off from the parent group at São Paulo.

The principal interest of investigators at the center is the genetics of one species of fruit fly, *Drosophila prosaltans*, with special reference to the incidence of lethal genes in natural populations, the frequency of inversions, and the sex ratios. Professor A. G. Lagden Cavalcanti is in charge of the research, for which the Foundation has appropriated the sum of \$7,500 until May 31, 1956, chiefly for the purchase of equipment for temperature control.

UNIVERSITY COLLEGE, UNIVERSITY OF LONDON

MAMMALIAN GENETICS

In the animal genetics group of Dr. Hans Grüneberg of the University College, University of London, England, research has focused on congenital abnormalities and inherited diseases of small laboratory animals. During his visit to the United States last year, Dr. Grüneberg noted that in many laboratories for research in genetics, cancer, and radiation biology there were being accumulated instances of spontaneous or induced mutations in common laboratory mammals at a rate far in excess of what could be analyzed without the concentrated effort of specialists. Much of this material is of great genetical value either because it is itself significant in explaining certain abnormalities of development, or because it will help to establish correlations necessary for chromosome map making.

Recently Dr. Grüneberg made a list of more than 25 mutants affecting the nervous, the skeletal, the blood-forming, and the sense-organ systems of the mouse, each of which

would require one or two scientist-years to analyze properly. He does not believe that so vast a field can be attacked in its entirety except by a well-balanced team of workers who can cover its most important aspects. He therefore proposes to add to his present group a skilled neuroanatomist, a recently graduated histologist-embryologist, and one or two trained technicians. To assist him in rounding out his team of workers, The Rockefeller Foundation has appropriated the sum of \$25,000 for the coming five years.

SMITH COLLEGE

GENETICS EXPERIMENT STATION

Foundation aid to Professor Albert F. Blakeslee's work in genetics has totaled \$72,750 since 1942. His research at the Genetics Experiment Station of Smith College, Northampton, Massachusetts, is concerned chiefly with *Datura*, a plant genus that includes the common Jimson weed and that has proved particularly well adapted for experimental studies. Among the many projects in progress under Professor Blakeslee's direction is a study of the embryology of *Datura*. This work touches on the major aspects of differentiation and growth, with special attention to ovular tumors associated with hybrid embryos and to factors in the microenvironment connected with embryo differentiation.

In 1953 The Rockefeller Foundation appropriated the sum of \$9,000 for this genetic research at Smith College.

UNIVERSITY OF WISCONSIN

CYTOGENETICS

In June of this year, The Rockefeller Foundation appropriated the sum of \$30,000 to the University of Wisconsin in support of research in cytogenetics under the direction of Professor C. Leonard Huskins of the Department of Botany. This grant was intended to continue for another three years.

aid which had been given to Professor Huskins' work over a considerable period, first at McGill University in Montreal and afterward at the University of Wisconsin. Because of the untimely death of Professor Huskins one month after the 1953 grant was made, the Foundation's commitment, in accordance with standing policy, will be reviewed at the end of a year's time.

GRANTS IN AID

University of Vienna, Faculty of Medicine; 26,400 Austrian schillings (about \$1,100) toward the expenses of research on genetics under the direction of Professor Felix Mainx, Institute of General Biology;

University of Milan; \$2,500 for the purchase of equipment to be used for research in genetics under the direction of Professor Claudio Barigozzi, Institute of Genetics;

Professor E. L. Tatum, Stanford University, California; \$2,300 toward travel and living expenses during a survey in Europe of current trends in genetics, microbiology, and biochemistry;

University of São Paulo, Brazil, Faculty of Philosophy, Science, and Letters:

\$4,300 for Professor Crodowaldo Pavan, head, Department of General Biology, toward the costs of his proposed visit to principal centers of genetics research in Europe and the United States;

\$2,350 for Dr. Antonio Brito da Cunha, Department of General Biology, toward the cost of his proposed visits to a number of European centers of *Drosophila* research;

University of Chile, Santiago; \$5,100 for research in population genetics in the Department of *Drosophila* Genetics, Institute of Biology, under the direction of Dr. Danko Brncic;

Dr. Ahmed El-Tabey Shehata, College of Agriculture, Alexandria, Egypt; \$1,700 for the cost of round-trip travel from Cairo to São

Paulo, Brazil, where he will work for a year with Dr. Antonio Brito da Cunha on *Drosophila* genetics;

University of Rio Grande do Sul, Pôrto Alegre, Brazil; \$2,400 for the cost of research in *Drosophila* genetics and ecology of reptiles under the general direction of Professor A. R. Cordeiro.

GROWTH AND METABOLISM

In accordance with the developing pattern of the program of the Division of Natural Sciences and Agriculture, the grants in Growth and Metabolism — clearly one of the significant sub-fields of modern experimental biology — have been made almost wholly to institutions outside the United States.

UNIVERSITY OF AMSTERDAM

EXPERIMENTAL EMBRYOLOGY

As the developing egg progresses from a two- to a four- to an n-cell stage, there also develops in some of these cells a specific potency to give rise to certain tissues and organs. How such specificity first arises, how it is conditioned, when it becomes fixed, and what determines the pattern of further development are all problems that have intrigued generations of embryologists. Numerous methods have been used to trace the lineage of cells making up a tissue or an organ: for example, dyes have been injected into one cell of a multiple-cell aggregate to follow its daughter cells, or microscopic grafts of pigmented cells have been made into nonpigmented regions of an embryo so that they might be followed.

At the University of Amsterdam, Netherlands, Professor M. W. Woerdeman and his colleagues in the Laboratory of Anatomy and Embryology have been attacking these problems by biochemical and serological techniques. As one instance, they have built up in a rabbit antibodies against the

eye lens of a chicken and then performed minute immunological tests to detect when and where certain cells of the developing chick embryo first show the presence of lens antigen.

To assist this group in its studies of the immunological aspects of development and to complete the equipping of its newly reorganized laboratories, The Rockefeller Foundation has appropriated the sum of \$15,000 over a three-year period.

UNIVERSITY OF LEIDEN

EXPERIMENTAL HISTOLOGY

One of the leading centers in Continental Europe for the study of problems of organized growth is the Laboratory of Experimental Histology at the University of Leiden, Netherlands. Comprising about 25 members plus a number of postgraduate students, the group is led by a former Rockefeller Foundation fellow, Professor P. J. Gaillard.

Long interested in the growth of cells and tissues, Professor Gaillard is presently studying the growth of bone in vitro, particularly the role of the surrounding capsules of epithelium in influencing differentiation; the growth of the ovary in vitro, with emphasis on the mechanisms which determine the ovum-producing potentialities of various portions of the ovary; the influence of growing thyroid tissue or thyroid hormones on the breakdown and repair of bone; and the influence of serum and plasma from normal and leukemic patients on the growth of white blood cells.

Professor Gaillard's group is about to move into expanded laboratory quarters on the grounds of the university hospital. Formerly used as a nurses' home, the new quarters have been completely rebuilt and in large measure re-equipped through substantial aid from the Dutch Ministries of Finance and Education. To add to the apparatus needed for these larger laboratories, The Rockefeller Foundation has contributed \$15,000 over a period of two years.

UNIVERSITY OF SÃO PAULO

CYTOCHEMISTRY

The Foundation this year renewed its collaboration with the University of São Paulo, Brazil, where under the direction of Professor Luiz Carlos Junqueira, the Laboratory of Histology and Embryology of the Faculty of Medicine is actively engaged in studying important problems of modern experimental biology.

Included in the program is work in cell physiology, cytochemistry, experimental embryology and histology, and protein chemistry. A wide variety of techniques, ranging from the classic ones through tissue culture and radioactive isotopes, are utilized and applied to specific problems such as the workings of the chick kidney or the salivary glands and pancreas of the mouse. An expansion of the tissue culture investigations is projected, in which Professor Junqueira plans to hold various tissues at or slightly above the maintenance level, instead of fostering their growth in the customary manner. This will enable him to study various aspects of metabolism, particularly cell secretion and kinetics.

For further development of his program, one of Professor Junqueira's principal needs is for microspectrophotometric equipment. To supply such items, The Rockefeller Foundation has appropriated \$13,000 for the period ending May 31, 1955.

UNIVERSITY OF CHILE

EXPERIMENTAL CYTOLOGY

Foundation aid has been given for the past five years in partial support of the research of Professor Gabriel Gasic at the Juan Noe Institute of Biology of the University of Chile. Professor Gasic's work has been concerned with *Drosophila* and mammalian genetics, experimental cytology and cellular metabolism, and the biological antagonisms

between a blood protozoan parasite and both avian and rodent tumors.

Recently Professor Gasic and his associates published their finding that while cortisone inhibits the local growth of a transplantable mammary adenocarcinoma, it induces multiple malignant metastases. Cortisone is said to be the first agent found which will produce metastases at will; but whether the action of cortisone is direct, or indirect through changes of the endocrine balance, is not yet known. This investigation offers a new approach to studies of the mechanism and prevention of tumoral propagation. Toward expenses of the research, the Foundation has appropriated the sum of \$7,800 through calendar 1955.

OXFORD UNIVERSITY

ANTIBIOTICS AND LIPIDS

The group of young scientists working under the direction of Professor Sir Howard Florey in the Sir William Dunn School of Pathology at Oxford University, England, is helping him to continue research in the broad field of antibiotics, to search for new compounds having inhibitory effects on the growth of microorganisms, and to study bacterial resistance to these substances. It has assisted him to develop successful methods for the use of macrophages grown in tissue culture as "microanimal" systems for the study of the intracellular growth of tubercle bacilli. More recently, workers in the School of Pathology have also been concerned with the absorption of fat and its distribution in the body, with emphasis on the role of cholesterol in various pathological conditions.

To facilitate these studies and to continue its long support of Professor Florey's research endeavors, The Rockefeller Foundation in 1953 allocated \$7,5000 to Oxford University for the purchase of a preparative ultracentrifuge.

UNIVERSITY OF MANCHESTER

ORGANIC CHEMISTRY

Appointed Sir Samuel Hall Professor of Chemistry at the University of Manchester, England, in 1947, Professor E. R. H. Jones brought to a Department of Organic Chemistry already rich in its traditions of research and teaching the experience of his years at the Imperial College in London, his own particular interests in the chemistry of acetylenic compounds, and his enthusiasm for developing collaborative teams of research. Under his guidance the various groups in organic chemistry at Manchester are working on such problems as the synthesis and analysis of steroid compounds, the enzyme degradation of nucleic acids and nucleotides, the isolation and characterization of various plant growth hormones and inhibitors, the biochemistry of fungal metabolism, and the chemistry of polyacetylenic compounds and terpenes.

To give Professor Jones aid in the continuing development of these studies of biologically important problems and to provide for additional purchases of equipment, The Rockefeller Foundation has appropriated to the University of Manchester the sum of \$45,000 spread over a period of five years.

CAMBRIDGE UNIVERSITY

SCHOOL OF BIOCHEMISTRY

Long famous as one of the important international centers for research on the chemistry of biologically significant molecules, the School of Biochemistry at Cambridge University, England, is today organized into six sections of specialized interests where separate teams work on problems of enzyme chemistry, protein chemistry, carbohydrate chemistry, plant chemistry, microbial chemistry, and the chemistry of hormones.

Research projects active at the present moment include

studies on the synthesis of proteins by microorganisms, the biosynthesis of nucleic acids in the absence of proteins, the purification and physicochemical characterization of enzymes, the mechanism of action of growth hormones, the factors which are responsible for the accumulation and release of sterols in the adrenal, the effect of growth hormones on bone growth in vitro, and the biochemistry of the yeast cell wall.

In 1953 The Rockefeller Foundation made a two-year appropriation of \$25,000 to Cambridge University primarily for the purchase of an analytical ultracentrifuge to be installed in the School of Biochemistry.

MONTREAL GENERAL HOSPITAL

RESEARCH INSTITUTE

Increasing recognition of the dependence of present-day medical research on the basic sciences is illustrated by the existence within the framework of a city hospital of an institute for the pursuit of fundamental cellular studies—the Research Institute of the Montreal General Hospital in Canada. Comprising a staff of 32, the institute is under the direction of Juda H. Quastel; it is housed in a separate building adjacent to McGill University, where Dr. Quastel is professor of biochemistry in the medical school.

One aspect of the work at the institute concerns the study of plasma proteins by application of the technique of filter paper chromatography. By this method, the plasmas of normal individuals yield roughly identical patterns, whereas varying and abnormal patterns are formed with the plasmas of diseased patients. Investigations are now proceeding on the patterns of plasmas of adults and children suffering from a variety of disorders in an effort to throw more light on the nature of the disorders, to follow the therapy, and to aid in diagnosis. The cheapness of the paper chromatography technique, and the readiness with which it can be adapted in

the great majority of laboratories, assure that this tool of basic science will prove most useful in the investigation of pathological disturbances.

Additional studies at the Research Institute involve analysis of the metabolism in the central nervous system, particularly as concerned with acetylcholine synthesis and with the action of narcotics and other drugs, and the relation of steroids to intracellular oxidations.

Continuing aid given in 1950, The Rockefeller Foundation this year has appropriated \$30,000 to the Montreal General Hospital for biochemical research under Dr. Quastel during the next three years.

JOHNS HOPKINS UNIVERSITY

TRACE ELEMENTS

The failure of apple trees to produce fruit is in some cases due to a lack of infinitesimal amounts of boron in the soil. This surprising fact is one of a group of phenomena relating to plant, animal, and perhaps human growth. Elements such as magnesium, manganese, cobalt, iodine, zinc, and iron — even in exceedingly minute quantities — can determine whether an organism will develop normally or suffer impairment. Disturbance of the delicate balance of these trace elements in the diet can result in actual disease. The quantities involved are so small that in the case of certain plants, the required copper is furnished merely by allowing the irrigation water to flow through a piece of copper pipe.

Presumably the most fundamental approach to these phenomena is by consideration of the effect of these trace elements on enzyme action. The McCollum-Pratt Institute of Johns Hopkins University, founded in 1947 for the study of trace elements in nutrition, is a leading research center devoted to basic studies of this nature. Under Professor William D. McElroy, investigations focus on the way in which trace metals combine with protein molecules and affect the

enzyme systems that in turn govern the chemical details of the metabolic processes.

The projected program at the institute includes studies dealing with the role of molybdenum in nitrogen metabolism, the alteration of metabolic patterns by trace element deficiencies, and metabolic patterns in sulphate and sulphite utilization. It is planned to expand the training program in order to bring a highly specialized type of instruction to pre-doctoral and postdoctoral students in biochemistry, and to support symposia on inorganic ion nutrition and metabolism.

To further the work of the institute in this important field with its evident implications for medical and agricultural practice, The Rockefeller Foundation is continuing its 1950 support with a five-year appropriation of \$115,000.

GRANTS IN AID

Nagoya University, Nagoya, Japan; \$10,000 toward the general program of research of the group in the Biological Institute, with emphasis upon the research in embryology under Professor Tuneo Yamada;

University of Padua, Italy; \$5,000 toward the purchase of equipment and supplies to be used at the Institute of Zoology and Comparative Anatomy for research in cytology and embryology under the direction of Professor Umberto D'Ancona;

Edinburgh University; £2,500 (about \$7,500) for research in cytology under the direction of Dr. J. M. Mitchison of the Department of Zoology, over a three-year period;

Dr. Gustavo Hoecker, Juan Noe Institute of Biology, University of Chile, Santiago; \$500 toward his expenses in returning to Chile from England where he has been engaged in research on immunogenetics at Guy's Hospital, London;

Hertha Meyer, Institute of Biophysics, University of Brazil, Rio de Janeiro; \$1,080 toward living expenses during a visit to the United States to study electron microscopy techniques;

Bristol University, England:

\$1,400 toward the living expenses of a research team to undertake studies in Switzerland on changes which may be brought about in bone marrow at high altitudes; the research team is directed by Professor J. M. Yoffey, Department of Anatomy;

\$6,200 as a contribution toward research in experimental histology and physiology under the direction of Professor J. M. Yoffey;

University of Bahia, Brazil, Faculty of Medicine; \$9,000 for equipment and supplies needed for research in the Department of Physiology under the direction of Professor Jorge Novis;

University of Rio Grande do Sul, Pôrto Alegre, Brazil, Faculty of Medicine; \$10,000 for the expenses of research under the direction of Professor Pery Riet Correa, director of the Institute of Physiology;

Professor Max Viscontini, Institute of Chemistry, University of Zurich, Switzerland; \$700 toward travel and living expenses to visit English laboratories specializing in research on enzyme chemistry;

Dr. H. F. Deutsch, University of Wisconsin, Madison; \$1,075 toward travel expenses between Madison and São Paulo, Brazil, where he will serve as visiting professor at the Department of Biochemistry, Faculty of Medicine, University of São Paulo;

Dr. Herman M. Kalckar, Institute of Cytophysiology, University of Copenhagen, Denmark; \$1,300 for expenses connected with his visit to the United States, part of which time he will spend at the virus laboratories of Professor Wendell M. Stanley at the University of California, Berkeley;

Dr. Ramón Rodriguez and Dr. Raul Palacios, Bacteriological Institute, Santiago, Chile; \$6,100 to visit virus research centers in the United States and Canada;

University of Nancy, France, Faculty of Medicine; \$3,000 toward the support of research in biological chemistry under the direction of Professor René Wolff;

Society for General Microbiology, England; \$1,200 toward the travel expenses of two American delegates taking part in the

society's special symposium on Autotrophic Microorganisms, to be held in England in the spring of 1954;

McMaster University, Hamilton, Ontario, Canada; \$1,500 toward research of Professor S. Kirkwood, Department of Chemistry, on the synthesis of plant alkaloids;

University of Geneva, Switzerland; \$2,000 for research in plant biochemistry under the direction of Professor Fernand Chodat, Institute of General Botany;

University of Wisconsin, Madison; \$2,000 to enable the university to invite Professor Henrik Lundegårdh, director, Institute of Plant Physiology, Royal Agricultural College at Uppsala, Sweden, to visit and travel in the United States;

Wayne University, Detroit, Michigan; \$10,000 for expenses of research on natural plant products under the direction of Professor Carl Djerassi in the Department of Chemistry and in the Institute of Chemistry, University of Mexico.

BIO-MOLECULAR STRUCTURE

One of the characteristic movements in biology, especially over the last 25 years, has been the increasing emphasis on the role played by smaller and smaller units. The preceding century saw the transition, with the ordinary optical microscope as the chief tool, from the study of organs and tissues to the study of individual cells. The present movement carries this to a further stage of refinement, and is concerned with what now is often called Molecular Biology. Basic to progress in this newer attack is a knowledge of the structure of biologically important molecules.

POLYTECHNIC INSTITUTE OF BROOKLYN

DETERMINATION OF PROTEIN STRUCTURE

The long-range project on protein structure planned and directed by Dr. David Harker of the Polytechnic Institute of

Brooklyn, New York, has progressed sufficiently in its preparatory phases to permit the launching, within the near future, of an all-out attack on the actual atomic arrangement of a protein molecule. Initiated in 1950, the program has been making use of X-ray diffraction methods to improve our knowledge of the structure of the protein ribonuclease. This particular enzyme was selected because it has the smallest molecular weight (13,400) of any protein known to be an antigen; because it can be made to crystallize in several forms; and because its crystals are very nearly perfect. By combining knowledge gained from the various crystalline modifications, it is possible to obtain structural information much more readily than from one crystal alone.

The work of the Harker group during the past year has been divided into four main lines of activity. The first pertains to the design, construction, and use of apparatus for collecting the X-ray diffraction data from crystalline proteins. The Geiger counter spectrometer described in last year's Annual Report is now available for use with single crystals of protein. With this apparatus, it is expected that soon a crystal can be mounted, its structural constants measured, and its symmetry determined in a matter of days. The spectrometer, together with a new electronic counting device, should make it possible to collect the 10,000 intensities of reflection from a crystal in a period of about six weeks, with a total exposure to the potentially harmful X rays of not more than 50 hours.

The second phase of the work concerns the preparation and acquisition of suitable protein crystals. Numerous solutions of ribonuclease in different solvents have been prepared, and techniques have been developed for growing from the solutions excellent crystals of various sizes — with diameters as large as three millimeters. Extensive experimental studies are now to be carried out, both chemically and by X-ray diffraction.

Analysis of the chemical and physical properties of the

protein crystals comprises the third category, which has developed this year as the crystals have become available. A program of density measurements has been started, using the method of flotation in a column of liquid with a density gradient. Possible changes in the enzymatic activity of ribonuclease after exposure to unusual solvents or to X-radiation are to be explored. A start has been made on collecting diffraction data from wet ribonuclease crystals at temperatures down to about -90° C, and a program of iodination and subsequent crystallization of ribonuclease is under consideration.

Last, and highly important of course, is the interpretation of the X-ray diffraction data obtained in the laboratory. This has been going forward on two different levels: efforts toward finding the correct absolute intensity scale of the diffracted rays by using a statistical treatment of the observed intensity; and correlation of the unit cell dimensions of the various forms of ribonuclease in the hope of learning about the shape of the molecule.

The Rockefeller Foundation, in addition to earlier support amounting to \$201,115, has made a 1953 appropriation of \$65,000, available as "forward financing" during the two-year period beginning July 1, 1956.

CAMBRIDGE UNIVERSITY
X-RAY CRYSTALLOGRAPHY

A group of workers at the Cavendish Laboratory of Cambridge University, England, has for many years been using the methods of X-ray crystal analysis in attempting to determine the exact structure of a protein. But even such a relatively small protein molecule as hemoglobin casts some 400 spots on a photographic film after exposure to a beam of X rays: and the two-dimensional evidence furnished by the location of these spots, plus the knowledge of their intensity, is simply not sufficient to permit an unambiguous and

methodical determination of the three-dimensional position of all the atoms of the molecule in question.

Recently Sir Lawrence Bragg and Dr. Max Perutz and their colleagues at Cambridge have studied the X-ray diffraction pattern of hemoglobin molecules into each of which have been previously introduced, by chemical means, two mercury atoms. These heavy metal atoms produce X-ray reflections which can be identified, and which serve as landmarks for locating some of the main features of the structure. With the basic skeleton of the crystal thus blocked out, it is reasonable to hope that the complete structure of hemoglobin may soon be resolved. To help accelerate the laborious analyses which yet remain to be done, the Foundation has made a grant of \$4,000 to Cambridge University for the purchase of an additional precession camera and two calculating machines.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

STRUCTURE ANALYSIS

Two years ago the Foundation supported a new approach to the determination of crystal structures, evolved by Professor Martin Buerger of the Massachusetts Institute of Technology. As in standard crystallographic procedure, a beam of X rays is directed onto a crystal and the complicated pattern of reflections of these rays from the various crystal planes is photographed. Professor Buerger's innovation lies in the details of his process for working from the Patterson structural diagram, obtained from the experimental data, step by step back to the actual space array of the electrons. The technique of interpretation developed by Professor Buerger has proved successful for two-dimensional cases, and is now being tested in three dimensions in an attempt to solve the structure of the antibiotic terramycin. The Foundation has continued its support of the work with a two-year grant of \$10,800.

GRANTS IN AID

Dr. Arthur J. C. Wilson, University College of South Wales, Cardiff; \$500 for travel and living expenses while attending a round-table conference on the configuration of polypeptide chains at the California Institute of Technology in the fall of 1953;

Birmingham University, England; \$5,000 toward the expenses of research on the chemistry of nucleic acids under the direction of Dr. A. R. Peacocke, Department of Chemistry;

University of Brussels, Belgium; \$4,000 toward research on the chemistry of proteins under the direction of Dr. Hubert Chantrenne;

University of São Paulo, Brazil, Faculty of Medicine; \$800 to purchase equipment and supplies needed by Dr. Hanna Rothschild, Department of Histology and Embryology, for research in protein chemistry;

Johns Hopkins University, Baltimore, Maryland; \$5,000 toward the research of Professor E. V. McCollum in the field of protein chemistry;

University of Graz, Austria; \$8,000 for the purchase of equipment to be used in research on the chemistry of proteins and fatty acids under the direction of Professor Otto Kratky, Institute for Theoretical and Physical Chemistry.

GENERAL BIOLOGY AND BIOCHEMISTRY

Our knowledge of life processes has increased during the present century in a most gratifying manner, but many signs indicate that the golden age of biology is only now beginning. Within the past twenty years we have seen the theory of the gene mature to the point where it can now contribute in a most significant way to an understanding of the basic differences between living and nonliving systems. Many enzymes have been isolated in a crystalline state, and we are rapidly learning how they operate within living creatures to catalyze chemical processes which in their absence could not take

place. Remarkable advances are now being made in our knowledge of the molecular structure of proteins and nucleic acids, substances of key importance in all living systems. Many viruses have been purified and crystallized, and rapid strides are being taken toward understanding more completely their chemical structures, genetics, methods of reproduction, evolution, and disease-producing characteristics.

While we have a long way to go before we can begin to understand in detail the mechanisms by which a complex organism grows, undergoes morphological differentiation, and carries on all its life functions, we can now see clearly the directions in which we must travel in the search for that understanding. Through our newly-won knowledge of genes and viruses, we are beginning to lose our fear of the question, "How does the living differ from the nonliving?" We see in giant protein and nucleic acid molecules a property of replica formation that makes systematic multiplication of living things possible. We see also in the phenomenon of mutability the basis of the whole process of organic evolution.

UNIVERSITY OF ILLINOIS

TRAINING IN MICROBIOLOGY

Research and teaching in the field of modern microbiology demand a comprehensive background in the basic disciplines of the physical and biological sciences. To meet the present shortage of highly trained personnel in this area, the Department of Bacteriology at the University of Illinois is setting up a new program; five research trainees, all first-year graduate students, are to be designated each year for the next three years and will be offered a carefully planned, specialized program of study. The Illinois department, by virtue of its staff, physical facilities, and research interests, is well able to provide the training necessary so that these students may later take over positions of responsibility in laboratories here and abroad.

To help in this program of research and advanced training under the direction of Dr. H. O. Halvorson, department head, The Rockefeller Foundation has granted \$27,000 to the University of Illinois for the proposed three-year period.

COLLÈGE DE FRANCE

BIOCHEMISTRY

Unable as yet to gather all his research team into the laboratories of the Collège de France, Professor of Biochemistry Jean Roche has nevertheless established a strong spiritual union between his former students at the University of Marseille, his assistants at the Marine Station of Concarneau in Brittany, and the group already in Paris. They comprise a well-integrated team of scientific workers actively studying such problems as the chemistry of thyroid hormones, the oxidative metabolism of peptides in invertebrate animals, the variations in the constitution of hemoglobin in health and disease, and the role of metals in various enzyme complexes.

For the purchase of apparatus, supplies, and chemicals needed for this research and to enable Professor Roche to acquire additional equipment for his projected new laboratories, the Foundation has made a two-year grant of \$15,000 to the Collège de France.

KAROLINSKA INSTITUTE

MOLECULAR BIOLOGY

Under the direction of Dr. Fritiof Sjöstrand, the Institute of Anatomy at the Karolinska Institute, Stockholm, Sweden, is becoming an important center for the study of animal tissues at the submicroscopic and molecular level.

One set of investigators at the institute is concerned with the ultrastructure of retinal rods and cones with the aim of explaining the functioning of the various components by revealing ever finer details of their cellular organization. An-

other group is working on the architecture of tubular cells in the mouse kidney; a third is analyzing the systems of intra-cellular cytoplasmic membranes in many epithelial cells; and other workers are studying the submicroscopic details of nerve fibers and myelin sheaths. The staff is also re-examining the problem of fixation artifacts, the methods of controlling tissue damage in freeze-drying procedures, and the details of handling serial sections almost too thin to be seen with the naked eye.

To facilitate the work of Dr. Sjöstrand's group and to enable them to increase their opportunity for training others in the techniques of ultramicroscopy, The Rockefeller Foundation has appropriated \$24,000 over a period of two years for the purchase of an additional electron microscope.

UNIVERSITY OF STOCKHOLM

RADIOBIOLOGY

A pioneer in the use of isotopes for the study of biological problems and winner of the 1943 Nobel Prize in Chemistry, Professor George Hevesy has had rich research experience in Hungary, in Germany, in Denmark, and in Sweden. One of the first to use deuterium to study water metabolism in animals, and radioactive phosphorus to trace compounds of this metal in living organisms, he has also been a pioneer in recognizing the need for standardization of isotope techniques and for special training of young investigators in this exacting field.

The Foundation in 1953 appropriated 21,000 Swedish crowns (about \$4,200) to the University of Stockholm, Sweden, for Professor Hevesy's use during the three-year period before his retirement from active research. The sum will help meet general expenses of his work, and will be applied toward the salaries of technical assistants. With this grant the Foundation brings to a close an uninterrupted span of 25 years of association with Professor Hevesy.

UNIVERSITY OF UPPSALA

CHEMISTRY OF LARGE MOLECULES

Fifteen years ago, under a Rockefeller Foundation fellowship, Professor Einar Stenhagen of the University of Uppsala, Sweden, began his studies on the surface chemistry of fatty acids. The Foundation has maintained continuous interest in this work, and since 1940 has contributed a total of \$18,000 for his research in biochemistry.

Professor Stenhagen has expanded these early studies into a broad survey of the chemistry of other long-chain and large-branched compounds composed of more than 40 carbon atoms, and the investigations of his research team at the Institute of Medical Chemistry now encompass the synthesis, the X-ray crystallographic structure, and the spectroscopic behavior of many optically active long-chain molecules, including those that are produced by the tubercle bacillus.

The Foundation this year continues its aid with a two-year appropriation of \$9,000.

GRANTS IN AID

University of Rome; \$7,500 for research in biochemistry at the Institute of Biological Chemistry under the direction of Professor Alessandro Rossi-Fanelli;

Ochanomizu University, Tokyo; \$3,000 for the purchase of equipment to be used for research in biochemistry under the direction of Dr. Kimiko Anno;

University of Athens; \$3,000 toward the expenses of research in biochemistry under the direction of Professor L. Zervas;

University of Minas Gerais, Belo Horizonte, Brazil, Faculty of Medicine; \$10,000 for research equipment needed by Professor José Baeta Vianna, Department of Biochemistry;

Indian Institute of Science, Bangalore; \$5,600 to purchase equip-

ment for use in research in biochemistry under the direction of Dr. Jagannath Ganguly;

University of Bombay; \$5,400 for the purchase of equipment to be used for research in biochemistry under the direction of Dr. Arunachala Sreenivasan, Department of Chemical Technology;

University of Adelaide, South Australia; \$3,000 to purchase equipment for use in research in biochemistry under the direction of Dr. Peter M. Nossal;

University of São Paulo, Brazil, Faculty of Medicine; \$3,000 for the expenses of research in biochemistry under the direction of Dr. Isaias Raw, Department of Physiological Chemistry;

University of Utrecht, Netherlands; \$2,500 toward the purchase of equipment to be used for research in biochemistry under the direction of Professor H. G. K. Westenbrink in the Laboratory of Physiological Chemistry;

University of Leiden, Netherlands; \$7,500 toward the expenses of research on the chemistry of biologically active molecules under the direction of Professor Egbertus Havinga;

Columbia University, New York; \$3,750 to enable Dr. David Rittenberg, associate professor of biochemistry, to study at the Institute for Advanced Study, Princeton, New Jersey, the possibility of introducing mathematical theory into biochemistry;

Federal Technical Institute, Zurich; \$4,000 toward the purchase of equipment to be used under the direction of Dr. Fritz Ruch, Institute of Plant Physiology;

University of Marseille; \$6,000 toward the purchase of equipment to be used in the Laboratory of Biological Chemistry, Faculty of Medicine and Pharmacy;

University of Leeds, England; \$5,000 toward research in radiation chemistry under the general direction of Professor F. S. Dainton, Department of Chemistry;

Dr. Cyril L. Smith, presently at Yale University, New Haven, Connecticut; \$600 toward travel and living expenses while visiting radiation laboratories in the United States and Canada, before returning to his work as physicist with the Department of Radiotherapy, Cambridge University, England;

University of Liège, Belgium; \$4,000 toward the purchase of equipment for use in research involving the application of isotope techniques to problems of biology and medicine, under the immediate direction of Dr. Walter G. Verly;

Oxford University, England:

\$1,800 toward the purchase of equipment for research in the Subdepartment of Microbiology under the general direction of Dr. D. D. Woods;

\$2,500 for Dr. Lloyd Stocken toward the cost of his proposed visit to the United States to visit representative American laboratories specializing in the study of the biomedical effects of high intensity radiation;

Professor Archibald Vivian Hill, University of London; \$2,100 toward living and travel expenses during a visit to the United States to attend a series of scientific conferences, as well as centers of biophysical research;

Dr. A. E. Mirsky, Rockefeller Institute for Medical Research, New York; \$2,000 toward expenses of his trip to Africa in connection with work in the biological sciences.

THE ORGANISM IN ITS ENVIRONMENT

Modern biology seeks not only knowledge of more minute details, but also more powerful syntheses of knowledge. Not only is it essential to study the living organism as a whole; it is also necessary to study the larger complex formed by the organism, or by similar or diverse groups of organisms, together with the total environment.

UNIVERSITY OF CHICAGO
POPULATION ECOLOGY

Although an integral part of the theory of evolution as propounded by Darwin in 1858 was the doctrine of survival of the fittest, only in recent years have controlled experimental data been accumulated on this phase of the theory. One of the substantial contributions is the work of Professor Thomas Park of the University of Chicago, Illinois. The recipient of a 1948 Rockefeller Foundation fellowship, Professor Park since that time has been analyzing the relation of six combinations of temperature and humidity to the census behavior of two species of beetles, first individually for each species, and then in reference to the new situation created when these two species associate as an interacting population competing for the same food.

The major findings seem to be two: the physical environment alters numerous properties of the populations when the species are not living together, but species extinction does not occur; in interspecies competition, on the other hand, invariable extinction of one species and successful persistence of the other is the rule, but the pattern and frequency of this extinction vary with the physical environment.

Professor Park's work has been aided since 1943 by The Rockefeller Foundation, which this year is continuing its support for another three years with a grant of \$9,600. The projected work includes, in addition to further analysis of the data already collected, research on the effect of adding controlled variables to the experimental design, and a definitive causation study of the behavior manifested by the populations under observation.

UNIVERSITY OF FLORIDA
ANIMAL ECOLOGY

Penetrating studies of the social hierarchy — often called the "peck order" — in flocks of common hens have

been conducted for many years by Professor W. C. Allee. First at the University of Chicago and now at the University of Florida, Professor Allee has directed work which will almost surely help ultimately to explain man's behavior through its illuminating analysis of similar behavior in lower organisms. His present experiments concern the effect of numbers of hens on the establishment and maintenance of social organization in flocks of White Leghorns.

Unconscious and automatic cooperation in other animal societies is also under consideration, with wild fowl from India the latest to be included in the studies. Last summer, in the course of investigations at Woods Hole, Professor Allee was able to show a simple dominance hierarchy in the smooth dogfish, the first demonstration of a social organization of this kind among vertebrates more primitive than the bony fishes. Professor Allee's work has been supported by The Rockefeller Foundation since 1943, and this year the Foundation continues its aid with a two-year grant of \$6,000.

UNIVERSITY OF ILLINOIS

INSECT NUTRITION

Presumably every leaf of every plant contains most if not all of the basic material necessary for insect life. Why then should one plant-feeding insect prefer one leaf, and another insect another? An answer to this question would go a long way toward solving the perpetual problem of crop destruction by insects, and ultimately toward providing protection against human parasites and viruses.

In order to pursue and apply research of this sort, a thorough knowledge of insect physiology is indispensable. Professor G. S. Fraenkel of the University of Illinois is known as a world leader in this field; he has made comprehensive studies of the nutrition of insects from different habitats, and is presently concentrating on the nutrition of those insects which feed on plants.

Such insects are notorious food wasters in that one-half to two-thirds of the food they eat is eliminated, mostly unchanged in form. Almost nothing is known about the basic food requirements of any plant-feeding insect, and similarly little is known about the detailed chemical composition of leaves. Comparison of leaves with milk has proved illuminating, as both contain about 90 per cent water and the amino acid composition of their proteins is surprisingly similar. Professor Fraenkel has come to the tentative conclusion that leaves from different plants, even at different seasons, do not vary sufficiently to make differences in composition a plausible explanation for the distribution of insects. The choice of plant host seems to be determined not so much by the nutritional qualities of the leaf as by sensory reactions of the insect to specific compounds in the leaf which act as attractants or repellents.

To support these and related studies by Professor Fraenkel and his colleagues, The Rockefeller Foundation has appropriated \$25,000 for a three-year period.

UNIVERSITY OF MIAMI

MARINE RESOURCES

Effective exploitation of the ocean areas as sources of food requires a greatly increased knowledge of marine biology and, more broadly, an increased knowledge of the cycle of energy and life within the sea. A research program aimed at filling some of these gaps is being undertaken at the University of Miami, Florida, under the direction of Dr. F. G. Walton Smith.

The Marine Laboratory there comprises the university Department of Marine Science, the headquarters of certain federal activities under the Fish and Wild Life Service, the headquarters of the Gulf and Caribbean Fisheries Institute, and the headquarters of the Florida State Board of Conservation. Specialized equipment is available,

and there is an able and international staff representing British, Japanese, Scandinavian, Latin, and American nationalities.

The projected research aims at analyzing various aspects of the great cycle of life that occurs in the ocean. The work falls into five categories: 1) qualitative and quantitative estimates of the standing crop and of the principal materials undergoing transformation in the food cycle, in all stages of the cycle; 2) the nature of the biochemical transformations in each stage of the cycle; 3) the controlling factors, both chemical and physical, at each stage of the cycle; 4) the rate of transfer of energy and materials at all stages of the cycle; and 5) the addition and removal of materials from the system by horizontal ocean currents.

For the first four years of this study, The Rockefeller Foundation has appropriated the sum of \$75,000 to the University of Miami.

UNIVERSITY OF CALIFORNIA

SCRIPPS INSTITUTION OF OCEANOGRAPHY

One of the outstanding research workers at the Scripps Institution of Oceanography of the University of California is Professor Denis L. Fox. For many years he has been working on the comparative biochemistry of marine organisms. More particularly, he is interested in the study of living pigments such as carotenoids.

The relation between such studies and the universal problems of nutrition, population, and exhaustion of natural food-producing resources is not hard to find. Carotenoids are made only by plants, but they are almost universal in their distribution throughout the living world. They give color to carrots and goldfish, to egg yolk and butter yellow, and to the plumage of birds. They are essential in the synthesis of vitamin A, they keep our skin soft, and they help us to see. In studying them we may also acquire new information

on the sensitive relation and reaction of the organism to its internal and external environments.

Because Professor Fox is studying organisms that form a part of the great cycle of life in the sea, his work falls under the Foundation's general interest in marine biology, and more broadly, under its interest in learning more about the potential resources of the sea. These biochemical studies in 1953 received renewed support at the level of \$8,000.

UNIVERSITY OF UPPSALA

PHOTOSYNTHETIC ACTIVITY

At the Institute of Physical Chemistry of the University of Uppsala, Sweden, former Foundation fellow Stig Claesson has utilized new research tools designed and constructed in his laboratory for investigating with increasing precision smaller and smaller changes occurring in macromolecules; for working in photochemistry, especially on the behavior of free radicals; and for studying the effect of intense ionizing radiations on proteins and other life stuffs.

Professor Claesson, who succeeded The Svedberg as director of the institute, plans to devote the next five years to a study of the mechanisms of photosynthesis. While much is known about the intermediate products of this vital life process, and while there are promising leads as to how these substances may be converted into the variety of foods needed by a plant, little is known about the details of the carbon dioxide, water, and chlorophyll interactions. For example, we still do not know how light energy is captured by chlorophyll, nor how some of that energy is used to break up the water molecule, nor even where the primary photochemical reaction takes place.

At Uppsala the research now proposed will focus on the structure and function of chloroplasts, which are the nearly visible particles within plant cells, themselves made up of little sacs of chlorophyll as well as other complex macro-

molecules. The isolated chloroplasts to be used will probably be derived from some readily available source such as the common burdock plant. Professor Claesson will also use some of the special equipment he has designed for flash photochemistry to study the photochemical behavior of all the possible complexes between chlorophyll and colloids. It seems probable that such complexes play a significant role in photosynthetic activity.

As a contribution toward research assistance and supplies during the five-year period projected for this research, The Rockefeller Foundation has appropriated the sum of \$35,000 to the University of Uppsala.

UNIVERSITY OF PARIS

ENERGY TRANSFER IN PHOTOSYNTHESIS

Broadly similar to the studies to be undertaken by Professor Claesson is the research under the direction of Professor René Wurmser of the University of Paris. Investigations in the Laboratory of Physical Chemistry of the Faculty of Sciences will also center on the series of events that takes place when light strikes the minute entity which is the energy-absorbing unit of the green plant.

For the past two years, workers in this laboratory have been studying energy transfer in pure synthetic pigments and in various chloroplast preparations. Professor Wurmser himself has maintained a continuous interest in the problems of photosynthesis for more than 20 years, since the writing of a doctoral thesis based chiefly on the bleaching of chlorophylls by light. In returning to active participation in the field, he is now anxious to study particularly the mode of transfer of energy immediately after absorption.

To carry through research in this important field, a monochromator — a device designed for the selective transmission of homogeneous radiant energy — and a high-energy

light source are needed in the laboratory. To aid in the purchase or construction of these items, as well as to contribute to general expenses of the research, The Rockefeller Foundation has made a three-year grant of \$15,000 to the University of Paris.

GRANTS IN AID

Institute of Biology, London, England; \$700 toward the travel expenses of an American delegate invited to participate in a symposium on Population Fluctuations in Man and Animals to be held in England in the fall of 1954;

Dr. Chester C. Roys, Department of Biology, Tufts College, Medford, Massachusetts; \$2,100 to enable him to spend a year on research in insect physiology at the University of São Paulo, Brazil;

Ministry of Agriculture, Santiago, Chile:

\$10,000 to the Department of Animal Industry for investigative and teaching purposes in the Institute of Veterinary Investigations, on problems of livestock parasitology, under the direction of Dr. Isaias Tagle;

\$2,850 to enable Dr. Isaias Tagle to visit research centers in parasitology in several Latin American countries and in the United States;

Bacteriological Institute of Chile, Santiago; \$7,200 for equipment and supplies needed in research in poultry pathology by Dr. Eliseo Gallardo;

Marine Station of Endoume, Faculty of Sciences, University of Marseille; \$5,000 as a contribution to research in marine biology and ecology under the direction of Professor J. M. Pérès, for a two-year period;

University of Hawaii, Honolulu; \$10,000 toward the purchase of equipment and supplies to be used for research in marine biology;

University of Chile, Santiago; \$10,000 for equipment and supplies needed by the Marine Biological Laboratory for work on problems of marine resources under the direction of Dr. Parmenio Yanez;

University of São Paulo, Brazil:

\$9,150 to purchase equipment and supplies needed by the Oceanographic Institute in connection with the program on development of marine resources;

\$2,650 for Professor Paulo Sawaya, for travel expenses during visits to Latin American centers of research on marine resources and experimental biology;

\$715 for Professor João Soares Veiga, director, Faculty of Veterinary Medicine, toward travel and living expenses during a visit to animal climatology centers in the United States;

Marine Biological Laboratory, Woods Hole, Massachusetts; \$3,500 toward the cost of a research analysis of the laboratory's operations;

Dr. Jan Bartholomeus Thomas, senior biologist, Biophysics Research Group, University of Utrecht, Netherlands; \$2,350 toward travel and living expenses during a three-month visit to photosynthesis research centers in the United States;

Dr. C. J. P. Spruit, Department of Plant Pathology, University of Wageningen, Netherlands; \$1,200 toward travel and living expenses to make possible an extension of his visit to the United States;

University College, University of London; \$3,000 as a contribution toward research in plant physiology in the Department of Botany.

GENERAL SCIENTIFIC SUPPORT

Substantial funds for research on biological problems are now available from a rather wide variety of sources in the

United States. This is one of the facts which has influenced The Rockefeller Foundation to reduce its own support of experimental biology in the United States. But much of the newly available support is short-term, and it is sometimes rather inelastically restricted to the attack on certain stated problems. Therefore, The Rockefeller Foundation, in its continuation of some support for biological research within the United States, is tending to give long-term grants which, flexible as to rate and nature of expenditure, will have a stabilizing influence on the general programs of outstanding individual leaders or outstanding groups. Clearly, only a very few such grants can be made in any one year. The present section lists grants, made during 1953, of this general and stabilizing character.

STANFORD UNIVERSITY

BIOLOGY

Modern fields of research are stressed in the Department of Biological Sciences at Stanford University, California, which is characterized by the quality of its leaders and the ability of its junior members. Work is carried on at three different locations — at the departmental headquarters on the campus, at the Natural History Museum, and at the Hopkins Marine Station in Pacific Grove. The activities and research interests of all three groups are closely linked and integrated, so that a healthy and fruitful relationship has been fostered between workers in classical and experimental fields. Since 1934, support from the Foundation to work in biology and closely related fields at Stanford has totaled over \$700,000, including several current grants.

Research projects in the department include studies of the photosynthetic activity of bacteria, the nature and effects of gene mutations in microorganisms, the cellular physiology of marine and fresh-water algae, the effects of ultraviolet light on protozoa, the development of the pigment cells

of the vertebrate skin, and the biology and genetics of fungi.

The department is also active in training young scientists. In the past five years 48 Ph.D. degrees, 74 M.S. degrees, and 555 A.B.'s have been awarded. Visiting investigators and postdoctoral fellows, several of them on Rockefeller Foundation fellowships, have been welcomed in sizable numbers. Research papers have been published in substantial volume.

This is the general program of work which will be advanced by a 1953 Foundation conditional appropriation of \$250,000 to Stanford University for research in biology. The fund is to be available during a three-year period, and is to be released in sums of \$50,000 for every matching \$50,000 received by the university from other sources for the same purpose. It seems altogether likely that the matching support will be forthcoming, so that at the end of the three-year period the department should have at its disposal, for the furthering of biological research, a fund of half a million dollars.

UNIVERSITY OF PENNSYLVANIA
RESEARCH IN ZOOLOGY

Another long-term, flexible grant supporting research in an entire department was made this year to the University of Pennsylvania. The nature, action, and interaction of the various cell constituents are presumably responsible for all the vital processes — fertilization of the egg; growth, differentiation, and behavior of the individual; and inheritance and evolution — and the senior group in the Zoology Department at Pennsylvania has a long tradition of emphasis on zoological research at the cellular level. The program of the department is a flexible one, varying to follow up new leads as they are uncovered. Through basic cellular studies utilizing the techniques of cytology, embryology, genetics, physiology,

biochemistry, and biophysics, workers at the University of Pennsylvania are making valuable contributions to our knowledge of the cell and its workings. In addition, the department averages between 40 and 50 graduate students in training per year.

Among the younger group of researchers in the department are an expert in biochemical and biophysical studies of growth and embryonic development, a specialist in the field of protozoan genetics, a scientist interested in immunological phenomena and host-parasite relations, and, commencing next fall, an investigator who is attacking problems of development via experimental, biochemical, and immunological studies on insects.

The Foundation's appropriation of \$125,000 for seven years, in addition to funds previously granted, will help fill the equipment and other research needs of the entire departmental program.

UNIVERSITY OF WASHINGTON

BIOCHEMISTRY

An appropriation of \$100,000 to the University of Washington, Seattle, over a seven-year period forms another instance of the interest of the Foundation in providing long-term aid to distinguished and fully established investigators. The researcher in this instance is Professor Hans Neurath of the Department of Biochemistry. His group of approximately 40 members is interested in the general problem of the relation of chemical structure to biological activity, with protein chemistry, enzymology, and intermediary metabolism in the foreground of the investigations.

Specific projects include a study of the controlled enzymatic degradation of proteins, designed to determine the minimum structural requirements of the protein molecule for biological activity. By use of carboxypeptidase, amino acids are liberated one by one from the carboxyl end of the

constituent polypeptide chains of protein substrates. This analytical tool has been applied with success to a partial elucidation of the changes involved when a biologically inert protein is converted to the active form.

The molecular-kinetic properties of proteins in solution are also being analyzed. Measurements of size and shape are made by means of light scattering and interferometric diffusion methods. It is expected that these high-precision measurements will lead to a revision of many of the recorded values of protein molecular weights.

Another phase of the research is the chemical modification of proteins under conditions which avoid a rearrangement of the polypeptide chains, or at least without detectable changes in the size or shape of the molecule. Since biological activity and specificity of proteins, particularly of enzymes, arise from special configurations of chemical groupings in the polypeptide chains which make up the protein molecule, controlled modification of these groupings, correlated with measurements of physico-chemical properties, may well lead to understanding and control of many important biological phenomena that are mediated by the proteins.

Professor Neurath himself intends to resume his kinetic investigations of the enzymatic specificities of proteolytic, or protein-breaking, enzymes. He will study particularly those of bacterial origin, and expects to extend his work to the kinetics of peptide bond synthesis.

CALIFORNIA INSTITUTE OF TECHNOLOGY

CHEMICAL BIOLOGY

At the California Institute of Technology a group of workers in the Division of Biology and the Division of Chemistry and Chemical Engineering are cooperatively and vigorously attacking the fundamental problems of biology and medicine. They are studying the structure and biosynthesis of proteins, nucleic acids, and other constituents of living

matter; the structure of the gene and the mechanisms of inheritance; cell division and growth; the molecular structural basis of the physiological activity of chemical substances; and the structure and properties of antibodies, enzymes, viruses, bacteria, and the cells of higher plants and animals. Because of their conviction that great progress can be made during the coming decade by an all-out attack on basic problems, members of the California group hope to continue and strengthen their work along the lines already so impressively established.

Although the program involves an attempt to uncover basic principles rather than to attack specific problems, discoveries of practical use will in all probability be forthcoming. The group hopes particularly that in the course of their fundamental studies new ideas will be developed which will provide the basis for clinical research on such medical problems as those presented by neoplastic, cardiovascular, and virus diseases.

Primary features at the institute are the rigorous and extensive training of members of the group in the exact sciences, their interest in attacking broad problems, and their high degree of cooperation. Physical and instrumental facilities are excellent, and a new research laboratory is about to be constructed. Advanced training constitutes an important phase of the program; 279 postdoctoral fellows have worked in biology and chemistry during the past seven years and have returned to responsible positions in many countries of the world.

The program of chemical biology at the California Institute of Technology is at present receiving about \$100,000 per year from The Rockefeller Foundation under a 1948 appropriation which expires June 30, 1955. This year the Foundation has appropriated an additional \$1,500,000 for the program, on condition that the institute secure an equal amount from other sources for the same purpose during the coming three years.

CORNELL UNIVERSITY
BIOCHEMICAL RESEARCH

Twenty years ago The Rockefeller Foundation began its support of the work of Dr. Vincent du Vigneaud, now of the Department of Biochemistry at the Cornell University Medical College. From early work on the chemistry of insulin, Dr. du Vigneaud and his associates have followed a path of research leading on through the chemistry and metabolism of the sulphur-containing amino acids and related compounds, and of certain biologically active polypeptides.

Dr. du Vigneaud's studies on methionine many years ago led to discovery of the amino acid, homocysteine. Nutritional studies on this substance in turn led to discovery of the process of transmethylation — that is, the transfer of the methyl group to certain nitrogen and sulphur compounds of the body. In collaboration with research teams elsewhere, it was determined by isotopic labeling that the methyl group is synthesized in the tissues of an animal body rather than by means of intestinal bacteria. Folic acid and vitamin B₁₂ may play a part in this process, and the du Vigneaud group is presently working to elucidate this interrelationship.

Along with this research, and stemming from the insulin studies, work has been pursued on polypeptide hormones less complex than insulin. The Cornell group was able first to obtain highly purified preparations of the hormones oxytocin and vasopressin, then to develop a complete structural picture of the former, a pituitary hormone that stimulates milk ejection. A substance has now been synthesized which, when given intravenously to human patients, induces milk ejection in 20 to 30 seconds. If this substance indeed proves to be oxytocin, as now seems almost completely assured, the first synthesis of a polypeptide will have been accomplished. This would be an achievement of great practical significance, one which will help establish methods of synthesizing analogous

molecules and one which leads on to a large number of important new problems.

Work of the same nature is now in progress on vasopressin; a tentative structure has been plotted, and attempts to synthesize the compound are under way.

The Rockefeller Foundation this year has made a seven-year grant of \$150,000 to Cornell University; the sum will be flexibly available for the entire program of biochemical research under Dr. du Vigneaud.

UNIVERSITY OF WISCONSIN

BIOCHEMISTRY

For over 20 years the natural science program of The Rockefeller Foundation has given special attention to the application of chemical knowledge and methods to the basic problems of biology. Under this program a considerable number of appropriations, totaling close to \$200,000 since 1940, have been made to various workers at the University of Wisconsin for research in biochemistry.

At Wisconsin the broad area of biochemistry has for many years comprised a large and active group of workers. These men have acquired an international reputation for leadership, and have trained some 200 students for their doctoral degree during the past ten years. Research activities can be roughly classified under four headings, although a close interrelationship is maintained among the different units.

The most sizable group is located in the Biochemistry Department of the College of Agriculture, and in closely allied departments; included here is work on the biochemical aspects of photosynthesis, and other biochemical research basically related to agriculture. A second group is working largely on the physical biochemistry of proteins and other large molecules of biological importance. A third unit is carrying on a program of training and research in enzyme chemistry at the university's Enzyme Institute; operating

entirely at a postdoctoral level, the institute is unusually well equipped and staffed for work in this field. The fourth group, at the McArdle Memorial Institute, is investigating the biochemical aspects of fundamental problems of cell growth.

In 1953 The Rockefeller Foundation made an outright grant of \$200,000 to the University of Wisconsin. Both principal and income will be available as flexible and stabilizing support for research in biochemistry.

UNIVERSITY OF SÃO PAULO

The Foundation's general support of scientific research this year included three departments of the University of São Paulo, Brazil: the Faculty of Philosophy, Sciences, and Letters; the Faculty of Veterinary Medicine; and the Faculty of Medicine at Ribeirão Preto, in each case for a period of three years.

Since its inception less than 20 years ago, the Faculty of Philosophy, Sciences, and Letters has fostered active investigations in all of the basic sciences. Work in physics, *Drosophila* genetics, and general and comparative physiology has attracted particularly widespread attention. A Rockefeller Foundation grant of \$45,000 will support research in experimental biology in nine of the faculty's science departments.

In the Faculty of Veterinary Medicine, aid will be applied in part toward work on animal climatology in the experimental heat chamber recently completed in the University City. This is the only such chamber in South America and one of about a half-dozen in the world. In addition, under the Foundation's appropriation of \$30,000, equipment and supplies will be furnished and teaching aided in the fields of physiology, food technology, bacteriology, and parasitology.

The last of the three grants will aid the university's second Faculty of Medicine. Located at Ribeirão Preto, about

200 miles from São Paulo, this modern, well-equipped medical school will help meet the shortage of trained physicians in Brazil. Foundation aid, in the amount of \$50,000, is intended particularly for research work in the departments of biochemistry, histology and embryology, and parasitology.

UNIVERSITY OF RIO GRANDE DO SUL

The University of Rio Grande do Sul, Pôrto Alegre, Brazil, in 1953 received support totaling \$75,000 from The Rockefeller Foundation. This aid for research and teaching facilities comprises \$50,000 to the Faculty of Philosophy and \$25,000 to the School of Agronomy and Veterinary Medicine.

Funds under the first appropriation are designated principally for three departments — genetics, botany, and paleontology. New science laboratories are increasing the opportunities for investigative work, and the Foundation is assisting in the acquisition of research equipment and supplies over a three-year period.

Since the University of Rio Grande do Sul is located in one of the rapidly developing agricultural and livestock regions of Brazil, research and educational activities of the School of Agronomy and Veterinary Medicine are both highly important. A new veterinary clinic and classroom building will provide enlarged quarters for these two phases of the school's program, and Foundation support for two years will aid in the purchase of equipment, supplies, and library materials.

Agriculture

As has been indicated in the general introductory statement on page 153, the program of the Division of Natural

Sciences and Agriculture now reflects increased emphasis on the broad problems of food supply.

OPERATING PROGRAMS

The operating agricultural activities during 1953 were carried out cooperatively with governments of Latin America. One of the significant developments was the enabling grant, made late in 1953, in support of corn improvement activities in the Central American countries. This activity draws upon and links geographically the main operating programs in Mexico and Colombia.

MEXICAN AGRICULTURAL PROGRAM

This year the collaborative agricultural program of the Mexican government and The Rockefeller Foundation entered its second decade. Working through the Office of Special Studies, a dependency of the Mexican Ministry of Agriculture, this joint undertaking has as its goal the improvement of Mexico's agricultural productivity, especially in the basic food crops.

From its modest beginnings in 1943, with one Foundation staff member and two Ministry personnel, the program has expanded steadily until today it comprises a staff of 6 Mexican and 14 American scientists, plus about 60 agronomists assigned by the Ministry. Land, buildings, and the salaries of the assigned agronomists have been among the contributions of the Government of Mexico; the Foundation, in providing the services of its staff members, equipment, and other support, has expended over \$3,000,000 for the program.

From the first, research emphasis has been on corn, wheat, and beans, which form the backbone of the Mexican agricultural economy. Developmental work was started in the Central Mesa area, which includes Mexico City and the

high plateau states. This is where the bulk of the Mexican population lives, and hence one of the areas where agricultural improvements assume their greatest importance. Over the years, experimentation has been instigated in all the major climatic zones of the country, in experiment stations developed cooperatively with the Ministry, the National Corn Commission and similar bodies, and state departments of agriculture. Decentralized research is a necessity in Mexico, where variation of a few hundred meters of altitude makes a tremendous difference in climatic and soil conditions. This is particularly evident in the case of corn, because of the extreme susceptibility of the growing plant to changes in length of day, to temperature, and to various diseases.

In the past decade, corn hybrids suited to the high and intermediate altitudes of Mexico have been developed and distributed through the National Corn Commission. Present efforts include the breeding of strains suitable for the low tropical regions of the Gulf Coast. The potentialities are great because rainfall, often a problem in other areas, is abundant in these sections. Progress was made this year with the development of a new tropical hybrid, H-501, which gives 25 to 30 per cent more grain than Rocamex V-520, an earlier selected variety which in itself was a considerable improvement over the indigenous types.

For the regions of intermediate altitude, the hybrid Celita has proved one of the best ever produced by the Office of Special Studies. This is a very early hybrid, highly resistant to drought, and is particularly useful for soils of low fertility which do not have irrigation and in areas where an early frost is likely. During periods of severe drought, the leaves of Celita roll up; the plant seems to stop growing until moisture is again available, at which time growth resumes and small but well-formed ears are produced.

Corn research under the Mexican Agricultural Program also includes a germ plasm bank of the native maize varieties. This work is now being done in cooperation with the National

Research Council in Washington, D. C.; to the program's earlier collections from within Mexico the council is adding samples from other parts of Central and South America. The seeds are to be maintained at Chapingo, under storage conditions which will keep them viable for 10 to 15 years. The bank currently numbers over 4,000 varieties which are being tested as the basis for future hybrids.

Mexican wheat production now rests solidly on the varieties developed under the Foundation's operating program, with well over 75 per cent of the total national production represented by wheat varieties developed by the Office of Special Studies. Favorable climatic conditions this year helped bring about what is probably the best wheat harvest in the history of the country. The great increase in wheat production evident throughout Mexico is particularly notable in the Bajío region and in the Northwest. Through better methods of land preparation, use of chemical fertilizers, and proper planting of the improved seed, yields have more than doubled on many farms in these areas. Other parts of Mexico are being tested as potential wheat-producing sections, and a number of new areas — for both summer and winter plantings — have already been determined.

While the threat presented by race 15B of stem rust has now largely been met, race 49 and the closely related 139 have reappeared in Mexico after lying dormant for 20 years. The Gabo and Yaqui varieties of wheat proved resistant to these rusts, but other strains such as Lerma, Kenya, and Supremo 51 were seriously menaced. Continuous research effort is necessary to combat the frequent shifting of populations of the rust parasite.

The work on beans has reached a point where the improved selections and hybrids have been increased and distributed widely in important bean-producing areas. A program of field increase was inaugurated in parts of the Valsequillo valley of Puebla, where a plentiful water supply and a long growing season assure conditions ideal for bean culti-

vation. Studies of the adaptability of various lines to the different regions of Mexico are currently in progress throughout the country, and the problem of winning wider public acceptance for new and improved varieties is being analyzed.

Continued investigations on truck crops have made possible the recommendation of superior varieties for several regions of Mexico. Although the vegetable program is still in its preliminary stages, certified tomato, cucumber, lettuce, carrot, beet, cabbage, broccoli, and onion seeds have been produced in small amounts this year. This should ultimately mean reduced cost and increased quantity of vegetable seeds for the farmer, and a more varied and healthful diet for the average Mexican.

Work on potato improvement has progressed in similar fashion, and it is now evident that Mexico can have its own seed potato industry with the attendant economic benefits. More than 150 hectares were planted in the State of Mexico this summer as a result of research and demonstrations conducted in 1952. The practicability of commercial spraying for the control of late blight was demonstrated, although attempts are presently being made to develop a resistant variety of potato that will require less spraying than the lines now in use. The resistance of a given line may hold in one area but not in another, thereby necessitating fundamental genetic studies. The Toluca Valley, because of its high altitude with accompanying daily rains and cool nights, is an ideal laboratory for such research.

In studies of the effect of fertilizers on corn and wheat, tests have continued to demonstrate the importance of nitrogen and phosphorus. Yield increases of the order of one-half to one ton per hectare apparently can be procured through proper application of these nutrients. Similar increases are indicated after interplanting legumes such as hubam clover with wheat or corn; preliminary experiments on this practice will be extended to other parts of Mexico, and further tests of interplanting with other legumes will be instigated.

The plant pathology laboratory, now located in Chapingo, continues research on the important corn and wheat diseases. The hybrids and open-pollinated varieties of corn now being recommended for commercial production are resistant, or at least tolerant, to attacks by ear rot and stalk rot pathogens. Research on wheat diseases has been aided this year by the addition of facilities and personnel permitting rust determinations to be made directly at the Chapingo laboratory.

Insect pests must be controlled as well as disease, and entomological studies of aphids, grasshoppers, and the like are aimed in this direction. In addition, a start has been made on controlling flies in dairy barns and insect pests in stored grains. New specimens have been added to the insect collection at Chapingo, with immature forms stressed because of the prevalence of crop damage from larvae and nymphs.

Under the training portion of the Mexican Agricultural Program, six scholarships for advanced study were awarded this year to Mexican scientists previously trained under the program. Twenty-six graduates of some of the leading agricultural schools in the Americas received specialized training in the Office of Special Studies, and there are currently some 50 Mexican trainees associated with the program. The knowledge gained as a result of the various activities is being spread not only by the newly trained specialists but through the consultative services of the staff and the expanding publication activity. This year a journal series was established for papers written by members of the staff, and a number of agricultural bulletins were published, contributing to the growing list of research and extension bulletins emanating from the Office.

The year saw a number of changes in physical location. The central administrative office of the program and the library are in new and more spacious quarters in Mexico City, provided by the Ministry of Agriculture. A garage for servicing the program's trucks and other vehicles is also located in

Mexico City. The Toluca experiment station, operated by the State of Mexico, is now in full use, and La Piedad station in the State of Guanajuato is well started. The plant pathology and soils laboratories have moved from San Jacinto, on the outskirts of Mexico City, into the Chapingo station.

The Rockefeller Foundation's appropriation for 1954, to help meet the cost of expanded operations, is greater by almost \$20,000 than the amount budgeted for 1953: for the coming calendar year, the sum of \$175,750 has been appropriated. This is in addition to a fund totaling \$400,000 for field service expenses of the Mexican and Colombian programs in 1954, and an additional \$6,500 which was expended for this purpose during 1953.

MEXICAN AGRICULTURAL PROGRAM

EXTENSION SERVICE

Early in 1953, the new President of Mexico decreed an emergency program aimed at increasing the quantity of basic food crops annually produced in Mexico. The goal is to be attained through what are essentially agricultural extension methods — that is, by placement of trained Mexican agronomists in important rural areas, by establishment of demonstration plots, by local production of certified seed under technical supervision, and by use of audio-visual aids to exploit newly improved materials and methods. Farm credit is another important phase of this program.

The nation-wide project will utilize and cooperate with state extension programs, where they already exist. Outstanding among these is the State of Mexico project, which the Foundation helped initiate in 1951. Extension work here has met with an enthusiastic response that augurs well for the success of the national plan.

The three crops upon which the State of Mexico program is initially concentrating are corn, wheat, and beans —

the staples of the Mexican diet. Most of the varieties of these crops which are being widely distributed are those that have been produced under the cooperative Mexican Agricultural Program. Similarly, much of the information to be disseminated to the farmer is contained in publications that have emanated from the Office of Special Studies. At the close of the year, benefits are already accruing. It is planned to expand the program, not only into new geographic areas, but also into new phases of crop production.

The Rockefeller Foundation has been asked to cooperate in the extension project and has responded by supplying both technical personnel and supplementary funds. The majority of the young agronomists selected for regional duty have been trained under the cooperative Mexican Agricultural Program. Improved seeds have been supplied for demonstration and increase in the various regions, as well as recommendations on the use of fertilizers and pesticides and cultural practices. Two Foundation grants for the extension work were made during 1953. The first was a three-year appropriation of \$60,000 to be expended for extension equipment and supplies, visual aids, sound equipment, assignment of technical personnel (including transportation), preparation of extension literature, and possible temporary assignment of extension specialists from the United States or elsewhere. At the end of the year, this fund was supplemented by an appropriation of \$100,000 available through 1955.

COLOMBIAN AGRICULTURAL PROGRAM

In 1948, at the invitation of the Colombian government, The Rockefeller Foundation adopted a plan for undertaking a collaborative program in agriculture similar to the one operating in Mexico. The purpose again is to improve the yield and the quality of the country's basic food crops, particularly corn and wheat. The Colombian program has made rapid progress, for it has been able to draw upon its predeces-

sor in Mexico not only for technical experience but also for improved seed stocks.

One of the highlights of 1953 was the completion of the new Tibaytató experiment station outside Bogotá. One of the largest stations in the Western Hemisphere, Tibaytató is an excellent example of the collaboration that characterizes all phases of the joint agricultural program; the station is owned and financed by the Colombian government, but Rockefeller Foundation staff and advisers have, from the start, served upon request to help in the planning and design of the buildings. Under a 1951 grant, the Foundation has also been sending specialists to Colombia on temporary assignments to assist in orienting the research programs currently being laid out. Most of the actual construction work was completed this fall, and a new laboratory and administrative building, built at a cost of approximately \$300,000 by the Colombian government, is being dedicated early in 1954.

Central administrative offices for the Colombian Agricultural Program as a whole are located in the Ministry of Agriculture in Bogotá. Two Foundation agriculturists direct the technical work of the Tibaytató station and of five substations in different agricultural regions of Colombia. Under a new contract signed this year, the Foundation operating program — upon invitation of the Colombian government — is assuming additional responsibility for the direction and management of improvement projects on wheat, barley, corn, beans, and potatoes throughout the country.

The addition of four specialists to the Foundation's Colombian staff last year has resulted in expanded activity during 1953 in their respective fields — entomology, potato improvement, soils science, and plant pathology. While the Tibaytató station serves as research headquarters, experimentation at various locations throughout the country is necessary because not only soil conditions and crop adaptability vary by area, but even the types of insect pests and the intensity of the damage they can do change regionally.

Thus the entomological studies, for example, are being conducted at four principal stations and utilize in addition the facilities of the Faculties of Agronomy at Medellín and Palmira.

The past year was also marked by a substantial enlargement of the seed increase and distribution program, a step of far-reaching importance for the agricultural development of Colombia. Improved varieties of corn, wheat, and beans have been singled out and in this, the program's fourth year of active operation, were increased in sufficient quantity to be made available to the Colombian farmer. The success of the wheat hybrid Rocol Menkemen 50 was outstanding; yields were so high that at least 2,000 tons of its seed should be ready for distribution in March 1954.

After new strains have been developed by the program's Office of Special Investigations, the work of seed increase and distribution is done in collaboration with the Caja Agraria, a government-owned credit bank. This organization also fills an important role in the nation's extension activities; its workers not only sell the seed literally, but "sell" it figuratively by demonstrating to the farmer the advantages of the improved varieties.

Improved corn seed (notably of Rocol 101, Palmira V-2, and Eto) was distributed on a larger scale in 1953, although not in quantity sufficient to meet the demand. Two double-cross hybrids — Rocol H-202 and H-203 — were produced, the first such varieties bred in Colombia. An international corn germ plasm bank was set up in Medellín and already contains over 2,000 varieties. Serving as a complement to its Mexican counterpart, the Colombian bank preserves maize varieties from countries in the Andean region. Seed has been sent in answer to requests from corn breeders throughout the world.

Research on wheat continues to aim for high-yielding varieties that combine disease resistance, early maturity, and satisfactory baking and milling properties. All the stand-

ard Colombian varieties lack one or more of these characteristics. The Menkemen hybrid most nearly meets the requirements, but comparative field tests are still being performed and experimentation for improved types continues.

A new barley improvement project, centered at Tibay-tatá, was greatly expanded in 1953 with purification of the best existing varieties as the most urgent preliminary to hybridization.

The potato work, also a new activity centered at Tibay-tatá, aims at more potatoes of high quality and low cost. A fundamental problem is determination of the varieties best adapted to the various regions of Colombia; studies must also be made on the chemical control of potato diseases and pests, and on the maximum effectiveness to be obtained from chemical fertilizers. Demonstration plots have been planted, and field days are being arranged so that results of the research may be made immediately available to the Colombian farmer.

Bean research also is in its preliminary stages. Work is going on at five stations, as different problems are involved in different areas. Crosses are being made for improved yield, quality, and disease resistance, while demonstration and seed increase of some of the interim varieties is taking place.

The soils investigations are assuming new importance as the program advances. It is clearly evident that yields of Colombia's basic food crops can be readily increased by improving the fertility status of the soil. Also important in soil fertility is crop rotation; studies of various nutrients will therefore include a careful analysis of how different legumes fit into an effective crop rotation system.

For calendar 1954, the Colombian government has expressed its intention of increasing by 40 per cent its direct support of the agricultural program. The Foundation too is raising its budget for the coming year. In addition to field staff expenses, which are taken from a separate fund of \$400,000 for Mexico and Colombia, an appropriation of

\$90,000 has been made for operating costs of the Colombian Agricultural Program. A further sum of \$50,000 will provide additional greenhouse facilities and scientific equipment for the new Tibaytata station.

CORN IMPROVEMENT PROJECT

CENTRAL AMERICA

In response to requests from several Central American governments, The Rockefeller Foundation this year is inaugurating a program of corn improvement which will extend to a wider area the experience gained through its research in Mexico and Colombia. Costa Rica, El Salvador, Honduras, Nicaragua, and Panama all have expressed enthusiastic interest and are expected to participate in the cooperative project.

It may be that certain of the corn hybrids already developed under the Mexican and Colombian Agricultural Programs will prove directly applicable in Central America. However, it seems likely that further research and breeding work will be necessary, particularly to find varieties of corn suited to the lowland areas. Once successful strains are developed for the Caribbean area, they may well find application along a broad corn belt spanning parts of Africa and the Far East as well.

It is planned that the experimental work will be under the auspices of the ministries of agriculture of the respective Central American governments. Testing centers and field trials will be established at strategic locations, and full exchange of information among the participants will be fostered. The genetic improvement method, based on native maize germ plasm, is to be utilized; in this connection the collections in the Mexican and Colombian germ plasm banks will be of service.

The Foundation has been asked to provide leadership and coordination for the over-all project. Appropriate staff

members will organize the work in the several countries, and an additional local appointee will serve as technical consultant and adviser. It is hoped to integrate the program in such a way as to obtain maximum advantage from the facilities each country has to offer as well as from materials available through the Foundation's field programs. The consultant's full-time services will be provided from a Foundation appropriation of \$30,000, which will also contribute toward travel expenses, meetings and conferences, special services, and a limited amount of equipment and vehicles.

INTER-AMERICAN SOCIETY OF PLANT BREEDERS,
PLANT PATHOLOGISTS, AND ENTOMOLOGISTS

An integral part of The Rockefeller Foundation's agricultural program has continually been the encouragement of closer rapport among Latin American scientists. In 1949 the Foundation supported an Inter-American Symposium on Plant Breeding, held in Mexico City under the auspices of the Office of Special Studies of Mexico's Secretariat of Agriculture. At this meeting the contacts made, the information exchanged, and the plans formulated proved so valuable that a second agricultural conference, on plant pests and diseases, was held the following year. At the second symposium, also in Mexico City, the consensus was that similar meetings should be held periodically. The many interested participants organized a Society of Latin American Agricultural Scientists. The group was at first limited to plant breeders, plant pathologists, and entomologists, but now proposes to include soil scientists as well.

Upon invitation of the State of São Paulo, the first meeting of the new society was held in Brazil in 1952, with nearly 300 scientists in attendance. Dr. E. C. Stakman, at that time chairman of the Foundation's Board of Consultants for Agriculture, was asked to give the opening address, and Dr. Harrar presided over the first joint technical session. The

group then separated into two sections; the geneticists proceeded to nearby Piracicaba where they concentrated on discussions of genetics and plant breeding, while the pathologists and entomologists continued at São Paulo. Later the two sections journeyed to the town of Campinas and resumed joint sessions. Here round-table discussions and field demonstrations were held in addition to the formal programs. Dr. Weaver was one of the speakers at the final banquet which closed the congress after nine full and rewarding days.

The next conference of the Inter-American Society is projected for 1955, with planning sessions already under way. The meeting will be held in Colombia, at the invitation of the Ministry of Agriculture. The Rockefeller Foundation has made a grant of \$25,000 through 1955, to be used for costs of the preliminary meetings of the planning and executive committee, for travel and living expenses of committee members and selected delegates, and for publication of the society's proceedings.

GRANTS IN AID

Mexican Agricultural Program, Maize Collection Center, Chapingo; \$7,500 to cover operating costs, including expenses of local personnel, occasional visits of scientists, international distribution of corn germ plasm, publications, local labor, equipment, and supplies;

Colombian Agricultural Program, Maize Collection Center, Medellín; \$7,500 to cover operating costs, including expenses of local personnel, occasional visits of scientists, international distribution of corn germ plasm, publications, local labor, equipment, and supplies;

For international cooperation in connection with, but not directly related to, the Colombian Agricultural Program; \$5,000 toward the cost of visits of agricultural scientists for temporary periods, the exchange of seeds and other plant materials, and the exchange of literature and information;

Gen. Arturo Chary, minister of agriculture, and Ing. Agron. Alfredo Velez, director of research, Ministry of Agriculture, Bogotá, Colombia; \$2,200 for travel and living expenses during a short visit to the United States to study the organization of agricultural education, research, and extension activities.

AID TO RESEARCH AND TEACHING

As activities in agriculture increase, it has proved desirable to supplement the research carried out directly under the agricultural field staff of The Rockefeller Foundation (as listed in the previous section) by means of grants to various projects undertaken by scientists in universities, colleges, and other agencies.

UNIVERSITY OF MINNESOTA

WHEAT AND ITS PATHOGENS

A new and long-range project that illustrates the close dependency of agricultural research on fundamental biological studies is being initiated this year at the University of Minnesota. The Departments of Plant Pathology and Botany and of Agronomy and Plant Genetics are studying the nature of host-parasite relationships, particularly in relation to wheat and the stem rust pathogen. Efforts are being made to determine whether new genes can be introduced or produced in wheat and in parasitic fungi by wide crossing, spontaneous or induced mutations, or both. The results will be applied to improving techniques for the production of crop plants resistant to those pathogens responsible for the greatest annual losses in cereal production.

Wheat was chosen as a starting point for these basic studies not only because of its economic value but because there are at least 15,000 varieties with which to experiment; the principles derived should then be applicable in varying

degrees to other important crop plants. One early goal is determination of the maximum virulence that can be created artificially, by combinations of genes, or that is likely to be produced naturally in plant pathogens such as stem rust.

The two departments that will be in charge of the studies at Minnesota are those which have been largely responsible for the development in this country of disease-resistant varieties of wheat and other small grains. Dr. J. J. Christensen and Dr. Will Martin Myers will direct the current project, which has received Foundation support through a grant of \$60,000 for the initial three-year period.

CORNELL UNIVERSITY

MAXIMUM YIELDS OF FOOD CROPS

In setting the target at which agricultural research is to aim, determination of maximum yield capacity of the important crop plants is a vital step. Knowing the top yield that is theoretically possible, agronomists can better analyze the inadequacies of current agricultural practice, and ultimately minimize or eliminate them.

To get at the factors which limit potential yield, intensive study of environmental conditions is only one aspect; the roles of fertilization, cultivation, soil management, and disease and pest control must all be determined. The interaction of these factors must be analyzed before reasons can be assigned for the tremendous differences in yield which presently exist. The yield per acre of corn, for example, ranges from 8 to 100 bushels, with a high of 260 on record. There are isolated highs for other crops too; if these can be investigated as a group, it may be that the prevailing conditions will indicate the optima for approaching the theoretical tops for the various crops.

A new project under the direction of Dr. Richard Bradfield, head of the Department of Agronomy at Cornell University, will initiate a long-range study of the significance of

the factors influencing plant growth and yield, both individually and in combination. The effect of water, light, heat, nutrient elements, nonpathogenic microorganisms, soils, pests, and diseases will be studied on a day-to-day basis under natural conditions, and parallel varieties will be grown under carefully controlled conditions. Corn, oats, clover, wheat, and alfalfa will be grown in rotation at two experimental farms. One of these farms, located north of Ithaca at an altitude of 600 feet above sea level, lies in the limestone soil belt and is typical of the more productive soils of the northwestern part of New York State; the other, located southeast of Ithaca at an altitude of 1,800 to 1,900 feet, lies in the silt-stone belt and is characteristic of southern New York and northern Pennsylvania.

Each crop will be grown at two fertility levels at both locations; one level will be that currently used by the best farmers, the other will be carefully designed to give maximum yields. The techniques will be revised as new treatments are developed in supplementary experiments. Provision will be made for an adequate supply of the trace elements, as well as of the required macronutrients, and the most modern cultural and irrigational practices will be fully exploited. Trained observers will make daily observations on the state of the crops and on the environmental factors involved, making an effort to analyze seasonal variations and their effect on the crops.

The Rockefeller Foundation has made an \$80,000 appropriation for the first five years of this study.

INSTITUTE OF AGRONOMY, CAMPINAS, BRAZIL

MICROCLIMATOLOGY

The science of microclimatology involves measuring the changes in temperature and humidity as they occur, inch by inch, from the surface of the ground to the top of a growing plant. In other words, it means studying the weather condi-

tions of the environment as they are reflected in the microcosm of an individual plant.

Dr. Carlos A. Krug, director of the Institute of Agronomy of the State Secretariat of Agriculture, Campinas, São Paulo, Brazil, is planning a study in crop ecology utilizing the techniques of microclimatology and embodying allied subjects such as water relationships, soils, and microbiology. This project is in line with the Foundation's interest in applying to practical agriculture more of the basic knowledge recently developed in such fields as plant physiology. A two-year grant of \$20,000 has been made to aid the institute in the purchase of specialized equipment.

CALIFORNIA INSTITUTE OF TECHNOLOGY

WATER RELATIONS OF PLANTS

One startling fact pertinent to the world's food production is that roughly half of the world's land surface does not receive enough rain to permit the production of normal crop yields without irrigation. Frequently the water loss by transpiration and evaporation in arid and in some semi-arid areas exceeds the regular water supply from rain and residual soil moisture.

At the California Institute of Technology is located one of the best equipped laboratories in the world for the study of plants under carefully controlled environmental conditions. The Earhart Plant Research Laboratory can simulate sun, rain, shade, heat, cold, humidity, dryness, wind, or calm. These facilities have proved invaluable for studies of the water relations of plants.

A logical project, taken up early in the four years of the laboratory's existence, is the study of dew utilization. In dry countries dew may amount to as much as 10 per cent of the total precipitation. Since most growth in plants occurs during the night, dew assumes particular importance through prolonged rainless periods. In order to learn how to utilize dew

more efficiently, studies are being made of its formation, and also of the water-retaining tensions inside plants. One potentially important discovery recently made at the laboratory is that under certain conditions plants can take in liquid through their leaves and later excrete it through their roots. By moistening the soil at the roots of the plant, this process may act as an adjunct to dew utilization.

Another facet of investigations on the water balance in plants concerns the effect of different external factors on both transpiration and photosynthesis. It has been found that different plants vary greatly in the amount of water lost by transpiration in relation to the amount of dry matter produced by photosynthesis. If photosynthesis can be made to occur with a smaller loss of transpiration water, plant production may be pushed further into semi-arid regions, and the plant breeder may be able to tailor crop varieties for different areas of the world.

The Earhart Laboratory plans to pursue further these fields of investigation, working principally with corn, sunflowers, and tomato plants. The effect of external factors on transpiration will be assessed and methods will be sought whereby transpiration can be decreased without detriment to growth and photosynthesis, thus making it possible for plants to produce more satisfactorily under relatively arid conditions. The studies will be under the general supervision of Dr. Frits Went, director of the laboratory, and have been aided by a three-year grant of \$42,600 from The Rockefeller Foundation.

TOKUGAWA INSTITUTE FOR BIOLOGICAL RESEARCH

MASS CULTIVATION OF MICROORGANISMS

As a source of supplementary protein for inadequate or deficient diets, the microscopic green alga known as *Chlorella* has shown considerable promise. This organism, which normally grows in the sea, can be dried to yield a dark green

powder comprising 56 per cent protein, as compared with 12 to 15 per cent protein for such dried plants as hay or alfalfa.

Unfortunately, acceptance of a new food substance is not determined by physiological considerations alone; social and traditional prejudices are also factors. Thus, for unicellular algae to be readily accepted as human food, it is desirable that they be prepared in such a manner as to resemble some pre-existing popular food, or that they be largely indistinguishable when mixed with other ingredients.

In Tokyo, Japan, workers under Professor Hiroshi Tamiya at the Tokugawa Institute for Biological Research are studying this problem. They are primarily concerned with improving the efficiency of the mass culture of *Chlorella*; but they are also interested in following through to practical applications. Thus they have tested *Chlorella* as an addition to Western and Japanese type soups, noodles, bread and rolls, cookies, ice cream, and even powdered green tea. A substitute soy sauce has been prepared by hydrolysis of the algal powder. In all cases, the foods have an agreeable taste and appearance, and their protein, fat, and vitamin contents are considerably increased.

Professor Tamiya presently works in a small-scale plant which produces about one pound, dry weight, of *Chlorella* per day. Aided by a Rockefeller Foundation grant in aid made early this year (see below), he visited Europe and Israel to observe projects in algal mass culture in those countries, and is now building a new pilot plant which should have about five times the capacity of his present quarters. If tests of his methods prove satisfactory there, a still larger plant will be built — close to the sea, and in cooperation with a large brewery which has available a plentiful supply of the necessary carbon dioxide gas. These advantages should help diminish the expense factor, currently a strong limitation on this type of process.

The Tokugawa Institute, an independent organization supported primarily by the Japanese government, was founded in 1917. In addition to the mass cultivation of algae for human food, fundamental and applied research on photosynthesis, the growth mechanisms of unicellular organisms, and the analysis of algal cells is in progress. Toward this program in some of the less traditional aspects of agriculture, the Foundation has appropriated \$25,000 for a five-year period.

SOCIETY OF AMERICAN FORESTERS

In recent years, the amount and scope of forestry research in this country have grown enormously. Estimates by the United States Forest Service indicate that today more than \$17,000,000 annually is being spent by federal, state, educational, and industrial agencies for all kinds of research in forestry and wood use. The first authoritative survey in this field was made 25 years ago, under a grant from the General Education Board to the National Academy of Sciences; the time is now opportune for a re-examination and reappraisal of the entire national program.

Under the auspices of the Society of American Foresters, such a project is being undertaken. Included will be the following branches of research: forest management and economics, forest influences, forest protection, forest pathology and entomology, wood use, wildlife management, and range research. Emphasis will be placed on the progress and present status of forestry research in the light of future goals and possible development during the next 25 years. While major attention will be given to work within the United States, pertinent information concerning research programs and needs in Canada and Mexico will also be sought. The data collected will be published in a report available to all interested persons.

The Division of Biology and Agriculture of the National Research Council is collaborating with the Society of Ameri-

can Foresters in the administration of the survey; a steering committee appointed by the two groups has chosen Dr. Frank H. Kaufert of the University of Minnesota to serve as project leader and will supervise his activities and those of his associates. In view of the significant relationship of forestry to conservation and agriculture, The Rockefeller Foundation is supporting this project with an appropriation of \$30,000 through 1954.

GAMMON INSTITUTE

COLLEGE FARM

The College of Agriculture of the Gammon Institute at Lavras, Minas Gerais, is the only private institution of its kind in Brazil. Founded and still operated in part under the auspices of the Presbyterian Board of World Missions, the school receives annual support from both federal and state governments. Its degrees are recognized throughout Brazil, and many of its 400 or so graduates hold positions of high responsibility.

At the school is a 600-acre experimental farm, from which it is desired to create an example of agricultural improvement for the entire area; the farm would also be a center for agricultural field days, a source of agricultural extension information, and a teaching and research area for faculty and students. A young American farm manager, Albert B. Coit, Jr., is now at Lavras working to develop the farm. This year, under a Rockefeller Foundation grant in aid, Mr. Coit visited the Colombian Agricultural Program in order to observe methods of farm management in use there. The Foundation has made a further appropriation of \$21,000 over a three-year period, which will be used chiefly for the purchase of necessary machinery, fertilizers, insecticides, seeds, and other supplies, for temporary labor, and for pedigree stock to be used in bettering the farm's flocks and herds.

GOVERNMENT OF UTTAR PRADESH, INDIA

RURAL RESEARCH AND ACTION CENTER

Some five years ago a grass-roots plan aimed at the improvement of village life in India was initiated, largely through the planning and vision of Mr. Albert Mayer, a distinguished American architect and city planner. The original pilot project in Etawah, Uttar Pradesh, involved 97 villages numbering roughly 80,000 inhabitants. Predicated on the basic importance of agriculture to rural life in India, this pilot project was financed in its entirety by the Government of Uttar Pradesh and staffed almost wholly by Indians.

In the half-decade which has elapsed since the establishment of this first pilot project, advances have been substantial; and this project has served as a model for the very large plan, financed by Indian, Point IV, and Ford Foundation funds, which expands the village improvement idea to the whole of India.

As to the Etawah project itself, not only have agricultural practices been affected — output of the main crops in the area has increased 30 to 40 per cent — but brick schools have been built, roads have been restored, a local weekly paper has been distributed to over 1,300 subscribers, irrigation and sanitary facilities have been improved, and recreational and educational activities have been fostered. Although the plan was purposely initiated on a small scale, the criterion of "reproducibility" was kept in the foreground at all times; each step was made simple and inexpensive enough to be repeated with ease in other regions.

As the new programs were established, and as the Etawah project itself progressed, it became evident that an independent and continuing body was needed to answer the barrage of questions from the local farmers, and to evaluate the progress of the experiment. Careful scrutiny of the requirements resulted in a plan for a Rural Research and Action Center, to be situated near Lucknow. This location was

chosen so that the center might be accessible to the operational headquarters in that city, near one of the actual village projects, and close to one of the training schools. The projects and studies to be undertaken will be determined by a joint board whose membership will include the Development Commissioner of Uttar Pradesh, the director of the Action Center, and a prominent Indian expert in sociology or economics.

The center basically will develop ideas to strengthen the over-all plan for village improvement and will supply a general appraisal of the program as it grows. At the same time it will furnish specialized skills and services to meet needs and problems that have already arisen, including leadership in women's welfare work, youth movements, improvement of cooperatives, and environmental sanitation. A rural life analyst will study the impact of the village improvement program on the life of the local people and the integration of the project activities into the pattern of rural life.

The estimated cost of the center, over a three-year period, is nearly \$400,000. The Rockefeller Foundation has made available to the Government of Uttar Pradesh funds totaling \$135,000 which will help provide expert guidance for the project and also contribute toward essential equipment, vehicles, and buildings for the center.

THE CONSERVATION FOUNDATION

UTILIZATION OF NATURAL RESOURCES

Foundation support was continued this year for an organization devoted to research and public education on all aspects of the conservation of renewable resources. The Conservation Foundation, established five years ago in New York City, has conducted studies on water utilization, soil erosion, forests, marine resources, and wild life, and on the relation of these factors to the population problem. The majority of these projects are carried out under the leadership of temporary research associates chosen for their special qualifications,

and close cooperation is maintained with other scientists as well as with government, business, and public interests. Four sets of educational films — on The Living Earth, The Living Forest, The Web of Life, and The Living Water — have recently been produced and annually reach an audience of more than two million people.

In connection with Foundation interest in the food supply problem and in other aspects of human ecology, a tapering grant of \$75,000 for a three-year period was made to the Conservation Foundation in 1953.

GRANTS IN AID

Dr. Lucio Toniolo, Faculty of Agriculture, University of Padua, Italy; \$700 toward expenses of a visit to Wales to observe work in genetics and plant breeding;

José Vallega, director, Institute of Plant Science, Ministry of Agriculture and Animal Industry, Castelar, Argentina; \$2,500 toward the cost of travel and living expenses while visiting leading European laboratories and agricultural scientists;

Professor Josué Augusto Deslandes, head, section of plant pathology, Institute of Agronomy of the South, Pelotas, Brazil; \$1,600 toward expenses while in the United States and Mexico continuing his research training in plant pathology;

Dr. E. K. Woodford, Department of Agriculture, Oxford University, England; \$2,500 toward his travel and living expenses during a 90-day visit to agricultural research centers in the United States, particularly those concerned with herbicides and plant growth regulators;

Luiz de Queiroz School of Agriculture, University of São Paulo, Piracicaba, Brazil; \$2,800 to purchase equipment and supplies needed for research in plant nutrition by Eurípedes Malavolta;

University of California, Berkeley:

\$7,300 toward the research of Dr. Nicholas T. Mirov of the Forest Experiment Station;

\$5,000 to Dr. William C. Snyder, Department of Plant Pathology, toward the cost of travel and living expenses during an eight-month visit to London and to other centers of mycological research;

University of Nebraska, Lincoln; \$1,250 for travel and living expenses of Dr. J. E. Livingston while in Mexico making field tests with chemicals to determine their use in control of stem rust of wheat and blight of potatoes;

Dr. M. S. Swaminathan of Kumbakonam, South India, a graduate research fellow at the University of Wisconsin, Madison; \$500 toward the cost of travel and living expenses in connection with visits to institutions in the United States where outstanding work is done on potatoes and potato breeding;

American Phytopathological Society, University of Wisconsin, Madison; \$5,000 toward the travel and living expenses of Latin American scientists invited by the society to participate in a symposium on biological research involving basic food crops in Latin America, held in September 1953 at the University of Wisconsin;

Colombian Institute of Cotton Development, Bogotá; \$10,000 to enable the institute to contract for the services of one or more American technicians to assist in the organization and development of the institute's field research program;

Institute of Agronomy, Campinas, Brazil; \$4,500 for equipment and supplies needed in the seed laboratory directed by Oswaldo Bacchi;

Professor Manfredo Reichart, professor of soils science, Faculty of Agronomy and Veterinary Medicine, University of Buenos Aires; \$1,125 toward travel and living expenses for a visit to wind-eroded areas in the United States;

Ministry of Agriculture, Santiago, Chile, Department of Agricultural Investigations; \$10,000 to purchase apparatus, equipment, and supplies needed for expansion of research facilities at the LaCruz Insectarium;

Dr. Juan Francisco Figueroa (Infante), Faculty of Veterinary Medicine, University of San Marcos, Lima, Peru; \$500 toward

visits to universities and laboratories of veterinary medicine in the United States;

Secretariat of Agriculture, State of Bahia, Brazil, Institute of Biology; \$4,700 for research equipment and supplies needed by Dr. Fulvio J. Alice for foot-and-mouth disease and other virus investigations;

Secretariat of Agriculture, State of São Paulo, Brazil, Division of Animal Production; \$3,000 toward the consultative services of Dr. Gustav Bohstedt in reorganizing and developing research in the division;

Secretariat of Agriculture, State of Rio Grande do Sul, Brazil:

\$5,000 for use by the Division of Animal Production to purchase equipment and supplies for field and laboratory investigations;

\$2,500 for Dr. Julio Wilson Costa, director, Division of Animal Production, toward travel and living expenses in connection with visits to agricultural centers in the United States and to the Mexican and Colombian agricultural programs;

\$2,500 for Dr. Aureo M. Elias, director, Division of Plant Production, toward travel and living expenses in connection with visits to agricultural centers in the United States and to the Mexican and Colombian agricultural programs;

Albert B. Coit, Jr., professor of agriculture, Superior School of Agriculture, Lavras, Minas Gerais, Brazil; \$1,400 for living and travel expenses in connection with his visit to the Colombian Agricultural Program;

Professor Karl M. Silberschmidt, Biological Institute, São Paulo, Brazil; \$360 for expenses while visiting the Colombian and Mexican agricultural programs;

For the exchange of scientific personnel between the Institute of Agronomy of the South, Pelotas, Brazil, and the Mexican Agricultural Program; \$322 to cover additional expenses;

Dr. Joaquim Fernandes Braga and Dr. Leonidas Machado Magalhaes, Rural University, State of Minas Gerais, Belo Horizonte, Brazil; \$3,800 for visits to Latin American centers of agricultural education and research;

Dr. Lorenzo Martinez Medina, director, Antonio Narro College of Agriculture, Saltillo, Coahuila, Mexico; \$2,000 for travel and living expenses during visits to agricultural, educational, and research centers in Latin America;

Frank S. Anthony, Department of Agronomy, Cornell University, Ithaca, New York; \$500 toward the cost of travel and living expenses in connection with visits to agricultural education and research centers in the United States;

Dr. Hiroshi Tamiya, director, Tokugawa Institute for Biological Research, Tokyo; \$1,700 toward the expenses of visits in Europe and Israel to research projects on the mass culture of algae;

University of Hawaii, Honolulu; \$3,000 toward the cost of inviting a distinguished agricultural scientist to spend approximately three months in Hawaii to examine the research and education program of the College of Agriculture;

University of Costa Rica, San José, School of Agriculture; \$10,000 for the purchase of equipment, supplies, and library materials to support the teaching and research functions of the school;

For the use of the Second Pan-American Congress of Agronomy, University of São Paulo, Brazil; \$2,000 for the purchase of a vari-type machine, including accessories and supplies.

SPECIAL PROJECTS

GRANTS IN AID

National University of Mexico, Mexico City, Institute of Mathematics; \$650 to purchase a 55-volume set of the *Jahrbuch über die Fortschritte der Mathematik*;

University of São Paulo, Brazil:

\$1,100 to provide materials needed by the Faculty of Philosophy, Sciences, and Letters in connection with the publication of a Union Catalogue of periodicals in Brazilian libraries;

\$850 for the purchase of deep sea reversing thermometers needed for work in the Oceanographic Institute;

University of Washington, Seattle; \$2,500 toward the expenses of research in mechanical translation under the direction of Professor Erwin Reifler, Far Eastern Department;

Institute for Advanced Study, Princeton, New Jersey; \$5,000 to enable Dr. Benoit B. Mandelbrot to continue his studies in the field of communication theory in the United States;

American Psychological Association; \$1,000 toward the expenses of a joint steering committee of the association and of the Society for the Study of Evolution, this joint committee to plan a conference on the Evolution of Behavior;

Congress for Cultural Freedom, Paris; \$10,000 toward the expenses of the international conference on Science and Freedom held in Hamburg, Germany, in the summer of 1953;

Fund totaling \$5,000 for grants of small amounts for travel, equipment, honoraria, materials, consumable supplies, and research and miscellaneous expenses, allotted under the supervision of the Director of the Division.

Division of Social Sciences

DIVISION OF
Social Sciences

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DIVISION OF Social Sciences

INTRODUCTORY STATEMENT	231
------------------------	-----

THE FUNCTIONING AND MANAGEMENT OF THE ECONOMY

Stanford University: Food Research Institute	233
National Bureau of Economic Research: Soviet Economic Growth	234
National Foundation of Political Sciences, Paris: Studies of the French Economy	235
Fletcher School of Law and Diplomacy: United States Commercial Policy	236
Ecole Polytechnique, Paris: Laboratoire d'Econométrie	237
Council on Foreign Relations: Study of the Sterling Area	238
IFO-Institut für Wirtschaftsforschung, Munich: Statistical Analysis	239
University of Chicago: Cowles Commission for Research in Economics	240
Dartmouth College: Pilot Study of Ocean Transport	241
University of Pennsylvania: Wharton School of Finance and Commerce	241
National Institute of Economic and Social Research, London: International Association for Research in Income and Wealth	242
University of Oslo: Institute of Economics	243
The Royal Institute of International Affairs, London: <i>The Theory of International Economic Policy</i>	244
Institute of Economics and History, Copenhagen: History of Prices and Wages in Denmark	244
University of Vienna: Economic Situation of Austrian Peasants	245
<i>Grants in Aid</i>	245

HUMAN BEHAVIOR AND INTERPERSONAL AND INTERGROUP RELATIONS

Harvard University: Laboratory of Social Relations	248
American Law Institute: Model Criminal Code	250
Hunter College: Study of Collective Bargaining	250
University of Michigan: Group Action Study	251
University of Michigan: Survey Research Center	252
Princeton University: Office of Population Research	252
University of Minnesota: Social Disorganization	253
University of Puerto Rico: Social Anthropological Studies	253
University of Vienna: Institute of Criminology	254
<i>Grants in Aid</i>	254

POLITICAL SCIENCE AND INTERNATIONAL AFFAIRS

Institute for European Politics and Economics, Frankfurt: Study of German Political Attitudes	256
Institute for Political Science, Berlin: Rise of National Socialism	257
Institute for Advanced Study, Princeton: George F. Kennan	258
Deutsche Hochschule für Politik, Berlin: Development of Political Science	258
The Royal Institute of International Affairs, London: Area Studies	259
University of Heidelberg: Alfred Weber Institute for Social and Political Sciences	260
<i>Grants in Aid</i>	261

LEGAL, POLITICAL, AND SOCIAL THEORY AND PHILOSOPHY

University of Wisconsin: The Law School	262
Harvard University: The Law School	263
Social Science Research Council: Fellowships in Legal Philosophy and Political Theory	264
<i>Grants in Aid</i>	265

DEVELOPMENT OF SOCIAL SCIENCE TALENT

Social Science Research Council: Fellowships	266
University of Toronto: Problems of Canadian Development	266
Canadian Social Science Research Council: Fellowships	267
Social Science Research Council: Summer Seminar Program	267
Queen's University, Ontario: Graduate Training Program in Economics	268
University of Chicago: Workshop in Money and Banking	269
<i>Grants in Aid</i>	270

METHODOLOGY

University of Chicago: Committee on Statistics	271
Cornell University: Research Techniques	271
University of Michigan: Research Center for Group Dynamics	272
<i>Grants in Aid</i>	273

DIVISION OF SOCIAL SCIENCES

THE Rockefeller Foundation appropriated \$3,597,285 during 1953 for its program in the social sciences. The grants are classified under six headings:

The Functioning and Management of the Economy

Human Behavior and Interpersonal and Intergroup Relations

Political Science and International Affairs

Legal, Political, and Social Theory and Philosophy

Development of Social Science Talent

Methodology

Funds for research on the functioning and management of the economy were appropriated for the work of scholars in both Western Europe and the United States. The research projects supported covered a wide range of topics, but all were addressed to the general objective of providing a deeper understanding of the processes and problems of the economy and, therefore, of the factors bearing upon economic stability. Many have relevance to international as well as national issues. The largest grant — \$500,000 — was made to the Food Research Institute of Stanford University as a capital sum to strengthen its studies of the economic problems that arise in the production, consumption, and distribution of food throughout the world. The varying claims of communist — and even of non-communist — scholars as to the comparative

rates of growth of production in the USSR and in the United States and the varying meanings attributed to these rates, led to a grant of \$275,000 to the National Bureau of Economic Research to enable its experts in rates of productivity and in national income, working in closest collaboration with professional students of the USSR, critically to review and appraise the existing estimates.

Men can no longer dodge problems as in earlier days by moving to a "frontier." They now live increasingly in metropolitan communities and work in large organizations. How human beings, individually or in groups, "get on" is a steadily more important and more difficult matter. All the insights and experience of the men of affairs, the journalists, the politicians, the novelists, the historians and philosophers are relevant to the problem. But we need as well more precise and ordered knowledge about the behavior of people and groups than we now have. Grants made by The Rockefeller Foundation in 1953 in support of research in the field of human behavior and intergroup and interpersonal relations were addressed to that end.

In the fields of political science and international affairs, several grants were made during 1953 to enable individual scholars to have periods of freedom or travel in order that they might pursue their scholarly studies. Other grants were made in support of on-going or new research programs at such institutions as The Royal Institute of International Affairs, London, the Institute for European Politics and Economics, Frankfurt, and the Alfred Weber Institute for Social and Political Sciences at the University of Heidelberg.

For the past two years the Foundation has been making an intensive study of the needs and opportunities for support of work in the fields of legal and political philosophy, and during 1953 funds for such work were made available on a modest scale. The Wisconsin Law School received a grant for studies of the legal and social history of Wisconsin, the Harvard Law School for studies of the ethics of

representation in the legal profession, and the Social Science Research Council for a three-year program of predoctoral and immediately postdoctoral fellowship awards in the field.

Domestic support for work in the social sciences and humanities in Canada has not kept pace with support for similar work in the natural sciences and engineering. On the assumption that Canada's vigorous expansion will continue to increase the demand for trained talent and that the provision of aid at this time would help to prevent a lowering of Canada's high standards in the future, many of the grants made by The Rockefeller Foundation during 1953 for the development of social science talent went to Canadian institutions.

To assist the growth of scholars, the increase of scientific and scholarly knowledge in strategic directions, the development of methods of inquiry and analysis, the application of knowledge to specific practical problems, and the strengthening of moral, legal, and political philosophy are the objectives to which Foundation grants in the social sciences during 1953 have been addressed.

The Functioning and Management of the Economy

STANFORD UNIVERSITY

FOOD RESEARCH INSTITUTE

The Food Research Institute at Stanford University, since its establishment in 1921, has been a center for basic research in all aspects of food — its production, distribution, and consumption.

Using as an approach the study of specific commodities — wheat, sugar, meat, fats and oils, and others — the institute has explored domestic, international, and economic aspects of food. National government policies toward food and agriculture have been analyzed and appraised, and be-

cause the behavior of most major foodstuffs within the nation cannot be fully understood except in their world framework, the international aspects of commodity problems have been emphasized. In studying commodity economics, attention has been directed to persistent tendencies in commodity behavior — to tides, trends, and cycles rather than to short-term fluctuations, to decades and years rather than to months and weeks.

The institute's impressive publishing record includes thirteen major books during the past six years alone, with five more currently in press, as well as numerous articles in professional journals on both sides of the Atlantic. Some outstanding titles are: *International Control of Sugar, 1918-1941*, by B. C. Swerling; *International Stockpiling as an Economic Stabilizer*, by M. K. Bennett and Associates; *The Population Upsurge in the United States*, by J. S. Davis, director emeritus of the institute.

With the aid of \$500,000 from the Foundation as a capital fund, the institute, under the direction of Merrill K. Bennett, anticipates during the next decade an expansion of research into commodity economics and policy, completion within a few years of its current series on *Food, Agriculture, and World War II*, continuation of newly-launched investigations into economic development of the tropics, and continuation of training of doctoral candidates in agricultural economics research.

NATIONAL BUREAU OF ECONOMIC RESEARCH

SOVIET ECONOMIC GROWTH

Official measures of economic growth published by the USSR claim increases in total and per capita national income at virtually unprecedented rates. The possibility of the USSR sustaining rates of economic growth of the magnitude indicated is a matter of supreme scientific interest to economists and students of government generally. Military, political, and economic policy in the countries of the free

world is deeply influenced by the existence of the Soviet system, and important judgments and decisions must be based on estimates of its economic power and potentiality. Despite the difficulty of working surefootedly with official Soviet statistics, a number of non-communist students of the Soviet economy have attempted more adequate measurement of the performance of Soviet-type economy and have reached what they believe to be reasonably accurate estimates. These estimates indicate a much less rapid rate of economic growth than official Soviet figures claim, but one much in excess of the rate of growth in the United States or in Britain.

The scientific and practical issues involved are so important that it was deemed desirable to have the National Bureau of Economic Research apply its long experience in economic measurement to the problem of assessing the performance of the Soviet economy beginning with the first year of the first Five-Year Plan (1928), or if possible with 1913. The study will investigate four component parts of the Soviet economy: national income and outlay, agriculture, industry, and population and labor force.

The project as a whole and each subsection will be directed by expert economic statisticians, aided, in collection and interpretation of data, by professional students of the USSR. Frequent consultations are also planned with an advisory committee composed of linguists, historians, geographers, economists, and others specializing in Soviet studies.

To finance this study over a three-year period, The Rockefeller Foundation appropriated \$275,000 to the National Bureau of Economic Research.

NATIONAL FOUNDATION OF POLITICAL SCIENCES, PARIS

STUDIES OF THE FRENCH ECONOMY

A group of French economists, drawn from the Center for Economic Studies and the Service for Studies of Eco-

nomic Activity and the Social Situation, is currently engaged in a study of long-term changes in the basic structure of the French economy. This empirical investigation, designed to provide an understanding of the economic and social transformations which have resulted in the present economic structure of France, will cover changes in the relations of income, savings, consumption, and investment within various enterprises and social groups; changes in the relative aggregate totals of farm income and industrial wages; the financial structure of enterprises and the method of financing investments; the relative importance of various types of direct and indirect revenue; the consumption of durable and non-durable goods by various groups; and the interrelations of such structural factors.

The results of this research, which is being carried out in close collaboration with economic historians and mathematical statisticians, should lead to a better understanding of actual conditions in which various schemes of economic analysis might be applied, and a more factual frame of reference for the formulation of economic policies. Of at least equal importance is the contribution such a study should make to the improved empirical training of young French economists. A grant of 20,000,000 French francs (about \$60,000) appropriated by The Rockefeller Foundation will cover the costs of this three-year investigation.

FLETCHER SCHOOL OF LAW AND DIPLOMACY, MEDFORD,
MASSACHUSETTS

UNITED STATES COMMERCIAL POLICY

With the assistance of Foundation support totaling \$46,800 available over a two-year period, Harry C. Hawkins, Will Clayton Professor of International Finance at the Fletcher School of Law and Diplomacy, will undertake a case study dealing with the major policy and operational decisions made during the period 1933-54 in the development of

United States international commercial policy. The term "commercial policy" includes policy relating to barriers to international trade, such as tariffs, quotas, exchange controls, and other government measures affecting imports into the United States and the movement of goods internationally.

In addition to illuminating a complex and crucial period of economic history, it is hoped that the proposed study will make the facts of decisions of that period — and the reasoning behind them — available to the public and to those charged with the future handling of problems of economic policy.

ECOLE POLYTECHNIQUE, PARIS

LABORATOIRE D'ECONOMÉTRIE

Solution of the current pressing problems of the French economy are of importance not only to France but to the whole free world. There are various centers in France actively engaged in econometric research, but a far greater effort is required to arouse the interest of research and government economists in the use of this type of economic analysis. The use of input-output techniques by the Laboratoire d'Econométrie at the Ecole Polytechnique in Paris has already been effective in this direction and the laboratory has earned an international reputation as an efficient and scientific institution.

For more than three years, the laboratory, under the direction of Professor François Divisia, has been engaged in research focused on the interrelations of French industries. A variety of econometric models have been used in testing and analyzing the data collected, contacts have been established with important government agencies and independent research agencies, and, from time to time, work on highly specialized problems has been commissioned from such organizations or from qualified individuals.

Of equal importance to the laboratory's research program has been its practice of training as research assistants young economists who have obtained invaluable experience and firsthand knowledge of the functioning of the French economy while preparing academically for careers in the various engineering corps, government service, or private industry.

With the assistance of a three-year grant of 12,500,000 French francs (about \$37,500) from the Foundation, the laboratory proposes to concentrate both upon further refinement of the methodological techniques which it has developed, and upon the expansion of the laboratory's contacts with government agencies and research organizations in an attempt to make available this type of economic analysis to those research workers and economists responsible for preparing the factual analyses upon which governmental policy decisions rest.

COUNCIL ON FOREIGN RELATIONS

STUDY OF THE STERLING AREA

Although many studies have been made of the sterling area, its real significance for the world economy and for the economies of its member countries is complex and often obscure or ambiguous. The area at present operates under a unique system of exchange controls and trade restrictions intended to deal with persistent and sizable dollar deficits and to achieve maximum circulation of sterling in the non-dollar world. Recurrent financial crises, however, have indicated the need for a deeper understanding of the functioning and problems of the area. Much remains to be learned about the working of the sterling area before its weaknesses and strengths can be fully understood and evaluated.

A clear understanding of the way the sterling area works, how it may change, and its impact on the world

economy, is also of importance to those charged with shaping the long-run aims of American foreign policy. Sterling area problems have implications for foreign aid, European economic cooperation, American-British relations, tariffs, and other aspects of foreign economic policy.

With the assistance of a \$50,000 grant from the Foundation, the Council on Foreign Relations is sponsoring a study designed to present a critical description of the sterling system, an assessment of its contradictory aspects, and an indication of the new lines along which the sterling area seems to be developing. The principal investigator for this study is Judd Polk, formerly Chief of the British Commonwealth and Middle East Division of the Treasury Department, who is working under the direction of a committee headed by Professor John H. Williams, of Harvard University and the New York Federal Reserve Bank.

IFO-INSTITUT FÜR WIRTSCHAFTSFORSCHUNG, MUNICH

STATISTICAL ANALYSIS

Since early 1950, the IFO-Institut für Wirtschaftsforschung in Munich has been developing and using a new "Business Test" method of economic research aimed at regular short-term observation of changes in the various factors of economic production and distribution. A standardized questionnaire, mailed monthly by the institute to the heads of some five thousand industrial and commercial firms in Western Germany, requests information about trends in their respective firms in terms of specific experience and plans in the immediate past and future. In this way the institute has collected, on a current basis, detailed information about business changes in individual firms throughout Western Germany. These data show with reasonable reliability the trends in various economic spheres as well as the magnitude of the responsible factors; and experience

has shown that the cumulative results of the "Business Test" and official aggregate statistics have agreed closely in many fields where they could be compared.

With the assistance of a Foundation grant of 108,000 German marks (about \$27,000), the institute is now undertaking a two-year analysis of the data collected by the "Business Test" method as they relate to business cycle theory, to policy intended to influence the business cycle, and to economic practice. The ultimate objectives of this program are the further development of business cycle theory and more successful forecasting of changes in business activity. The "Business Test" method developed by the institute is arousing considerable interest among economists both in Europe and in the United States, and it is hoped that in time the institute's efforts may stimulate improvements in German official statistics.

UNIVERSITY OF CHICAGO

COWLES COMMISSION FOR RESEARCH IN ECONOMICS

Various influences in economics have, in recent years, placed emphasis on the monetary factors in economic behavior. The function of the price mechanism as one of the fundamental factors of adjustment in a free market has been given much less systematic attention.

In an attempt to advance research in this area, H. S. Houthakker is conducting, under the auspices of the Cowles Commission for Research in Economics at the University of Chicago, a study of prices in markets for future delivery. The behavior of important groups of traders in various commodities will be analyzed in detail with the aid of as yet unpublished figures to which access has been promised by the Commodity Exchange Authority. One set of these data will show the distribution of hedging commitments in corn and wheat between different futures; another the complete spot, call, and futures positions of large cotton merchants.

It is expected that this study will shed light not only on the structure of the markets concerned but also on the fundamentals of price theory.

The Rockefeller Foundation made a grant of \$15,700 to the University of Chicago toward the costs of this study.

DARTMOUTH COLLEGE

PILOT STUDY OF OCEAN TRANSPORT

Despite the fact that three-fourths of the volume and the value of goods moving in international commerce is carried in ships, little account is ordinarily taken in discussions of the development of unindustrialized areas of the critical role which the availability, adequacy, and cost of ocean shipping play in such development.

Professor Daniel Marx, Jr., of Dartmouth College, is currently engaged in a pilot study of this problem, using the development of the Venezuelan iron ore industry as an illustration. This study will 1) analyze factors relating to ship operating efficiency and low costs bearing on the transport requirements of a selected underdeveloped area, and 2) study both trends in the general level of rates and the behavior of rates for the more important commodities. It is expected that the study may discover principles of wider applicability and serve as a model for further study of the same problem in other areas.

A grant of \$15,120 was made by the Foundation to Dartmouth College toward the costs of this pilot study.

UNIVERSITY OF PENNSYLVANIA

WHARTON SCHOOL OF FINANCE AND COMMERCE

For 32 years the Industrial Research Department of the Wharton School of Finance and Commerce has used the Philadelphia area as a laboratory for the intensive

analysis of economic and social problems of broad significance.

Among research projects currently under way in the Industrial Research Unit (successor to the Industrial Research Department) are 1) a history of changes in employment, unemployment, and part-time employment, and of shifts in occupation, in the Philadelphia labor market over the last two decades; 2) a history of wholesale prices of commodities in Philadelphia from 1852 to 1896, a period representing a gap between previous studies made by the department and modern governmental statistics; 3) a history, based on records of two Philadelphia manufacturing companies, of the changes in entrepreneurial practice for more than a century; and 4) a study of the relation of prices to trade (based on analysis of the import, export, and shipping data for Philadelphia before the American Revolution). All of these studies will appear in the series of Industrial Research Studies issued by the University of Pennsylvania Press. In addition, past and present staff members will undertake a survey and appraisal of the experience, methods, and policies of the department during its active years.

Toward the costs of this research, the Foundation appropriated \$25,000 to the University of Pennsylvania to be used by the Industrial Research Unit during an 18-month period.

NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL
RESEARCH, LONDON

INTERNATIONAL ASSOCIATION FOR RESEARCH IN
INCOME AND WEALTH

One of the scientific achievements in economic-statistical research in the last thirty years has been the development of usable methods for measuring currently the amount and distribution of national income — a task which has baffled

the world for three centuries. A new aspect of this old problem now appears. The fact that United Nations dues are based on national income compels each country to attempt the complex task of measuring currently the amount and distribution of its own national income. Only a few countries have the personnel and developed tools for this task.

To facilitate communication and the improvement of scientific methods among the personnel of different countries, an association of scholars has been formed under the title of the International Association for Research in Income and Wealth. The objectives of the organization, for which current Foundation support will be used, are the improvement of technical and analytical methods in this field, and the spread of knowledge of these methods by the circulation of unpublished materials made available by members, by the publication of bibliographies and other materials, by conferences, and by the maintenance of communication.

The most recent contribution from the Foundation for the work of this association is an outright grant of \$35,000 to the National Institute of Economic and Social Research, which acts as fiscal agent for the association.

UNIVERSITY OF OSLO

INSTITUTE OF ECONOMICS

The Institute of Economics at the University of Oslo, an organization primarily occupied with research in economic theory, has been attempting, by means of special techniques it has developed, to present a statistically concrete description and analysis of the Norwegian economy. Analyses of production, consumption, and financial structure have been completed, and integration of these data into a comprehensive analytical structure is the focus of the institute's current program.

Continuing previous support of this program, the Foundation in 1953 appropriated \$3,000 to the University of Oslo.

THE ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS,
LONDON

THE THEORY OF INTERNATIONAL ECONOMIC POLICY

A further grant of £1,350 (about \$4,050) has been made by the Foundation to The Royal Institute of International Affairs to assist Professor James E. Meade in the continuance of his studies on *The Theory of International Economic Policy*.

Volume I of this study, *The Balance of Payments*, was published in 1951. Volume II will be entitled *International Trade, Migration, and Investment*, and will cover the whole complex of problems involved in the application of modern theories of economic welfare to problems of international trade and international factor movements.

INSTITUTE OF ECONOMICS AND HISTORY, COPENHAGEN

HISTORY OF PRICES AND WAGES IN DENMARK

In 1941, the Institute of Economics and History, Copenhagen, initiated a series of investigations concerned with the history of prices and wages in Denmark during the period 1660-1800. This project, under the direction of Professor Astrid Friis, progressed on a modest scale during World War II, but since 1947 has been carried on more extensively. The collection of data is now largely completed and work is progressing on the statistical analyses. The resulting volume, scheduled for publication during 1953, will include an extensive summary in English and table texts in both English and Danish.

The Rockefeller Foundation appropriated \$2,000 to the institute toward the costs of completing this work.

UNIVERSITY OF VIENNA

ECONOMIC SITUATION OF AUSTRIAN PEASANTS

Three years ago The Rockefeller Foundation made a grant in aid to the University of Vienna in support of a study of the subsistence problems of Alpine farms, by Professor Ernst Lagler of the Institute of Economics. With the assistance of a further two-year grant of \$2,200 from the Foundation, Professor Lagler will widen the range of his previous work to a general investigation of the economic situation of Austrian peasants.

GRANTS IN AID

National Bureau of Economic Research, New York; \$10,000 in support of Hiram S. Davis' research in the field of productivity;

New School for Social Research, New York; \$9,800 for the use of its Institute of World Affairs toward the costs of research under the direction of Mrs. Edith Elbogen Yalden-Thomson into the problems of the world sugar industry;

New York University, New York; \$8,900 toward a study of national income estimates of various countries by Professors Paul Studenski and Julius Wyler;

Stanford University, California; \$7,500 for use by the Food Research Institute in support of research by S. D. Zagoroff on national energy input in the United States and the USSR since 1900;

The Brookings Institution, Washington, D. C.; \$7,500 toward the expenses of an investigation of problems of the sterling area, by Walter W. Stewart;

Stockholm School of Economics; 33,200 Swedish kroner (about \$6,500) for the preparation by Professor Torsten Gårdlund of a biography of Knut Wicksell;

Yale University, New Haven, Connecticut; \$4,850 to enable Professor Henry C. Wallich of the Department of Economics to

undertake a field study of the postwar economic development of Germany;

University of Missouri, Columbia; \$3,600 to enable Professor Lewis E. Atherton to spend seven months at the Harvard Research Center in Entrepreneurial History;

Ernst Söderlund, University of Stockholm; \$3,000 to visit American research centers in economic history;

University of Wisconsin, Madison; \$2,500 to enable Shu-Chin Yang to complete a study of balance of payments problems related to economic development;

Princeton University, New Jersey:

\$2,125 toward the costs of Professor Jacob Viner's research into the history of economic thought from 1600 to 1890;

\$3,175 to cover the costs of four lectures on economics and administration in the underdeveloped areas, to be delivered by Sir Theodore Gregory, British member of the Currency Committee of the Bank of Greece;

University of Paris, Institute of Statistics; \$1,800 to aid studies in theoretical economics being undertaken by Professor Maurice Allais;

University of Vienna; \$1,500 for the use of the Institute of Economics toward the cost of completion of studies by Wilhelm Weber and Karl Heinz Werner;

Oxford University, England:

\$1,525 to enable Philip W. S. Andrews, Nuffield College, to visit American universities and industrial centers in connection with his research in industrial economics;

\$1,300 to enable Professor H. J. Habakkuk to spend two months at the Harvard Research Center in Entrepreneurial History;

Louis M. Goreux, University of Louvain, Belgium; \$1,250 to provide six months' maintenance and tuition at the University of Chicago, Illinois;

Graduate School of International Studies, Geneva:

5,200 Swiss francs (about \$1,250) to enable Professor Michael Heilperin to prepare lectures in international economics;

6,400 Swiss francs (about \$1,600) to enable Professor Charles P. Kindleberger, Massachusetts Institute of Technology, to spend the summer term of 1954 as visiting professor at the institute;

Albert Kervyn, Economic Commission for Europe, United Nations, Geneva; \$800 to consult various American specialists on international economic equilibrium;

University of Bombay; \$525 for supplementary travel and expenses of C. N. Vakil, professor of economics, while in England and the United States;

Harvard University, Cambridge, Massachusetts:

\$10,000 for use by the Graduate School of Business Administration toward the costs of preparing and publishing extensions of the Kress Library Catalogue of books in business and economics;

\$9,000 for the use of the Russian Research Center for a study by Timothy Sosnovy on *Development of Urban Centers in Soviet Russia*;

University of California, Berkeley:

\$1,500 to enable Professor Howard S. Ellis to consult with European economists after attending meetings of the International Economic Association, of which he is the newly-elected president;

\$4,200 to enable Professor Norman S. Buchanan to spend six months in Europe studying theoretical aspects of economic development;

London School of Economics and Political Science:

\$1,900 to enable Professor Lionel C. Robbins to visit American universities and research centers;

\$1,300 to enable David Solomons to visit American industrial centers and university schools of business administration;

Columbia University, New York:

\$6,625 for use by the School of International Affairs in support of Dr. A. S. James Baster's research on problems of economic development, with particular reference to the Middle East;

\$7,000 to enable Dr. Shun-hsin Chou to complete his book on *China Under Hyper-Inflation, 1939-1950*;

Professor I. Ian Bowen, University College, Hull, England; \$3,650 to study teaching methods in the United States in the field of economics and business administration.

Human Behavior and Interpersonal and Intergroup Relations

HARVARD UNIVERSITY

LABORATORY OF SOCIAL RELATIONS

The complexities of human behavior and social relations are so baffling that, despite wide agreement about the great importance of extending our knowledge in this field, many are discouraged about the possibility of going beyond the common sense knowledge of wise men of affairs, the insights of artists and humanists, and the broad interpretations of historians and social philosophers. At the same time, increasing numbers of highly trained men are turning their energies to the task of developing more exact and dependable knowledge of human social behavior than we now have.

One important part of this endeavor, intensive study of small groups of human beings, has been developing rapidly. Because the study of small groups permits more complete

and accurate observation of the processes of social interaction than is possible in larger groups, and even makes some controlled experimentation feasible, it offers important possibilities for rigorous study of such processes and thus for building and testing scientific theory. And because so much of everyone's life is devoted to activities in small groups, better understanding of how such groups operate can have great practical importance.

A research project at Harvard University's Laboratory of Social Relations for several years has been analyzing the functioning of small working committees. From close study of large numbers of committees of various types and sizes, much has been learned about the processes by which committees accomplish their tasks and about the roles that must be performed by committee members if success is to be achieved. Dr. R. F. Bales, the project director, and his associates are now studying the personality characteristics best suited to the different roles required in working committees, and testing their ability to improve committee performance by selecting members in accordance with the principles they are developing. In support of this work and further analysis of other factors which influence the efficiency of committees, The Rockefeller Foundation in 1953 appropriated \$52,500 for a three-year period.

A second study at the Laboratory of Social Relations is investigating another important aspect of social behavior in a wider community context. With the aid of Harvard's Graduate School of Education, a large sample of the superintendents and school board members in Massachusetts is being interviewed to determine the character and extent of agreement or disagreement in views about the proper functions and responsibilities of school superintendents, and the relations between such views and the effectiveness of the superintendents. Toward the costs of this study, which is expected to contribute both to the sociological analysis of professional roles in our society and to the improved training

of school administrators, The Rockefeller Foundation in 1953 made a three-year appropriation of \$57,000.

AMERICAN LAW INSTITUTE

MODEL CRIMINAL CODE

Among a series of grants made by the Foundation in recent years in support of studies in the field of criminal law, the American Law Institute in 1951 received a grant of \$222,500 toward the costs of preparing a model criminal code with commentaries. A further grant of \$53,000 has now been made to the American Law Institute for this work.

Professor Herbert Wechsler of the Columbia University Law School is acting as Chief Reporter for the project and is assisted by Professor Louis B. Schwartz of the University of Pennsylvania Law School and Paul W. Tappan, professor of sociology and lecturer in law at New York University, as Associate Reporters. The supplementary funds will be used to provide additional junior assistance to relieve the Reporters of detailed legal research and to provide for such special field studies as a close examination of the operation of the California Adult Authority.

HUNTER COLLEGE

STUDY OF COLLECTIVE BARGAINING

Collective bargaining in Germany has been characterized by a maximum of formal, legalistic control by the state and a minimum of the voluntarism more characteristic of the United States. Professor Heinrich Hoeniger, formerly professor of economics at Hunter College and now visiting professor at the University of Frankfurt, was for many years a leading German authority on labor law and union-management relations and has spent eleven years in the United States studying and teaching these same subjects.

While lecturing in Germany during the past few years, Professor Hoeniger has found great interest in American methods of handling industrial and labor relations but almost no published material that presents a comparative picture of union-management relations in the two countries.

As a result of this experience, Professor Hoeniger has formulated a two-way comparative study of collective bargaining in the United States and Germany designed to make available in each nation the means of understanding the other's philosophy and practices. The project is being carried out by members of the faculties of Hunter College and the University of Frankfurt, working under the direction of Professor Hoeniger. Toward the costs of this work, The Rockefeller Foundation in 1953 appropriated \$54,900 to Hunter College.

UNIVERSITY OF MICHIGAN

GROUP ACTION STUDY

Greater knowledge of how individuals form cohesive groups capable of common purposes and action is of great importance to military commanders who must weld recruits into effective fighting units, to industrial supervisors who wish to develop and maintain high productivity among workers, to community leaders, and to the many others who are striving to deal more effectively with the problems of group action. No less important is knowledge of the ways and extent to which participation in a cohesive group affects the attitudes and behavior of the individual members. Professor Theodore M. Newcomb of the University of Michigan has planned an intensive study of a group of students in a newly-formed cooperative house, throughout the first year of its existence, in an attempt to learn more about these closely related processes. The Rockefeller Foundation has made a two-year grant of \$24,500 to the University of Michigan toward the costs of this study.

UNIVERSITY OF MICHIGAN

SURVEY RESEARCH CENTER

In 1947 the Human Relations Program of the Survey Research Center at the University of Michigan initiated a long-range program of research in the area of social organization in an attempt to formulate a set of scientific principles which would aid in understanding how many types of organizations and groups operate. Since that time several industrial and governmental organizations have been studied and some tentative conclusions reached. The center has now completed plans to extend this program to include labor organizations.

For an initial study of four local labor organizations The Rockefeller Foundation has made a one-year grant of \$23,000. This study, under the direction of Robert L. Kahn, will attempt to answer some of the significant questions about the internal functioning of labor unions which already have been posed for other kinds of social organizations. The central problem initially will be to compare the effects of democratic and authoritarian leadership on membership participation in and attitudes toward union activities.

PRINCETON UNIVERSITY

OFFICE OF POPULATION RESEARCH

Intensification during recent years of efforts to improve conditions of health and levels of living throughout the world has magnified the need for better knowledge of the relationships between these developments and population growth. The Office of Population Research at Princeton University has long played a leading role in demographic analyses of important foreign areas. In addition, it has provided training and clearinghouse services for population specialists from many countries.

The Rockefeller Foundation, which has supported the work of the office since 1945, in 1953 appropriated \$40,000 to Princeton University to maintain this support at the current level for another two years.

UNIVERSITY OF MINNESOTA

SOCIAL DISORGANIZATION

The first of the recently established awards of the American Association for the Advancement of Science for a theoretical contribution in the social sciences was made for a paper on *A Theory of Social Organization and Disorganization* by Professor Arnold M. Rose of the University of Minnesota. Professor Rose subsequently planned a series of studies designed to test various aspects of this theory, beginning with study of the effects of varying degrees of social isolation on divergence in values, deviant behavior, and disorganization in both individuals and groups. The Rockefeller Foundation in 1953 appropriated \$15,075 to the University of Minnesota toward the cost of studies of social disorganization by Professor Rose during a three-year period.

UNIVERSITY OF PUERTO RICO

SOCIAL ANTHROPOLOGICAL STUDIES

The Foundation shared equally with the University of Puerto Rico the costs of field work in 1948 and 1949 under a program of social anthropological studies of Puerto Rico. These studies were chiefly concerned with analyzing the impact of American institutions and influences on the native culture of the Puerto Ricans. Professor Julian Steward, who supervised the field work, has taken chief responsibility for a comprehensive, integrated report of these studies. The report is now complete, and the Foundation in 1953 made a grant of \$2,500 to the university to provide one-half the cost of publication.

UNIVERSITY OF VIENNA

INSTITUTE OF CRIMINOLOGY

War damage, occupation by a foreign power, juvenile delinquency, and the influx of refugees from communist-controlled countries have all made the detection, control, correction, and rehabilitation of criminals a problem of acute importance in Vienna and Austria. It is on this problem that Professor Roland Grassberger and his co-workers at the Institute of Criminology of the University of Vienna have been working intensively for several years, concentrating particularly on research on sex crimes and fraud. The Foundation in 1953 made a grant of \$1,000 to the University of Vienna to enable the Institute of Criminology to employ full- and part-time research assistants needed in the continuance of research in these particular areas.

GRANTS IN AID

University of Copenhagen; 68,500 Danish kroner (about \$10,000) toward the costs of research on social stratification to be carried out in the Division of Sociology under the direction of Dr. Kaare Svalastoga;

New York University, New York; \$9,150 toward the costs of exploratory research on the psychology of trust and mistrust in interpersonal relations, under the direction of Professor Morton Deutsch;

University of Vienna; \$8,500 for the use of the Department of Sociology to support studies, under the direction of Leopold Rosenmayr, of factors which contribute to the basic social, economic, and political views of major groups in Vienna;

University of Chicago; \$8,500 toward the costs of a study, under the direction of Professor Ernest W. Burgess, of adjustment during the middle years of marriage;

Ohio State University, Columbus; \$7,000 to finance the completion by Professor John W. Bennett of a study of the interrelations of

the demography, economy, social relations, and culture patterns in Japanese rural society;

University of Pennsylvania, Philadelphia; \$3,375 toward the cost of research on the structure and interpretation of labor and industrial relations, by Professor Waldo E. Fisher of the Wharton School of Finance and Commerce;

G. P. Hirsch, Agricultural Economics Research Institute, Oxford University, England; \$3,000 to visit American research centers in rural sociology;

International Sociological Association; \$2,650 toward travel expenses of delegates to its Second World Congress held in Liège, Belgium, August 24 to September 1, 1953;

Syracuse University, New York; \$2,000 to enable Professor Douglas G. Haring to complete an ethnographic survey of Amami Oshima in the Northern Ryukyus;

Research Institute of Population Problems, Tokyo:

\$1,500 for the purchase and shipment of Western books on demography and related subjects;

\$775 to enable Dr. Ayanori Okasaki, director, to visit centers of population study in Washington, Princeton, and New York;

Netherlands Institute for Social Research, Amsterdam; 29,000 Dutch florins (about \$7,800) toward the expenses of a study of social stratification and mobility in the Netherlands;

Loyola University, Chicago; \$6,500 toward the cost of a study of labor-management relations in the meatpacking industry, under the direction of the Reverend Theodore V. Purcell, S.J.;

Princeton University, New Jersey; \$5,015 toward the cost of exploratory field work in industrial sociology by Professor Melvin M. Tumin;

Columbia University, New York:

\$4,500 for use by the Bureau of Applied Social Research toward the costs of completion of a study of world literacy and educational trends, under the direction of Professor Kingsley Davis;

\$7,500 for use by the Bureau of Applied Social Science for a study by Dr. Fred C. Iklé of the quantitative relation between distance and human interactions;

University of the Philippines, Quezon City; \$8,000 to provide the university with the services of John E. deYoung, of the University of California, for one year in the sociology department;

University of Oslo, Norway; \$4,800 toward the cost of securing Kaspar D. Naegele as a visiting professor in sociology for the academic year 1953-54.

Political Science and International Affairs

INSTITUTE FOR EUROPEAN POLITICS AND ECONOMICS,
FRANKFURT

STUDY OF GERMAN POLITICAL ATTITUDES

The rapid social changes following the defeat of Germany in World War II, which affected not only Germany but the whole of Europe, have brought into sharp focus the importance of the attitude of the German people toward European unity and particularly toward Germany's integration with the West. In connection with a broad program of research already under way, the Institute for European Politics and Economics in Frankfurt plans a one-year pilot study of this vital aspect of the problems of European unity.

Without neglecting the traditional approaches of the historian and of the student of international relations to a study of this nature, the institute plans to draw upon the diversity of experience already gained in several social science fields in an attempt to evaluate other effective approaches. Dr. Walther Karbe, a sociologist, will direct the study which will examine educational and informational programs initiated in Germany since 1945 designed to promote European integration, including analyses of 1) political education in the state school system and through

adult education media, 2) campaigns of the European Movement, 3) campaigns of other private organizations such as trade unions, youth and women's groups, and 4) reorientation activities and cross-cultural exchange programs.

A grant of 80,000 German marks (about \$20,000) has been made by The Rockefeller Foundation for this one-year project.

INSTITUTE FOR POLITICAL SCIENCE, BERLIN

RISE OF NATIONAL SOCIALISM

How did the Nazis, starting as a minority party, overthrow the Weimar Republic and cement its domination over the German people? This question, crucial for an understanding of the mechanisms and techniques used by anti-democratic forces to destroy the democratic system of government and establish and consolidate totalitarian rule, is the subject of an investigation currently being carried out by the history section of the Institute for Political Science in Berlin.

Following the completion of a study of the disintegration of the Weimar democracy, the section will undertake an analysis of the social and political processes through which the National Socialist system of domination was established and cemented in the crucial years 1933 and 1934. Working closely with the research director of the institute, Dr. K. D. Bracher, head of the history section, and his staff will use a number of carefully planned research approaches: 1) a survey of memoirs and other literary sources; 2) content analysis of the media of communication and propaganda; 3) compilation from the denazification files of at least three Länder of information about the leadership and membership of the National Socialist party; 4) investigation of the Nuremberg files and other archives; and 5) interviewing of participants and observers. Toward the support of this

research the Foundation has made a two-year grant of 80,000 German marks (about \$20,800).

INSTITUTE FOR ADVANCED STUDY, PRINCETON

GEORGE F. KENNAN

Mr. George F. Kennan recently retired from the Department of State after 25 years with the United States Foreign Service. To enable this scholarly public servant to systematize and precipitate his thoughts on certain issues of strategic importance to public understanding, the Foundation has made a one-year grant of \$15,000 to the Institute for Advanced Study at Princeton, where Mr. Kennan is a member of the School of Historical Studies.

Mr. Kennan will, during this period, continue his earlier efforts to refine a set of connected case studies and theme studies on the legalistic and moralistic trend in the United States foreign policy in the last fifty years. A second subject to which he will give attention is a study of the structure of the party and government in Soviet Russia.

DEUTSCHE HOCHSCHULE FÜR POLITIK, BERLIN

DEVELOPMENT OF POLITICAL SCIENCE

The marked renaissance of all aspects of German life during the past five years has included development of the several social sciences. Some of these, particularly economics, had already been well established in German universities, but political science is a new discipline to most German scholars. Although several universities have recently created professorships in political science, the field has been developed most fully in Berlin, where the Deutsche Hochschule für Politik has been, since its revival in 1949, a center for teaching and research at the university level under the direction of Dr. Otto Suhr.

Since political science is a newcomer to the German academic curriculum, there is a serious lack of materials for use by students, and professors are compelled to use their lecture time to communicate to students basic facts and the contents of documents. In order to remedy this serious lack of teaching materials and to raise the level of instruction in this new discipline, scholars at the Hochschule will prepare ten basic source books and ten manuals in such major fields of political science as the German system of government, the structure and function of German political parties since 1945, international organization since 1945, foreign governments and political parties, and international relations. A Foundation grant of 69,000 German marks (about \$17,940) will partially cover the expenses of this two-year project.

THE ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS,
LONDON

AREA STUDIES

The area studies program of The Royal Institute of International Affairs has, since 1945, focused upon the following regions: the Soviet Union and Eastern Europe, Western Europe, the Middle East, the Far East and Southeast Asia, and Latin America. With funds from the Foundation, this program has been substantially expanded during the past two years, particularly with respect to work on the Soviet Union and the Middle East. In addition, work has continued on a wide range of subjects, including contemporary history, international law, philosophy and politics, international economics, British Commonwealth relations, and international organizations.

A further grant of £24,000 (about \$72,000) has been made to the Royal Institute toward support of its program of research on the Middle East, Southeast and East Asia, and the North Atlantic — especially the European—community. In this program, emphasis will be placed upon the develop-

ment of young talent, and upon studies of timeliness and usefulness to the makers and administrators of policy and to the general public whose interest and understanding is essential to the successful management of international relations.

UNIVERSITY OF HEIDELBERG

ALFRED WEBER INSTITUTE FOR SOCIAL AND POLITICAL SCIENCES

The Alfred Weber Institute for Social and Political Sciences at the University of Heidelberg, is one of the most active German centers for research in the field of political science. For the past two years it has been engaged in a program of research on the nature of political parties. This program, under the direction of Dr. Dolf Sternberger, lecturer in political science, has resulted in a series of eight monographs by graduate students on specific aspects of the subject. With the assistance of a \$5,000 grant from The Rockefeller Foundation, these monographs were completed during 1952.

With the assistance of another grant of 69,400 German marks (about \$17,300) from the Foundation, the institute is currently engaged in the preparation of a series of monographs relating to parliamentary opposition in a multi-party system. Included among these monographs will be studies of: The Constitutional Position of the Opposition; The BHE (German Refugee Party) in Coalition and Opposition; The Opponents of Parliamentary Democracy; Elimination of the Opposition by Force; and Characteristics and Practical Possibilities of an All-Party Coalition. Dr. Sternberger continues to direct the work of the graduate students engaged in the preparation of these monographs and will himself prepare an introduction to the current study which will compare the role of the opposition in the Anglo-Saxon two-party system with that of the opposition in the continental multi-party system.

GRANTS IN AID

Carnegie Endowment for International Peace, New York; \$10,000 toward the costs of a conference of leaders of institutes of international relations;

Columbia University, New York; \$10,000 for use by the School of International Affairs toward the costs of research in political theory by Miss Dorothy Fosdick;

Institute of Public Administration, London; £2,700 (about \$8,100) for a study of developments in the structure of executive government, both central and regional, in the United Kingdom since 1918;

University of Chicago, Illinois; \$7,500 for use by the Center for the Study of American Foreign Policy toward the costs of two research projects under the direction of Professor Hans J. Morgenthau;

Christian-Albrechts-Universität, Kiel; 28,800 German marks (about \$7,200) for use by the Seminar for the Science and History of Politics in support of research on the political structure of Schleswig-Holstein;

London School of Economics and Political Science, University of London; \$5,925 to enable W. H. Morris-Jones to spend a year in India and Pakistan doing research on parliamentary government and Indian political parties;

Johns Hopkins University, Baltimore:

\$9,905 for the use by the School for Advanced International Studies, toward the costs of a study of the vitality of the Kuomintang by Professor Paul Linebarger;

\$4,500 toward the expenses of a committee planning a Center of Advanced International Studies to be established in Washington, D. C.;

Stanford University, California; \$3,250 for use by the Hoover Institute and Library toward the costs of completion of Homer G. Angelo's study of the *Legal Aspects of United Nations' Action Against Aggression*;

Dr. Alexander Loveday, warden, Nuffield College, Oxford; \$1,600 to visit Paris, Geneva, and Rome to undertake research in connection with the preparation of a volume on international administration;

Vargas Foundation, Rio de Janeiro; \$1,500 for the purchase and shipment of books in public administration and related social science fields for the foundation's Brazilian School of Public Administration;

Professor Michael P. Fogarty, University College, Cardiff, Wales; \$1,000 for travel and living expenses while visiting European centers in connection with his study of the European Christian-Social Movements;

University of California, Berkeley; \$3,000 to cover the costs of a visiting professorship for President Alford Carleton of Aleppo College, Syria, for the second semester of the academic year 1953-54;

Colgate University, Hamilton, New York; \$500 for the completion of a short geography of Korea by Professor Shannon McCune;

Indian Council of World Affairs, New Delhi:

\$2,075 to provide supplementary travel and maintenance expenses in the United States of S. L. Poplai, the council's director of surveys and documents;

\$4,000 toward the purchase of books for its new library.

Legal, Political, and Social Theory and Philosophy

UNIVERSITY OF WISCONSIN
THE LAW SCHOOL

Legal studies and social studies have tended to go forward in relatively separate compartments, despite the many efforts to integrate them and despite the fact that

they are addressed to the same social process. Professor Willard Hurst of the University of Wisconsin is attempting to bridge this intellectual separateness. Through the window of legal history — legislative and executive as well as judicial — he is studying the social process so that he may thereby better understand law in its developing relation to such matters as group conflict in society, the release of human energy, the wide dispersion of decision-making, the ordering of life and of change, the balance of power, and the development of integration in society. This ten-year project is expected to result in a series of volumes concerning the relation of law to such factors in society.

Another important objective of Professor Hurst's project is the development of scholars in the field of legal history. While working on a previous study under a Foundation grant, Professor Hurst made a practice of bringing in to work with him young scholars from other law schools, each to assume responsibility for a particular phase of the study and to publish the results under his own name. Professor Hurst plans to continue these "internships" during the period described above. By this method, the growth of men more capable of writing legal history and of integrating law and the social sciences is being and will be aided.

The Foundation has contributed \$76,000 to the University of Wisconsin toward the costs of Professor Hurst's research program.

HARVARD UNIVERSITY

THE LAW SCHOOL

The growing organizational complexity of modern society means that the individual is being called on more and more to act in representative capacities — whether as lawyer, government official, business executive, or trade union official. In simpler days a man who dealt with others usually represented his own interest; today the man who

transacts affairs acts typically for an abstract entity called "the company," "the membership," or "the people," whose interests may be quite different from his own. Many of our fundamental institutions — the banking system or the mutualized insurance company, for example — could not function at all if the general morality of representation had not attained a fairly high standard.

It is this central ethical issue — as applied to the legal profession — which Professor Lon L. Fuller and Associate Dean David F. Cavers of the Harvard Law School propose to explore with the assistance of a two-year grant of \$28,400 from the Foundation. The work will be carried out with the assistance of Mr. Frederick B. MacKinnon, a former teaching fellow on the Harvard Law School faculty, and in close cooperation with carefully selected individuals in the profession. The most strategic cases and problems which have arisen in the practices of these leading members of the bar will be analyzed for their implications both for lawyers and for other categories of representatives in society.

SOCIAL SCIENCE RESEARCH COUNCIL

FELLOWSHIPS IN LEGAL PHILOSOPHY AND POLITICAL THEORY

The social fields, which are more closely allied to the moral philosophy from which the present social sciences have all derived, have received much less support from fund-granting agencies than have the scientific studies of social problems. Both approaches are important and each is essential to the other's full development.

After careful investigation of the means of aiding scholarship in these areas, the Foundation has decided upon a program consisting largely of grants in aid both for outstanding young graduate students and mature scholars of distinction in the fields of legal philosophy and political theory.

In order to ensure continuation of at least part of this program beyond the end of the current academic year, the Foundation has appropriated \$86,250 to the Social Science Research Council for fellowship awards in these fields at the predoctoral and immediate postdoctoral levels during a three-year period.

GRANTS IN AID

Stanford University, California:

\$1,500 for use by the Food Research Institute to cover travel expenses incurred by Dr. Joseph S. Davis in his preliminary research into the relations between economics and religion;

\$10,000 for use by the Food Research Institute toward the costs of a study by Dr. Joseph S. Davis of possible contributions of economics to moral, ethical, and religious teaching;

Columbia University, New York; \$6,750 to permit Professor Franz L. Neumann of the Department of Public Law and Government to devote the summer of 1953 and the academic year 1953-54 to a study of political systems and political theory;

University of Chicago, Illinois; \$5,000 to enable Dr. Shirley Robin Letwin of the Committee on Social Thought to prepare a study of the trend of British political philosophy from the eighteenth century to the present;

National Institute of Economic and Social Research, London; £1,500 (about \$4,500) in further support of G. E. Fasnacht's research project, "The History of Liberty in the Acton Manuscripts";

Società Italiana per la Organizzazione Internazionale, Rome; 600,000 lire (about \$1,000) in further support of research in connection with the preparation of a critical edition of the works of Dionisio Anzilotti;

Peter Laslett, St. John's College, Cambridge University, England; \$900 for travel in the United States in order to examine certain manuscripts dealing with John Locke's political philosophy.

Development of Social Science Talent

SOCIAL SCIENCE RESEARCH COUNCIL

FELLOWSHIPS

The Social Science Research Council has been concerned since its inception with the important problem of improving the quality of research in the social sciences. One major approach has been its fellowship program, which since 1925 has upheld consistently high standards in assisting talented and potentially productive graduate and postdoctoral students to get research experience and training beyond that available in their normal academic programs. This service has been especially useful during the postwar years because it has encouraged many of the ablest young social scientists to continue their training and their interest in fundamental research rather than be drawn prematurely into non-research activities or into applied research concerned only with immediately practical results.

The Rockefeller Foundation, which has supported this important research training fellowship program from its beginning, continued its support for another three years with an appropriation of \$345,000 in 1953.

UNIVERSITY OF TORONTO

PROBLEMS OF CANADIAN DEVELOPMENT

A six-year grant of C\$215,000 (about \$225,750) was made by The Rockefeller Foundation in 1953 to the University of Toronto for a program of research on "the problems of Canadian development — economic, political, social, historical, and international — since Confederation." The program will be administered by a faculty committee appointed by the president of the University of Toronto. Eligible for appointment are staff members of Canadian universities (including Toronto), members of the Canadian Civil Service,

other Canadian scholars, and scholars from universities in other countries. Each year one senior grantee will be designated the Harold A. Innis Visiting Professor, in honor of the late H. A. Innis, professor of political economy.

CANADIAN SOCIAL SCIENCE RESEARCH COUNCIL

FELLOWSHIPS

The huge expansion now occurring in Canada is inevitably creating permanently enlarged demands for persons with advanced competence. Although the Canadian government is supporting research in the natural sciences and engineering, it has not as yet been able to take similar action in the fields of the social sciences and humanities where much young talent of high promise is being lost through lack of fellowship assistance.

As a contribution to the conservation and development of young talent in the social sciences, the Foundation in 1953 continued previous support of the fellowship program of the council with a grant of C\$125,000 (about \$131,250). Half of this sum has already been made available; the rest will be released on a dollar-for-dollar basis as the council receives contributions for the same purpose from Canadian sources.

SOCIAL SCIENCE RESEARCH COUNCIL

SUMMER SEMINAR PROGRAM

Through its summer seminar program begun in 1950, the Social Science Research Council has enabled 20 to 30 members of university faculties to devote uninterrupted summers to research or study. These seminars have brought together groups of mature social scientists for intensive work and consultation on research problems of mutual interest. The 17 seminars sponsored so far have been concerned with the appraisal of significant fields of research, attempts

to reconcile divergent empirical or theoretical approaches to specific problems, and the designing of new research problems of major future consequence. Participants have indicated that they have found the opportunity to devote at least a short period to their own primary scientific interests, without restraint or specific supervision beyond the critical opinion of their colleagues, an invigorating and stimulating experience of a kind rare today.

The Rockefeller Foundation in 1953 made a grant of \$100,000 to the Social Science Research Council toward the expenses of this program of inter-university summer seminars during the next three years.

QUEEN'S UNIVERSITY, ONTARIO

GRADUATE TRAINING PROGRAM IN ECONOMICS

Canada's rapid industrial growth is placing ever increasing demands upon her human resources, including her small supply of highly skilled and competent economists. As a result of this expanded demand and of higher earnings available in business or government service, much of the best talent has been drained from the universities. Moreover, older scholars are burdened by heavy teaching loads and many of the younger economists must teach in the relative isolation of the smaller Canadian universities. All these circumstances constitute major deterrents to the persistent pursuit of professional competence by younger scholars, and the number of such young men and of opportunities for their professional growth is quite disproportionate to the urgent demands of the national situation.

In the hope of encouraging younger economists to remain in the academic field, in spite of outside pressures, Queen's University has this year initiated a three-year program of advanced training and research in fiscal, monetary, and economic policy. Under this program, it is planned to assemble at Queen's University for a two-month period

each summer a group of eight to ten of the most promising young economists of Canada. Each member of the group will receive a stipend approximately equivalent to that offered by universities for summer school teaching. Each will have selected — and perhaps embarked upon — a topic of research in the field, and will have the assistance and criticism of other members of the group, of Queen's faculty members, and of such visiting professors as may from time to time be brought to the campus. Funds will also be available for travel to Ottawa by the group, or members of it, as well as for visits to the group by competent economists from Ottawa, other parts of Canada, and the United States.

Toward the costs of this three-year program, the Foundation in 1953 contributed C\$45,000 (about \$47,250).

UNIVERSITY OF CHICAGO

WORKSHOP IN MONEY AND BANKING

During the past two years, Professor Milton Friedman and his associates at the University of Chicago have been conducting an experiment designed to promote research in monetary theory and policy, and concurrently to improve research training by providing a situation in which students could participate actively in important projects under careful and continuing guidance.

In July 1954, this experiment will evolve into a Workshop in Money and Banking, with the role of monetary factors in business cycles as its center of interest. Several aspects of this subject are already in various stages of examination, among them a study of the construction of new estimates of the money stock in the United States in the post-Civil War period; a comparative analysis of the behavior of prices and monetary magnitudes in the Civil War and the two World Wars, and an examination of monetary and price behavior during the National Socialist

régime in Germany. These studies derive from a common theoretical formulation — the great importance of the quantity theory of money as a determinant of the course of money income and prices — and it is expected that one of the first publications of the workshop will be a volume tentatively entitled *Studies in the Quantity Theory of Money*.

The educational aim of the workshop will be realized by requiring a rotating group of students to devote full time during one or more academic terms to research on some part of the continuing program. They will receive credit for their work, as well as informal guidance on general reading in the field. A report of publishable quality will be expected from each project.

Experiments such as this, which link the graduate training of students in the social sciences to active participation in advanced research, promise to improve the competence and standards of social science personnel for the future.

A Foundation grant of \$50,500 to the University of Chicago will aid the establishment of the workshop and contribute toward its continuation for a three-year period.

GRANTS IN AID

University of the Philippines, Quezon City; \$3,000 for the purchase and shipments of books in the social sciences and humanities;

Harvard University, Cambridge, Massachusetts; \$3,480 for the use of the Law School toward living expenses of Kwang Lim Koh, Seoul National University, Korea, while he completes his legal studies;

\$5,000 for use by the Director of the Division to cover travel, honoraria, books, journals, and other research and miscellaneous expenses.

Methodology

UNIVERSITY OF CHICAGO

COMMITTEE ON STATISTICS

A statistician's practical experience with applications of statistics largely determines the direction he will take in work on fundamental theory and new techniques. The consulting services of the department of statistics at the University of Chicago, until recently confined to research projects of the Department of Defense, have been almost entirely in the natural sciences, and as a result the department members' contributions to the development of mathematical statistics have been relevant mainly to the natural sciences. The department has now completed plans for providing consultative services on problems arising in the conduct of social science research. This program is aimed primarily at influencing mathematical statisticians to develop statistical theories and techniques suitable to the problems of social science. A secondary objective is improving the quality of quantitative research in the social sciences and assisting the development of social science theories and techniques along mathematical and quantitative lines.

The Rockefeller Foundation has appropriated \$135,000 to the University of Chicago for use by the Committee on Statistics during a six-year period in support of this program for orienting research in mathematical statistics toward problems of the social sciences.

CORNELL UNIVERSITY

RESEARCH TECHNIQUES

Efforts to assist the development of non-Western peoples and areas of the world, to be guided wisely and accepted most readily, require much knowledge and understanding of the cultures in these areas. Increasing demands for valid and

reliable data about specific peoples in important underdeveloped areas have created a growing interest in better research methods for securing this information. Social anthropologists, who have most experience in studying contemporary non-Western peoples and cultures, have developed and used their methods chiefly in studying tribal groups and similar comparatively small and homogeneous societies. Sociologists and other students of modern complex mass societies have worked almost entirely within Western culture. Adaptations of methods of both groups are needed for studying the large non-Western societies in which the major development programs are active.

Cornell University field stations in Peru, Thailand, and India are working on studies of the impact of technological change in those areas. These substantive studies provide unusual opportunities for carrying out methodological tests designed to investigate both the usefulness and the necessary modifications in non-Western cultures of social science research techniques which have been developed in our Western culture. Cornell anthropologists, working closely with a sociologist and a psychologist, have designed a program of development and testing of improved research methods for studies in underdeveloped areas. For this program The Rockefeller Foundation in 1953 made a grant of \$64,900 to Cornell University.

UNIVERSITY OF MICHIGAN

RESEARCH CENTER FOR GROUP DYNAMICS

In 1950 the Foundation made a grant to the University of Michigan for a three-year trial period in support of a program of methodological research in the field of human relations by the Research Center for Group Dynamics. This grant enabled the center to secure the part-time services of a young mathematician to work with its staff members on methodological problems and to work on developments in

mathematics which seemed likely to have application in social science research. It also made possible the release of principal members of the center's staff for periods of concentrated work on methodological problems encountered in the various research programs there. Both methodological and substantive research have benefited, and mathematical and methodological skills have improved; one of the most interesting developments has been in connection with the application of graph theory to research in progress at the center.

For a three-year continuation of this program, the Foundation in 1953 made a grant of \$48,900 to the University of Michigan.

GRANTS IN AID

Harvard University, Cambridge, Massachusetts; \$4,500 for use by the Laboratory of Social Relations toward the costs of research on the methodology of attitude studies.

Division of Humanities

DIVISION OF
Humanities

Director CHARLES B. FAHS

Associate Directors

EDWARD F. D'ARMS JOHN MARSHALL

Assistant Director CHADBOURNE GILPATRIC

DIVISION OF Humanities

INTRODUCTORY STATEMENT	279
INTERCULTURAL STUDIES	
AMERICAN STUDIES	
Kyoto University, Doshisha University, and the University of Illinois: American Studies Program	284
University of Ankara: American Studies	285
Oxford University: Max Beloff	286
Occidental College: Southwestern and Mexican Studies	286
American Council of Learned Societies: <i>Dictionary of American Biography</i>	287
Columbia University: Biography of Booker T. Washington	288
Grants in Aid	289
NEAR EASTERN STUDIES	
Grants in Aid	290
SOUTH ASIAN STUDIES	
Grants in Aid	291
FAR EASTERN STUDIES	
Kyoto University: Korean Archaeology	292
Grants in Aid	293
HISTORY	
The Royal Institute of International Affairs: Professor and Mrs. Arnold Toynbee	293
Yale University: Contemporary History	294
Indian Council of World Affairs: Recent Indian History	294
McGill University: W. L. Mackenzie King	296
New School for Social Research: Recent German History	297
National Institute of Economic and Social Research, London: De Tocqueville Papers	298
Grants in Aid	299
PHILOSOPHY	
University of Chicago: Professor Charles Morris	300
Grants in Aid	301
LITERATURE	
State University of Iowa: Fellowships in Literature	303
University of the South: Fellowships in Literature and Criticism	304

Mexican-American Cultural Institute, Mexico City: Creative Writing Project	304
<i>Grants in Aid</i>	305
THE ARTS	
Louisville Philharmonic Society, Inc.: Composition and Recording of New Works by Living Composers	306
The City Center of Music and Drama, Inc.: New Opera and Ballet Productions	308
University of Wisconsin: Community Arts	311
Ballet Society, Inc.: Dance Notation Bureau	312
<i>Grants in Aid</i>	313
GENERAL EDUCATION	
Haverford College: General Education	313
Massachusetts Institute of Technology: Foreign Language Instruction	315
<i>Grants in Aid</i>	316
SPECIAL PROJECTS	
Humanities Research Council of Canada: Development of the Humanities in Canada	316
Columbia University: American Press Institute	317
Association of Special Libraries and Information Bureaux: <i>British Union Catalogue of Periodicals</i>	318
Korean Language Society: Korean Dictionary	319
<i>Grants in Aid</i>	320

DIVISION OF HUMANITIES

THE great traditions of culture and the human spirit deserve more than to be preserved; they should live. They can do so only as they produce new growth through the creative work of living thinkers, writers, and artists enriching the lives and times of their fellow men. From the inception of the Humanities program, therefore, The Rockefeller Foundation has sought to identify and stimulate new cultural growth. The selection of limited areas for assistance from among many actual and possible claimants is an inevitable responsibility in foundation operations. But programs need not for that reason be rigid or unchanging; those of The Rockefeller Foundation have evolved steadily. Some of the areas given primary attention in the early days of the Humanities program remain important in that program today while others have received less attention as new areas of interest were added.

Among the grants approved in 1953 are a considerable number representing interests of long standing or continued assistance to undertakings which were supported in earlier years and described in earlier reports. However, four emerging trends are evident which deserve special attention: increasing aid to interpretative studies of recent history; widening opportunities to assist American studies in other countries; a search for effective means of assistance to creative writing; and the initiation of major grants in music and the other arts.

In a century of progress and conflict, promise and confusion like this one, each people needs organized and sound concepts of its own past, particularly its more formative recent past, in order to have perspective and confidence. Yet the interpretation of recent history is difficult and so rarely undertaken that the opportunities for Foundation help are few. To stimulate thinking along these lines, funds were provided in 1953 for a conference in Lebanon on the interpretation of Arab tradition, thought, and culture, and for a conference in Turkey on the interpretation of present day Turkish life and problems. In India less formal discussions over the last several years have already resulted in two grants for interpretation of recent history, one to the Indian Council of World Affairs for a history of the period 1941 to 1952 in India by V. P. Menon, and another to the Jamia Millia Islamia for a cultural history of recent India by S. Abid Husain. These also illustrate an assumption underlying Foundation grants in this field — that while entirely adequate interpretations of recent history can perhaps never be achieved, they can be approximated if a serious effort is made by a variety of independent and competent scholars. Recognizing that biography can also be an appealing and enlightening method of historical interpretation, the Foundation has given assistance in Canada to studies of Mackenzie King and John A. Macdonald, two late statesmen who played such an eminent role that good treatments of their lives must inevitably also be general interpretations of the development of modern Canada. Still another approach to an understanding of recent developments of significance is the study of religion in Germany since the Second World War, for which a grant was made to the New School for Social Research under the direction of Professor Carl Mayer.

The two history projects in India might also be considered a part of the long standing Rockefeller Foundation concern with advancing knowledge of important cultures outside of Europe — a development believed desirable both

for the enrichment of humanistic studies everywhere and for better understanding of international problems. Over the years the Foundation has given substantial support to Japanese, Chinese, and Slavic studies in the United States, and more recently this support has been extended to work on Southeast Asia, India, and the Near East. Support has also been given to Asiatic studies in England, continental Europe and, increasingly, in some parts of Asia itself. The United States, however, has been a relatively neglected field of study in most other parts of the world. It is notable that American studies have grown more slowly abroad than have studies of Asia and other foreign areas in the United States. On the assumption, however, that reciprocal knowledge is desirable, the Foundation has in recent years from time to time given support for American studies abroad, and a number of grants reported this year indicate that interest in such studies is growing in depth and spreading to new institutions. Grants were given in 1953 to two sizable university programs of American studies; one in Kyoto, Japan, and one in Ankara, Turkey. In addition, however, there are among the grants in aid five for American studies in Great Britain, one in Japan, one in Israel, and two in Sweden. One additional grant in aid in Norway was for a general survey of what is now being done in American studies in universities throughout Europe, since the development has now become general enough to require this type of overall appraisal. It should be noted that in encouraging Asiatic studies in the United States, the Foundation has given primary emphasis to the development of American staff competent to deal with Asiatic subjects. Similarly, in the development of American studies abroad, while some of the projects utilize American staff, the primary emphasis has been on the development of scholars in different countries competent to interpret American topics in their own terms to their own people.

The rapid expansion of higher education during the last half-century has greatly increased institutional opportunities

for literary scholarship through the multiplication of salaried posts for teachers of literature. There appears to have been no comparable improvement in the support given to the creative writer whether he is a novelist, a poet, or a dramatist. It would be unfortunate if the expansion of the study of literature should be accompanied by a decline in its creation. The Rockefeller Foundation has, therefore, sought ways by which creative work in literature can be encouraged and assisted. It is not easy to find such means. Possibly the only long-term satisfactory solution will be the development of public reader support to the point where a reasonable number of writers of high quality can expect to be able to live by the returns from their writing. Pending such a long-term development, which perhaps may come through general improvement in the teaching of literature in our schools and colleges, the Foundation has tried several methods of assistance. In the 1930's substantial assistance was given to the development of drama programs and creative writing programs in the universities. In 1952 with an appropriation to Kenyon College, the Foundation began a trial of one more approach to this problem— provision through qualified sponsors for the award of fellowships in creative writing. In the belief that diversity of point of view is desirable in literary judgments, two comparable but independent grants were made in 1953 to the State University of Iowa and the University of the South, enabling them also to offer annually a small number of fellowships. All three institutions have traditions of interest in contemporary literary production, and staff members who through their normal work are in close touch with young writers in various parts of the country. They are thus each in a position to identify some of the young writers likely to profit most from a period of fellowship assistance. It is hoped that sponsorship of fellowships by several institutions rather than a single one will both assist in nationwide coverage and give freedom to a variety of literary judgments while maintaining high standards. At this

time, however, there can be no assurance that this program can be continued. The grants are for an experimental period of three years during which the effectiveness of this type of aid will be tested.

A quite different approach to the problem is represented by the writing center of the Mexican-American Cultural Institute in Mexico City, to which a grant was also made. While this project also involves fellowships for writers, it is international and bilingual in character and is also more directly concerned with finding solutions for some of the difficult problems of support for writers in Mexico.

With the emphasis on creative work already developed in its program in literature, it was only natural that the Foundation should also explore the possibilities of assistance in the other arts. Here too the difficulty of finding effective means has delayed action. The most important new development in the Foundation program in Humanities in 1953 was the inauguration of such assistance with two major grants to the Louisville Philharmonic Society in Kentucky and The City Center of Music and Drama in New York. These grants are described more fully below, but a word is in order with regard to the general concepts which lie behind them. The concern of the Foundation is primarily with creative work of high quality. A prominent assumption is, however, that the Foundation neither can nor should take the place of other forms of private patronage of the arts, nor should it in general give direct aid to individual artists. If modern society produces higher standards of living and a wider distribution of wealth, we assume that the artist can and must find a broader base of support through the use of his work. Rather than give direct aid to artists, it is thought preferable to give indirect assistance through projects which offer reasonable promise of building toward a broader and firmer base of public support for creative work, support which is not likely to be lost when, as must be the case with each project, aid from the Foundation is eventually discontinued.

It was with this problem of a broader base for the arts in modern society in mind that a grant was also approved in 1953 to the University of Wisconsin for the continuation of a survey of its experiences in community arts work during the past forty years.

The items referred to above under evolving trends in assistance to literature and the arts will be found under those headings in the full list of grants which follows. For convenience a familiar and traditional classification has been adopted. The dual interest of the Foundation both in better understanding of the world's cultures and in significant work in history, philosophy, and other aspects of contemporary thought makes the grants in recent history and American studies abroad classifiable in more than one way. They will be found either under intercultural studies or under history.

Intercultural Studies

AMERICAN STUDIES

KYOTO UNIVERSITY, DOSHISHA UNIVERSITY, AND THE UNIVERSITY OF ILLINOIS

AMERICAN STUDIES PROGRAM

In the summer of 1952 a seminar in American studies was held in Kyoto, Japan, under the joint auspices of Kyoto University, Doshisha University, and the University of Illinois. This program was made possible by a grant of \$22,500 from The Rockefeller Foundation. The summer session was staffed by five professors from the United States, representing various branches of the social sciences and the humanities. An intensive series of lectures and conferences was offered for the more than a hundred Japanese professors, instructors, and graduate students attending.

Kyoto and Doshisha universities are now eager to further their work in American studies by having a visiting

professor from the United States in residence throughout 1954. They plan to invite two American professors, one in the humanities and one in the social sciences, to spend approximately five months each in Kyoto. The first is scheduled to arrive in early spring and remain through the summer, while the second is to arrive at the beginning of the summer and remain until midwinter. They will offer regular courses at Kyoto and Doshisha and thus be in close contact with the faculties and student bodies at both institutions.

Arrangements have also been made to hold a second American studies seminar in the summer of 1954, when both visiting professors will be in Kyoto. As before, this session will be open to scholars and teachers from colleges and universities throughout the country. As a step toward developing Japanese leadership in the American studies program, several professors from the Kyoto area will this year collaborate in organizing and teaching the summer seminar.

In support of this new program, the Division of Humanities and the Division of Social Sciences have made a joint grant of \$14,000 to Kyoto University for use by the Kyoto University-Doshisha University Committee on American Studies. An additional sum of \$18,200 was appropriated to the University of Illinois, which continues to be the American sponsor of the Kyoto project.

UNIVERSITY OF ANKARA

AMERICAN STUDIES

The University of Ankara in Turkey has for some time been preparing for the establishment of a full-fledged program of studies in American civilization. Courses on American life and thought have been offered in the past few years by visiting professors invited to Turkey under the provisions of the Fulbright Act. Members of the regular faculty at the university have been encouraged to gain a firsthand knowledge of the United States through study and travel in this

country; several of these trips were made possible by grants in aid and fellowships provided by the Foundation.

In 1953 a grant of \$21,000 was made to assist the university in setting up a new program of American studies. To complete organization of this program, the services of professors of American history and literature from the United States are required at first. The Foundation grant will contribute to the salaries of these appointees over the next two years. At that time, the University of Ankara plans to assume full financial responsibility for developing the work in American studies. The university also intends to place, as soon as possible, qualified members of the regular faculty in charge of all courses offered under this program.

OXFORD UNIVERSITY

MAX BELOFF

The sum of \$3,500, available through March 1955, was appropriated this year to Oxford University, England, to enable Max Beloff to visit the United States to conduct research in American history and institutions. Mr. Beloff, who holds the title of Nuffield Reader in the Comparative Study of Institutions at Oxford, received a Foundation grant in aid in 1947 for travel and study in the United States and Canada. He has now undertaken to prepare a volume on American institutions for publication in England. In order to consult American sources for this book, he plans to return to the United States in 1954, and will spend the fall term of that year in residence at the Institute for Advanced Study in Princeton.

OCCIDENTAL COLLEGE

SOUTHWESTERN AND MEXICAN STUDIES

During the past few years Occidental College has been moving toward a comprehensive area studies program focus-

ing on the southwestern United States and northern Mexico. The college is located in a suburb of Los Angeles, California, in the heart of the region where these two cultures meet. By emphasizing studies of this area, Occidental hopes to enter into a closer relationship with the community and to prepare its students better for teaching and community work in the Southwest.

In 1949 the Foundation contributed \$35,000 to Occidental College to help in developing the early stages of its regional studies program. This grant has been used to provide travel and research grants for faculty members, to increase library resources, and to hold annual conferences on area problems in which both Mexican and American intellectual leaders have participated.

These activities have resulted in two notable modifications in the curriculum at Occidental. A major in studies of the southwestern United States and northern Mexico, requiring a knowledge of the Spanish language, is now offered. The use of Spanish as an integral part of an area studies program has important implications for the future development of foreign language education. Even more significant is the introduction of regional materials into the college's basic two-year general education course. An attempt is here being made to make general education more pertinent for the student by incorporating data on an area with which he is familiar. To enable Occidental College to continue expanding these and other aspects of its regional studies program, the Foundation in 1953 appropriated \$50,000, available over the next five years.

AMERICAN COUNCIL OF LEARNED SOCIETIES

DICTIONARY OF AMERICAN BIOGRAPHY

In response to the need for an American counterpart to the *British Dictionary of National Biography*, the American Council of Learned Societies began some three decades ago

to compile a *Dictionary of American Biography*. With the aid of substantial grants from *The New York Times*, and supplementary assistance from the publishers, The Rockefeller Foundation, and the council's general funds, the main edition of the dictionary was completed and published in 1937. This twenty-volume work, which contains the names of over 14,000 persons who have made important contributions to American life, has proven to be a valuable research tool for scholars and historians.

As the original edition contained only the names of persons whose deaths occurred prior to 1930, it was planned to bring the dictionary up to date at five-year intervals by issuing supplementary volumes. The first of these, devoted to the biographies of prominent individuals who died between 1930 and 1935, appeared in 1944. The American Council of Learned Societies now plans to set up a continuing program for issuing additional supplements at regular intervals.

In support of this program the Foundation has made a five-year grant of \$30,000 to the council, available at the rate of one dollar for every two dollars secured from other sources. The council expects to finance the compilation of future volumes from the proceeds of the sale of the original edition, the 1944 supplement, and a second supplement, which is now being prepared.

COLUMBIA UNIVERSITY

BIOGRAPHY OF BOOKER T. WASHINGTON

Marquis James, twice winner of the Pulitzer Prize for biography, has been engaged for the past year in preparing a biography of Booker T. Washington. In support of this project, The Rockefeller Foundation in 1951 appropriated \$15,000 to Columbia University, and this year renewed its aid with a grant of \$10,000.

Mr. James has concentrated so far on studying the extensive source material on Washington's life in the possession

of the Library of Congress. This collection, which is estimated to contain over a million items, has never before been thoroughly investigated or classified. The author subsequently plans to examine material at Washington's early homes in Virginia and West Virginia, at Hampton Institute and Tuskegee Institute, and in various other collections. It is hoped that the resulting biography may lead to a fuller understanding of the life and works of Booker T. Washington.

GRANTS IN AID

Oxford University, England:

University College; £3,425 (about \$9,675) for expenses in connection with a Conference on American Studies held in the summer of 1953;

Lincoln College; \$600 in addition to the \$1,550 given earlier in the year, to enable H. C. Allen to visit the United States in connection with his comparative studies of Australian and American history;

University of Nottingham, England; \$5,000 for the acquisition of books and materials needed in the development of American studies;

Cambridge University, England; \$6,500 to enable Frank Thistlethwaite, St. John's College, to continue research on American history in the United States;

Stanford University, California; \$6,000 to enable Professor Kenichi Nakaya, Tokyo University, to carry on study and research in American studies in the United States;

Hebrew University, Jerusalem; \$5,000 to enable the university to secure the services of a visiting professor of American studies from the United States, for the academic year 1953-54;

University of Pennsylvania, Philadelphia; \$5,500 to enable the university to develop work on science in American civilization in connection with its general offering in that field;

State Historical Society, Madison, Wisconsin; \$5,000 for expenses in connection with two symposia on "The American Indian in Contemporary Civilization" and "The College and the Community" to be held in Madison during 1954;

Lars Ahnebrink, docent in literature, University of Uppsala, Sweden; \$500 to continue his studies on the works of Hamlin Garland;

University of Lund, Sweden; \$3,000 for the acquisition of books and materials in American studies;

Professor Sigmund Skard, University of Oslo, Norway; \$1,000 to visit European centers of American studies;

J. R. Pole, Princeton University, New Jersey; \$450 to continue his research in the United States on the extension of suffrage during the early period of American history, prior to taking up his duties as assistant lecturer in American history at University College, London, England.

NEAR EASTERN STUDIES

GRANTS IN AID

For the use of the officers of the Division of Humanities; \$3,000 for the expenses of a meeting in the Near East to plan a proposed conference on the interpretation of Arab tradition, thought, and outlook;

Turkish American University Association, Istanbul; \$1,355 for a conference on the interpretation of present day Turkish life and problems;

Kenneth Cragg, Department of Arabic and Islamic Studies, Hartford Seminary Foundation, Connecticut, and editor, *Muslem World*; \$3,000 to visit Turkey, Lebanon, Syria, Iraq, Jordan, Egypt, and possibly North Africa, to gain a direct acquaintance with contemporary Muslem thought and movements;

Middle East Institute, Washington, D. C.; \$2,000 toward the expenses of the preparation of Volume One of the work on *Law in the Middle East*;

University of Toronto, Canada; \$3,400 to enable Professor John W. Wevers to visit the Near East to gain a direct acquaintance with contemporary Muslem thought and movements;

Iraqi Ministry of Education; \$3,000 to enable Dr. Nasir Hani of the ministry to visit centers of Near East studies in the United States;

American University of Beirut, Lebanon:

\$3,000 to enable Anis Frayha, associate professor of Semitics, to study linguistics in the field of Arabic in Great Britain.

Professor Nabih A. Faris, director, Arab studies; \$575 to gain a direct acquaintance with the organization of area studies in American and Canadian universities;

Oxford University, England:

Delegates of the Press; 1,940 Egyptian pounds (about \$5,820) to assist Professor K. A. C. Creswell in the further preparation of the fourth volume of his work on Muslem architecture;

Geoffrey Lewis, lecturer in Turkish; \$2,000 to enable him to visit Turkey to gain direct acquaintance with contemporary thought and movements in that country;

Professor H. A. R. Gibb, St. John's College; \$350 to gain a direct acquaintance with contemporary thought and movements in Iraq.

SOUTH ASIAN STUDIES

GRANTS IN AID

Deccan College, Poona, India:

44,500 rupees (about \$9,800) for preliminary studies and a conference on Indian language problems and research;

\$500 for the purchase and shipment of a tape recorder to be used in the study of Indian languages by Oscar Chavarria-Aguilar and the Postgraduate and Research Institute;

\$2,500 to selected American consultants for guidance in planning future research on South Asian languages;

Library of Congress, Washington, D. C.; \$600 for the completion of a bibliography on recent Indian history;

London School of Economics and Political Science; \$1,000 to enable Marian W. Smith to make a preliminary study of the attitudes toward violence and nonviolence which influence social practice in India and Pakistan.

FAR EASTERN STUDIES

KYOTO UNIVERSITY

KOREAN ARCHAEOLOGY

Most of our information on the early periods of Korean history comes from archaeological sources, since there are few written records dating from before the thirteenth century A.D. Unfortunately, many of the valuable historical materials in the possession of the National Museum of Korea in Seoul were lost during the Communist invasion in 1951.

There is, however, a large collection of records and documents pertaining to archaeological investigations in Korea at Kyoto University in Japan. These materials were gathered by Sueji Umehara, professor of archaeology at Kyoto, who was engaged in research in Korea for more than thirty years. Professor Umehara now plans to organize these records and make them available to historians throughout the world. Three complete sets of documents are to be prepared: one for presentation to the National Museum of Korea, one for a suitable public institution in the United States, and one for a similar organization in Japan. Two assistants from the National Museum will be appointed to work with Professor Umehara; they will thus gain invaluable experience for resuming archaeological investigations in Korea when conditions in that country permit. In support of this project, The Rockefeller Foundation in 1953 appropriated \$10,500 to Kyoto University, available over the next three years.

GRANTS IN AID

China Foundation for the Promotion of Education and Culture, New York; \$10,000 for expenses of the Institute of History and Linguistics of the Academia Sinica in erecting storage facilities for its archaeological and historical materials at Yang Mei, on condition of an appropriation by the China Foundation of \$5,000 for the same purpose;

Library of Congress, Washington, D. C.; \$9,000 to enable T. L. Yuan to complete the supplement to Cordier's *Bibliotheca Sinica*;

Yale University, New Haven, Connecticut; \$4,000 for the completion of a critical survey of modern Chinese literature by Dr. Chih-tsing Hsia;

Dr. Li Chi, National Taiwan University, Taipeh; \$3,500 for a visit to the United States and Mexico to renew associations with American scholars and to observe new methods and programs in the teaching of history;

Anders Kristian Jensen, missionary; \$1,800 to revisit Korea to survey present needs for the development of educational and community leadership;

Cambridge University, England; \$1,800 to enable P. van der Loon to prepare a Union List of Chinese publications, *Ts'ung-shu*, in British and Continental collections;

Toyo Bunko (Oriental Library), Tokyo; 324,000 yen (about \$1,000) for the expenses of a seminar on recent Chinese history.

History

THE ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS

PROFESSOR AND MRS. ARNOLD TOYNBEE

Professor Arnold Toynbee's *A Study of History* is widely recognized as one of the most challenging historical works of our time. Six of the ten volumes of this work have been published, and the remaining four are scheduled to appear

shortly. Professor and Mrs. Toynbee are now contemplating a revision of *A Study of History*, including a complete re-writing of the section on the New World. In order to acquire a firsthand knowledge of the remains of the ancient Aztec, Mayan, and Incan civilizations, they plan to visit the sites of these cultures in Central and South America. Toward the expenses of these trips, The Rockefeller Foundation in 1953 appropriated \$12,000 to The Royal Institute of International Affairs in London, available through December, 1956.

YALE UNIVERSITY

CONTEMPORARY HISTORY

Of great importance for contemporary thought is the development of increased understanding of the fundamental social and cultural changes which have taken place since the beginning of the twentieth century. In an effort to clarify the many significant developments of the past fifty years, Professor Ralph Turner of Yale University has been preparing a study of the characteristics of this period. He is devoting special attention to analyzing a series of factors which he considers to be particularly indicative in the historical process; these include population, wealth, power, learning, and orientation. The Rockefeller Foundation has in the past contributed over \$30,000 toward Professor Turner's research; support of his work in contemporary history has now been renewed with a grant of \$10,000.

INDIAN COUNCIL OF WORLD AFFAIRS

RECENT INDIAN HISTORY

In 1947, after nearly two centuries of British rule, India and Pakistan attained political autonomy. The years immediately preceding and following independence were crucial ones for the 400,000,000 people of the great subcontinent. To their leaders fell the momentous tasks of negotiating the

transfer of power from the British authorities, of welding the diversified elements of the population into a unified whole, and of evolving an effective system of self-government. The events of this period of transition are bound to affect the future not only of India and Pakistan, but of all Asia as well.

Knowledge of this important phase of Indian history is, unfortunately, far from complete. Few scholarly attempts have been made as yet to analyze and interpret the complex political developments of these years. One of the greatest drawbacks has been the paucity of reliable documentary materials, which the governments and individuals concerned have been reluctant to release.

A history of the period from 1941 to 1952 is now planned by V. P. Menon. While not a professional historian, Mr. Menon is unusually qualified to undertake a work of this nature by virtue of his intimate personal knowledge of the transitional period. From the late thirties until his retirement in 1952, Mr. Menon held a series of important governmental posts. He served successively as an official under British rule, as a member of Lord Mountbatten's staff during negotiations, and as a principal assistant to Sardar Patel, deputy prime minister of India, after 1947. In recognition of his services, he was appointed one of the first state governors of India.

Mr. Menon plans to present his account of Indian affairs in two volumes. The first is to cover the transfer of power from the British to the Indian government; the second will deal with the problems involved in forming a unified nation from the hundreds of heterogeneous political units into which India was divided. Mr. Menon will be aided in his research and writing by three well-qualified historians; one of these is to be selected from India, one from the United States, and one from Great Britain. In addition to providing an insight into current and future developments in India, the project will thus introduce two Western scholars to the little known field of South Asian history.

In support of Mr. Menon's proposed history, The Rockefeller Foundation has made a two-year grant of \$43,890 to the Indian Council of World Affairs, which is sponsoring the project.

MCGILL UNIVERSITY

W. L. MACKENZIE KING

The death of the Honorable William Lyon Mackenzie King in 1950 brought to a close one of the most brilliant public careers of our times. As prime minister of Canada for over twenty years, Mr. King guided his country through a period of unprecedented internal expansion, and played a prominent role in shaping the present-day British Commonwealth of Nations. As Canada's representative in international affairs, he earned the gratitude of free peoples everywhere for his vigorous leadership in the struggle against totalitarianism.

Following his retirement from public life in 1948, Mr. King began to organize his personal papers and diaries preparatory to writing an autobiography. At the same time, the staff of the Dominion Archives in Ottawa undertook the classification of public papers and correspondence relating to his prime ministry. In support of these two projects under the personal supervision of Mr. King, The Rockefeller Foundation in 1949 appropriated \$100,000 to McGill University, which accepted administrative responsibility for the grant.

At the time of Mr. King's death, Professor R. McGregor Dawson of the University of Toronto was asked to continue preparation of his biography. Collaborating with him has been F. A. McGregor, who was authorized under the terms of Mr. King's will to serve as one of his literary executors. It is now planned to facilitate preparation of the biography by enlisting the services of three additional writers, who will prepare monographs on certain aspects of

the former prime minister's life. Toward the completion of these studies of the public and private life of William L. Mackenzie King, the Foundation in 1953 made a new grant of \$70,000 to McGill University, available through 1955.

NEW SCHOOL FOR SOCIAL RESEARCH

RECENT GERMAN HISTORY

The religious institutions of Germany, and the moral and politico-social climate which they reflect, have undergone drastic reorganization and reorientation during the past twenty years. Religion has played an especially great and often fateful role in German history since the Protestant-Catholic cleavage of the sixteenth and seventeenth centuries; its influence is no less strong today, although the composition of its various factors has undergone change.

These changes, and their meaning in terms of the present-day problems of Germany, are the object of study in a research program undertaken by Professor Carl Mayer, of the New School for Social Research, New York. Professor Mayer, a specialist in the sociology of religion, has written on the situation of German Protestantism at the end of the war and on the Vatican, and is working on a sociology of the American churches. In the new investigation he will study the organization, doctrine, and social and political attitudes of the major religious groups of Germany, with especial attention to the changes which have taken place since World War II. In so far as information is available, the religious situation in the Soviet Zone will be included, but the major emphasis will be on Western Germany. There will also be an appendix on Judaism in Germany today.

In support of Professor Mayer's study The Rockefeller Foundation has made a grant of \$50,500, available through 1955, to the New School for Social Research.

NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH,
LONDON

DE TOCQUEVILLE PAPERS

The writings of Alexis de Tocqueville, one of the foremost historians and political theorists of the nineteenth century, have been known primarily through the edition of his works published in 1864. In view of the extensive information on de Tocqueville's life and thought which has become available since that time, Peter Mayer began several years ago to prepare a new and more complete edition of his writings. Mr. Mayer has been particularly fortunate in having access to the de Tocqueville family papers, which the present Comte de Tocqueville has permitted him to use. The French Ministry of Foreign Affairs has cooperated by opening to him the records of the great historian's public career, and British institutions have furnished hitherto unpublished correspondence between de Tocqueville and prominent English scholars, philosophers, and statesmen of his day. Mr. Mayer has also received valuable guidance and support from an international advisory committee composed of British and French scholars. The Centre National de la Recherche Scientifique and the Direction des Arts et des Lettres have contributed materially to this project through grants totaling 3,350,000 francs, and by supplying working quarters. Publication has been undertaken by Gallimard.

The revised edition of de Tocqueville's works is expected to comprise 16 volumes. Four of these, *De la Démocratie en Amérique* in two volumes, and *L'Ancien Régime*, also in two volumes, have already appeared. The correspondence between de Tocqueville and Reeve, Mill, and Gobineau is scheduled for publication in the near future. Work is also under way on several of the remaining volumes, which have been assigned to subeditors for preparation.

In the past The Rockefeller Foundation has contributed a total of \$17,000 toward Mr. Mayer's project, which is

sponsored by the National Institute of Economic and Social Research in London. In 1953, a new four-year grant of \$17,500 was made to the institute to enable Mr. Mayer to bring to completion his editorial revision of the writings of Alexis de Tocqueville.

GRANTS IN AID

Jamia Millia Islamia, India, (college); \$10,000 to enable Dr. S. Abid Husain, principal, to complete a cultural history of recent India and a comparative study of the social and moral philosophies of Gandhi and Nehru;

Sweet Briar College, Virginia; \$6,640 for studies by Dr. Gerhard Masur in recent intellectual history;

University of Hamburg, Germany; \$5,500 to enable Professor Egmont Zechlin to do research in history in the United States;

Columbia University, New York; \$4,000 to enable Professor J. Bartlett Brebner to continue, in Great Britain, his study of the industrialization of British society, during the academic year 1954-55;

State University of Iowa, Iowa City; \$4,000 to enable Professor William O. Aydelotte, chairman, Department of History, to complete his research on the British House of Commons from 1841-47;

Oxford University, England:

\$3,400 to enable Asa Briggs to visit the United States to continue his research on urban history;

\$3,300 to enable G. N. Clark, Oriel College, to visit the United States to consult with American scholars and to carry on his historical research;

Institute of Historical Research, University of London; \$3,000 for the collection of materials pertaining to British Parliamentary debates during the period 1754-1784;

Professor Hans Herzfeld, Free University of Berlin; \$1,500 to visit Washington, D. C. and Stanford University for research in German militarism;

University of Toronto, Canada; \$2,000 to enable Professor D. G. Creighton to complete his biography of Sir John A. Macdonald;

Hebrew University, Jerusalem, Israel; £700 (about \$2,100) to enable Professor Richard Koebner to continue his research in England on *Studies in the History of Political and Historical Concepts: Their Rise and Influence in Public Life*;

Professor Ayden Sayili, Ankara, this year a visiting professor with the Department of Oriental Studies, University of Pennsylvania; \$525 for additional visits with other scholars before returning to Turkey;

Philosophy

UNIVERSITY OF CHICAGO

PROFESSOR CHARLES MORRIS

Contemporary philosophical thought has been significantly enriched by the contributions of Professor Charles Morris of the University of Chicago. Professor Morris has been concerned principally with formulating a general theory of signs and a philosophy of values which takes into account the comparative strength of ideals in different cultures. The Rockefeller Foundation has assisted his work for the past decade through grants in aid totaling \$16,250; this year a three-year grant of \$21,000 was made to the University of Chicago to enable Professor Morris to elaborate more fully his views on values and the role of signs in human behavior.

Professor Morris expounded the theory of values in two major works, *Paths of Life* and *The Open Self*. In these volumes he described and classified the various patterns of

belief and motivation which exist in contemporary society. He has since collected extensive factual material on the value patterns of young people in China, India, and Japan. The next step is to analyze these data and to collate them with his earlier works. Professor Morris subsequently plans to incorporate this information into a comparative study of the value patterns of youth in several Eastern and Western cultures. This study will be of particular value in clarifying the basic similarities and differences between oriental and occidental civilizations.

In 1946 Professor Morris published *Signs, Language, and Behavior*, one of the most stimulating of recent works in the field of language and symbolism. He now wishes to follow *Signs, Language, and Behavior* with a volume devoted to demonstrating the central role played by symbolic processes in the origin and maintenance of the human personality, in the social system, and in culture. The literature of psychology, sociology, and anthropology contains valuable data on this subject which have not as yet been brought together in a comprehensive study. This Professor Morris proposes to do, in the belief that further exploration of the theory of signs will lead to a fuller understanding of its importance.

GRANTS IN AID

Harvard University, Cambridge, Massachusetts:

\$10,000 for the preparation for publication of the remaining unpublished papers of the American philosopher, Charles S. Peirce;

\$2,000 to enable Professor John Wild, Department of Philosophy, to plan a cooperative project for the critical study of dialectical materialism directed toward the formulation of constructive philosophical alternatives;

Lawrence College, Appleton, Wisconsin; \$7,500 to enable Professor Herbert Spiegelberg to write a book on phenomenology;

University of Delhi, India; 25,000 rupees (about \$5,500) in support of A. S. Ayyub for work on the philosophy of values, over a two-year period;

Tufts College, Medford, Massachusetts; \$8,750 to enable Professor George B. Burch to study Vedanta philosophy in India;

University of Pennsylvania, Philadelphia; \$2,500 toward the expenses of making and bringing to the university's library microfilms of the unpublished manuscripts of the philosopher Gottfried Leibniz, now located at the Niedersaechsische Landesbibliothek, Hannover, Germany;

Yale University, New Haven, Connecticut; \$3,000 to enable Professor Paul Weiss to study new philosophical developments in Israel, India, and Japan;

University of Mysore, India:

\$3,900 to enable Professor A. C. Deve Gowda, head, Teachers Training College, to visit the United States for studies in educational philosophy;

\$750 to enable Professor N. A. Nikam, to visit philosophical centers in the eastern and midwestern United States;

Professor G. P. Malalasekera, University of Ceylon; \$750 to visit universities in the United States in connection with studies of contemporary Buddhism;

Dr. Leopoldo Zea, National Autonomous University of Mexico, Mexico City; \$600 to gain, during a month in Europe, a direct acquaintance with current work in the philosophy and history of ideas;

University of Geneva, Switzerland; 7,500 Swiss francs (about \$1,800) for preliminary studies in genetic epistemology, under the direction of Professor Jean Piaget;

Institute for Advanced Study, Princeton, New Jersey; \$1,000 for a conference to discuss the broader training of philosophers in the social sciences;

American Philosophical Association, Princeton, New Jersey:

Eastern Division; \$500 for the advance preparation and circulation of conference materials;

Western Division; \$600 for the expenses of a conference of the committee to advance original work in philosophy;

Professor C. J. Ducasse, Brown University, Providence, Rhode Island; \$250 for travel and living expenses when addressing the meetings of the Western Conference on the Teaching of Philosophy, held in St. Louis, Missouri, from April 30 through May 2.

Literature

STATE UNIVERSITY OF IOWA

FELLOWSHIPS IN LITERATURE

The State University of Iowa was one of the first institutions of higher learning in America to include work in creative writing as part of its established curriculum. Over the years a graduate program in writing has developed which attracts young authors from all 48 states and several foreign countries. More than fifty books by students in the program have been published, and their works appear regularly in many national magazines and literary reviews.

In the course of this work, members of the Iowa faculty have developed an extensive knowledge of promising writers in all parts of the United States and particularly in the Midwest. A selection committee composed of Professor Paul Engle, director of Iowa's creative writing project, and other faculty members concerned, will now be responsible for the annual award of four fellowships in the fields of fiction, poetry, and drama. Fellows, while not required to reside at the university, will be free to consult with members of the committee about their work. To enable the State University of Iowa to award these fellowships, The Rockefeller Foundation has appropriated \$40,000 for use during the next three years.

UNIVERSITY OF THE SOUTH
FELLOWSHIPS IN LITERATURE AND CRITICISM

The University of the South is the home of the oldest of American literary quarterlies, *The Sewanee Review*. Leading contemporary authors, including William Faulkner, Katherine Anne Porter, Robert Penn Warren, and Eudora Welty, among many others, have in the past been associated with the *Review*. By consistently presenting fiction, poetry, and criticism of the highest caliber, it has won the esteem of writers and critics throughout the English-speaking world. At the same time the *Review* has played an active role in encouraging literary activity in the South.

A fellowship program similar to the one planned at Iowa has now been drawn up by Monroe K. Spears, editor of *The Sewanee Review*, and others associated with the journal. Nine awards are to be made over the next three years to individuals whose work in poetry, fiction, and criticism merits encouragement. A committee headed by Mr. Spears will choose the fellows and offer personal guidance in their work. In support of this program, the Foundation has appropriated \$45,000 to the University of the South, available through 1956. This grant includes a modest contribution toward the expenses of *The Sewanee Review*.

MEXICAN-AMERICAN CULTURAL INSTITUTE, MEXICO CITY
CREATIVE WRITING PROJECT

Another grant to encourage literary activity, this time in Mexico, was made this year for the creative writing project sponsored by the Mexican-American Cultural Institute in Mexico City, D.F. This program was initiated in 1951 under the direction of Miss Margaret Shedd and a supervisory committee composed of distinguished Mexican scholars and authors. In 1952, the institute assumed responsibility for this Writing Center. The aims of the project are similar

to those of the fellowship programs at Kenyon College, the State University of Iowa, and the University of the South: to encourage promising young writers by providing them with financial aid and professional guidance.

In the past two years, with funds made available by the Foundation, nine fellowships in creative writing and six research grants have been awarded. While the writing grants have all been held by young Mexican authors, the research fellowships have been awarded to both American and Mexican writers for joint studies of literary activity in Mexico.

Supervision is provided for the grantees through a series of biweekly seminars. Here the novel, play, poem, or research project under way is first discussed with the program director and then with the group of fellows as a whole. In addition, qualified persons not directly connected with the creative writing project are invited to contribute their suggestions and criticism at these sessions.

The success of the program has become evident. Several plays and short stories written by the fellows have been published and well received, while other fellows are still engaged in projects which show promise.

The Rockefeller Foundation has now renewed its support of the Writing Center with an appropriation of \$28,020 for the coming year. This grant is to be used to set up four fellowships in creative writing and three for further research into literary activity in Mexico. Three additional awards, all for creative writing, will be financed jointly by Foundation funds and contributions from Mexican sources. The fellowships this year are open to young writers from both the United States and Mexico.

GRANTS IN AID

Friends of European Thinking Inc., Offenburg, Baden, Germany; \$7,000 for expenses connected with preparing a special edition of the journal *Merkur* dealing with young German intellectuals and writers;

University of Wisconsin, Madison; \$3,300 to enable Miss Ruth Herschberger to continue as playwright in residence with the Wisconsin Idea Theatre;

Buddhadeva Bose, Indian poet and critic; \$3,550 to enable him to gain direct acquaintance with writers and literary critics in the United States and Europe;

Museum of Modern Art, New York; \$2,500 to provide for the preparation by Lloyd Frankenberg of a critical bibliography of available phonograph recordings of poetry;

Robert C. North, editor, *Pacific Spectator*: \$2,500 to study contemporary writing and the literary scene in India;

University of Chicago, Illinois:

\$1,500 to enable Joseph Frank to continue his studies on the philosophical foundations of modern criticism;

\$1,800 to enable Simon O. Lesser to continue his psychological study of response to narrative art;

Professor Richard P. Blackmur, Princeton University, New Jersey; \$1,000, in addition to a 1952 grant, to establish contact with writers and scholars in contemporary literature in Europe and the Near East;

State University of Iowa, Iowa City; \$1,800 to enable Martin C. Carroll, Jr., to survey the present state of literature and literary criticism in Australia and to purchase a basic collection of works in this field for the library of the university;

Roger Lemelin, Canadian novelist; \$1,300 to visit France to gain a direct acquaintance with French writers and writing.

The Arts

LOUISVILLE PHILHARMONIC SOCIETY, INC.

COMPOSITION AND RECORDING

OF NEW WORKS BY LIVING COMPOSERS

The Louisville Orchestra has received national and international recognition in recent years for its policy of

commissioning, performing, and recording new works by contemporary composers. Prompted by its concern with modern music, the Louisville Philharmonic Society in 1948 began to invite prominent composers to create original works for performance by the orchestra. Since then some 25 new works by such composers as Paul Hindemith, Darius Milhaud, Virgil Thomson, and Heitor Villa-Lobos have been introduced at Louisville. Whenever possible, the orchestra has invited the composers themselves to be present at the premières of their works, and on many occasions the performances have been highlighted by their active participation as conductor. The readings given the pieces have earned the warm praise of the composers, music critics, and audiences, and established the Louisville Orchestra as one of the finest of America's smaller orchestras.

The experiences and successes of the past five years have indicated the larger possibilities of this policy, and the Louisville Orchestra has now embarked upon a program which is virtually unique in the annals of musical history. In the conviction that public interest in contemporary music is far greater than is generally realized, the orchestra plans to commission, perform, and record no less than 46 works annually. Each year it will choose thirty artists of proven ability to write orchestral works, and four to compose short operas. Promising students of musical composition will be given the opportunity to contribute the remaining twelve works. In addition, the commissions will be awarded on an international basis — approximately two-thirds to American composers, and the rest to artists from Europe, Latin America, and the Near East.

Beginning in January, 1954, the Louisville Orchestra will introduce one of the commissioned compositions each week during its 46-week season, retaining the work on its program for three weeks following the première. Each piece will thus be performed four times, assuring it of the repeated hearings necessary for the understanding and

assimilation of new music. To afford a ready hearing, ticket prices will be no higher than those at leading Louisville motion picture theatres.

The orchestra expects, however, to carry its program to a national and international audience through arrangements for recording the new compositions. After the orchestra has become thoroughly familiar with new works, recordings will be made on magnetic tapes which will then be made available to educational and cultural broadcasting stations throughout the world. The orchestra also intends to issue twelve long-playing records of the commissioned works each year, to be sold on a subscription basis. The more successful of the new compositions will eventually be released by a commercial firm.

Through this program the Louisville Orchestra believes that it can encourage both established and aspiring composers by providing an expanded and continuing market for their work, as well as stimulate public appreciation and enjoyment of contemporary music. It expects that its program will become self-supporting within a few years, but to assist it during the first years of operation, The Rockefeller Foundation has granted the Louisville Orchestra the sum of \$400,000, to be available in diminishing yearly amounts during the next four years.

THE CITY CENTER OF MUSIC AND DRAMA, INC.

NEW OPERA AND BALLET PRODUCTIONS

A cultural institution in which New York City has increasing reason to take pride is The City Center of Music and Drama, Inc. Formed in 1943, the City Center is a non-profit corporation, receiving no financial support from the municipal government, and is devoted to offering opera, ballet, and drama at the lowest possible prices. That there is need for such an institution is evidenced by the fact that the City Center, in only ten years, has developed its early

intermittent seasons into a year-round civic theater maintaining two permanent units, the New York City Ballet and the New York City Opera Company. A third group, known as the New York City Theatre Company is in the process of formation.

The high artistic quality of the City Center's performances, and its courage in presenting modern and unfamiliar works, have won for it increasing recognition. It is estimated that the City Center, now under the general direction of Lincoln Kirstein, enjoys a loyal and enthusiastic audience of over a half million people yearly, attracted not only by its reasonable admission prices, but by the excellence of its productions of contemporary and classical works.

The City Center Opera Company, which ranks second only to the Metropolitan in the United States, is particularly noted for its introduction of modern operas and revivals of the seldom-heard works of old masters. It has also received acclaim for its fine presentations of the standard repertory. The company has given two operas their world premières, and others, including Bartok's *Bluebeard's Castle* and von Einem's *The Trial*, their first performances in America. Two of the most recent and successful revivals were Rossini's *La Cenerentola*, which had not been heard in New York for over a century and a quarter, and Humperdinck's *Hansel and Gretel*, which made its first appearance in over fifteen years.

The New York City Ballet Company has built an enviable reputation on its productions of new works by twentieth century composers. Of the 22 ballets presented during the 1953 spring season, twenty were created during the past quarter century; the remaining two, Tschaikovsky's *Swan Lake* and Stravinsky's *Firebird*, were completely redesigned by George Balanchine, the company's talented artistic director. Some of the leading composers and choreographers of our day, including Igor Stravinsky, Leonard

Bernstein, Sir Arnold Bax, Benjamin Britten, Aaron Copland, Jerome Robbins, Frederick Ashton, and Mr. Balanchine, have produced original works for the company's repertory. Three highly successful European tours have brought international renown to the New York City Ballet. In 1950, the company accepted an invitation to visit London and other cities in Great Britain; two years later it was again enthusiastically received, this time by audiences in major cities throughout Europe and Great Britain. The troupe at that time took part in the Congress for Cultural Freedom in Paris and the famed Edinburgh Festival, and, at the invitation of the United States Department of State, was one of the American representatives at the Arts Festival of Western Berlin. The company's third tour in 1953 again earned high praise from both critics and audiences. In Rome, it was awarded the rarely presented Medal of Honor of the Civic Opera, and in Trieste, the city's Medal of Honor.

The City Center's opera and ballet companies are now firmly established as performing organizations of high artistic caliber, whose audiences are apparently eager to see and hear the new works they present. The City Center thus has an unusual opportunity to introduce new works and revivals into its repertory. The creation of entirely new productions is, however, far more expensive than the repetition of traditional works, and in spite of its distinguished record, the City Center has always been hindered in the realization of this opportunity by the slender resources with which it must operate. To aid the City Center in presenting new operas and ballets, The Rockefeller Foundation has contributed \$200,000, to be used over the next three years on a diminishing scale of \$100,000 the first year, \$60,000 the second, and \$40,000 the third year. The grant is limited to financing the initial or creative phases of production, such as the commissioning of new scores, libretti, and choreography, and the design of stage sets and costumes.

UNIVERSITY OF WISCONSIN

COMMUNITY ARTS

The University of Wisconsin in 1917 set out to encourage the people of the state to organize community projects in various branches of the arts. The General Extension Division and the College of Agriculture of the university were the original sponsors of this program, and there has always been special emphasis on reaching rural as well as urban areas. The community arts program, which includes music, drama, painting, and creative writing, now has an annual budget of over \$50,000 and employs the services of eight full-time specialists.

In 1945 the Wisconsin Idea Theatre was established as a permanent center for coordinating dramatic activity. Through its efforts there are now some 35 active community theaters in existence, and it is estimated that nearly one-third of the residents of Wisconsin have participated in or attended theatrical performances during the past five years. In music, emphasis has been placed on the quality of instruction in the schools, and on encouraging rural organizations to use music more effectively in their community gatherings. Institutes, workshops, and conferences have been set up for teachers, students, and interested adults, and many thousands of school children have been taught the art of good singing by the "Journeys in Musicland" radio program. Widespread interest has also been shown in the rural art program, which began 13 years ago, and at the present time 12 regional art exhibits, two state-wide drawing and painting shows, and one state-wide crafts exhibit are held annually. Some 90,000 school children participate in the "Let's Draw" program sponsored by the Wisconsin School of the Air. The university's most recent venture, in the field of creative writing, began in 1948 with the organization of the Wisconsin Rural Writers' Association. The association now has nearly 2,000 members, and its yearly contests attract hundreds of entries.

In 1952 the University of Wisconsin decided to undertake a survey of its experiences in community arts work during the past forty years. With the help of a \$10,000 grant in aid from The Rockefeller Foundation, the university began to analyze the history of the arts program and to make a detailed study of its impact on a typical Wisconsin community. Substantial progress has been made in both phases of this project, and now, with the aid of a 1953 Foundation grant of \$10,000, it is to be continued for a second year. The purpose of the survey is to clarify the past achievements of the arts program and to provide a guide for future activities. An additional sum of \$5,000 was appropriated to the university to enable two of the program's directors to observe community arts work in England. The resulting exchange of information and ideas with British officials may prove to be of benefit in the development of community arts programs on both sides of the Atlantic.

BALLET SOCIETY, INC.

DANCE NOTATION BUREAU

The dance, probably the oldest of the arts, has been the last to develop a practicable system of notation. Thus, while the work of most creative artists has been preserved through musical scores, paintings, books, and manuscripts, the efforts of choreographers and dancers have seldom been passed on to posterity. It is possible, for example, to reproduce the music, costumes, and scenery of famous ballets of the past almost exactly as the artist intended; the actual movements of the dancers, on the other hand, are practically unknown to us.

Although the desirability of recording dance movements has long been recognized, the first usable system of notation was devised only 25 years ago by Rudolf von Laban. The Laban system, which has won widespread acceptance, can be used to describe with precision the choreography of

many different dances, ranging from classical ballet to folk dancing.

While the Laban system provides a sound basis for recording dance movements, it needs to be further elaborated and standardized. This Miss Ann Hutchinson, director of the Dance Notation Bureau, is planning to do by preparing a textbook for the use of choreographers, dancers, and teachers. In support of her work the Foundation has made a grant in aid of \$4,800 to Ballet Society, Inc., which has accepted administrative responsibility for the project.

GRANTS IN AID

Centre Européen de la Culture, Geneva, Switzerland; \$10,000 toward the expenses of an international conference of composers, critics, and performing artists to be held in Rome in 1954;

International House of Japan, Inc., Tokyo; 1,432,220 yen and \$2,325 (about \$6,500) toward travel and other expenses of a visit to Japan by Dr. and Mrs. Walter Gropius;

Barnard College, New York; \$3,240 for the purchase of basic equipment to be used for creative research in the field of electronic music;

Muslim University, Aligarh, India; \$1,500 for the purchase of art reproductions, musical recordings, and other materials needed to develop art education;

Miss Luce Turnier, Port-au-Prince, Haiti; \$150 to purchase materials for her work in painting while a fellow of the French government, pursuing her work in France.

General Education

HAVERFORD COLLEGE

GENERAL EDUCATION

Haverford College, one of the leading liberal arts colleges in the United States, has recently been re-examining

its curriculum in light of the changing needs of its student body. Like many other American institutions of higher learning, Haverford has been increasingly concerned with the problem of educational over-specialization. To enable fourth-year students concentrating in different fields to exchange information and ideas, Haverford is now planning to organize a senior seminar. The senior class is to be divided into small groups, each including representatives of all the major disciplines, which will investigate philosophic problems of interest to all. It is anticipated that students, by pooling their knowledge in search of solutions for these problems, will gain some insight into other fields of learning and acquire a fuller understanding of the relationship between their particular field of interest and the other disciplines.

Recently Haverford has made certain important innovations in its program. The freshman English course, for example, has been revised; unusual features of the new course are that reading material used as a basis for essays and discussion sessions is primarily concerned with moral values, and that weekly papers are read and discussed in groups of three or four. An experimental program whereby juniors and seniors may work individually on special projects in their major field of study has also been introduced.

Plans have now been made for setting up independent reading courses with a minimum of faculty supervision for members of the junior and senior classes. These courses, like the special projects program already under way, seek to encourage students to assume greater responsibility for their own intellectual development. The comprehensive examinations given to all graduating students will permit the effectiveness of this program to be evaluated.

To aid Haverford College in developing an independent reading course and a senior seminar over the next three years, the Foundation in 1953 appropriated the sum of \$28,950.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

FOREIGN LANGUAGE INSTRUCTION

The development of linguistic ability among American college students has been handicapped by the limited opportunity for using a foreign language after it has been studied. Although most institutions have a minimum language requirement, students are seldom, if ever, called upon to use the language after they have satisfied this requirement. A number of colleges and organizations of language teachers have considered this difficulty, and sought, by various means, to overcome it. An experiment of particular promise is one at the Massachusetts Institute of Technology, where a special section of a required general education course is to be taught in French, with the supplementary reading material also in that language.

For some years the institute has been experimenting with the introduction of work in the humanities and social sciences in its curriculum. All freshmen are now required to take a basic course in the humanities, called *The Foundations of Western Civilization*. A complementary second-year course, *Modern Western Ideas and Values*, offers the student an option of focusing on the American or European scene. A rich literature exists in French on the topics of both years' work.

A recent survey at the institute indicated that nearly half of the freshman class would have been interested in doing their humanities work in a foreign language section, and that a substantial proportion had had sufficient previous training in French to do so. To plan the new course and collect the necessary material, the institute has appointed a new member to its faculty. During the current year, the first in the experiment, this instructor is conducting a small pilot section of volunteers from the freshman class. A full section will be formed next year and, in the meantime, materials will be collected for the extension of the plan into

the sophomore humanities course by means of another special section. In support of this project, the Foundation has made a three-year grant of \$19,300 to the Massachusetts Institute of Technology.

GRANT IN AID

Society of Friends of Leibniz College, Tübingen, Germany; \$6,000 toward the support of its work in general education.

Special Projects

HUMANITIES RESEARCH COUNCIL OF CANADA

DEVELOPMENT OF THE HUMANITIES IN CANADA

The Humanities Research Council of Canada was formed in 1943 to encourage the development of humanistic studies throughout the country. In the past decade the council, which is supported by subscriptions from the Canadian universities, has initiated important research projects, sponsored regional and national conferences of humanists, and organized local associations of laymen and scholars interested in the humanities.

The most pressing problem now facing the council is that of developing new personnel in the humanities. The rapidly expanding population and economy of Canada have created an unprecedented demand for teachers and research workers in this field. The present rate of population growth indicates that there will be a steady rise in secondary school, college, and university enrollments over the next ten years. At the same time, the services of humanists are increasingly needed by the professional and technical schools of the country in their attempts to liberalize their curricula.

In spite of the need for additional personnel in the humanities, many students with humanistic backgrounds

and inclinations are each year entering other fields of endeavor. This is due in part to the disparity between the number of fellowships available for advanced work in the humanities and those offered for studies in the natural and social sciences. For example, the Humanities Research Council was able to award fellowships totaling only \$8,000 annually, while comparable organizations for the social sciences and the natural sciences offered grants amounting to \$37,000 and \$226,000 respectively. The council is now making a particular effort to correct this imbalance, and thereby to encourage some qualified students to remain in the field of the humanities.

In support of the program of the Humanities Research Council of Canada, the Foundation has appropriated the sum of \$68,250, to be used over the next two years. This grant will be devoted to the planning and development of future council activities and to setting up predoctoral and postdoctoral fellowships in the humanities.

COLUMBIA UNIVERSITY

AMERICAN PRESS INSTITUTE

In an effort to contribute to the development of responsible and independent journalism throughout the world, the American Press Institute has in recent years enabled press leaders from various countries to meet for the discussion of mutual problems. With the aid of over \$65,000 from The Rockefeller Foundation, the institute has invited journalists from Germany and Japan to visit the United States to participate in seminars and to observe the operation of the press in this country.

A similar program of study and travel is now contemplated for journalists from Southeast Asia. In order to ascertain the special problems of the press in that part of the world, the director of the institute, J. Montgomery Curtis, spent several months in Southeast Asia in 1952.

The program now being arranged by the institute will thus be specifically designed to meet the needs of journalists from that area. In support of this project, the Foundation has appropriated \$31,880 to Columbia University for the use of the American Press Institute.

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION
BUREAUX

BRITISH UNION CATALOGUE OF PERIODICALS

A two-year grant of \$15,000 was made in 1953 to the Association of Special Libraries and Information Bureaux in London, for the completion of the British *Union Catalogue of Periodicals*. The catalogue, which is modeled on the American *Union List of Serials*, was begun in 1944 with Foundation aid. It will contain, when completed, an accurate inventory of all periodicals in the possession of about 320 British libraries, ranging from the great national, university, and public collections to specialized libraries of all kinds.

Excellent progress has been made in the past nine years. The complete holdings of the 170 largest libraries have been catalogued, information from 70 more is being incorporated, and data on the final group of 80 collections will soon be received. The task of compiling the new bibliography, however, has proven to be considerably greater than was originally anticipated. At the same time, the need for a reference work of this sort has increased materially. For example, over forty per cent of the periodicals listed in the British catalogue are not included in the American *Union List of Serials*. It will thus be a valuable tool for scholars in America as well as in Great Britain. In light of this fact, and of the increasing demand for bibliographical information in connection with research, the importance of assuring early completion of the *Union Catalogue of Periodicals* is evident.

KOREAN LANGUAGE SOCIETY

KOREAN DICTIONARY

The Korean Language Society has for many years been engaged in compiling a six-volume dictionary of the Korean language, the first complete work of this type in existence. This compendium is expected to serve as a valuable tool for Korean scholars and educators, and as the basis for needed bilingual dictionaries.

An interesting feature of the new work is its utilization of the native Korean alphabet instead of the Chinese characters in which Korean is usually written. Although this alphabet was worked out some five hundred years ago, it has never succeeded in replacing the more complicated Chinese method. In the belief that adoption of a simplified system of writing will help in combating illiteracy, and in promoting the cultural development of the country, the Korean Language Society decided to use the native alphabet for its dictionary.

Publication of the dictionary was begun in Seoul in 1947. The following year The Rockefeller Foundation contributed \$45,000 to the society for the purchase of essential materials. By June 1950, when the Korean war broke out, two volumes had been published and the remaining four were in various stages of completion. The rapidity of the Communist invasion made it impossible to get the manuscript out of Seoul; it was, instead, buried in an earthenware jar near the home of one of the society's members. When the city was retaken by the United Nations' forces, the jar was dug up and the manuscript recovered. A duplicate was quickly made and sent to the South for safekeeping. The original manuscript survived the second Communist occupation of Seoul in the same manner, but the materials provided by the Foundation and most of the stock of published volumes were lost.

The Korean Language Society plans to resume publica-

tion of its long-delayed dictionary, and in support of this project, the Foundation has made a new grant of \$33,000 to the society.

GRANTS IN AID

Brown University, Providence, Rhode Island; \$8,950 to enable Professor Abraham Sachs to work on historical and astronomical cuneiform texts, principally at the British Museum; and \$475 for the purchase of photographic equipment to be used by Professor Sachs while working at the British Museum;

University of Notre Dame, South Bend, Indiana; \$8,000 toward the studies by Professor Elie Denissoff in Russian Church history relating to Maxime le Grec;

Hebrew University, Jerusalem; \$5,000 to enable Dr. D. W. Senator, executive vice-president of the university, to visit European and American universities in connection with the planning and establishment of a new university building program;

University of the Philippines, Quezon City; \$1,500 for the purchase and shipments of books in the social sciences and humanities;

University of Saskatchewan, Canada; \$2,500 to aid Professor C. H. Andrusyshen in seeing through the press his Ukrainian-English dictionary;

M. Bashir, registrar, University of the Punjab, Lahore, Pakistan; \$500 to carry on, in the United States, a study of the administrative practices and policies of American universities;

Dr. Bruno Snell, rector, University of Hamburg, Germany; \$4,000 to visit centers of linguistic study and to observe university administration in Europe and the United States;

Professor Emile Benveniste, Collège de France, Paris; \$3,000 to develop a classification of languages through continuing studies of North American Indian languages;

Columbia University, New York; \$1,000 to enable Professor John Lotz to complete a book on language and communication;

Indiana University, Bloomington; \$2,500 to be used in planning three seminars on meaning, held at the Linguistic Institute during the summer of 1953;

University of Copenhagen, Denmark; \$3,125 for the purchase and shipment of equipment to be used in linguistic research;

Scripps College, Claremont, California; \$5,000 for the purchase of equipment in connection with experimental work on new printing techniques;

Philippine Normal College, Manila; \$7,200 for the appointment of a director of the drama program;

Ateneo Puertorriqueño, San Juan, Puerto Rico; \$2,250 toward the cost of equipment for its experimental theater;

Fund totaling \$4,000 for use by the Director of the Division for travel, equipment, materials, consumable supplies, research and miscellaneous expenses.

Other Appropriations

Other Appropriations

INTRODUCTORY STATEMENT	325
INSTITUTE OF INTERNATIONAL EDUCATION: INTERNATIONAL STUDENT EXCHANGE	325
INSTITUTE OF JUDICIAL ADMINISTRATION	326
GERMANISTIC SOCIETY OF AMERICA, INC.: SCHOLARLY PUBLICATIONS	327
MINISTRY OF EDUCATION, EGYPT: UNIVERSITY COMMISSION	327
<i>Grants in Aid</i>	328

OTHER APPROPRIATIONS

Grants which fall somewhat outside the specific divisional programs or include elements relating to more than one aspect of the Foundation's work are taken from general funds. In 1953 four appropriations and four grants in aid were of this character.

INSTITUTE OF INTERNATIONAL EDUCATION

INTERNATIONAL STUDENT EXCHANGE

The Institute of International Education was founded in 1919 to facilitate the international exchange of personnel for educational purposes. As the agency with the broadest experience in this field, the institute has been called upon increasingly to provide a variety of services for the many exchange programs which have been developed since World War II. In response to this demand, the institute established a clearing house to supply information on awards, entrance requirements, housing facilities, travel arrangements, and other subjects of interest to exchange students. The clearing house now answers more than 50,000 inquiries each year from prospective students all over the world.

In addition to its information service, the institute has assumed responsibility for administering a large number of fellowships made available by governmental and private agencies. In 1952 it handled over 4,000 of these grants: processing the applications, appointing selection committees, making travel and entrance arrangements, organizing orien-

tation courses, and planning for the guidance of grantees during their stay in this country.

Although the institute receives compensation for some of the administrative services it renders, a sizable proportion of its budget must be obtained from private individuals, corporations, and philanthropic organizations. During the past 25 years The Rockefeller Foundation and the former Laura Spelman Rockefeller Memorial together contributed more than a half million dollars toward its program. The Foundation in 1953 made a grant of \$75,000, to be used by the institute over the next three years.

INSTITUTE OF JUDICIAL ADMINISTRATION

A group of distinguished jurists headed by Arthur T. Vanderbilt, chief justice of New Jersey, has established an Institute of Judicial Administration for the purpose of investigating the rules of procedures in lower courts. The institute will undertake a systematic and continuous survey of the structure, operation, and personnel of the courts, with the aim of developing a valid science of judicial administration. An information service concerned with all aspects of judicial procedure and reform will be developed by the institute. It also plans to sponsor conferences on state, regional, and national levels to encourage the acceptance of improved administrative procedures. The publication of studies on relevant aspects of judicial administration is another phase of its program.

The Rockefeller Foundation has contributed to the establishment of the Institute of Judicial Administration with a five-year grant of \$250,000. Although the institute is an independent entity, it is located at New York University in order to take advantage of the facilities of the university and of the presence there of some of its most active members. Shelden D. Elliott, formerly dean of the Law School of the University of Southern California, has been appointed director of the new institute.

GERMANISTIC SOCIETY OF AMERICA, INC.

SCHOLARLY PUBLICATIONS

The Germanistic Society of America seven years ago initiated a program designed to supply American scholarly journals to the depleted university and research libraries of Western Germany. The society has since expended more than \$265,000 for this purpose, including funds contributed by the United States Department of State, The Rockefeller Foundation, and private individuals and organizations in both Germany and America. A special effort has been made to utilize these funds as effectively as possible, particularly by eliminating duplication. Arrangements have been made, for example, whereby each institution in Germany concentrates on collecting journals relating to particular fields of study. Through an interlibrary loan system, these materials are then made available to interested individuals all over the country.

In addition to arranging for German libraries to receive current editions of American journals, the society has attempted to furnish those issues which could not be acquired during the war years. Although most of these back issues have been located, certain important files are still incomplete. It is hoped that some of these can be obtained through dealers, and the society plans to secure microfilm copies of the rest from the Army Medical Library and the Library of Congress. To aid the Germanistic Society of America in carrying out this last phase of its program, the Foundation in 1953 contributed \$9,000.

MINISTRY OF EDUCATION, EGYPT

UNIVERSITY COMMISSION

In 1952 a special committee was set up by the Egyptian government to plan the future development of higher education in that country. To aid in implementing the recom-

mendations of the committee, a commission is to be appointed by the minister of education to study university practices and administration in the West. Eight prominent educators, selected from the faculties of the three Egyptian universities, will be invited to participate in the project. Two members of the commission will be assigned to observe institutions of higher learning in each of the four areas chosen for study, notably the United States, Great Britain, France, and Switzerland, and other Western European countries. After spending approximately four months abroad, members of the commission will come together to formulate a general report based on their experiences in the various countries visited. The Rockefeller Foundation has appropriated the sum of \$17,500 to the Ministry of Education, Egypt, toward the expenses abroad of this commission.

GRANTS IN AID

American School Foundation, Mexico City; \$10,000 as a contribution to the American School Building Fund;

Greater New York Council for Foreign Students; \$7,000 toward the cost of a study of the problems of foreign students in the New York area;

Association of American Universities; \$3,000 for the costs of printing and distributing the association's statement on *The Rights and Responsibilities of Universities and Their Faculties*;

Dr. Hifsi Timur, professor of law, University of Istanbul, Turkey; \$750 to gain a direct acquaintance with the practices and administration of American universities through visits in the Middle West.

Fellowships for 1953

FELLOWSHIPS

THE FOUNDATION'S FELLOWSHIP APPOINTMENTS are integrated with the programs of its several Divisions.

Through fellowships for postdoctoral study, the Foundation seeks to advance knowledge in a wide variety of fields in medicine and public health, the natural sciences and agriculture, the social sciences, and the humanities. The 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 in their native countries.

During 1953 a total of 321 persons held Foundation fellowships. This number includes 179 fellowships awarded in previous years and continued into 1953, as well as 142 new awards. Their distribution by Division is as follows:

	Number of fellows in 1953	Awards in 1953	Awards continued into 1953
Medicine and Public Health ¹	163	68	95
Natural Sciences and			
Agriculture	69	34	35
Social Sciences	45	19	26
Humanities	44	21	23
	—	—	—
	321	142	179

¹ The Division of Medicine and Public Health was formed in 1951 by the consolidation of the International Health Division and the Medical Sciences.

The fellows in 1953 came from 43 different countries.
Countries represented by three or more fellows were:

Argentina	3
Australia	9
Belgium	3
Brazil	33
Canada	3
Chile	11
Colombia	3
Denmark	7
Finland	8
France	16
Germany	17
Great Britain	19
India	29
Iraq	3
Italy	9
Japan	32
Lebanon	5
Mexico	5
Netherlands	3
Norway	5
Pakistan	4
Peru	8
Portugal	5
Sweden	16
Switzerland	8
Turkey	5
Union of South Africa	5
United States of America	18
Uruguay	4
Yugoslavia	3

Fellowships were also held during 1953 by individuals from the following countries: Austria (2); Ceylon (2); China (2); Costa Rica (1); Cuba (1); Ecuador (2); Egypt (1); El Salvador (2); Guatemala (1); Honduras (1); Jamaica, B.W.I. (1);

New Zealand (2); Spain (2); and from the World Health Organization (2).

The Rockefeller Foundation made available a total of \$1,000,000 for its fellowship activities during 1953, allocated for use by the Divisions as follows: Medicine and Public Health, \$400,000; Natural Sciences and Agriculture, \$300,000; Social Sciences, \$150,000; and Humanities, \$150,000. To support the fellowship program during 1954, the Foundation has appropriated \$1,025,000.

In addition to the fellowships awarded and administered directly by the Foundation, national agencies have awarded fellowships with funds contributed in 1953 and previous years by the Foundation. These agencies administered a total of 196 fellowships during 1953:

National Research Council

Medical Sciences	18
Welch Fellows	1
Natural Sciences	12
Social Science Research Council	69
Canadian Social Science Research Council	34
American Council of Learned Societies	49
National Theatre Conference	1
British Medical Research Council	12
	—
	196

Grants made in 1953 to other agencies for fellowship awards included \$345,000 to the Social Science Research Council for use over a three-year period, and Canadian \$125,000 (about \$131,250) to the Canadian Social Science Research Council, available until June 30, 1958.

Below is a listing of the individuals who in 1953 held fellowships financed and administered by The Rockefeller Foundation and awarded either by the Foundation itself or by the British Medical Research Council. The six fellowships awarded during 1953 by the BMRC have been included in

this listing because the fellows received guidance and supervisory assistance from Foundation fellowship advisers.

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 division, institution with which fellow was affiliated when appointed, principal countries of fellowship study, and dates of fellowship.

- AGARWAL, INDRA PRAKASH (India)** b. 1924. M.B.B.S., Med. Coll., Lucknow, 1946. Anatomy (DMPH). Appointed from Gajra Raja Med. Coll., Gwalior, Madhya Bharat. *Place of Study:* U.S.A., 1953-.
- AGARWAL, SOMANLAL (India)** b. 1924. M.D., Agra Univ. 1951. Pharmacology (DMPH). Appointed from Sawai Man Singh Med. Coll., Jaipur. *Place of Study:* U.S.A., 1953-.
- AHMAD, MUKHTARUD DIN (India)** b. 1924. Ph.D., Muslim Univ., Aligarh, 1951. Near Eastern Studies (DH). Appointed from Muslim Univ. *Place of Study:* England, 1953-.
- ALICE, FULVIO JOSÉ (Brazil)** b. 1913. D.V.M., National School of Vet. Med., Rio de Janeiro, 1938. Veterinary Medicine (NSA). Appointed from Inst. of Biology, Bahia. *Place of Study:* U.S.A., 1953.
- ALLARDT, ERIK ANDERS (Finland)** b. 1925. Dr.pol., Univ. of Helsinki 1952. Sociology (DSS). Appointed from Univ. of Helsinki. *Place of Study:* U.S.A., 1953-.
- ALLEN, WILLIAM SIDNEY (England)** b. 1918. Ph.D., Cambridge Univ. 1949. Language, Logic, and Symbolism (DIL). Appointed from Univ. of London. *Place of Study:* U.S.A., 1953.
- ALVI, F. R. M. (Pakistan)** b. 1916. M.Sc., Gov't. Coll., Lahore, 1938. Chemistry—Food & Drugs (DMPH). Appointed from Inst. of Hygiene & Public Health, Lahore. *Place of Study:* U.S.A., 1953-.
- ANDERSON, JOHN RUSSELL (Great Britain)** b. 1918. M.B., Ch.B., Univ. of St. Andrews 1942. Pathology (BMRC). Appointed from Univ. of Glasgow. *Place of Study:* U.S.A., 1953-.
- ARAUJO, JOSÉ EMILIO GONÇALVES (Brazil)** b. 1922. Agron. Eng., Rural Univ., Rio de Janeiro, 1945. Agriculture (NSA). Appointed from National School of Agron., Pelotas. *Place of Study:* U.S.A., 1953-.
- VAN ARKEL, DIRK (Netherlands)** b. 1924. Ph.D., Univ. of Leiden 1952. History (DH). Appointed from The Netherlands. *Place of Study:* France, 1953-.
- BACCHI, OSWALDO (Brazil)** b. 1916. Agron. Eng., Luiz de Queiroz School of Agric., Piracicaba, 1936. Agriculture (NSA). Appointed from Agron. Inst., Campinas. *Place of Study:* U.S.A., 1953.

- BARBER, HORACE NEWTON (Australia) b. 1914.** Ph.D., Univ. of London 1942. Biology (NSA). Appointed from Univ. of Tasmania. *Place of Study:* U.S.A., 1953-.
- BARROS DE ANDRADE, ODETE (Brazil) b. 1918.** Nursing Dipl., Univ. of São Paulo 1950. Public Health Nursing (DMPH). Appointed from Univ. of São Paulo. *Place of Study:* U.S.A., Canada, 1953-.
- BASU, AJIT KUMAR (India) b. 1912.** M.B.B.S., Calcutta Med. Coll. 1936. Surgery (DMPH). Appointed from Nilratan Sarkar Med. Coll., Calcutta. *Place of Study:* U.S.A., 1953.
- BEGUM, KHURSHID (Pakistan) b. 1924.** M.B.B.S., Punjab Univ. 1948. Anesthesiology (DMPH). Appointed from Lady Aitchison Hosp., Lahore. *Place of Study:* England, 1953-.
- BELTRAMI, DANIELE (Italy) b. 1915.** Libero Docenza, Univ. Inst. of Econ. and Comm., Venice, 1951. Economic History (DSS). Appointed from Univ. Inst. of Econ. and Comm. *Place of Study:* U.S.A., 1953-.
- BONNER, JOHN TYLER (U.S.A.) b. 1920.** Ph.D., Harvard Univ. 1947. Biology (NSA). Appointed from Princeton Univ. *Place of Study:* France, 1953.
- BROOKES, RALPH HERBERT (New Zealand) b. 1924.** B.Sc.Econ., London School of Econ. and Polit. Sci. 1949. Political Science (DSS). Appointed from Victoria Univ. Coll., Wellington. *Place of Study:* U.S.A., 1953-.
- BROWN, JAMES RUSSELL (England) b. 1919.** B.A., Oxford Univ. 1952. Religion (DH). Appointed from Hebrew Union Coll., Cincinnati. *Place of Study:* U.S.A., 1953-.
- BURGOS, MARIO HECTOR (Argentina) b. 1921.** M.D., Univ. of Buenos Aires 1948. Physiology (DMPH). Appointed from Inst. of Biol. and Exper. Med., Buenos Aires. *Place of Study:* U.S.A., 1953-.
- CAPODIECI, GIUSEPPE (Italy) b. 1925.** Dr. in Econ. and Commerce, Univ. of Catania 1948. Economics (DSS). Appointed from Italian Commercial Bank, Rome. *Place of Study:* U.S.A., 1953-.
- CASTRO ESTRADA, RUBEN (Mexico) b. 1918.** M.S., Iowa State Coll. 1946. Agriculture (NSA). Appointed from Antonio Narro Coll. of Agric., Saltillo. *Place of Study:* U.S.A., 1953-.
- CASTRONOVO, ALFONSO JORGE PEDRO (Argentina) b. 1917.** Agron. Eng., National Univ. of La Plata 1944. Agriculture (NSA). Appointed from Inst. de Fitotécnia, Castelar. *Place of Study:* U.S.A., 1953-.
- CERRATE VALENZUELA, ALFONSO (Peru) b. 1925.** Graduated from National School of Agric., La Molina 1950. Agriculture (NSA). Appointed from National School of Agric. *Place of Study:* U.S.A., 1953-.
- CHAVARRIA-AGUILAR, OSCAR L. (U.S.A.) b. 1922.** Ph.D., Univ. of Pennsylvania 1952. Indian Studies (DH). Appointed from Social Sci. Research Council. *Place of Study:* India, 1953-.
- CREMER, CARLOS LUIZ (Brazil) b. 1926.** Agron. Eng., School of Agron., Univ. of Rio Grande do Sul, Pelotas, 1948. Agriculture

- (NSA). Appointed from Forage Exper. Station, Vacaria. *Place of Study:* U.S.A., 1953-.
- DAHLSTRÖM, EDMUND FREDERIK TAYLOR (*Sweden*) b. 1922. Ph.D., Univ. of Stockholm 1952. Sociology (DSS). Appointed from League for Social and Econ. Studies, Stockholm. *Place of Study:* U.S.A., 1953-.
- DE LOURDES RAMOS DOS SANTOS, MARIA (*Portugal*) b. 1929. Dipl., Professional School of Nursing, Lisbon, 1952. Nursing Administration (DMPH). Appointed from Professional School of Nursing, Portuguese Oncological Inst., Lisbon. *Place of Study:* U.S.A., Canada, 1953-.
- DEL RÍO Y SEPÚLVEDA, FERNANDO (*Cuba*) b. 1916. B.S.A., Univ. of Puerto Rico, Río Piedras, 1938. Agriculture (NSA). Appointed from Tech. Cooperation Program, Havana. *Place of Study:* U.S.A., 1953-.
- DJAPARIDZE, DAVID (*France*) b. 1919. Dipl., Ecole des Langues Orientales, Paris. Slavic Studies (DH). Appointed from Ecole des Langues Orientales. *Place of Study:* U.S.A., 1953-.
- DOUGHAN, ZAHIA (*Lebanon*) b. 1911. License in Educ., Inst. of Educ., Cairo, 1939. Philosophy (DH). Appointed from Maqassis Islamiyan, Beirut. *Place of Study:* U.S.A., 1953-.
- DOVRING, FOLKE (*Sweden*) b. 1916. Ph.D., Univ. of Lund 1947. Agrarian Economics (DSS). Appointed from Univ. of Lund. *Place of Study:* Italy, 1953-.
- EDELMAN, JEFFREY (*England*) b. 1927. Ph.D., Univ. of Sheffield
1950. Biology (NSA). Appointed from Imperial Coll., London. *Place of Study:* U.S.A., 1953-.
- ENGELL, HANS CHRISTIAN EMIL (*Denmark*) b. 1920. M.D., Univ. of Copenhagen 1953. Surgery (DMPH). Appointed from Univ. of Copenhagen. *Place of Study:* U.S.A., 1953-.
- EPSTEIN, BERNARDO (*Uruguay*) b. 1916. D.V.M., Fac. of Vet. Med., Montevideo, 1939. Veterinary Medicine (NSA). Appointed from Inst. of Animal Biology, Ministry of Animal Industry and Agric., Montevideo. *Place of Study:* U.S.A., 1953-.
- EVANS, DANIEL HERBERT LODWICK (*Great Britain*) b. 1920. M.B.B.S., Univ. of London 1943. Anatomy (BMRC). Appointed from Univ. of London. *Place of Study:* U.S.A., 1953-.
- EWELL, CLEVE WINFIELD (*U.S.A.*) b. 1922. M.D., Meharry Med. Coll. 1947. Medicine (DMPH). Appointed from Hubbard Hosp., Nashville. *Place of Study:* U.S.A., 1953-.
- FERNÁNDEZ, RAMÓN LUCIO (*El Salvador*) b. 1920. M.D., National Univ., San Salvador, 1949. Public Health Administration (DMPH). Appointed from Health Center of Santiago de María. *Place of Study:* U.S.A., 1953-.
- FIESTER, DONALD REID, JR. (*Costa Rica*) b. 1924. M. Agric., Inter-American Inst. of Agric. Sciences, Turrialba, 1952. Agriculture (NSA). Appointed from Inter-American Inst. of Agric. Sciences. *Place of Study:* U.S.A., 1953-.
- FILGO, WILLIAM WARD (*U.S.A.*) b. 1920. B.S., Mississippi State Coll. 1942. Sanitary Engineering

- (DMPH). Appointed from Tennessee Valley Authority, Paris, Tennessee. *Place of Study:* U.S.A., 1953-.
- FOLKOW, BJÖRN UNO GOTTFRID (*Sweden*) b. 1921. M.D., Univ. of Lund 1949. Physiology (DMPH). Appointed from Med. Coll. of Göteborg. *Place of Study:* U.S.A., 1953-.
- FOSTER, ALLAN BENTHAM (*England*), b. 1926. Ph.D., Birmingham Univ. 1950. Biochemistry (NSA). Appointed from Birmingham Univ. *Place of Study:* U.S.A., 1953-.
- FRANKLAND, ANTHONY NOBLE (*England*) b. 1922. Ph.D., Oxford Univ. 1951. History (DH). Appointed from Cabinet Office, London. *Place of Study:* U.S.A., 1953-.
- FROTA-PESSOA, OSWALDO (*Brazil*) b. 1917. M.D., Univ. of Brazil, Rio de Janeiro, 1941. Biology (NSA). Appointed from Univ. of Brazil. *Place of Study:* U.S.A., 1953-.
- FUENTES SANTOYO, JAIME (*Mexico*) b. 1928. M.D., Univ. of Guanajuato, León, 1953. Pharmacology (DMPH). Appointed from Univ. of Guanajuato. *Place of Study:* Mexico, 1953-.
- FUKUDA, TSUNEARI (*Japan*) b. 1912. M.A., Tokyo Univ. 1936. Criticism and Playwriting (DH). Writer. *Place of Study:* U.S.A., 1953-.
- GAGGERO CAPELLARO, ALDO (*Chile*) b. 1925. D.V.M., Univ. of Chile, Santiago, 1950. Veterinary Medicine (NSA). Appointed from Bacteriological Inst., Santiago. *Place of Study:* U.S.A., 1953-.
- GARCIA-LAVERDE, ALBERTO (*Colombia*) b. 1922. M.D., National Univ., Bogotá, 1948. Parasitology (DMPH). Appointed from National Univ. *Place of Study:* U.S.A., 1953-.
- GARTRELL, FRANCIS EUGENE (*U.S.A.*) b. 1913. M.P.H., Johns Hopkins Univ. 1944. Public Health Administration—Air pollution problems (IHD); (DMPH). Appointed from Tennessee Valley Authority. *Place of Study:* U.S.A., 1943-44; 1953-.
- GENTIL DA SILVA MARTINS, ALICE (*Portugal*) b. 1928. Dipl., Professional School of Nursing, Lisbon, 1952. Nursing Education (DMPH). Appointed from Professional School of Nursing, Portuguese Oncological Inst., Lisbon. *Place of Study:* U.S.A., 1953-.
- GOMEZJURADO, LIGIA MARÍA (*Ecuador*) b. 1918. R.N., National School of Nursing, Quito, 1945. Nursing Education (IHD); Nursing Administration (DMPH). Appointed from National School of Nursing. *Place of Study:* U.S.A., Canada, 1945-47; U.S.A., 1953-.
- GONZÁLEZ-SIFUENTES, WILFREDO (*Peru*) b. 1921. Medico Cirujano, National Univ., San Marcos, 1948. Public Health Administration (DMPH). Appointed from Sihuas, Ancash, Peru. *Place of Study:* U.S.A., 1953-.
- GRAUHAN, ANTJE (*Germany*) b. 1930. Nursing Dipl., Univ. of Heidelberg 1951. Nursing Education (DMPH). Appointed from Univ. of Heidelberg. *Place of Study:* U.S.A., 1953-.
- GREGG, JOHN RICHARD (*U.S.A.*) b. 1916. Ph.D., Princeton Univ. 1945. Biology (NSA). Appointed from Columbia Univ. *Place of Study:* England, 1953-.

- GUERRA-MEJIA, GERMÁN (Chile)**
b. 1917. Veterinarian, Univ. of Chile, Santiago, 1938. Public Health Administration (DMPH). Appointed from National Health Service, Santiago. *Place of Study:* U.S.A., 1953-.
- GUNTER, LAURIE MARTIN (U.S.A.)**
b. 1922. M.A., Fisk Univ. 1953. Nursing Education (DMPH). Appointed from Meharry Med. Coll. *Place of Study:* U.S.A., 1953-.
- GYSLER, AURORA (Switzerland)** *b. 1920.* R.N., Bon Secours School of Nursing, Geneva, 1945. Public Health Nursing (IHD); Nursing Education (DMPH). Appointed from Bon Secours School of Nursing. *Place of Study:* Canada, U.S.A., 1948-49; U.S.A., 1953-.
- HAMMOND, SAMUEL B. (Australia)**
b. 1916. B.A. Honors, Univ. of Western Australia, Perth, 1941. Social Psychology (DSS). Appointed from Univ. of Melbourne. *Place of Study:* U.S.A., 1953-.
- HANSON, EMMELINE JEAN (England)** *b. 1919.* Ph.D., Univ. of London 1950. Biology (NSA). Appointed from British Med. Research Council. *Place of Study:* U.S.A., 1953-.
- HARUKI, TAKESHI (Japan) b. 1909.** M.A., Univ. of Southern California 1936. International Relations (DSS). Appointed from Aoyama Gakuin Univ., Tokyo. *Place of Study:* U.S.A., 1953-.
- HEATH, HAROLD (England) b. 1922.** Ph.D., Univ. of London 1951. Biochemistry (NSA). Appointed from Univ. of London. *Place of Study:* U.S.A., 1953-.
- HERRERA ARANGUENA, JUAN M. (Peru) b. 1926.** Agron. Eng., National School of Agric., La Mo- lina, 1951. Agriculture (NSA). Appointed from Agric. Exper. Station, Cañete Farmers' Assoc., Cañete. *Place of Study:* U.S.A., 1953-.
- HERS, HENRI-GÉRY (Belgium) b. 1923.** M.D., Univ. of Louvain 1948. Biochemistry (NSA). Appointed from Univ. of Louvain. *Place of Study:* U.S.A., 1953-.
- HU, CHAO-HSIN (China) b. 1921.** B.S.C.E., Tsinghua Univ., Peiping, 1948. Sanitary Engineering (DMPH). Appointed from Taiwan Provincial Government, Taipei. *Place of Study:* U.S.A., 1953-.
- HUTTER, OTTO FRED (Great Britain) b. 1924.** B.Sc., Univ. of London 1947. Physiology (BMRC). Appointed from Univ. of London. *Place of Study:* U.S.A., 1953-.
- ISAZA GONZALEZ, JAVIER (Colombia)**
b. 1923. M.D., National Univ. of Colombia, Bogotá, 1950. Pathology (DMPH). Appointed from National Univ. of Colombia. *Place of Study:* U.S.A., 1953-.
- IVEMARR, BJÖRN ISAAC (Sweden) b. 1925.** Med. lic., Karolinska Inst., Stockholm, 1951. Pathology (DMPH). Appointed from Karolinska Hospital, Stockholm. *Place of Study:* U.S.A., 1953-.
- JACOBSON, NILS BERTIL (Sweden) b. 1923.** M.D., Karolinska Inst., Stockholm, 1951. Biochemistry (NSA). Appointed from Karolinska Inst. *Place of Study:* U.S.A., 1953-.
- JALILI, MAHMOUD A. (Iraq) b. 1920.** M.D., Fouad I Univ., Cairo, 1945. Nutrition (DMPH). Appointed from Royal Faculty of Med., Baghdad. *Place of Study:* U.S.A., 1953-.

- JENSEN, REIMER JOHANNES (*Denmark*) *b. 1918.* Cand. Psych., Univ. of Copenhagen 1947. Psychology (DMPH). Appointed from Univ. of Copenhagen. *Place of Study:* U.S.A., 1953-.
- JUILLAND, ALPHONSE G. (*France*) *b. 1922.* Ph.D., Univ. of Paris 1951. Language, Logic, and Symbolism (DH). Appointed from Rumanian Research Center, Paris. *Place of Study:* U.S.A., 1953-.
- KAIPAINEN, WILHELM JOHANNES (*Finland*) *b. 1918.* M.D., Univ. of Helsinki 1951. Microbiology (DMPH). Appointed from Univ. of Helsinki. *Place of Study:* England, 1953-.
- KÄLLEN, ANDERS JAN BENGT (*Sweden*) *b. 1929.* Cand. M.D., Univ. of Lund 1952. Embryology (DMPH). Appointed from Univ. of Lund. *Place of Study:* U.S.A., 1953-.
- KIMURA, SHOICHI (*Japan*) *b. 1915.* Tokyo Univ. 1937-40. Slavic Studies (DH). Appointed from Hokkaido Univ., Sapporo. *Place of Study:* U.S.A., 1953-.
- KOBAYASHI, FUMIE (*Japan*) *b. 1921.* St. Luke's Coll. of Nursing, Tokyo, 1938-42. Public Health Nursing (DMPH). Appointed from Ministry of Health and Welfare, Tokyo. *Place of Study:* U.S.A., 1953-.
- KOJIMA, KIYOSHI (*Japan*) *b. 1920.* M.Ed., Tokyo Univ. of Commerce 1945. Economics (DSS). Appointed from Hitotsubashi Univ., Tokyo. *Place of Study:* Europe, U.S.A., 1953-.
- KRELLE, WILHELM ERNEST (*Germany*) *b. 1916.* Dr.rer.pol., Univ. of Freiburg 1947. Economics (DSS). Appointed from Univ. of Heidelberg. *Place of Study:* U.S.A., 1953-.
- KUO, CHEN (*China*) *b. 1924.* B.S.C.E., Tsinghua Univ., Peiping, 1948. Sanitary Engineering (DMPH). Appointed from Taiwan Provincial Government, Tai-peh. *Place of Study:* U.S.A., 1953-.
- LANDGREN, SVEN OLOF ESBJÖRN (*Sweden*) *b. 1921.* D.V.M., Veterinary High School, Stockholm, 1952. Physiology (DMPH). Appointed from Veterinary High School. *Place of Study:* Australia, 1953-.
- LARRAMENDI, LUIS MANUEL H. (*Spain*) *b. 1922.* M.D., Univ. of Madrid 1945. Neurophysiology (DMPH). Appointed from Cajal Inst., Madrid. *Place of Study:* Canada, 1953-.
- LULOFS, JOHANN GERHARD (*Netherlands*) *b. 1921.* Doct., Univ. of Amsterdam 1952. Economics (DSS). Appointed from Univ. of Amsterdam. *Place of Study:* U.S.A., 1953-.
- LUNDBLAD, MARTA (*Sweden*) *b. 1909.* Sophiahemmet School of Nursing, Stockholm, 1930-34. Nursing Education (DMPH). Appointed from Sophiahemmet School of Nursing. *Place of Study:* U.S.A., Canada, 1953-.
- LUXORO MARIANI, MARIO FERNANDO (*Chile*) *b. 1926.* Ch.E., Santa Marfa Tech. Univ., Valparaíso, 1948. Biology (NSA). Appointed from Univ. of Chile, Santiago. *Place of Study:* U.S.A., 1953-.
- LYNEN, FEODOR (*Germany*) *b. 1911.* D.Sc., Univ. of Munich 1937. Biochemistry (NSA). Appointed from Univ. of Munich. *Place of Study:* U.S.A., 1953.

- McCALLUM, ROBERT IAN** (*Great Britain*) *b. 1920.* M.D., Univ. of London 1946. Industrial Health (BMRC). Appointed from King's Coll., Newcastle-upon-Tyne. *Place of Study:* U.S.A., 1953-.
- MACEDO SOUZA FILHO, ASTOLPHO** (*Brazil*) *b. 1918.* D.V.M., School of Vet. Med., Curitiba, 1940. Veterinary Medicine (NSA). Appointed from Inst. of Biol. and Tech. Research, Curitiba. *Place of Study:* Chile, 1953-.
- MAHRT-OLSEN, ELSE** (*Denmark*) *b. 1914.* Dipl., Univ. of Aarhus 1949. Nursing Education (DMPH). Appointed from Rigshospitalet School of Nursing, Copenhagen. *Place of Study:* U.S.A., 1953-.
- MALHERBE, HUBERT HENRI** (*Union of South Africa*) *b. 1914.* M.B., B.Ch., Univ. of Witwatersrand, Johannesburg, 1949. Virology (DMPH). Appointed from South African Inst. for Med. Research, Johannesburg. *Place of Study:* U.S.A., 1953-.
- MARTINS-FERREIRA, Hiss** (*Brazil*) *b. 1920.* M.D., Univ. of Brazil, Rio de Janeiro, 1943. Biology (NSA). Appointed from Univ. of Brazil. *Place of Study:* Sweden, 1953-.
- MASCARELLO, ALDERICO** (*Brazil*) *b. 1917.* Graduated from Univ. of Rio Grande do Sul, Pôrto Alegre, 1942. Agriculture (NSA). Appointed from Rice Experiment Station, Pôrto Alegre. *Place of Study:* U.S.A., 1953-.
- MATERA, ERNESTO ANTONIO** (*Brazil*) *b. 1915.* D.V.M., Univ. of São Paulo 1935. Veterinary Medicine (NSA). Appointed from Univ. of São Paulo. *Place of Study:* Canada, 1953-.
- METZENTHIN, ANNE-MARIE** (*France*)¹¹ *b. 1923.* 2nd Baccalau-
- reate, Coll. Lucie Berger, Strasbourg, 1941. Nursing Education (DMPH). Appointed from Ecole d'Infirmières et d'Assistantes Sociales, Strasbourg. *Place of Study:* U.S.A., 1953-.
- MEYER-MICKELEIT, RUDOLF** (*Germany*) *b. 1918.* M.D., Univ. of Freiburg 1944. Neurophysiology (DMPH). Appointed from Univ. of Freiburg. *Place of Study:* Canada, 1953-.
- MIYAIRI, MASATO** (*Japan*) *b. 1914.* M.D., Chiba Med. Univ., Chiba City, 1939. Public Health Administration — Epidemiology (DMPH). Appointed from Institute of Public Health, Tokyo. *Place of Study:* U.S.A., 1953-.
- MONTJOIE, RENÉ FRANÇOIS MARIE** (*France*) *b. 1926.* Eng. of National Corps of Mines, National Higher School of Mines, Paris, 1951. Economics (DSS). Appointed from Ministry of Industry and Trade, Paris. *Place of Study:* U.S.A., 1953-.
- NAHHAS, LILY AZAR** (*Lebanon*) *b. 1926.* Nursing Dipl., American Univ. of Beirut 1946. Nursing Education (DMPH). Appointed from American Univ. of Beirut. *Place of Study:* U.S.A., 1953-.
- NAKAO, KIKU** (*Japan*) *b. 1912.* M.D., Univ. of Tokyo 1937. Internal Medicine (DMPH). Appointed from Univ. of Tokyo. *Place of Study:* U.S.A., 1953-.
- NAQUET, ROBERT** (*France*) *b. 1923.* M.D., Univ. of Marseille 1947. Neurophysiology (DMPH). Appointed from Univ. of Marseille. *Place of Study:* U.S.A., 1953-.
- NODA, MATAO** (*Japan*) *b. 1910.* M.A., Kyoto Univ. 1933. Philosophy (DH). Appointed from

- Kyoto Univ. *Place of Study:* U.S.A., 1953-.
- OCHOA, CARLOS (*Peru*) b. 1920. Agron. Eng., Univ. of San Simon, Cochabamba, Bolivia, 1944. Agriculture (NSA). Appointed from Agric. Exper. Station, Huancayo. *Place of Study:* Mexico, U.S.A., 1953-.
- ODAKA, KUNIO (*Japan*) b. 1908. Litt.D., Tokyo Univ. 1947. Sociology (DSS). Appointed from Tokyo Univ. *Place of Study:* Europe, U.S.A., 1953-.
- OOKA, SHOHEI (*Japan*) b. 1909. B.A., Kyoto Univ. 1932. Literature (DH). Writer. *Place of Study:* U.S.A., 1953-.
- PADILHA, ILSA (*Brazil*) b. 1914. Nursing Dipl., School of Nursing of São Paulo 1949. Nursing Education (DMPH). Appointed from Univ. of Rio Grande do Sul, Pôrte Alegre. *Place of Study:* U.S.A., 1953-.
- PARENTINI, MARÍA ROSA (*Uruguay*) b. 1930. Univ. School of Nursing, Montevideo, 1949-51. Nursing Education (DMPH). Appointed from Univ. School of Nursing. *Place of Study:* Canada, 1953-.
- PAUL, JOHN (*Great Britain*) b. 1922. M.B., Ch.B., Univ. of Glasgow 1953. Biochemistry (BMRC). Appointed from Univ. of Glasgow. *Place of Study:* U.S.A., 1953-.
- PETERS, MOOKENCHERIL LUCY (*India*) b. 1922. B.Sc. in Nursing, Christian Med. Coll., Vellore, 1951. Nursing Education (DMPH). Appointed from School of Nursing, Ernakulam District Hosp., Ernakulam. *Place of Study:* U.S.A., 1953-.
- PRASAD, SRI NANDAN (*India*) b. 1921. Ph.D., Allahabad Univ. 1948. History (DH). Appointed from Ministry of Defense, New Delhi. *Place of Study:* U.S.A., 1953-.
- RABINOVITCH, MICHEL PINKUS (*Brazil*) b. 1926. M.D., Univ. of São Paulo 1949. Biology (NSA). Appointed from Univ. of São Paulo. *Place of Study:* U.S.A., 1953-.
- RAJA RAO, SRIRANGAPATAM VENKATASUBBARAO (*India*) b. 1914. M.B.B.S., Madras Med. Coll. 1939. Public Health Administration (DMPH). Appointed from Nutrition Survey, Bangalore. *Place of Study:* U.S.A., 1953-.
- RAMA RAO, S. V. (*India*) b. 1920. M.B.B.S., Med. Coll., Mysore, 1944. Public Health Administration—Epidemiology (DMPH). Appointed from Secondary Centre, Krishnarajanagar, Mysore District. *Place of Study:* U.S.A., 1953-.
- REED, IRIS JACQUELINE. See: Shannon, Iris Reed.
- RIVLIN, HELEN ANNE (*U.S.A.*) b. 1918. Ph.D., Oxford Univ. 1953. Near Eastern Studies (DH). Graduate student, Oxford Univ. *Place of Study:* U.S.A., 1953-.
- RODRÍGUEZ, MARÍA ISABEL (*El Salvador*) b. 1923. M.D., Autonomous Univ. of El Salvador, San Salvador, 1949. Cardiology (DMPH). Appointed from Rosales Hosp., San Salvador. *Place of Study:* Mexico, 1953-.
- RONALDSON, MARJORIE GRACE (*Australia*) b. 1924. M.A., Univ. of Melbourne 1948. Economic History (DSS). Appointed from Univ. of Melbourne. *Place of Study:* England, U.S.A., 1953.

ROSARIO, EDWIN FRANCIS (India)
b. 1907. M.B.B.S., Bombay Univ.
 1932. Hospital Administration
 (DMPH). Appointed from Med.
 Coll. Hosp., Nagpur. *Place of
 Study:* U.S.A., 1953-.

SALINAS, VICTORIA (Chile) *b. 1916.*
 Public Health Nurse, Univ. Nurs-
 ing School, Santiago, 1940. Nurs-
 ing Education (DMPH). Ap-
 pointed from Beneficencia Nurs-
 ing School, Santiago. *Place of
 Study:* U.S.A., Canada, 1953-.

SAMUEL, KENNETH CLEMENT
(India) b. 1925. M.D., Agra Univ.
 1951. Pathology (DMPH). Ap-
 pointed from Sawai Man Singh
 Med. Coll., Jaipur. *Place of Study:*
 U.S.A., 1953-.

SANDERS, JIM ALVIN (U.S.A.) *b.
 1927.* B.D., Vanderbilt Univ.
 1951. Religion (DH). Appointed
 from Hebrew Union Coll., Cin-
 cinnati. *Place of Study:* U.S.A.,
 1953-.

SARKAR, NIHAR KUMAR (Ceylon)
b. 1915. M.A., Univ. of Calcutta
 1938. Economics (DSS). Ap-
 pointed from Univ. of Ceylon,
 Peradeniya. *Place of Study:* Eng-
 land, 1953-.

SEGARRA-OBIOL, JOSÉ MANUEL
(Spain) b. 1922. M.D., Univ. of
 Madrid 1951. Neurology
 (DMPH). Appointed from Bar-
 celona Med. School. *Place of
 Study:* U.S.A., 1953-.

SEILER, HANSJAKOB (Germany) *b.
 1920.* Ph.D., Univ. of Zurich,
 Switzerland, 1947. Language,
 Logic, and Symbolism (DH). Ap-
 pointed from Univ. of Hamburg.
Place of Study: U.S.A., 1953-.

SEIP, MARTIN FREDRICK (Norway)
b. 1921. Med. Lic., Univ. of Oslo
 1947. Pediatrics (DMPH). Ap-

pointed from Univ. of Oslo. *Place
 of Study:* U.S.A., 1953-.

SEPÚLVEDA DAGNINO, GONZALO
(Chile) b. 1918. M.D., Univ. of
 Chile, Santiago, 1942. Medicine
 (DMPH). Appointed from Univ.
 of Chile. *Place of Study:* U.S.A.,
 1953-.

SHANNON, IRIS REED (U.S.A.) *b.
 1925.* Dipl., Meharry Med. Coll.
 School of Nursing 1948. Public
 Health Nursing (DMPH). Ap-
 pointed from Meharry Med.
 Coll. *Place of Study:* U.S.A.,
 1953-.

SHIRAI, REIKO (Japan) *b. 1921.*
 St. Luke's Coll. of Nursing,
 Tokyo, 1938-41. Nursing Educa-
 tion (DMPH). Appointed from
 Tokyo Demonstration School of
 Nursing. *Place of Study:* U.S.A.,
 1953-.

SHISHIDO, AKIRA (Japan) *b. 1918.*
 D.M.Sc., Univ. of Tokyo 1951.
 Microbiology (DMPH). Ap-
 pointed from National Inst. of
 Health, Tokyo. *Place of Study:*
 U.S.A., 1953-.

**SORENSEN, HOLGER STEEN (Den-
 mark)** *b. 1920.* M.S., Univ. of
 Copenhagen 1952. Language,
 Logic, and Symbolism (DH). Ap-
 pointed from Univ. of Copen-
 hagen. *Place of Study:* U.S.A.,
 1953.

STAFFORD, JOHN LEGGE (Jamaica)
b. 1923. M.B., Ch.B., Bir-
 mingham Univ., England, 1945. Pa-
 thology (DMPH). Appointed
 from Univ. Coll. of the West
 Indies, Kingston. *Place of Study:*
 U.S.A., 1953-.

STELLA, JOSÉ LUIS (Uruguay) *b.
 1914.* D.V.M., Fac. of Vet. Med.,
 Montevideo, 1941. Veterinary
 Medicine (NSA). Appointed from
 Inst. of Animal Biology, Min-

- istry of Animal Industry and Agric., Montevideo. *Place of Study:* U.S.A., 1953-.
- TABATONI, PIERRE (France) b. 1923. D.Sc. Econ., Univ. of Aix-Marseille 1950. Economics (DSS). Appointed from Univ. of Aix-Marseille. *Place of Study:* U.S.A., 1953-.
- TAKEDA, HIROMICHI (Japan) b. 1919. B.A., Kyoto Univ. 1952. Philosophy (DH). Appointed from Osaka City Univ. *Place of Study:* U.S.A., 1953-.
- TANAKA, KIYOSHI (Japan) b. 1913. D.M.Sc., Kyushu Univ. 1941. Pharmacology (DMPH). Appointed from Tottori Univ., Yonago. *Place of Study:* U.S.A., 1953-.
- TAUBES, JACOB (U.S.A.) b. 1923. Ph.D., Univ. of Zurich, Switzerland, 1947. Philosophy (DH). Appointed from U.S.A. *Place of Study:* U.S.A., 1953-.
- TETREAULT, ERNEST R. (Canada) b. 1923. M.D., Univ. of Montreal 1949. Psychiatry (DMPH). Appointed from Boston Psychopathic Hosp. *Place of Study:* U.S.A., 1953-.
- THERIAULT, ADRIEN (Canada) b. 1925. Ph.D., Laval Univ., Quebec, 1952. Literature (DH). Appointed from Laval Univ. *Place of Study:* U.S.A., 1953-.
- TIMONEN, KAAPO SAKARI (Finland) b. 1915. M.D., Univ. of Helsinki 1945. Anatomy (DMPH). Appointed from Univ. of Helsinki. *Place of Study:* U.S.A., 1953-.
- TOPITSCH, ERNST (Austria) b. 1919. Ph.D., Univ. of Vienna 1946. Social Philosophy (DSS). Appointed from Univ. of Vienna. *Place of Study:* U.S.A., 1953-.
- TURNER, BRIAN BAXTER (Australia) b. 1927. M.B., Royal Prince Alfred Hosp., Sydney, 1951. Pathology (DMPH). Appointed from Univ. of Sydney. *Place of Study:* England, 1953-.
- ULLAH, INAYAT (Pakistan) b. 1919. M.D., Punjab Univ. 1951. Pathology (DMPH). Appointed from King Edward Med. Coll., Lahore. *Place of Study:* England, 1953-.
- ULRICH, ROLF HERMANN WILHELM (Germany) b. 1920. M.D., Univ. of Göttingen 1945. Public Health Administration (DMPH). Appointed from Bremen, Germany. *Place of Study:* U.S.A., 1953-.
- VALLENAS PANTIGOZO, G. AUGUSTO (Peru) b. 1928. D.V.M., National Univ. of San Marcos, Lima, 1952. Veterinary Medicine (NSA). Appointed from National Univ. of San Marcos. *Place of Study:* U.S.A., 1953-.
- VERHOESTRAEDE, LOUIS (World Health Organization) b. 1912. M.D., Univ. of Louvain, Belgium, 1938. Public Health Administration—Maternal & Child Health (DMPH). Appointed from World Health Organization. *Place of Study:* U.S.A., 1953-.
- VILLEGRAS, JAIME (Honduras) b. 1910. B.S. in Agric., Coll. of Agric. and Mech. Arts, Mayagüez, P.R., 1933. Agriculture (NSA). Appointed from Pan-American Agric. School, Tegucigalpa. *Place of Study:* U.S.A., 1953-.
- WATKINSON, GEOFFREY (Great Britain) b. 1921. M.D., Univ. of London 1945. Medicine (BMRC). Appointed from Univ. of Leeds. *Place of Study:* U.S.A., 1953-.

WERNER, JOSUA (*Switzerland*) b.
1924. Ph.D., School of Econ. and
Public Admin., St. Gallen, 1951.
Economics (DSS). Appointed
from School of Econ. and Public
Admin. *Place of Study:* U.S.A.,
1953-.

WILWERTH, ALBERTO MONTEIRO
(*Brazil*) b. 1915. D.V.M., Higher
School of Agric. and Vet. Sci.,
Viçosa, 1938. Veterinary Medi-
cine (NSA). Appointed from
Univ. of Minas Gerais, Belo Hor-
izonte. *Place of Study:* U.S.A.,
1953-.

WOITRIN, MICHEL (*Belgium*) b.
1919. LL.D., Univ. of Louvain

1942. Economics (DSS). Ap-
pointed from Univ. of Louvain.
Place of Study: U.S.A., 1953.

YOKOGAWA, MUNEO (*Japan*) b.
1918. D.M.Sc., Chiba Med.
Univ., Chiba City, 1951. Micro-
biology—Parasitology (DMPH).
Appointed from Inst. of Public
Health, Tokyo. *Place of Study:*
U.S.A., 1953-.

ZANCHETTI, ALBERTO (*Italy*) b.
1926. M.D., Univ. of Parma
1950. Physiology (DMPH). Ap-
pointed from Univ. of Pisa. *Place*
of Study: U.S.A., 1953-.

Report of the Treasurer

REPORT OF THE TREASURER

IN THE FOLLOWING PAGES is submitted a report of the financial transactions of The Rockefeller Foundation for the year ended December 31, 1953.

Accountants' Certificate	349
Balance Sheet	350
Principal Fund	351
Appropriations and Payments	351
Unappropriated Authorizations	352
Income Available for Commitment	352
Appropriations and Unappropriated Authorizations	353
Equipment Fund	353
Appropriations during 1953, Unpaid Balances of Prior Year Appropriations, and Payments thereon in 1953	354
Refunds on Prior Year Closed Appropriations	415
Finance Committee's Statement of Transactions Relating to Invested Funds	417
Schedule of Securities on December 31, 1953	424

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS
250 PARK AVENUE, NEW YORK 17

March 19, 1954

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, 1953 and the related statements of principal fund and income available for commitment 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.

In accordance with the policy of the Foundation, no effect has been given in the accompanying statements to accrued income not received, nor to expenditures made from advance accounts not reported in time to be recorded when the books were closed as of December 31, 1953.

In our opinion, with the foregoing explanation, the accompanying balance sheet and statements of principal fund and income available for commitment present fairly the financial position of the Foundation at December 31, 1953 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles.

(Signed) Haskins & Sells

BALANCE SHEET — DECEMBER 31, 1953

ASSETS

SECURITIES (Ledger value)	\$173,643,321.62
(Market value \$345,153,514.50)	
CURRENT ASSETS:	
Cash on deposit	2,075,703.89
Advances and deferred charges	\$429,444.62
Sundry accounts receivable	63,460.57
	<hr/>
EQUIPMENT:	
In New York	96,303.48
	<hr/>
	\$176,308,234.18
	<hr/>

FUNDS AND OBLIGATIONS

PRINCIPAL FUND	\$141,969,594.95
COMMITMENTS:	
Unpaid appropriations	\$26,843,350.59
Unappropriated authorizations	2,046,418.00
	<hr/>
INCOME AVAILABLE FOR COMMITMENT	4,748,844.92
CURRENT LIABILITIES:	
Accounts payable	603,722.24
EQUIPMENT FUND	96,303.48
	<hr/>
	\$176,308,234.18
	<hr/>

PRINCIPAL FUND

Balance, December 31, 1952		\$137,156,143.83
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Add:

Amount by which securities sold during the year exceeded their ledger value	\$4,804,478.22
Less:	
Premium paid on purchase of securities	\$1,562.50
Deficiency sustained on redemption and sales of bonds	<u>1,482.60</u>
	3,045.10
	<u>\$4,801,433.12</u>

Gifts received:

Mrs. Rodolph Linscomb	\$ 11.00		
Anonymous	<u>12,007.00</u>	12,018.00	<u>4,813,451.12</u>

Balance, December 31, 1953		<u>\$141,969,594.95</u>
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APPROPRIATIONS AND PAYMENTS

Unpaid appropriations, December 31, 1952		\$25,603,944.07
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Appropriations during the year 1953 (For detail see pages 354 to 414):

Medicine and Public Health	\$3,819,585.00
Natural Sciences and Agriculture	5,428,831.92
Social Sciences	3,597,285.00
Humanities	1,763,490.00
General	151,500.00
Administration	<u>2,010,890.00</u>
	<u>\$16,771,581.92</u>
Unused balances of appropriations allowed to lapse	880,933.85
	<u>15,890,648.07</u>
	<u>\$41,494,592.14</u>

APPROPRIATIONS AND PAYMENTS — *continued*

Payments on 1953 and prior years' appropriations (For detail see pages 354 to 414):	
Medicine and Public Health	\$3,898,302.60
Natural Sciences and Agriculture	3,424,188.97
Social Sciences	3,153,890.48
Humanities	1,517,979.25
General	713,622.77
Administration	1,943,257.48
Unpaid appropriations, December 31, 1953	<u>14,651,241.55</u>
	<u>\$26,843,350.59</u>

UNAPPROPRIATED AUTHORIZATIONS

Balance, December 31, 1952	\$1,574,849.00
Authorizations made during the year	573,469.00
	<u>\$2,148,318.00</u>
Less:	
Appropriations for which funds were previously authorized	101,900.00
Balance, December 31, 1953	<u>\$2,046,418.00</u>

INCOME AVAILABLE FOR COMMITMENT

Balance, December 31, 1952	\$3,396,176.00
Add:	
Income and refunds:	
Income from securities	\$17,586,148.75
Refunds	128,737.24
Unused balances of appropriations allowed to lapse	880,933.85
	<u>18,595,819.84</u>
	<u>\$21,991,995.84</u>
Deduct:	
Appropriations	\$16,771,581.92
Authorizations (\$573,469.00 less \$101,900.00 previously authorized)	471,569.00
Income available for commitment, December 31, 1953	<u>17,243,150.92</u>
	<u>\$4,748,844.92</u>

APPROPRIATIONS AND UNAPPROPRIATED AUTHORIZATIONS

Commitments, December 31, 1952:

Unpaid appropriations	\$25,603,944.07		
Unappropriated authorizations	1,574,849.00		\$27,178,793.07

Add:

Appropriations	\$16,771,581.92		
Authorizations	573,469.00		
			\$17,345,050.92

Less:

Appropriations for which funds were previously authorized	\$101,900.00		
Appropriations lapsed during the year	880,933.85	982,833.85	16,362,217.07
			\$43,541,010.14

Deduct:

Payments on 1953 and prior years' appropriations	14,651,241.55	
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Commitments, December 31, 1953:

Unpaid appropriations	\$26,843,350.59		
Unappropriated authorizations	2,046,418.00		\$28,889,768.59

EQUIPMENT FUND

	BALANCE	CHANGES DURING 1953		BALANCE
	DEC. 31, 1952	ADDITIONS	DEPRECIATION	DEC. 31, 1953
Library Equipment	\$10,141.00	\$ 1,222.79	\$ 1,276.79	\$10,087.00
	65,034.05	38,369.79	17,187.36	86,216.48
	<u>\$75,175.05</u>	<u>\$39,592.58</u>	<u>\$18,464.15</u>	<u>\$96,303.48</u>

APPROPRIATIONS DURING 1953, UNPAID BALANCES OF PRIOR YEAR APPROPRIATIONS,
AND PAYMENTS THEREON IN 1953

354

		APPROPRIATIONS PRIOR YEARS	1953 PAYOUTS
MEDICINE AND PUBLIC HEALTH			
<i>Control and Investigation of Specific Diseases and Deficiencies</i>			
MALARIA			
Caribbean			
Tobago. 1951-1952 (GA 5011, 51117, 52112)		\$1,460.33	\$..... \$790.52
Europe			
Italy			
Sardinia Anopheles Eradication Program. 1949-1953 (IH 50126)		14,012.35 10,325.81
Sardinia Public Health Program. 1951-1952 (GA 5167, 5198)		161.26 Cr. 33.96
Far East			
India, Mysore			
Studies and Control Demonstration. 1951-1954 (GA 51118, 52119)		11,642.43 7,777.28
Mexico			
Studies on Control of Insect Vectors with DDT. 1952 (GA 51131)		83.35
South America			
Brazil. Equipment for research. 1950-1952 (GA 5009)		1,956.81
NUTRITION			
Far East			
India, Mysore			
Anemia Studies. 1949-1953 (GA 51114, 52123)		3,611.81 1,539.80
United States			
Vanderbilt University, Nashville, Tennessee School of Medicine. 1949-1952 (IH 49016)		408.83 Cr. 108.72

THE ROCKEFELLER FOUNDATION

TUBERCULOSIS			
United States			
Tennessee. 1952-1953 (RF 52193, 53151)	\$18,960.00	\$21,000.00	\$18,960.00
VIRUS DISEASES			
Central Laboratory in New York City			
Maintenance. 1952-1954 (RF 51199, 52177, 53164)	162,435.04	150,000.00	150,776.20
Field Laboratories			
Brazil. 1953-1954 (RF 52177, 53164)	8,000.00	14,000.00
Egypt, Cairo. 1952-1954 (RF 51199, 52177, 53164)	16,313.08	7,000.00	7,642.40
India, Poona. 1952-1954 (RF 51199, 52177, 53164)	72,184.27	24,000.00	26,155.46
Johannesburg. 1953-1954 (RF 52177, 53164)	6,000.00	20,000.00
Trinidad, Port of Spain. 1952-1954 (RF 51199, 52177, 53164)	102,000.00	55,000.00	66,796.81
Studies Elsewhere. 1952-1954 (RF 51199, 52177, 53164)	77,280.00	30,000.00
France			
Pasteur Institute, Paris			
To purchase equipment for Virus Research Division (RF 52088)	9,999.70	2,238.23
YELLOW FEVER			
United States			
Book on Yellow Fever. 1950-1954 (GA 5001, RF 51098)	6,040.31
Africa			
Uganda. 1949 (IH 48016)	547.25	Cr. 508.78
<i>Development of the Health Sciences</i>			
UNITED STATES			
Child Research Council of Denver, Colorado			
Studies in child growth and development (RF 48057, 49116, 50068, 51154)	87,547.82	25,000.00

	PRIOR YEARS	APPROPRIATIONS 1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — <i>continued</i>			
<i>Development of the Health Sciences — <i>continued</i></i>			
UNITED STATES — <i>continued</i>			
Columbia University, New York City			
Work in brain chemistry (RF 52094)	\$3,000.00	\$.....	\$3,000.00
Duke University, Durham, North Carolina			
Work in parapsychology (RF 50052, 53117)	5,000.04	15,000.00	20,000.00
Georgia State College for Women, Milledgeville			
Research in medical genetics (RF 52042)	1,000.00	636.84
Harvard University, Cambridge, Massachusetts			
Research on physiological aspects of the development of behavior patterns at the Laboratory of Social Relations (RF 51179)	32,958.50	3,884.86
Investigation of personality (RF 52093)	30,000.00	15,000.00
Teaching and research in psychiatry in the Harvard Medical School (RF 48055)	19,026.62	12,478.32
Study of adult development by Department of Hygiene (RF 50097)	1,250.00	1,248.29
Field study of population problems in India (RF 53173)	58,450.00	8,000.00
Indiana University, Bloomington			
Research in psychotherapy (RF 52113)	45,875.00	21,297.50
Massachusetts General Hospital, Boston			
Research in endocrinology and metabolism (RF 52129)	8,000.00	4,000.00
Massachusetts Institute of Technology, Cambridge			
Studies in mathematical biology conducted jointly with the National Institute of Cardiology, Mexico City (RF 47009) (Joint project with Natural Sciences)	5,509.41	Cr. 1,000.00
National Research Council, Washington, D. C.			
Committee for Research in Problems of Sex (RF 49074, 51063)	124,312.95	75,434.78

New England Medical Center, Boston, Massachusetts Research in endocrinology (RF 50076)	\$22,000.00	\$.....	\$6,000.00
New York University, New York City Interdepartmental project on the rehabilitation of neurological patients (RF 51169)	65,016.00	17,633.25
Princeton University, New Jersey Work of the Department of Psychology (RF 53057)	75,000.00
Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine Studies of genetic factors of intelligence and emotional variation in mammals (RF 50005, 51019, 52080, 53074)	100,000.00	50,000.00	50,000.00
University of California, Berkeley Establishment of an Institute for Personality Assessment and Research (RF 49048, 53092)	6,553.69	50,000.00	20,863.16
University of Chicago, Illinois Investigation of non-directive psychotherapy (RF 51081)	58,000.00	58,000.00
University of Illinois, Urbana Research in brain chemistry (RF 51090)	12,000.00	7,007.41
University of Minnesota, Minneapolis Research in human genetics at The Dight Institute of Human Genetics (RF 51016)	13,650.00	11,994.74
University of Oregon Medical School, Portland For work in constitutional medicine (RF 51004)	73,550.00	18,921.24
University of Texas, Austin Salary of a research associate in its law-science program (RF 52153)	2,000.00	2,000.00
Western Reserve University, Cleveland, Ohio Research in psychiatry, especially in biochemistry related to mental disease (RF 48056)	8,377.88	7,000.00

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — <i>continued</i>			
<i>Development of the Health Sciences — <i>continued</i></i>			
UNITED STATES — <i>continued</i>			
Yerkes Laboratories of Primate Biology, Orange Park, Florida			
Building and general budget (RF 50073, 51121)	\$120,006.04	\$.....	\$60,000.00
CANADA			
Dalhousie University, Halifax, Nova Scotia			
Joint study by the Department of Obstetrics and Gynecology and by the Department of Psychiatry of psychological factors in pregnancy and childbirth (RF 51007)	11,250.00	3,750.00
McGill University, Montreal			
Maintenance of Department of Psychiatry (RF 49033)	13,515.85	6,750.00
Research on the physiological basis of behavior (RF 51172)	18,572.13	5,100.00
University of Toronto			
Development of a laboratory of experimental clinical neurology (RF 49049)	8,208.70	4,128.48
MEXICO			
National Institute of Cardiology, Mexico City			
Research in neurophysiology and pharmacology (RF 49036)	12,588.97	7,588.15
CARIBBEAN AREA			
Dominican Republic			
Endemic Disease Control Service, 1951-1954 (GA 52118, 53116)	6,000.00	3,992.56

SOUTH AMERICA

Bolivia				
Division of Rural Endemic Diseases. 1952 (GA 5197)	\$3,015.89	\$.....	\$2,931.28	
Chile				
Local Health Work. 1952-1954 (RF 51217, GA 53128)	13,796.84	1,098.18	
National Department of Sanitary Engineering. 1951-1953 (IH 50128, RF 51184, 52190)	49,207.50	23,411.84	
Peru				
Division of Development of Program of Ministry of Health. (IH 44015, 45054, 47024, 47025, 47026, 47027, 48036, 50170)	85,964.44	46,480.25	
Institute of Andean Biology, University of San Marcos, Lima				
Equipment for a high altitude laboratory at Morococha (RF 49061)	157.25	

EUROPE

Belgium				
University of Brussels				
Research in neurophysiology (RF 50088)	15,172.39	1,843.79	
University of Liege				
Development of the Laboratory of Neuroanatomy (RF 50143)	7,492.22	4,708.23	
Denmark				
National Health Department. 1950-1954 (IH 49031, RF 52017)	20,185.00	18,895.50	
University of Aarhus				
Development of research and teaching in Psychiatry (RF 49004)	8,358.02	1,765.28	
University of Copenhagen				
Establishment of a Child Guidance Clinic (RF 50009)	17,163.23	5.72	
Work in the genetics of mental defect (RF 48112)	7,332.25	1,388.75	

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — <i>continued</i>			
<i>Development of Health Sciences — <i>continued</i></i>			
EUROPE — <i>continued</i>			
Finland			
Local Health Work. 1950–1953 (IH 49025)	\$21,694.71	\$.....	\$21,694.71
France			
College de France, Paris			
Equipment for an experimental monkey station in Algeria (RF 49001)	1,057.3016
Survey of Soissons Area. 1951–1952 (GA 5017, 51119)	303.45
Germany			
University of Heidelberg			
Institute of Psychosomatic Medicine. Establishment and Support (RF 50001, 53099)	12,385.78	27,915.00	17,640.83
University of Würzburg (Julius-Maximilians-Universität)			
Neurological research (RF 52041)	8,461.93	5,735.54
Great Britain			
Burden Neurological Institute, Bristol, England			
Research in neurophysiology (RF 47088, 52122)	36,453.47	9,014.00
Cardiff City Mental Hospital, Wales			
Research in normal and pathological biochemistry of brain tissue (RF 48014)	6,923.28
Medical Research Council, London, England			
Purchase of scientific equipment (RF 51182)	2,702.17	2,275.20
St. Thomas' Hospital Medical School, London, England			
Research on the relationship between physical form and physiological function in man and their develop- ment during growth (RF 52096)	12,658.12	3,287.56
Tavistock Institute of Human Relations, London, England			
General Support (RF 52001)	85,502.81	19,726.88

University of Birmingham, England			
Research in psychiatry and in the biochemistry and pharmacology of the nervous system (RF 53104)	\$.....	\$86,400.00	\$.....
University of Cambridge, England			
Research in neurophysiology (RF 50024)	8,182.23	2,447.43
University of London, England			
Galton Laboratory			
Research in problems of human heredity (RF 50085)	19,465.81	4,770.13
Maudsley Hospital			
Psychological effects of frontal-lobe operations in the Institute of Psychiatry (RF 53131)	23,400.00
University of Oxford, England			
Neurohistological research in the Department of Human Anatomy (RF 48058, 53105)	31,554.65	43,500.00	10,422.53
Welsh Regional Hospital Beard, Cardiff			
Support of the Neuropsychiatric Research Centre at Whitchurch Hospital, Cardiff, Wales (RF 53027)	26,400.00	5,468.50
Italy			
Institute of Experimental Psychology, Florence			
Research on the psychological aspects of school-child health and development (RF 52163)	16,740.00	5,018.13
Superior Institute of Public Health, Rome			
Research on the biology of the housefly (RF 52144)	49,040.00	12,677.59
University of Pavia			
Institute of Zoology; Research on the cytogenetics of anopheline mosquitoes (GA 5010, RF 52147)	7,545.05	3,372.39
University of Pisa			
Support of teaching and research in the Department of Physiology (RF 51100)	4,518.69	2,531.88

	PRIOR YEARS	APPROPRIATIONS 1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — continued			
<i>Development of the Health Sciences — continued</i>			
EUROPE — continued			
Netherlands			
University of Amsterdam			
Support of the Psychosomatic Unit at the Wilhelmina-Gasthuis (RF 51153)	\$42,636.72	\$.....	\$9,162.67
Norway			
Norwegian Ministry of Social Welfare			
Salary increases in Health Department, 1946-1952 (HC 46014)	2,500.00
University of Oslo			
Establishment of a research laboratory of respiratory physiology at the Ulleval Hospital (RF 51011)	4,726.79	4,726.79
Investigation of the incidence of mental disease (RF 51026)	4,785.00	4,215.00
Sweden			
Karolinska Institute, Stockholm			
Research in neurophysiology (RF 49120)	1,000.00	1,000.00
University of Lund			
Research in endocrinology (RF 50165, 53032)	739.30	12,640.00	9,171.90
Switzerland			
University of Geneva			
Support of an Institute of Human Genetics (RF 50164)	3,000.00	3,000.00
University of Zurich			
Psychiatric research (RF 50144)	11,643.29	4,679.40
AFRICA AND ASIA MINOR			
Egypt			
Local Health Work, 1951-1952 (IH 50129)	298.24	185.98

AUSTRALIA

Walter and Eliza Hall Institute, Melbourne
 Equipment for researches on virus diseases (RF 51064) \$2,506.38 \$..... \$553.69

FAR EAST

India

Indian Cancer Research Centre, Bombay
 Operation of a laboratory for studies on human variation (RF 52192) 23,800.00 9,450.39
 Mysore State Department of Public Health
 Improvement of laboratory services. 1953-1954 (GA 52138) 6,000.00

Medical Care

UNITED STATES

American Psychiatric Association, New York
 Study of mental hospital design, construction and equipment (RF 53060) 140,000.00 63,900.00
 American Public Health Association, Washington, D. C.
 Support of Subcommittee on Medical Care. 1950-1956 (IH 49010, RF 52055) 100,000.00 27,408.59
 Commission on Chronic Illness, Baltimore, Maryland
 For preparatory expenses connected with a Conference on Care of the Long-Term Patient (RF 53116) 18,865.00 18,865.00
 Health Insurance Plan of Greater New York
 · Study of the recorded experience of the Plan (RF 51070) 55,325.43 55,325.43
 Study to determine the type of worker, or workers, required to provide certain basic health and social welfare services within the family (RF 51152) 22,221.49 17,794.63

	PRIOR YEARS	1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — <i>continued</i>			
<i>Medical Care — <i>continued</i></i>			
UNITED STATES — <i>continued</i>			
University of North Carolina, Chapel Hill			
Division of Health Affairs			
Research and planning for a state-wide health and medical care program (RF 52006)	\$19,596.00	\$.....	\$19,105.44
Study of medical practice (RF 53050)	45,000.00	35,610.00
CANADA			
University of Toronto			
Faculty of Medicine and the School of Hygiene. Teaching and research in medical care (RF 52130)	5,250.00	5,250.00
FRANCE			
Association d'Hygiène Sociale de L'Aisne, Soissons			
Support of Soissons Centre de la Santé Publique (RF 53090)	133,000.00	8,608.32
GREAT BRITAIN			
University of Manchester, England			
Development of an experimental Health Center (IH 50101)	87,500.00
<i>Professional Education</i>			
UNITED STATES			
Cornell University, Ithaca, New York			
Statistical consultant in the Department of Preventive Medicine at the Medical College (RF 51119)	23,500.00	8,715.97
Harvard University, Cambridge, Massachusetts			
Support of School of Public Health 1946-1956 (RF 45109)	300,000.00	100,000.00
Development of legal medicine (RF 44001, 52075)	80,224.72	18,112.99
Development of the Department of Dermatology of Harvard Medical School (RF 48039)	58,505.20	7,629.03

Johns Hopkins University, Baltimore, Maryland Institute of History of Medicine (RF 50035, 51074)	\$45,000.00	\$.....	\$45,000.00
School of Hygiene and Public Health For developmental purposes, 1948-1958 (RF 48037)	380,000.00	75,000.00
Salaries of temporary staff to replace regular staff assigned to Institute of Hygiene of the University of the Philippines (RF 53068)	12,000.00	4,000.00
New England Center Hospital, Boston, Massachusetts Postgraduate medical education in certain rural areas and towns in Massachusetts (RF 50100)	30,730.47	20,000.00
Simmons College, Boston, Massachusetts Toward establishment of a graduate course in public health nursing in cooperation with the Harvard School of Public Health (RF 53008)	40,000.00	13,450.00
Teachers College, Columbia University, New York City Nursing education research, experimentation and field service (RF 52103)	100,000.00	23,228.60
Vanderbilt University, Nashville, Tennessee For the use by the Department of Pediatrics of the School of Medicine in the exchange of senior assistants (RF 53157)	3,000.00
Washington University, St. Louis, Missouri School of Medicine Teaching of preventive medicine (RF 52111)	67,250.00	19,950.00
Yale University, New Haven, Connecticut Work in the history of medicine (RF 51065)	10,500.00	4,500.00
CANADA			
University of Toronto School of Nursing. Construction of new building (RF 45037)	300,000.00	258,077.98

MEDICINE AND PUBLIC HEALTH — *continued****Professional Education — continued*****MEXICO**

National Institute of Cardiology, Mexico City
Equipment (RF 52082)

APPROPRIATIONS
PRIOR YEARS

1953

1953
PAYMENTS

\$44,000.00 \$..... \$34,121.39

SOUTH AMERICA**Brazil**

Araraquara Health Training Center, 1951-1955. (GA
51124, 52114, RF 53155)

13,690.87 10,000.00

11,595.20

Chile

Catholic University of Chile, Santiago

Apparatus and research expenses of the Departments
of Physiology, Pharmacology, and Biochemistry of
the Medical School (RF 51131)

3,875.30 1,035.72

Department of Neurosurgery

..... 11,100.00

3,600.00

Salary and equipment (RF 53013)

School of Public Health, University of Chile, Santiago

Courses for Sanitary Engineers (GA 51121)

2,336.35 1,777.94

Colombia

National School of Hygiene, Bogotá

General Expenses (IH 48007)

12,343.76 10,799.15

Uruguay

University Nursing School, Montevideo

General budget (IH 47054)

20,942.57 8,271.06

EUROPE

Austria

University of Vienna

Local fellowships for training in child psychiatry
(RF 52162)

\$17,200.00 \$..... \$4,507.05

Belgium

University of Brussels

Support of the Department of Social Medicine (RF
52034)

25,000.00 6,000.63

Finland

Helsinki Institute of Industrial Hygiene

Scientific equipment (IH 49026)

University of Helsinki, Medical School

Research and teaching positions for assistants in the
basic science institutes (RF 53054)

2,109.46 847.69

..... 67,500.00

France

Association pour la Santé Mentale de l'Enfance, Paris

Development of child mental health teaching and
research (RF 52158)

100,000.00 10,632.18

Germany

Health Authority of The Free Hanseatic City of Ham-
burg

Teaching program (RF 53147)

..... 35,000.00

Technische Hochschule, Stuttgart

Education and research in sanitary engineering (RF
53094)

..... 72,000.00 32,501.92

MEDICINE AND PUBLIC HEALTH — *continued**Professional Education — continued*EUROPE — *continued*

University of Heidelberg

School of Nursing. Teaching material and equipment
and for travel of staff (RF 52123)

Teaching and research at the Physiological Institute
(RF 52097)

Great Britain

Institution of Civil Engineers, London

Bursaries for graduate training and research in public
health engineering in universities in the United
Kingdom (RF 52086)

London School of Hygiene and Tropical Medicine

Public Health Engineering (IH 49001)

Public Health Practice Experiments (RF 53026)

Rehabilitation of teaching and public health personnel
(HC 45002)

University of Edinburgh, Scotland

Faculty of Medicine. Teaching of family practice (RF
52140)

University of London, England

University College. Study of medical student selection
(RF 48008, 52160)

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
University of Heidelberg	\$25,065.65	\$.....	\$19,494.84
Teaching and research at the Physiological Institute (RF 52097)	7,613.22	4,498.68
Institution of Civil Engineers, London			
Bursaries for graduate training and research in public health engineering in universities in the United Kingdom (RF 52086)	30,848.91	17,305.13
London School of Hygiene and Tropical Medicine			
Public Health Engineering (IH 49001)	3,691.26	3,691.26
Public Health Practice Experiments (RF 53026)	61,920.00	12,429.20
Rehabilitation of teaching and public health personnel (HC 45002)	5,626.53
University of Edinburgh, Scotland			
Faculty of Medicine. Teaching of family practice (RF 52140)	75,000.00
University College. Study of medical student selection (RF 48008, 52160)	35,165.01

Italy				
University of Naples				
Education and research in sanitary engineering (RF 53095)	\$.....	\$45,800.00		\$877.50
Netherlands				
Institute of Preventive Medicine, Leiden				
Development of Institute (IH 49035)	32,119.00
University of Utrecht				
Teaching and research at the Institute of Clinical and Industrial Psychology (RF 51132)	4,235.15		2,282.01
Sweden				
Karolinska Institute, Stockholm				
Construction of a laboratory for the Department of Experimental Surgery (RF 52004)	200,000.00
State Institute of Public Health, Stockholm				
Equipment. 1951 (GA 5021)	155.76
Switzerland				
Le Bon Secours School of Nursing, Geneva				
Development of graduate and under-graduate nursing education programs (IH 47033, RF 52187)	40,121.99		10,505.25
Yugoslavia				
Development of School of Public Health Engineering at Institute of Hygiene and School of Engineering (IH 50127)	5,910.71		1,916.00

		APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — <i>continued</i>				
<i>Professional Education — <i>continued</i></i>				
EUROPE — <i>continued</i>				
Miscellaneous				
European Symposia on Medical Education (RF 52024)	\$3,775.90	\$.....	\$3,766.63	
FAR EAST				
Ceylon				
National School of Nursing				
Developmental aid (IH 48005)	2,034.18	
India				
Indian Council of Medical Research, Bombay				
Fellowships (RF 53044)	121,000.00	23,270.84	
Sawai Man Singh Medical College, Jaipur				
Research equipment (RF 53115)	22,345.00	3,821.36	
Japan				
Institute of Public Health, Tokyo				
For equipment, teaching, and field training facilities (GA 5008, RF 52013, 53098)	1,956.63	72,050.00	16,694.53	
Keio University, Tokyo				
For equipment for cardio-pulmonary research laboratory in the Department of Medicine (RF 52095)	3,451.44	3,181.04	
Philippine Islands				
University of the Philippines, Manila				
To provide housing allowances and travel expenses for visiting staff of the Johns Hopkins School of Hygiene and Public Health (RF 53067)	18,300.00	6,090.00	

NEAR EAST			
Lebanon			
American University of Beirut			
For development and operation of its medical division (RF 53001)	\$.....	\$500,000.00	\$200,000.00
AUSTRALIA			
University of Melbourne			
Equipment and supplies for the Department of Physiology (RF 51162)	5,879.39	1,038.20
MISCELLANEOUS			
Journals, periodicals and books for public health institutions and schools in need of assistance as a result of the war (HC 45012, GA 5015)	2,619.83
<i>Fellowships and Grants in Aid</i>			
FELLOWSHIPS			
Administered by The Rockefeller Foundation (RF 48138, 49144, 50153, 51220, 52146, 52194, 53182, IH 49037)	715,179.28	400,000.00	401,950.99
Medical Library Association, Detroit, Michigan Fellowships in medical librarianship (RF 51075)	15,650.00	9,500.00
Medical Research Council of Great Britain, London, England (RF 52008)	47,278.85	23,869.76
National Research Council, Washington, D. C. Medical Sciences (RF 51151)	100,000.00	50,000.00
Welch Fellowships in internal medicine (RF 41028)	14,576.82	7,960.85

	PRIOR YEARS	1953	1953 PAYMENTS
MEDICINE AND PUBLIC HEALTH — <i>continued</i>			
<i>Fellowship and Grants in Aid — <i>continued</i></i>			
GRANTS IN AID			
Administered by The Rockefeller Foundation (RF 47089, 47138, 48142, 50090, 51159, 51224, 52198, 53106, 53183)	\$607,067.59	\$450,000.00	\$311,170.98
Special Emergency Grant in Aid Fund			
Scientific equipment for medical science laboratories of universities and technical schools in the Netherlands (RF 45089) (Joint project with Natural Sciences)	6,382.45
<i>Field Service</i>			
FIELD STAFF			
Salary, Travel and Other Expenses 1952-1954 (RF 51198, 52176, 53018, 53163)	765,854.31	701,000.00	690,946.91
Miscellaneous			
Exchange Fund (IH 33077)	14,161.66
Revolving Fund to provide working capital (RF 29093)	200,000.00
Rockefeller Institute for Medical Research, New York City			
General Expense of administration and operation (RF 52178, 53165)	50,000.00	50,000.00	50,000.00
TOTALS — MEDICINE AND PUBLIC HEALTH	\$7,033,059.76	\$3,819,585.00	\$3,898,302.60

NATURAL SCIENCES AND AGRICULTURE

Experimental Biology

Amherst College, Massachusetts Research in biology (RF 51110)	\$32,550.00	\$	\$13,950.00
California Institute of Technology, Pasadena Research programs in biology and chemistry (RF 48030, 53176)	303,495.16	1,500,000.00	86,617.61
Carlsberg Foundation, Copenhagen, Denmark Research in biochemistry (RF 51157)	30,109.37	7,818.50
Centre National de la Recherche Scientifique, Paris, France Scientific equipment for the Institute of Genetics at Gif (RF 50034)	54,000.00
College de France, Paris Research in biochemistry (RF 53154)	15,000.00
Columbia University, New York Cost of publishing a <i>Bibliography of the Research in Tissue Culture, 1900-1950</i> (RF 52161)	10,000.00	10,000.00
Research on enzymes in the Department of Medicine, College of Physicians and Surgeons (RF 52040)	16,750.00	10,750.00
Research in immunochemistry (RF 51018)	29,000.00	13,000.00
Research in genetics and experimental zoology (RF 48076, 51069)	60,273.90	40,561.79
Research in the Department of Biochemistry at the Col- lege of Physicians and Surgeons (RF 50078, 51006, 51186, 52104)	134,526.84	24,202.70
Connecticut Agricultural Experiment Station, New Haven Research in genetics (RF 48018)	5,436.46	3,638.01

NATURAL SCIENCES AND AGRICULTURE — *continued**Experimental Biology* — *continued*

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
Cornell University, Ithaca, New York			
Research in biochemistry (RF 53178)	\$.....	\$150,000.00	\$.....
Research in enzyme chemistry (RF 49082)	14,110.72	9,729.94
To assist in establishing an Electron Microscope Laboratory (RF 49069)	9,000.00	6,500.00
Support of the Maize Genetics Cooperation Project (RF 51133)	185.64
Duke University, Durham, North Carolina			
Research on physical biochemistry of proteins (RF 49070)	97,995.98
Federal Technical Institute, Zurich, Switzerland			
Laboratory of Organic Chemistry. Research on constitution and synthesis of physiologically active compounds (RF 46099)	34,771.63	33,777.23
Research on chemistry of physiologically important compounds (RF 51058)	27,742.70	12,572.96
Research in electron microscopy (RF 52203)	12,000.00	12,000.00
Gordon Research Conferences of the American Association for the Advancement of Science			
Expenses of foreign scientists at Conferences (RF 52018)	17,000.00	5,945.00
Harvard University, Cambridge, Massachusetts			
Research in the Medical School on problems of tissue structure (RF 51052)	48,565.89	15,144.39
Research in enzyme chemistry (RF 50020)	7,450.21	2,500.00

Research in biophysical chemistry in the Department of Chemistry (RF 51013)	\$6,200.00	\$.....	\$6,200.00
Research on the biochemistry of vision (RF 52068)	13,844.75	2,155.25
Haskins Laboratories, New York			
Research in protozoological chemistry (RF 52145)	15,000.00	10,000.00
Indiana University, Bloomington			
Research in genetics (RF 51051)	160,000.00	70,307.80
Iowa State College, Ames			
Research in physiological genetics (RF 49028)	3,000.00
Research in protein chemistry (RF 51028)	6,000.00	3,945.78
Johns Hopkins University, Baltimore, Maryland			
Biochemical research (RF 50105, 53022)	4,625.00	115,000.00	16,124.84
Karolinska Institute, Stockholm, Sweden			
Anatomical Institute. Research in electron microscopy (RF 53135)	24,000.00
Institute of Chemistry. Research in biochemistry (RF 47100)	11,010.30	2,974.56
Development of a section of morphology and cytology (RF 52166)	5,000.00	5,000.00
Department of Physical Cell Research. Equipment for biophysics research (RF 52165)	9,500.00	9,500.00
Institute for Cell Research. Research (RF 49030)	225.69	225.69
Medical Nobel Institute, Department of Biochemistry. Research (RF 50017)	9,647.82	2,557.19
Marine Biological Laboratory, Woods Hole, Massachusetts			
Modernization of laboratory building and general support (RF 48131, 51056)	17,500.00	17,500.00
Massachusetts General Hospital, Boston			
Research in enzyme chemistry (RF 52003)	61,850.00	8,200.00

NATURAL SCIENCES AND AGRICULTURE — *continued**Experimental Biology — continued*

Massachusetts Institute of Technology, Cambridge

Research in biology (RF 47039, 52184)

APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
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\$520,000.00	\$.....	\$519,967.80
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Research in the physical chemistry of protein solutions
(RF 45107, 52157)

52,924.99	16,127.66
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Research in X-ray crystallography (RF 51030, 53081)

2,474.89	10,800.00	7,915.54
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Ministry of Public Health, Montevideo, Uruguay

Equipment and expenses of the Research Institute of
Biological Sciences (RF 49008, 52011)

62,075.04	1,559.97
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Montreal General Hospital, Quebec, Canada

Biochemical research (RF 50046, 53076)

1,113.37	30,000.00	12,113.37
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National Research Council, Washington, D. C.

United States National Committee of the International
Union of Crystallography. Publication of program
(RF 50166)

3,500.00	3,500.00
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Support of American Institute of Biological Sciences
(RF 51117)

16,250.00	11,250.00
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Support of program of Committee on Development of
Biology (RF 51123)

7,500.00	6,072.94
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National University of Mexico

Institute of Chemistry. Equipment and supplies (RF
52189)

50,000.00
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Northwestern University, Evanston, Illinois

Research in the physical chemistry of proteins (RF
52066)

23,750.00	9,750.00
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Pennsylvania State College, State College Biophysical research (RF 51124)	\$7,352.00	\$.....	\$.....
Polytechnic Institute of Brooklyn, New York Research on protein structure (RF 50069, 51180, 52083, 53063)	113,750.00	65,000.00	48,750.00
Princeton University, New Jersey Research in genetics (RF 51136)	10,000.00	4,842.00
Purdue University, Lafayette, Indiana Research in genetics (RF 52038)	18,750.00	7,500.00
Smith College, Northampton, Massachusetts Work in genetics (RF 52131, 53120)	4,500.00	9,000.00	9,000.00
Society for Experimental Biology, England Expenses of American delegates to annual conferences on biological subjects (RF 52043)	9,000.00	1,500.00
Stanford University, Palo Alto, California Biochemical research (RF 51076)	15,000.00	6,839.77
Research in biochemistry of nucleic acids (RF 51077)	17,550.00	12,259.37
Research in biochemical genetics (RF 49057)	2,364.57	2,364.56
Research in biology (RF 53020)	250,000.00
Research in physical biochemistry (RF 51102)	2,420.95	Cr. 4.26
State University of Iowa, Iowa City Research in genetics (RF 53071)	22,680.00	7,800.00
Tokugawa Institute for Biological Research, Japan Equipment and research expenses (RF 53174)	25,000.00
Tufts College, Medford, Massachusetts Program on nucleic acid chemistry (RF 51021)	15,000.00	11,238.82
University College, Dublin, Ireland Research in biochemistry in the Department of Bio- chemistry and Pharmacology (RF 51029)	2,329.87	2,226.49

NATURAL SCIENCES AND AGRICULTURE — *continued**Experimental Biology* — *continued*

University of Aarhus, Denmark

Research in biochemistry (RF 52148)

APPROPRIATIONS	1953	1953
PRIOR YEARS	1953	PAYMENTS

University of Alabama, Birmingham

Program on glycoproteins (RF 51012)

University of Amsterdam, Netherlands

Research in experimental embryology at the Laboratory
of Anatomy and Embryology (RF 53139)Research on tissues in the Laboratory of Histology (RF
50095)

University of Bern, Switzerland

Theodor Kocher Institute. Equipment and assistance to
foreign guests (RF 50074)

University of Birmingham, England

Research in biochemistry (RF 51137)

University of Brazil, Rio de Janeiro

Institute of Biophysics Research (RF 49020, 52012)

Research expenses in the Center of Genetics Research,
Faculty of Philosophy (RF 53122)

University of Brussels, Belgium

Equipment for research in biochemical embryology
(RF 50096)

University of California, Berkeley

Research in biochemistry (RF 51078, 52044)

Research in the comparative biochemistry of marine
organisms (RF 49009, 53083)

Research on the biochemistry of marine microorganisms (RF 52059)	\$29,250.00	\$.....	\$11,541.07
University of Cambridge, England			
Cavendish Laboratory			
X-ray crystallography research equipment (RF 53156)	4,000.00
Research in X-ray crystallography (RF 52132)	961.50	843.00
Molteno Institute of Biology and Parasitology. Research in cell physiology (RF 47101)	10,085.57	3,432.09
Equipment for research in biochemistry (RF 51138, 53127)	2,393.24	25,000.00	2,123.94
Research on biologically important materials (RF 51112)	62,602.61	8,971.56
University Chemical Laboratory. Research equipment and supplies (RF 50112)	3,146.07	2,362.90
University of Chicago, Illinois			
Research in experimental ecology (RF 50094, 53015)	1,421.67	9,600.00	4,519.75
University of Chile, Santiago			
Research in experimental cytology in the Juan Noe In- stitute of Biology (RF 53016)	7,800.00	1,254.29
University of Copenhagen, Denmark			
Research on the biological uses of isotopes (RF 51158)	19,250.00	7,250.00
Research in biochemistry (RF 52045)	6,000.00	1,500.00
Research in physiology in the Institute of Neurophysi- ology (RF 52133)	12,830.78	1,722.20
University of Edinburgh, Scotland			
Department of Animal Genetics. Establishment of sev- eral studentships for young scientists (RF 50116)	1,499.06
Department of Chemistry. Equipment (RF 51033)	151.12	Cr. 109.25

NATURAL SCIENCES AND AGRICULTURE — *continued**Experimental Biology* — *continued*

		APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
University of Florida, Gainesville				
Support of research in ecology (RF 53035)	\$.....	\$6,000.00	\$3,000.00	
University of Geneva, Switzerland				
Research in Organic Chemistry (RF 50081)	3,433.00	2,334.00	
University of Illinois, Urbana				
Program of research in entomology (RF 53070)	25,000.00	4,295.00	
Program of research and advanced training in microbiology in the Department of Bacteriology (RF 53096)	27,000.00	
University of Leiden, Netherlands				
Purchase of equipment for the Laboratory of Experimental Histology (RF 53014)	15,000.00	14,000.00	
University of London, England				
King's College. Research in Biophysics (RF 50065)	18,219.88	2,697.38	
Imperial College of Science and Technology. Research on the organic chemistry of biologically important molecules (RF 52046)	13,539.19	2,499.87	
University College. Research in mammalian genetics in the Department of Eugenics, Biometry and Genetics (RF 53107)	25,000.00	4,000.00	
University of Manchester, England				
Equipment for Department of Organic Chemistry (RF 50058)	2,619.42	2,281.11	
Research on the chemistry of biologically important materials (RF 53132)	45,000.00	

University of Miami, Florida			
Support of research in marine biology (RF 53089)	\$.....	\$75,000.00	\$10,000.00
University of Munich, Germany			
Research in experimental zoology (RF 52062)	19,000.00	9,000.00
University of Oslo, Norway			
Research in plant physiology and X-ray crystallography (RF 51190)	8,025.40	8,000.00
University of Oxford, England			
Department of Human Anatomy. Development of new methods in microscopy and microspectroscopy and their application to biological problems (RF 52167)	12,000.00	3,578.23
Dyson Perrins Laboratory of Organic Chemistry			
Research in organic chemistry (RF 51155)	19,539.06	6,817.80
Equipment for research (RF 49122)	252.82
Sir William Dunn School of Pathology. Equipment for research (RF 53141)	7,500.00
Chemical Crystallography Laboratory. Research in X-ray crystallography (RF 52149)	3,720.75
University of Paris, France			
Research in biochemistry in the Laboratory of Biological Chemistry (RF 51187)	13,109.77	1,394.04
Research in the Laboratory of Physical Chemistry (RF 53140)	15,000.00
University of Pennsylvania, Philadelphia			
Research in zoology (RF 53053)	125,000.00	2,000.00
University of Pittsburgh, Pennsylvania			
Research on the chemistry of fats and proteins (RF 49019, 52065)	15,832.50	6,659.35
Support of a project in pulmonary physiology (RF 52019)	9,875.00	9,875.00

NATURAL SCIENCES AND AGRICULTURE — *continued**Experimental Biology* — *continued*

University of Rochester, New York

Research in genetics (RF 53109)

	PRIOR YEARS	1953	1953 PAYMENTS
	\$.....	\$1,651.92	\$1,651.92
University of São Paulo, Brazil			
Faculty of Medicine			
Research in Laboratory of Histology and Embryology (RF 51103, 53119)	2,288.56	13,000.00	2,412.51
Research expenses at Ribeirão Preto (RF 53145)	50,000.00
University Radiochemistry Laboratory. Work with radioactive isotopes in experimental biology and medicine (RF 50146)	5,784.51	2,487.16
Faculty of Philosophy. Equipment for research in the Department of Physics (RF 45061)	3,459.47	2,600.57
University of Sheffield, England			
Research in biochemistry (RF 51114)	18,776.27	7,924.03
University of Stockholm, Sweden			
Research in biochemistry (RF 50011)	89.31
Research in radiobiology (RF 50027, 53036)	134.70	4,200.00
University of Texas, Austin			
Research in genetics (RF 51089)	30,000.00	29,577.97
University of Uppsala, Sweden			
Researches in Institute of Medical Chemistry (RF 53034)	9,000.00	9,000.00
Researches in Institute of Physical Chemistry (RF 53126)	35,000.00

Researches in Institute of Physiology (RF 49126)	\$1,686.76	\$.....	\$35.55
Equipment for research on proteins and polysaccharides (RF 49142)	8,062.32	3,469.07
Research in biochemistry (RF 52141)	45,017.37	10,002.39
University of Utah, Salt Lake City			
Research in enzyme chemistry (RF 52090)	24,000.00
University of Utrecht, Netherlands			
Research in biophysics and biochemistry (RF 49113)	10,000.57	7,314.64
University of Washington, Seattle			
Research in physical biochemistry of proteins (RF 51091, 53062)	6,000.00	100,000.00	16,126.92
University of Wisconsin, Madison			
Research in biochemistry (RF 51171, 53177)	28,750.00	200,000.00	206,250.00
Research in genetics (RF 53108)		25,000.00	3,500.00
Research in metabolism of plant tissues (RF 51009)	32,830.00
Research in physical chemistry of the proteins (RF 50059)	5,352.00
Research in cytogenetics (RF 50048, 53097)	5,006.11	30,000.00	9,845.28
Scientific equipment for the Enzyme Institute (RF 48031)	8,252.45	8,093.14
Research in enzyme chemistry (RF 50047, 52064)	34,878.86	11,000.00
Washington University, St. Louis, Missouri			
Research in experimental embryology (RF 50037)	5,430.11	4,367.65
Biochemical research (RF 49117)	22,670.75	14,769.09
Woods Hole Oceanographic Institution, Massachusetts			
Support of two major appointments in marine biology (RF 52078)	62,500.00	25,000.00

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
NATURAL SCIENCES AND AGRICULTURE — <i>continued</i>			
<i>Experimental Biology — continued</i>			
Worcester Foundation for Experimental Biology, Massachusetts			
Research on the physiology of mammalian eggs and sperm (RF 50082)	\$10,950.00	\$.....	\$10,950.00
Yale University, New Haven, Connecticut			
Biochemical Research (RF 51168)	57,750.00	13,858.33
Research in the Department of Botany (RF 48032)	5,477.83	5,000.00
Research in the physical chemistry of proteins (RF 52029)	65,000.00	5,652.79
Zoological Station of Naples, Italy			
General expenses and equipment (RF 51059)	15,366.29	9,366.29
<i>Agriculture</i>			
CENTRAL AMERICA AND MEXICO			
Central America			
Establishment of a corn improvement project (RF 53170)	30,000.00
Costa Rica			
Inter-American Institute of Agricultural Sciences, Turrialba			
Strengthening the library resources and making possible the development of a scientific communication program (RF 49077)	20,983.06
Development of a tropical dairy cattle project (RF 50057)	1,800.00

Mexico				
Latin American Scholarships (RF 50151, 51120)	\$86,243.30	\$.....	\$31,181.18	
Mexican Agricultural Program				
Additional greenhouse and farm building facilities at La Piedad, Guanajuato (RF 52180)	25,000.00	24,228.64	
General expenses (RF 51044, 51205, 52174, 52179, 53161, 53166)	251,664.11	176,500.00	173,638.14	
Mexican Ministry of Agriculture. Toward costs of an agricultural extension service (RF 53045, 53167)	160,000.00	42,002.48	
Mexico Agricultural Education				
To improve agricultural education in Mexico (RF 52108)	33,350.00	
Instituto Technologico y de Estudios Superiores, School of Agriculture, Monterrey	31,077.24	16,112.15	
Antonio Narro College of Agriculture, Saltillo, Co- ahuila	4,583.75	21,226.58	
National College of Agriculture, Chapingo, State of Mexico	37,440.00	2,516.39	
Expansion of staff in Mexico for training purposes (RF 51207)	46,507.57	1,714.45	
Research, demonstration and extension program, State of Mexico (RF 51210)	60,165.73	35,632.99	
Mexico and Colombia				
Field Staff				
Division of Natural Sciences and Agriculture (RF 52182, 53030, 53171)	343,700.00	406,500.00	280,627.11	
Scientific Aides				
Temporary (RF 51208)	1,963.53	1,433.41	
Special Temporary (RF 51209)	2,001.50	Cr. 20.04	

NATURAL SCIENCES AND AGRICULTURE — *continued**Agriculture — continued*

LATIN AMERICA

Latin American Agricultural Information Center

Establishment and support (RF 52109)

APPROPRIATIONS	1953	1953
PRIOR YEARS	1953	PAYMENTS

SOUTH AMERICA

Brazil

Gammon Institute, College of Agriculture, Lavras,
Minas Gerais. Development of the College Farm
(RF 53110)

Institute of Agronomy, Campinas

Equipment for climatological research (RF 53010)

Research in plant viruses (RF 49156)

801.97

Rural University of the State of Minas Gerais

Equipment and supplies for the Schools of Agriculture
and Veterinary Medicine (RF 52016)

30,000.00

University of Rio Grande Do Sul, Pôrto Alegre

Equipment, supplies and library materials (RF 53149)

25,000.00

University of São Paulo

Equipment and supplies for work in the Faculty of
Veterinary Medicine (RF 51163, 53144)

5,292.09

30,000.00

2,856.99

Instituto Agronómico, Campinas (RF 50148)

3,675.41

.....

1,122.45

Instituto Biológico, São Paulo (RF 50149)

5,109.96

.....

4,462.15

School of Agriculture, Piracicaba (RF 50147)

15,501.03

.....

9,944.95

Chile				
Bacteriological Institute of Chile, Santiago				
Equipment and supplies for work in animal viruses (RF 52007)	\$7,336.35	\$.....	\$1,630.51	
Colombia				
Agricultural Experiment Station, El Rubí				
Furnishing expert advice and service in connection with its development (RF 52126)	22,723.83	5,478.67	
Collaborative Operating Program in Agriculture (RF 51206, 52175, 52181, 53162, 53168)	113,235.80	90,500.00	75,211.68	
Inter-American Society of Plant Breeders, Plant Path- ologists, and Entomologists				
Expenses of conference to be held in 1955 (RF 53007)	25,000.00	3,314.30	
Ministry of Agriculture				
Experimental greenhouse (RF 53169)	50,000.00	
National University of Colombia				
Faculty of Agronomy, Medellín				
Equipment (RF 47117)	2,003.77	1,293.64	
To send outstanding graduating class students for specialized training with The Rockefeller Founda- tion's agricultural staff in Mexico (RF 48072, 50079)	8,630.43	
Teaching and research facilities, study trips of staff members, and to assist in bringing foreign visiting professors to the Faculty (RF 49031)	4,244.11	
Faculties of Agronomy at Palmira and Medellín				
Toward cost of student dormitory at each of these agricultural colleges (RF 50102)	50,000.00	38,196.54	

	PRIOR YEARS	1953	1953 PAYMENTS
NATURAL SCIENCES AND AGRICULTURE — <i>continued</i>			
<i>Agriculture — continued</i>			
<i>SOUTH AMERICA — continued</i>			
Colombia — <i>continued</i>			
Faculty of Agronomy, Palmira			
Equipment for a second scientific laboratory building (RF 51084)	\$2,544.91	\$.....	\$74.37
Teaching and research facilities, study trips of staff members, and to assist in bringing foreign professors to the Faculty (RF 51085)	11,081.78	671.88
Ecuador			
Ministry of Economy			
Equipment and supplies for use in forestation and re-forestation programs (RF 52021)	5,549.07	295.06
Peru			
National School of Agriculture, La Molina			
Equipment, supplies and library materials for a college of advanced and post-graduate studies (RF 52139)	30,000.00	23,141.85
University of San Marcos, Lima			
Faculty of Veterinary Medicine. Equipment and supplies (RF 50150)	44,822.96
EUROPE			
Sweden			
University of Lund			
Institute of Genetics. Research in genetics and plant breeding (RF 52142)	40,000.00	13,999.40

FAR EAST

India

Government of Uttar Pradesh	\$.....	\$35,000.00	\$.....
Physical Plant (RF 53180)			
Pilot Development Project at Etawah (RF 52053)	100,000.00

UNITED STATES

California Institute of Technology, Pasadena			
Earhart Plant Research Laboratory. Research on the water relations of plants (RF 53051)	42,600.00	14,200.00
Cornell University, Ithaca, New York			
Research in the Department of Agronomy of the New York State College of Agriculture (RF 53042)	80,000.00	10,000.00
Society of American Foresters, Washington, D. C.			
Expenses of a survey of forestry research (RF 53003)	30,000.00	20,000.00
University of California, Berkeley			
Citrus Experiment Station, Riverside. Research on the mode of action of insecticides (RF 52033)	11,250.00	9,660.02
University of Florida, Gainesville			
Expenses of a counselor to Latin American students enrolled in agricultural courses (RF 52035)	25,000.00	13,806.73
University of Illinois, Urbana			
Research on the mode of action of insecticides (RF 52032)	21,730.40	5,750.00
University of Minnesota, Minneapolis			
Research in the Departments of Plant Pathology and Botany and of Agronomy and Plant Genetics (RF 53043)	60,000.00

NATURAL SCIENCES AND AGRICULTURE — *continued**Agriculture — continued**UNITED STATES — continued*

University of North Carolina, Chapel Hill

Research in mathematical and experimental genetics
under the auspices of the Institute of Statistics (RF
52186)*Fellowships and Grants in Aid***FELLOWSHIPS**Administered by The Rockefeller Foundation (RF 48139,
49145, 50154, 51221, 52195, 53182)National Research Council, Washington, D. C. (RF
50054, 51150)**GRANTS IN AID**Administered by The Rockefeller Foundation (RF 48143,
49149, 50159, 51225, 52199, 53183)*Other Subjects*

American Academy of Arts and Sciences, Boston, Massachusetts

Support of activities aimed at making more sound and effective the interrelationships between the various branches of the Natural Sciences, the Social Sciences, and the Humanities (RF 52020)

Centre National de la Recherche Scientifique, Paris, France

Travel of non-French delegates to conferences of scientists (RF 46049, 52058)

Conservation Foundation, New York

APPROPRIATIONS	1953	PAYMENTS
PRIOR YEARS	1953	

\$170,000.00	\$.....	\$34,000.00
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499,022.51	300,000.00	172,928.20
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130,860.78	66,591.68
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799,830.00	450,000.00	312,036.72
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Research and general administrative expenses (RF 51001, 53091)	\$37,312.74	\$75,000.00	\$49,000.00
Institute of Biology and Technological Research, Curitiba, Brazil			
Equipment for a new biological laboratory building (RF 52009)	40,000.00
Princeton University, New Jersey			
Research in social physics (RF 50167)	5,000.00	2,000.00
University of Brazil, Rio de Janeiro			
Full-time professorships in the Faculty of Philosophy (RF 49154)	1,476.50
University of California, Berkeley			
White Mountain Research Station Support (RF 52117)	30,000.00	17,991.25
University of Chicago, Illinois			
Advanced training in applied statistics (RF 51087) (Joint project with Social Sciences)	60,000.00	22,740.25
University of Iceland, Reykjavik			
Building and equipping an Institute of Experimental Pathology (RF 48110)	27,877.42	6,674.79
University of Rio Grande Do Sul, Brazil			
For research expenses in the Faculty of Philosophy (RF 53148)	50,000.00
University of São Paulo, Brazil			
Research expenses, equipment and supplies for science departments (RF 50145, 53143)	27,958.98	45,000.00	22,756.04
TOTALS — NATURAL SCIENCES AND AGRICULTURE	\$6,450,078.13	\$5,428,831.92	\$3,424,188.97

	PRIOR YEARS	APPROPRIATIONS 1953	1953 PAYMENTS
SOCIAL SCIENCES			
American Law Institute, Philadelphia, Pennsylvania Preparation of model criminal code with commentaries (RF 51213, 53066)	\$178,000.00	\$53,000.00	\$53,000.80
American Museum of Natural History, New York Study of social change in the Admiralty Islands (RF 52143)	16,550.00	13,000.00
American Psychological Association, New York Research connected with the development of a code of ethical practice for psychologists (RF 49012)	3.97	Cr. 326.72
Bennington College, Vermont Study of interest-group interaction in the political process (RF 51083)	13,550.50	7,116.56
Brookings Institution, Washington, D. C. Research and education in the field of international rela- tions (RF 50083, 52185)	255,000.00	105,000.00
Canadian Institute of International Affairs, Toronto General budget (RF 46036)	3,965.56
Columbia University, New York Development of a program of Far Eastern Studies through the various social sciences departments (RF 48041)	49,764.54	34,555.32
Program of the Institute for Urban Land Use and Housing Studies (RF 51003)	11,000.00	11,000.00
Program of training in the social sciences (RF 51170)	60,000.00	44,322.54
School of International Affairs General support of the Russian Institute (RF 50133)	232,500.00	72,500.00
Columbia University Press, New York Toward publication costs of book <i>On Social Survival</i> (RF 52134)	2,200.00

Committee on Research in Economic History, Inc., Cambridge, Massachusetts			
Research and training in economic history (RF 50103)	\$7,500.00	\$.....	\$7,500.00
Cornell University, Ithaca, New York			
Development and testing of improved research methods for studies in underdeveloped areas (RF 53002)	64,900.00	21,200.00
Program of research on community action and inter-group relations (RF 50104)	50,639.88	20,000.00
Study of the relation of Civil Rights to the Control of Subversive Activities in the United States (RF 51142, 52098)	9.25
Council on Foreign Relations, Inc., New York			
History of foreign relations of the United States during World War II (RF 46002)	1,175.22
Study of the sterling area (RF 53101)	50,000.00	32,750.00
Study of the political implications of the economic development of unindustrialized areas (RF 51149)	6,500.00	6,500.00
Two research and publication projects in the field of international relations (RF 52092)	7,000.00	Cr. 7,000.00
Crete Survey			
Expenses of a survey in Crete as a means of exploring ways of raising the standard of living in undeveloped countries (RF 48102)	53.47
Dartmouth College, Hanover, New Hampshire			
Pilot study of the relation of overseas transport to the development of underdeveloped areas (RF 53152)	15,120.00	3,000.00
Deutsche Hochschule für Politik, Berlin, Germany			
Preparation of source books and outline manuals in political science (RF 53114)	17,940.00	4,296.20

		APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
SOCIAL SCIENCES — <i>continued</i>				
Dortmund Center for Social Science Research, Germany				
Costs of a study of social relations in a steel mill (RF 52159)	\$25,500.00	\$.....	\$13,886.29	
Duke University, Durham, North Carolina				
Studies of differences in state per capita incomes (RF 51072)	31,201.50	6,265.41	
Ecole Polytechnique, Paris, France				
Research and training program of the Laboratoire d'Econométrie (RF 53133)	37,500.00	1,502.05	
Economic Commission for Europe, United Nations, Geneva, Switzerland				
Study of long-run tendencies in the European economy (RF 52150)	73.15	
Fellowships				
Administered by The Rockefeller Foundation (RF 49146, 51160, 51222, 52196, 53182)	299,330.06	175,000.00	104,991.19	
Australian-New Zealand Social Science Fellowship Committee, Melbourne, Australia				
Administrative expenses (RF 52168)	2,250.00	676.88	
Canadian Social Science Research Council, Montreal				
For special fellowship assistance (RF 53087)	131,250.00	63,125.00	
Program of research and publication and for awards of fellowships and professorial leaves (RF 52112)	146,423.44	29,325.00	
Toward the costs of fellowships and professorial leaves (RF 50070, 51080)	3,910.70	
Economic Commission for Europe, United Nations, Geneva, Switzerland				
In-service training scholarships (RF 51139, 52120)	32,000.00	12,000.00	

Institut de Science Economique Appliquée, Paris, France In-service training scholarships (RF 51035)	\$2,673.20	\$.....	\$2,673.20
Social Science Research Council, New York (RF 51054, 53023, 53181)	120,000.00	431,250.00	122,500.00
Fletcher School of Law and Diplomacy, Medford, Massachusetts			
Case Study of United States Commercial Policy (1933- 1954) (RF 53128)	45,000.00	9,450.00
Gokhale Institute of Politics and Economics, Poona, India Economic and demographic research program (RF 51094)	19,938.75	2,115.00
Grants in Aid			
Administered by The Rockefeller Foundation (RF 46141, 48091, 48144, 50109, 51183, 51226, 52164, 52200, 53153, 53183)	460,715.64	500,000.00	284,603.32
Harvard University, Cambridge, Massachusetts			
Research Center in Entrepreneurial History For research (RF 52081)	135,000.00	45,000.00
Graduate School of Business Administration			
Support of research on profits and the functioning of the economy (RF 52063)	55,136.00	10,061.05
Laboratory of Human Development			
Study of social and cultural factors in child development (RF 51173)	53,750.00	21,597.08
Laboratory of Social Relations			
Research on the structure and functioning of working committees (RF 53048)	52,500.00	17,500.00
Study of conflicts within occupational roles (RF 53049)	57,000.00	21,500.00
Study of comparative values in five cultures (RF 51175)	82,676.50	41,105.43
Studies of motivated perception (RF 49073)	4,044.19	4,044.19
Program of Economic Research (RF 51071)	100,000.00	37,468.01

SOCIAL SCIENCES — *continued*

	APPROPRIATIONS	1953	1953
	PRIOR YEARS	1953	PAYMENTS
Studies of state election statistics (RF 51082)	\$28,798.20	\$.....	\$6,437.74
The Law School			
Study of the ethical problems of representation (RF 53065)	28,400.00	13,100.00
Hunter College, New York			
Comparative study of union-management relations in the United States and Germany (RF 53073)	54,900.00	15,750.00
IFO-Institut für Wirtschaftsforschung, Munich, Germany			
Research program in economics (RF 53146)	27,000.00
Institut de Science Economique Appliquée, Paris, France			
Research on the methodology of social accounting (RF 52091)	21,221.26	10,051.28
Institut für Europäische Politik und Wirtschaft, Frankfurt, Germany			
Research on problems of European integration (RF 53150)	20,000.00	9,550.12
Institut für Politische Wissenschaft, Berlin, Germany			
Study of the consolidation of the Nazi totalitarian system (RF 53113)	20,800.00	4,743.72
Institute for Advanced Study, Princeton, New Jersey			
Research in history and government (RF 53118)	15,000.00	7,500.00
For assistance and compensation in a program of study and writing (RF 49064)	7,975.70	5,000.00
Institute of Economics and History, Copenhagen, Denmark			
Completing a history of prices in Denmark from 1660 to 1800 (RF 53017)	2,000.00	2,000.00

International African Institute, London, England Field studies of the Fulani-speaking peoples of West Africa (RF 51034)	\$5,734.64	\$.....	\$2,768.70
Johns Hopkins University, Baltimore, Maryland Salaries and travel expenses of European visiting professors in the Department of Political Economy (RF 51111)	18,750.00	5,864.05
London School of Economics and Political Science, England Purchase of land for expansion of school plant (RF 31028)	8,153.32
Department of Sociological and Demographic Research. General expenses (RF 49115)	25,201.31	9,608.21
Mayor's Advisory Committee for the Aged, New York Exploration of the problems of adjustment of the aged in New York City (RF 52204)	10,000.00	10,000.00
McGill University, Montreal, Canada Institute of International Air Law. Expenses of two Euro- pean students during years 1952-53 and 1953-54 (RF 52047)	6,000.00	6,000.00
Miami University, Oxford, Ohio Studies of population redistribution (RF 46080, 52028)	89,294.72	21,082.19
National Bureau of Economic Research, New York General programs and special programs of research in finance and fiscal policy (RF 47120, 49141, 50134) Study of Soviet economic growth (RF 53125)	1,080,000.00 275,000.00	240,000.00
National Council of The Churches of Christ in the United States of America Studies of its Department of The Church and Economic Life (RF 52054)	107,500.00	17,500.00
National Foundation of Political Science, Paris, France Study of changes in the structure of the French economy (RF 53025)	60,000.00	15,503.23

SOCIAL SCIENCES — *continued*

	PRIOR YEARS	APPROPRIATIONS 1953	1953 PAYMENTS
National Institute of Economic and Social Research of Great Britain, London			
General budget (RF 50075)	\$17,793.75	\$.....	\$16,871.25
Expenses of the International Association for Research in Income and Wealth (RF 50006, 53103)	13,404.73	35,000.00	41,442.29
Princeton University, New Jersey			
Office of Population Research of the School of Public and International Affairs (RF 48105, 53077)	80,496.14	40,000.00	40,000.00
Institute of International Studies. General Support (RF 51017)	160,000.00	60,000.00
Queen's University, Kingston, Canada			
Program of advanced training and research in fiscal, monetary and economic policy (RF 53055)	47,250.00	11,903.25
Royal Institute of International Affairs, London, England, (Chatham House)			
History of the war and of the peace settlement (RF 47071, 52002)	73,952.93	32,338.96
Research on Europe, the Middle East, and Southeast and East Asia (RF 53046)	72,000.00	22,467.50
Research on the Middle East, the Soviet Union and under-developed territories (RF 51062)	17,024.41	14,071.88
Study of <i>The Theory of International Economic Policy</i> (RF 52026, 53047)	324.39	4,050.00	1,266.19
Royal Statistical Society, London, England			
Library facilities and additional secretarial and editorial assistance (RF 50087)	15,140.92	10,068.92

Sixth Section of the Ecole Practique des Hautes Etudes, Paris,
France

For expenses of seminars and program of research in eco-
nomic history (RF 52136)

\$10,913.79 \$..... \$5,172.42

Social Science Research Council, New York

Administrative budget (RF 51053)

60,000.00 40,000.00

Conferences and planning (RF 51204)

125,000.00 62,500.00

Grants in aid of research (RF 51055)

48,000.00 20,000.00

Program of inter-university summer seminars (RF 53175)

..... 100,000.00

Support of the *Current Digest of the Soviet Press* (RF 51218)
(Joint project with Humanities)

31,723.60 15,000.00

Study of "Economic Growth: The Problem and Its Set-
ting" (RF 52105)

35,000.00

Preparation of a series of monographs based on the 1950
census (RF 52118)

35,000.00 15,000.00

Stanford University, California

Food Research Institute

Capital Fund — 1953 (RF 53172)

..... 500,000.00 500,000.00

Program of predoctoral training in agricultural economics
research (RF 50086)

20,816.70

Research Program (RF 51060)

38,333.66 16,002.77

State Historical Society of Colorado

Study of the Western Range Cattle Industry (1865-1895)
(RF 52099)

12,350.00

Swarthmore College, Pennsylvania

Study of the Good Neighbor Policy of the United States
(RF 52137)

3,700.00 3,700.00

University of Basle, Switzerland

Development of research and training in monetary and
credit economics (RF 52060)

180,000.00 60,247.85

University of British Columbia, Vancouver, Canada

Development of a program in Slavic Studies (RF 49080)

11,223.43 5,960.82

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
SOCIAL SCIENCES — <i>continued</i>			
University of California, Berkeley			
Institute of Industrial Relations. Studies of the impact of an aging population on American society (RF 49139)	\$46,027.58	\$.....	\$29,042.69
University of Cambridge, England			
History of English Criminal Law (RF 51096)	13,503.91	5,278.51
Department of Applied Economics			
Study of the Social Accounts of Cambridgeshire (RF 51177)	65,055.33	17,648.54
University of Chicago, Illinois			
Toward the costs of establishing a Workshop in Money and Banking (RF 53179)	50,500.00
Toward the costs of the fourth volume of <i>History of Public Administration in the United States</i> (RF 52039)	25,000.00	5,000.00
Program of the Cowles Commission for Research in Economics (RF 48047, 53079)	20,000.00	15,700.00	35,499.05
Program in education, training and research in race relations (RF 47031)	17,737.68	15,040.53
Research on low productivity in American agriculture (RF 51088)	24,000.00	16,000.00
Research in mathematical statistics (RF 53061)	135,000.00
University of Delaware, Newark			
Study of individual income tax returns in Delaware for years 1925 through 1936 (RF 51178)	5,700.00	5,700.00
University of Heidelberg, Germany			
Alfred-Weber-Institut für Sozial-und Staatswissenschaften. Research program on political parties (RF 53056)	17,300.00	8,282.12
University of Manchester, England			
Faculty of Economic and Social Studies. Support of research (RF 51097, 52023)	21,705.60	11,057.91

University of Michigan, Ann Arbor Survey Research Center			
Study of labor organizations (RF 53028)	\$.....	\$23,000.00	\$23,000.00
Theoretical analysis of survey data relating to economic behavior (RF 52031)	26,288.00	26,288.00
Analysis of data from an experimental study of the effect of differing patterns of supervision on employee productivity and morale (RF 52036)	16,125.00	16,125.00
Program of methodological research in the field of human relations (RF 50019, 53093)	7,166.99	48,900.00	17,540.67
Study of behavior in a small group (RF 53111)	24,500.00	6,225.00
University of Minnesota, Minneapolis			
Studies of social disorganization (RF 53112)	15,075.00
University of Missouri, Columbia			
Study of the rural church as a social institution in Missouri (RF 51216)	34,820.00	5,082.00
University of Notre Dame, South Bend, Indiana			
Research in international relations (RF 52084)	55,500.00	36,500.00
University of Oklahoma, Norman			
Experimental study of intergroup relations (RF 52115)	24,000.00	24,000.00
University of Oslo, Norway			
Institute of Economics. Research program (RF 52138, 53142)	5,000.00	3,000.00	8,000.00
University of Oxford, England			
Nuffield College. Additional research faculty in the social sciences (RF 46132)	109,255.87	5,633.53
University of Pennsylvania, Philadelphia			
Wharton School of Finance and Commerce. Research projects (RF 53137)	25,000.00	9,375.00
Studies on redistribution of population and economic growth in the United States (RF 52106)	112,000.00	40,000.00

SOCIAL SCIENCES — *continued***University of Puerto Rico, San Juan**

Publication of the integrated report of social anthropological studies of Puerto Rico (RF 53124)

APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
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\$.....	\$2,500.00	\$.....
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University of Toronto, Canada

Development of Slavic studies (RF 49054)

13,502.39	13,500.00
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Research on the problems of Canadian development (RF 53086)

.....	225,750.00	15,367.97
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University of Vienna, Austria

Institute of Criminology

Research assistance (RF 53037)

.....	1,000.00	500.00
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Study of the economic situation of Austrian peasants on small farms (RF 53084)

.....	2,200.00	800.00
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University of Wisconsin, Madison

Research in the field of legal history (RF 53052)

.....	76,000.00
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Study of the Law and the Lumber Industry in Wisconsin (RF 48051)

8,487.50
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Vanderbilt University, Nashville, Tennessee

Institute of Research and Training in the Social Sciences. Research in agricultural economics and in the organization of industry (RF 52077)

112,000.00	37,204.90
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Visiting Scholars at Harvard Research Center in Entrepreneurial History

Special Grant in Aid Fund (RF 51127)

5,530.00	460.00
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Yale University, New Haven, Connecticut

Institute of International Studies Research program (RF 49062)

5,475.00	5,475.00
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Studies of communication and attitude change (RF 51174)

106,791.00	37,986.92
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TOTAL -- SOCIAL SCIENCES

\$5,749,534.97	\$3,597,285.00	\$3,153,890.48
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HUMANITIES

American Board of Commissioners for Foreign Missions, Boston, Massachusetts			
Studies in intellectual and cultural movements in Turkey (RF 49138)	\$6,551.76	\$.....	\$.....
American Council of Learned Societies, Washington, D. C.			
General support, planning, development and fellowships (RF 50033)	153,125.00	134,140.15
Pacific Coast Committee for Humanities. General support (RF 51144)	2,000.00	1,925.61
Preparation of a revised edition of <i>Encyclopedia of Islam</i> under auspices of the Royal Netherlands Academy of Sciences (RF 52022)	12,000.00	3,000.00
Preparation of the supplementary volumes of the <i>Dictionary of American Bibliography</i> (RF 53134)	30,000.00
Program of translations into English of modern materials in Near Eastern languages (RF 48125)	15,797.24
Study of personnel problems in the humanities (RF 51008)	25,500.00	16,684.23
American School of Classical Studies, Athens, Greece			
Museum to house objects excavated in the Agora (RF 37089)	138,354.94	138,354.94
American University of Beirut, Lebanon			
Interpretative studies of the modern Arab Middle East (RF 49071)	8,654.75
Translation from western languages into Arabic of books in the humanities (RF 52101)	9,950.00	3,050.00
Association of Special Libraries and Information Bureaux, London, England			
Completion of British <i>Union Catalogue of Periodicals</i> (RF 44001, 53011)	8,973.19	15,000.00	7,185.72

HUMANITIES — *continued*

	APPROPRIATIONS	1953	PAYMENTS
	PRIOR YEARS	1953	
Austrian College Society, Vienna			
Institute for Current European Cultural Research. Research Program (RF 52188)	\$40,000.00	\$.....	\$13,330.00
British Museum, London, England			
To enable the museum to offer to American libraries, at a discount, subscriptions to the new edition of its Catalogue of Printed Books (RF 29086, 30076)	44,946.24	323.17
City Center of Music and Drama, Inc., New York City			
Creating new productions in opera and ballet (RF 53064)	200,000.00	70,000.00
Colegio de México, Mexico, D. F.			
Research and a training seminar on contemporary Mexican history (RF 51219)	12,818.50	4,540.72
Columbia University, New York City			
Advanced study in the United States and Europe by journalists from Southeast Asia (RF 53009)	31,880.00
Preparation of a biography of Booker T. Washington (RF 51230, 53012)	5,500.00	10,000.00	13,505.33
Commission on History of Pan American Institute of Geography and History, Mexico, D. F.			
Program of research in history of ideas (RF 51165)	10,000.00	5,000.00
Work on history of the Americas (RF 51118)	11,120.00	11,120.00
Conference on interpretation of Arab tradition, thought, and outlook, to be held in Near East (RF 51005)	19,800.40
Cornell University, Ithaca, New York			
Development of methods, materials, and personnel for the teaching of the history of modern science (RF 48124)	7,525.00	7,524.06
Southeast Asian Studies (RF 50139)	217,517.81	75,335.00

Fellowships

Administered by The Rockefeller Foundation (RF 48141, 49147, 51161, 51223, 52197, 53182)	\$258,881.24	\$150,000.00	\$117,187.95
American Council of Learned Societies, Washington, D. C.			
Fellowships in the humanities (RF 51048, 51049)	197,500.00	17,895.13
State University of Iowa, Iowa City			
For fellowships in creative writing (RF 53005)	40,000.00	7,790.00
University of the South, Sewanee, Tennessee			
For fellowships in creative writing (RF 53004)	45,000.00	14,500.00
Grants in Aid			
Administered by The Rockefeller Foundation (RF 47109, 48145, 50089, 50161, 51227, 52201, 53138, 53183)	493,063.64	340,000.00	294,001.69
Special Grant in Aid Fund			
To enable non-Muslem students of Islam, through visits to Islam, to gain a direct acquaintance with contemporary thought and movements within Islam (RF 51086)	17,530.66	5,540.48
Surveys, Studies and Conferences (RF 48083)	1,377.62
Harvard University, Cambridge, Massachusetts			
Graduate School of Education. Support of program in history and philosophy (RF 52087)	34,813.00	13,713.00
Preparation of a descriptive analysis of the contemporary Russian language (RF 50040)	25,169.58	10,474.59
Support in the development of the publication <i>Confluence, an International Forum</i> (RF 52124)	26,000.00	26,000.00
Haverford College, Pennsylvania			
Development of reading courses and a senior seminar (RF 53102)	28,950.00	3,725.00

	PRIOR YEARS	APPROPRIATIONS 1953	1953 PAYMENTS
HUMANITIES — <i>continued</i>			
Henry E. Huntington Library and Art Gallery, San Marino, California			
Program of regional studies (RF 5002)	\$8,500.00	\$.....	\$4,036.36
Humanities Research Council of Canada, Toronto			
Support of activities in planning and development (RF 51130, 53088)	4,744.81	68,250.00	20,300.98
Indian Council of World Affairs, Delhi			
Preparation of a history of India's attainment of independ- ence (RF 53069)	43,890.00	8,020.08
Italian Institute of Historical Studies, Naples (Instituto Italiano de Studi Storici)			
Library materials, and fellowships and general support (RF 52151)	8,510.47	3,090.54
Keio University, Tokyo, Japan			
Support of the Japan Library School (RF 52107)	118,200.00	50,815.19
Kenyon College, Gambier, Ohio			
Fellowships in creative writing and criticism awarded by editors of <i>The Kenyon Review</i> and for editorial expenses of the Review (RF 52119)	41,400.00	19,373.88
Korean Language Research Society, Seoul, Korea			
Publication of its dictionary of the Korean language (RF 52191)	33,000.00
Kyoto University, Japan			
Kyoto University — Doshisha University Committee. American studies at Kyoto (RF 53129) (Joint Project with Social Sciences)	14,000.00
Organization and reproduction of materials on the archae- ology of Korea (RF 53082)	10,500.00	1,725.00

Lehigh University, Bethlehem, Pennsylvania Research on the British Empire before the American Revolution (RF 52061)	\$17,500.00	\$.....	\$7,000.00
Library of Congress, Washington, D. C. American Studies (RF 43095)	19,000.00
Louisville Philharmonic Society, Inc., Kentucky Composition, performance and recording of new works by living composers (RF 53041)	400,000.00	21,545.00
Massachusetts Institute of Technology, Cambridge Experiment in the use of French as a language of instruction in basic humanities courses (RF 53078)	19,300.00
McGill University, Montreal, Canada Expenses of an Institute of Islamic Studies (RF 51108)	184,877.08	23,995.50
Studies in the public and private life of W. L. Mackenzie King (RF 49060, 53058)	27,000.00	70,000.00	27,000.00
Mexican-American Cultural Institute, Mexico City Program to encourage creative writing in Mexico (RF 53100)	28,020.00	28,020.00
Modern Language Association of America, New York Inquiry into the role which foreign languages and literatures should play in American life (RF 52116)	101,500.00	39,500.00
National Diet Library, Tokyo, Japan Establishment of a Microfilm Laboratory (RF 52156)	41,000.00	28,880.22
National Institute of Anthropology and History, Mexico City Support of two South American fellowships (RF 52049)	1,765.48	1,655.21
National Institute of Economic and Social Research, London, England Editorial work on edition of complete works of Alexis de Tocqueville (RF 51167, 53130)	4,480.06	17,500.00	5,355.19

HUMANITIES — *continued*

	APPROPRIATIONS PRIOR YEARS	1953	1953 PAYMENTS
New Dramatists Committee, Inc., New York General support of its program (RF 51156)	\$14,500.00	\$.....	\$5,500.00
New School for Social Research, New York City Study of religion in Germany since the end of World War II (RF 53024)	50,500.00	26,950.00
Occidental College, Los Angeles, California Developing humanistic studies in the Southwest area of the United States and of Northern Mexico (RF 49024, 53021)	4,203.24	50,000.00	14,148.18
Princeton University, New Jersey Development of Near Eastern studies (RF 46066, 52005) (Joint project with Social Sciences)	90,600.00	30,000.00
Expenses of an experimental group in literary criticism (RF 49023)	623.79
Support of Seminars in Criticism (RF 52056)	90,000.00	20,000.00
Royal Institute of International Affairs, London, England Travel preliminary to a revision of <i>A Study of History</i> (RF 53031)	12,000.00	1,551.93
St. Vladimir's Orthodox Theological Seminary and Academy, New York Support of research and writing by members of its faculty (RF 50031)	17.76
Stanford University, California Development of Far Eastern and Slavic studies (RF 44130)	800.00	Cr. 300.40

Tokyo University, Japan			
Seminars in American studies sponsored jointly by Tokyo University and Stanford University (RF 51211) (Joint project with Social Sciences)	\$127,000.00	\$.....	\$24,816.34
University of Ankara, Turkey			
To enable its Faculty of Letters to appoint a Professor of American Literature and a Professor of American History (RF 53072)	21,000.00
University of Bordeaux, France			
Development of work in humanities (RF 47061)	43.63
University of Bristol, England			
Development of university program in drama (RF 49119)	4,894.89	3,625.31
University of British Columbia, Vancouver, Canada			
Development of a program in Slavic studies (RF 49080)	11,223.42	5,960.82
University of California, Berkeley			
Development of personnel in Slavic studies (RF 47128)	10,542.49	10,542.49
University of Cambridge, Downing College, England			
Salary of an assistant for director of English studies (RF 49016, 51166)	7,234.27
University of Chicago, Illinois			
Work in philosophy (RF 53029)	21,000.00	7,000.00
University of Cologne, Germany			
Development of a program of American studies (RF 51037)	8,274.62	198.05
University of Delaware, Newark			
Development of a program in American Studies (RF 52085)	59,500.00	15,500.00
University of Durham, England			
Study of materials available for an understanding of modern Near Eastern cultures (RF 51176)	19,625.09	11,836.13

HUMANITIES — *continued*

University of Illinois, Urbana

Program of American studies in Kyoto under the sponsorship of Kyoto University, Doshisha University and the University of Illinois (RF 53130) (Joint Project with Social Sciences)

University of Michigan, Ann Arbor

Cross-disciplinary studies in the theory of language and symbolism (RF 50140)

University of Munich, Germany

Visiting professors from the United States or Canada and library materials for its America Institute (RF 49094)

University of Oxford, England

Research in American history and institutions (RF 53123)

University of Pennsylvania, Philadelphia

Work in modern Indian languages and literatures (RF 47129)

University of the Philippines, Manila

Library development and research in Philippine history (RF 48111)

University of the South, Sewanee, Tennessee

Payment of writers whose work is published in *The Sewanee Review* (RF 48011)

University of Toronto, Canada

Development of Slavic studies (RF 49054)

University of Toulouse, France

Development of work in the humanities (RF 47062)

	APPROPRIATIONS	1953	1953 PAYMENTS
	PRIOR YEARS	1953	
University of Illinois, Urbana			
Program of American studies in Kyoto under the sponsorship of Kyoto University, Doshisha University and the University of Illinois (RF 53130) (Joint Project with Social Sciences)	\$.....	\$18,200.00	\$.....
University of Michigan, Ann Arbor	2,521.22
Cross-disciplinary studies in the theory of language and symbolism (RF 50140)	441.35
University of Munich, Germany			
Visiting professors from the United States or Canada and library materials for its America Institute (RF 49094)	559.77
University of Oxford, England			
Research in American history and institutions (RF 53123)	3,500.00
University of Pennsylvania, Philadelphia			
Work in modern Indian languages and literatures (RF 47129)	26.98
University of the Philippines, Manila			
Library development and research in Philippine history (RF 48111)	1,588.00	1,588.00
University of the South, Sewanee, Tennessee			
Payment of writers whose work is published in <i>The Sewanee Review</i> (RF 48011)	13,502.38	13,500.00
University of Toronto, Canada			
Development of Slavic studies (RF 49054)	7,327.38
University of Toulouse, France			
Development of work in the humanities (RF 47062)			

University of Washington, Seattle Far Eastern Institute		\$3,000.00	\$.....	\$3,000.00
Research on the Far East (RF 47035)				
University of Wisconsin, Madison				
Research and teaching in the materials of American civilization (RF 49081)	1,402.48		1,402.48
Evaluation and future planning of its community cultural arts program (RF 53080)	15,000.00	
Yale University, New Haven, Connecticut				
Preparation of a study of the characteristics of the history of the twentieth century (RF 52050, 53033)	5,000.00	10,000.00	15,000.00	
TOTALS — HUMANITIES	\$2,900,401.23	\$1,763,490.00	\$1,517,979.25	

GENERAL

American Library Association, Chicago, Illinois				
Support of International Youth Library, Munich, Germany (RF 51020)	\$16,550.00		\$16,548.41
Colgate University, Hamilton, New York				
Pilot study of the impact of the ROTC program on the college curriculum (RF 52010)	10,000.00		10,000.00
European Rehabilitation (RF 49038)	31,867.34		Cr. 5,472.06
Exchange Fund (RF 46123)	12,992.70		
Free University of Berlin, Germany				
Work in the social sciences and the humanities (RF 50063)	3,762.06		1,331.19
General Education Board, New York				
Support of program for advancement of education in the southern states (RF 51202)	100,000.00		100,000.00

GENERAL — *continued*

	APPROPRIATIONS	1953	1953
	PRIOR YEARS	1953	PAYMENTS
Germanistic Society of America, Inc., New York American scholarly publications for libraries in Western Germany (RF 53121)	\$.....	\$9,000.00	\$4,500.00
Grants in Aid administered by The Rockefeller Foundation for allocation by the officers within categories described by Trustee action and within specified limitations of amount and duration (RF 51122, 52121, 52202, 53183)	122,646.64	50,000.00	21,793.66
History of the International Health Division For completion and publication (RF 52125)	21,615.53	4,433.63
Institute of International Education, New York International student exchange (RF 53059)	75,000.00
Institute of Judicial Administration, Inc, New York Toward its expenses (RF 52073)	250,000.00	84,163.83
International House of Japan, Inc., Tokyo Toward establishment and support of an international cultural center in Tokyo (RF 52102, 52183)	600,706.17	319,963.35
International Press Institute, Zurich, Switzerland Maintenance and development (RF 51050)	20,000.00	20,000.00
Ministry of Education, Cairo, Egypt Expenses of a mission to study university practice and administration in the West (RF 53075)	17,500.00
National Research Council, Washington, D. C. Conference Board of the Associated Research Councils Study of Human Resources and the Fields of Higher Learning (RF 52074)	76,924.06	53,074.06
Pacific Science Association, Washington, D. C. Establishment of Permanent Secretariat (RF 52014)	13,300.00	13,300.00

Salzburg Seminar in American Studies, Inc., Austria General budget (RF 51073)	\$30,000.00	\$.....	\$30,000.00
Social Science Research Council, New York Committee on Cross-Cultural Education (RF 52067)	50,000.00	15,904.67
Stanford University, California Research in fields of communication and psychiatry (RF 52110)	25,000.00	15,500.00
Yale University, New Haven, Connecticut Establishment and general support of a Carbon 14 dating laboratory (RF 50132)	16,800.00	8,582.03
TOTALS -- GENERAL	\$1,402,164.50	\$151,500.00	\$713,622.77

ADMINISTRATION

Home Office			
1952 (RF 2824, 51195, 52070, 53019)	\$66,542.40	\$25,000.00	\$83,480.84
1953 (RF 52170, 53059, 53040)	1,721,825.00	10,000.00	1,653,713.95
1954 (RF 53158)	1,752,801.00
Treasurer's Office			
1952 (RF 51196, 52072)	18,363.21	14,196.94
1953 (RF 52171)	59,954.00	43,669.94
1954 (RF 53159)	62,859.00
Field Offices			
(RF 51197, 52154, 52172, 53160)			
Africa and Asia Minor			
Egypt, Cairo, 1952-1954	11,668.68	7,500.00	7,484.40
Canada, Toronto, 1952, 1953	4,568.09	1,800.39
Caribbean Region			
Central Office, Florida, Miami, 1952	1,633.34416.32
Dominican Republic, Ciudad Trujillo, 1952-1954	4,788.29	2,360.00	3,848.04

ADMINISTRATION — *continued***Field Offices — *continued*****Europe**

England, London. 1952-1954	\$12,628.00	\$13,280.00	\$10,098.90
France, Paris. 1952-1954	89,884.92	74,590.00	69,306.29
Retirement Plan (RF 53038)	1,900.00	1,893.48
Italy, Rome. 1952	275.52	217.90

Far East

India, Delhi and Bangalore. 1952-1954	20,879.57	22,000.00	16,776.14
Japan, Tokyo. 1952-1954	4,016.63	3,000.00	1,947.86

South America

Bolivia, Cochabamba, La Paz. 1952-1953	3,499.50	2,597.10
Brazil, Rio de Janeiro. 1952-1954	18,109.11	18,000.00	10,184.00
Chile, Santiago. 1952-1954	6,988.51	5,000.00	3,802.95
Colombia, Bogotá. 1952-1953	3,906.32	2,009.91
Peru, Lima. 1952-1953	8,819.92	7,905.50
Mexico, Mexico City. 1952-1954	9,574.47	7,600.00	7,906.63
Miscellaneous. 1952-1954	780.00	5,000.00

TOTALS — ADMINISTRATION	\$ 2,068,705.48	\$ 2,010,890.00	\$ 1,943,257.48
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TOTALS	\$25,603,944.07	\$16,771,581.92	\$14,651,241.55
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LESS:			
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Unused balances of appropriations allowed to lapse	880,933.85
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GRAND TOTALS	\$24,723,010.22	\$16,771,581.92	\$14,651,241.55
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REFUNDS ON PRIOR YEAR CLOSED APPROPRIATIONS

American Council of Learned Societies, Washington, D. C.	(RF 49053)	\$1,889.19
American Council on Education, Washington, D. C.	(RF 51061)	1,057.35
American Philosophical Association, New York City	(RF 47024)	2,336.56
American Studies Seminar in Japan	(RF 52015)	425.49
Chile School of Public Health, Santiago, Chile	(IH 48014)	77.21
Columbia University, New York City	(RF 47006)	107.59
Columbia University, New York City	(RF 47051)	2,554.08
Columbia University, New York City	(RF 48049)	1,453.16
Columbia University, New York City	(RF 49005)	587.20
Dominican Republic — Endemic Disease Control Service	(GA-MPH 51100)	305.32
Encyclopaedia of the Social Sciences, New York City	(RF 32114)	1,879.35
Grants in Aid — Natural Sciences 1940	(RF 40108)	118.29
Grants in Aid — Humanities 1948	(RF 48084)	1,456.04
Harvard University, Massachusetts	(RF 50051)	6.29
Inter-American Symposium on Plant Breeding, Pests and Diseases, Mexico	(RF 51135)	483.73
Kenyon College, Gambier, Ohio	(RF 47037)	211.89
National Research Council, Washington, D. C.	(RF 49121)	828.79
National Research Council, Washington, D. C.	(RF 50084)	1,305.43
Pan American Sanitary Bureau, Washington, D. C.	(IH 50131)	100,000.00
Princeton University, New Jersey	(RF 51215)	2,295.87

REFUNDS ON PRIOR YEAR CLOSED APPROPRIATIONS — *continued*

Public Administration Clearing House, Chicago, Illinois	(RF 51140)	\$ 476.57
Tennessee Tuberculosis Studies — 1952	(RF 51185)	176.16
University of California, Berkeley	(GA-IH 5020)	2,759.47
University of California, Berkeley	(RF 48132)	12.33
University of Colorado, Boulder	(RF 51066)	2,793.82
University of Rome, Italy	(IH 48008)	1,071.95
University of Texas, Austin	(RF 49027)	111.10
University of Toronto, Canada	(GA-IH 5019)	1,292.55
University of Wisconsin, Madison	(RF 46118)	664.46
		<hr/> <u>\$128,737.24</u>

FINANCE COMMITTEE'S STATEMENT OF TRANSACTIONS RELATING TO INVESTED FUNDS

FOR THE YEAR ENDED DECEMBER 31, 1953

PURCHASED

USA Treasury Bills:			
\$4,400,000	dated 1/8/53 due 4/9/53 @ 99.50		\$4,378,000.00
3,000,000	" 2/13/53 " 5/14/53 @ 99.505		2,985,150.00
7,000,000	" 2/19/53 " 5/21/53 @ 99.502		6,965,140.00
3,000,000	" 3/26/53 " 6/25/53 @ 99.488		2,984,640.00
4,400,000	" 4/9/53 " 7/9/53 @ 99.477		4,376,988.00
3,000,000	" 5/14/53 " 8/13/53 @ 99.427		2,982,810.00
7,000,000	" 5/21/53 " 8/20/53 @ 99.473		6,963,110.00
3,000,000	" 6/11/53 " 9/10/53 @ 99.414		2,982,420.00
3,000,000	" 6/25/53 " 9/24/53 @ 99.511		2,985,330.00
4,400,000	" 7/9/53 " 10/8/53 @ 99.495		4,377,780.00
3,000,000	" 8/13/53 " 11/12/53 @ 99.466		2,983,980.00
7,000,000	" 8/20/53 " 11/19/53 @ 99.469		6,962,830.00
3,000,000	" 9/10/53 " 12/10/53 @ 99.507		2,985,210.00
3,000,000	" 9/24/53 " 12/24/53 @ 99.59		2,987,700.00
3,000,000	" 12/24/53 " 3/25/54 @ 99.568		2,987,040.00
2,000,000	" 12/31/53 " 4/1/54 @ 99.602		1,992,040.00
			<u>\$62,880,168.00</u>
USA Treasury Bonds:			
11,000,000	2½s due 9/15/56-59 @ 99.3295		10,926,250.00
5,000,000	2½s due 6/15/58 @ 100.03125		5,001,562.50
1,920,000	2½s due 9/15/61 @ par		1,920,000.00
4,400,000	USA Treasury Notes Series "A", 1½s, 3/15/55 @ 99.2443		4,366,750.00
1,000,000	USA Treasury Certificates of Indebtedness 2s, 8/15/53 @ 100.140625		1,001,406.25
1,500,000	" " " " " 2½s, 3/22/54 @ par		1,500,000.00
2,412½	shares American Gas & Electric Co. Common (Par \$5) @ \$33.6498		81,180.20
5,600	" Canadian Industries Limited Common (No par) @ \$39.3052		220,109.05

FINANCE COMMITTEE'S STATEMENT OF TRANSACTIONS
RELATING TO INVESTED FUNDS — *continued*

PURCHASED — *continued*

2,500	shares Corning Glass Works Common (Par \$5) @ \$88.8984	\$222,246.21
6,000	" Crown Zellerbach Corporation Common (Par \$5) @ \$35.4485	212,691.24
33 $\frac{3}{4}$	" Dow Chemical Co. Common (Par \$5) @ \$38.3538	1,270.47
800	" Fireman's Fund Insurance Co. Capital (Par \$5) @ \$65.0658	52,052.69
13,900	" B. F. Goodrich Co. Common (Par \$10) @ \$74.65988	1,037,772.44
5,000	" International Paper Co. Common (Par \$7.50) @ \$56.6062	283,031.10
3,957	" Monsanto Chemical Co. Common (Par \$5) @ \$88.1048	348,630.80
493	" Travelers Insurance Co. Capital (Par \$100) @ \$830.193711	409,285.50
5,000	" Union Carbide & Carbon Corporation Capital (No par) @ \$74.86946	374,347.33
8,100	" Westinghouse Electric Corporation Common (Par \$12.50) @ \$51.75784	419,238.57
		<hr/>
		\$91,257,992.35

DIVIDENDS IN STOCK

787 $\frac{1}{2}$	shares American Gas & Electric Co. Common (Par \$5) received on 31,500 shares of stock owned of record 2/2/53. Taken into the books at no value thereby reducing the price per share of stock owned	\$— 0 —
391 $\frac{3}{4}$	" Dow Chemical Co. Common (Par \$5) received on 15,675 shares of stock owned of record 10/27/53. Taken into the books at no value thereby reducing the price per share of stock owned	— 0 —
5,000	" International Paper Co. Common (Par \$7.50) received on 50,000 shares of stock owned of record 11/20/53. Taken into the books at no value thereby reducing the price per share of stock owned	— 0 —
12,000	" Standard Oil Co. (New Jersey) Capital (Par \$15) received on 600,000 shares Standard Oil Co. (Indiana) Capital (Par \$25). Taken into the books @ \$68.1875 in accordance with noticed received from Standard Oil Co. (Indiana) dated 9/21/53 and the value credited to income	818,250.00
		<hr/>
		\$818,250.00

OTHERWISE ACQUIRED

\$1,000,000	USA Treasury Bonds 2½s due 12/15/58 received in exchange for \$1,000,000 USA Treasury Notes Series "A" 2½s due 12/1/53	\$1,000,000.00
USA Treasury Certificates of Indebtedness:		
3,000,000	2½s due 2/15/54 received in exchange for \$3,000,000 1½s due 2/15/53	2,998,894.83
4,000,000	2½s " 6/1/54 " " " 4,000,000 1½s due 6/1/53	3,997,877.76
1,000,000	2½s " 8/15/54 " " " 1,000,000 2s due 8/15/53	1,001,371.58
5,000,000	2½s " 9/15/54 " " " 5,000,000 USA Treasury Bonds 2s due 9/15/51-53	5,000,000.00
31,500 shares American Gas & Electric Co. Common (Par \$5) received in exchange for 15,750 shares American Gas & Electric Co. Common (Par \$10)	— 0 —	
20,000 rights American Telephone & Telegraph Co. received on account of the ownership of 20,000 shares American Telephone & Telegraph Co. Capital (Par \$100) and the value used to reduce the ledger value of stock owned	48,600.00	
3,000 shares Fiber Products, Inc. Common (Par \$1.00) received as a stock distribution on 30,000 shares of Weyerhaeuser Timber Co. Capital (Par \$25) owned of record 11/30/53. Taken into the books at \$5.50 the bid price 12/1/53	16,500.00	
		<u>\$14,063,244.17</u>

ADDITIONS TO LEDGER VALUE

Interest increment on USA Savings Bonds Series "F" (12 year appreciation bonds):

\$67,500	(Maturity value) due 5/1/53	\$1,350.00
67,500	" " " 1/1/54	2,362.50
.67,500	" " " 7/1/54	2,227.50
135,000	" " " 1/1/55	4,185.00
		<u>\$10,125.00</u>
		<u>\$106,149,611.52</u>

**FINANCE COMMITTEE'S STATEMENT OF TRANSACTIONS
RELATING TO INVESTED FUNDS—*continued***

REDEEMED AT MATURITY OR SOLD		PROCEEDS	LEDGER VALUE
\$100,000	Chesapeake & Ohio Ry. 2nd Equipment Trust 2½s, 5/15/53 @ par	\$100,000.00	\$100,806.05
125,000	Chicago, Milwaukee, St. Paul & Pacific R.R. Co Trustee Equipment Series "EE" 2s, 7/1/53 @ par	125,000.00	123,968.81
225,000	Chicago & North Western Ry. Co. Equipment 2nd issue of 1948 2½s, 11/1/53 @ par	225,000.00	223,799.51
200,000	Illinois Central R.R. Co. Equipment Series "EE" 2½s, 4/1/53 @ par	200,000.00	201,181.19
350,000	Southern Pacific Co. Equipment Series "EE" 2½s, 4/1/53 @ par	350,000.00	353,350.89
100,000	Wheeling & Lake Erie Ry. Co. Equipment Series "O" 1½s, 12/1/53 @ par	100,000.00	98,834.32
USA Treasury Bills (issued on discount basis):			
4,400,000	dated 10/9/52 due 1/8/53 @ 99.54	\$4,379,760.00	
3,000,000	" 11/13/52 " 2/13/53 @ 99.53	2,985,900.00	
7,000,000	" 11/20/52 " 2/19/53 @ 99.528	6,966,960.00	
3,000,000	" 12/26/52 " 3/26/53 @ 99.448	2,983,440.00	
4,400,000	" 1/8/53 " 4/9/53 @ 99.50	4,378,000.00	
3,000,000	" 2/13/53 " 5/14/53 @ 99.505	2,985,150.00	
7,000,000	" 2/19/53 " 5/21/53 @ 99.502	6,965,140.00	
3,000,000	" 3/26/53 " 6/25/53 @ 99.488	2,984,640.00	
4,400,000	" 4/9/53 " 7/9/53 @ 99.477	4,376,988.00	
3,000,000	" 5/14/53 " 8/13/53 @ 99.427	2,982,810.00	
7,000,000	" 5/21/53 " 8/20/53 @ 99.473	6,963,110.00	

3,000,000	"	6/11/53	"	9/10/53 @ 99.414	\$2,982,420.00
3,000,000	"	6/25/53	"	9/24/53 @ 99.511	2,985,330.00
4,400,000	"	7/9/53	"	10/8/53 @ 99.495	4,377,780.00
3,000,000	"	8/13/53	"	11/12/53 @ 99.466	2,983,980.00
7,000,000	"	8/20/53	"	11/19/53 @ 99.469	6,962,830.00
3,000,000	"	9/10/53	"	12/10/53 @ 99.507	2,985,210.00
3,000,000	"	9/24/53	"	12/24/53 @ 99.590	2,987,700.00
					<u>\$75,217,148.00*</u> \$75,217,148.00
800,000		USA Treasury Certificates of Indebtedness 1 1/8s, 2/15/53 @ 100.0625			800,500.00 800,041.83
67,500		(Maturity value) USA Savings Bonds Series "F" 5/1/53 (12 year appreciation bonds) @ par			67,500.00 67,500.00
					<u>\$77,185,148.00</u> \$77,186,630.60
SOLD					
20,000	rights	American Telephone & Telegraph Co.	@ \$2.43	\$48,600.00	\$48,600.00
107,763	shares	The Buckeye Pipe Line Co.	Capital (No par) @ \$18.32	1,974,218.16	1,270,627.60
33,765	"	Interstate Natural Gas Co. Inc.	Capital (No par) @ \$44.90	1,516,048.50	505,106.25
356,818	"	National Fuel Gas Co.	Capital (No par) @ \$14.839506	5,295,002.94	2,765,339.50
20,900	"	Standard Oil Co. (New Jersey)	Capital (Par \$15) @ \$72.50709	1,515,398.28	955,116.31
				<u>\$10,349,267.88</u>	\$5,544,789.66

*Proceeds of USA Treasury Bills augmented by sum of \$373,353.39 which was appropriately credited to income (cost of these bills is identical with the redemption price).

**FINANCE COMMITTEE'S STATEMENT OF TRANSACTIONS
RELATING TO INVESTED FUNDS — *continued***

SURRENDERED IN EXCHANGE		PROCEEDS	LEDGER VALUE
\$5,000,000	USA Treasury Bonds 2s, 9/15/51-53 for \$5,000,000 USA Treasury Certificates of Indebtedness 2½s, 9/15/54	\$5,000,000.00	\$5,000,000.00
	USA Treasury Certificates of Indebtedness:		
3,000,000	1⅓s due 2/15/53 for \$3,000,000 2⅓s due 2/15/54	2,998,894.83	2,998,894.83
4,000,000	1⅓s " 6/1/53 " 4,000,000 2⅓s " 6/1/54	3,997,877.76	3,997,877.76
1,000,000	2s " 8/15/53 " 1,000,000 2⅓s " 8/15/54	1,001,371.58	1,001,371.58
1,000,000	USA Treasury Notes Series "A" 2⅓s, 12/1/53 for \$1,000,000 USA Treasury Bonds 2½s, 12/15/58	1,000,000.00	1,000,000.00
15,750 shares American Gas & Electric Co. Common (Par \$10) for 31,500 shares American Gas & Electric Co. Common (Par \$5)		— 0 —	— 0 —
		\$13,998,144.17	\$13,998,144.17

LEDGER VALUE REDUCED

Finance Committee Minute No. 5326, dated 11/5/53 directed that the premium paid on the purchase of \$5,000,000 USA Treasury Bonds 2½s, 6/15/58, be charged to surplus

The 20,000 shares American Telephone & Telegraph Capital (Par \$100) were reduced by the value of 20,000 rights

The 30,000 shares Weyerhaeuser Timber Co. Capital (Par \$25) were reduced by the value of 3,000 shares Fiber Products, Inc. Common (Par \$1)

— 0 —	\$1,562.50
\$48,600.00	48,600.00
16,500.00	16,500.00
\$65,100.00	\$66,662.50
\$101,597,660.05	\$96,796,226.93

AMORTIZATION OF PREMIUM PAID ON PURCHASE OF SECURITIES

\$6,200,000	USA Treasury Bonds 2½s, 12/15/59-62	\$2,688.68
1,000,000	USA Treasury Certificates of Indebtedness 2s, 8/15/53	34.67
		<u>\$2,723.35</u>

RECONCILIATION

Ledger value of securities, December 31, 1952	\$164,292,660.38
Purchased	\$91,257,992.35
Dividends in Stock	818,250.00
Otherwise Acquired	14,063,244.17
Additions to Ledger Value	10,125.00
	<u>106,149,611.52</u>
Redeemed at Maturity or Sold	\$77,186,630.60
Sold	5,544,789.66
Surrendered in Exchange	13,998,144.17
Ledger Value Reduced	66,662.50
	<u>\$270,442,271.90</u>
Amortization	\$96,796,226.93
	2,723.35
Ledger value of securities, December 31, 1953	<u>96,798,950.28</u>
	<u>\$173,643,321.62</u>

SCHEDULE OF SECURITIES ON DECEMBER 31, 1953

BONDS	PAR	LEDGER VALUE		MARKET VALUE		
		PRICE	TOTAL	PRICE	TOTAL	
International Bank for Reconstruction and Development 3½s, October 15, 1971	\$1,000,000	\$98.	\$980,000.00	\$100.25	\$1,002,500.00	
Standard Oil Co. (Indiana) Conv. Deb. 3½s, October 1, 1982	5,450,000	105.844	5,768,484.37	102.875	5,606,687.50	
United States of America Treasury Bills:						
March 25, 1954	3,000,000	99.568	2,987,040.00	99.568	2,987,040.00	
April 1, 1954	2,000,000	99.602	1,992,040.00	99.602	1,992,040.00	
United States of America Treasury Bonds:						
INT. DUE						
2% — June 15, 1952-54	4,500,000	100.	4,500,000.00	100.34375	4,515,468.75	
2% — Dec. 15, 1952-54	6,600,000	100.	6,600,000.00	100.28125	6,618,562.50	
2½% — Sept. 15, 1956-59	11,000,000	99.330	10,926,250.00	100.125	11,013,750.00	
2¾% — June 15, 1958	5,000,000	100.	5,000,000.00	100.78125	5,039,062.50	
2½% — Dec. 15, 1958	1,000,000	100.	1,000,000.00	100.3125	1,003,125.00	
2¼% — June 15, 1959-62	7,000,000	100.	7,000,000.00	98.875	6,921,250.00	
2½% — Dec. 15, 1959-62	6,200,000	100.260	6,216,132.02	98.875	6,130,250.00	
2¾% — Sept. 15, 1961	1,920,000	100.	1,920,000.00	102.75	1,972,800.00	

United States of America Treasury Certificates of Indebtedness:

SERIES	INT.	DUE					
A	2 1/4%	— Feb. 15, 1954	\$3,000,000	\$ 99.963	\$2,998,894.83	\$100.40625	\$3,012,187.50
* C	2 1/2%	— Mar. 22, 1954	1,500,000	100.	1,500,000.00	100.21875	1,503,281.25
B	2 5/8%	— June 1, 1954	4,000,000	99.95	3,997,877.76	100.53125	4,021,250.00
D	2 5/8%	— Aug. 15, 1954	1,000,000	100.137	1,001,371.58	100.75	1,007,500.00
E	2 5/8%	— Sept. 15, 1954	5,000,000	100.	5,000,000.00	100.84375	5,042,187.50
United States of America Treasury Notes Series "A" 1 1/2%, March 15, 1955			4,400,000	99.244	4,366,750.00	99.71875	4,387,625.00
United States of America Savings Bonds Defense Series "F" (12 year appreciation bonds):							
Jan. 1, 1954 — Maturity value			67,500	98.	66,150.00	98.	66,150.00
July 1, 1954	"	"	67,500	96.20	64,935.00	96.20	64,935.00
Jan. 1, 1955	"	"	135,000	94.50	127,575.00	94.50	127,575.00
United States of America Savings Bonds 2 1/2% Series "G" due October 1, 1962			1,000,000	100.	1,000,000.00	95.10	951,000.00
					<u>\$75,013,500.56</u>		<u>\$74,986,227.50</u>

* Tax Anticipation

SCHEDULE OF SECURITIES — *continued*

STOCKS	SHARES	LEDGER VALUE	MARKET VALUE
		PRICE TOTAL	PRICE TOTAL
American Gas & Electric Co. (Par \$5)	34,700	\$25.685 \$891,254.31	\$34.625 \$1,201,487.50
American Telephone & Telegraph Co. Cap. (Par \$100)	20,000	137.283 2,745,668.24	156.125 3,122,500.00
Canadian Industries Limited (No par)	10,000	39.356 393,562.52	37.625 376,250.00
Christiana Securities Co. (Par \$100)	200	5,568.00 1,113,600.00	7,400.00 1,480,000.00
Consolidated Natural Gas Co. Cap. (Par \$15)	133,174	28.462 3,790,417.87	54.25 7,224,689.50
Corning Glass Works (Par \$5)	2,500	88.898 222,246.21	88.50 221,250.00
Continental Insurance Co. Cap. (Par \$10)	10,000	65.597 655,965.37	75.50 755,000.00
Continental Oil Co. Cap. (Par \$5)	150,000	14.46 2,169,117.65	52.00 7,800,000.00
Crown Zellerbach Corporation (Par \$5)	6,000	35.445 212,691.24	35.00 210,000.00
Dow Chemical Co. (Par \$5)	16,100	19.947 321,142.87	38.25 615,825.00
Fiber Products, Inc. (Par \$1)	3,000	5.50 16,500.00	6.25 18,750.00
Fireman's Fund Insurance Co. Cap. (Par \$5)	10,800	58.22 628,761.66	65.25 704,700.00
First National Bank of Chicago (Par \$100)	6,000	193.229 1,159,379.35	262.00 1,572,000.00
General Electric Co. (No par)	20,000	59.021 1,180,424.14	87.50 1,750,000.00
Goodrich, B. F. Co. (Par \$10)	23,900	73.340 1,752,821.81	76.875 1,837,312.50
Hartford Fire Insurance Co. Cap. (Par \$10)	15,000	130.075 1,951,131.15	174.00 2,610,000.00

International Nickel Co. of Canada Ltd. (No par)	52,500	\$40.818	\$2,142,936.29	\$35.00	\$1,837,500.00
International Paper Co. (Par \$7.50)	60,000	39.455	2,367,288.41	56.25	3,375,000.00
Kennecott Copper Corporation Cap. (No par)	30,000	58.539	1,756,180.37	64.25	1,927,500.00
Monsanto Chemical Co. (Par \$5)	10,000	77.132	771,318.65	82.25	822,500.00
National Fuel Gas Co. Cap. (No par)	24,200	7.750	187,550.00	15.625	378,125.00
The Ohio Oil Co. (No par)	94,684	32.735	3,099,446.50	53.75	5,089,265.00
Peoples Gas Light & Coke Co. (Par \$100)	7,000	120.653	844,573.46	133.50	934,500.00
Phelps Dodge Corporation Cap. (Par \$12.50)	70,000	26.358	1,845,087.74	30.875	2,161,250.00
Socony-Vacuum Oil Co. Cap. (Par \$15)	300,000	33.015	9,904,514.61	35.50	10,650,000.00
Standard Oil Co. of California Cap. (No par)	75,600	7.84	592,739.03	52.875	3,997,350.00
Standard Oil Co. (Indiana) Cap. (Par \$25)	600,000	28.369	17,021,661.26	68.50	41,100,000.00
Standard Oil Co. (New Jersey) Cap. (Par \$15)	2,084,100	15.378	32,049,783.20	72.00	150,055,200.00
Tennessee Gas Transmission Co. 4.25% Cum. Pfd. (Par \$100)	5,000	96.675	483,372.50	86.875	434,375.00
Travelers Insurance Co. (Par \$100)	493	830.194	409,285.50	840.00	414,120.00
Union Carbide & Carbon Corporation (No par)	5,000	74.869	374,347.33	74.25	371,250.00
Union Pacific R.R. Co. (Par \$50)	10,000	107.565	1,075,659.68	105.75	1,057,500.00
Union Tank Car Co. Cap (No par)	240,000	6.692	1,606,087.97	45.50	10,920,000.00
United Fruit Co. Cap. (No par)	15,000	57.965	869,477.29	45.00	675,000.00

SCHEDULE OF SECURITIES — *concluded*

STOCKS — <i>concluded</i>	SHARES	LEDGER VALUE		MARKET VALUE	
		PRICE	TOTAL	PRICE	TOTAL
Westinghouse Electric Corporation (Par \$12.50)	8,100	\$51.758	\$419,238.57	\$50.875	\$412,087.50
Weyerhaeuser Timber Co. Cap. (Par \$25)	30,000	53.486	1,604,588.31	68.50	2,055,000.00
TOTAL STOCKS			\$98,629,821.06		\$270,167,287.00

SUMMARY

	LEDGER VALUE		MARKET VALUE	
Bonds		\$75,013,500.56		\$74,986,227.50
Stocks:				
Preferred	\$483,372.50		\$434,375.00	
Common	98,146,448.56	98,629,821.06	269,732,912.00	270,167,287.00
		\$173,643,321.62		\$345,153,514.50

Geographical Distribution of Grants, 1953

Geographical Distribution of Grants, 1953

UNITED STATES

	<i>Amount \$</i>	<i>page</i>
CALIFORNIA		
CALIFORNIA INSTITUTE OF TECHNOLOGY		
Chemical Biology: research	1,500,000	192
Earhart Plant Research Laboratory	500,000	214
UNIVERSITY OF CALIFORNIA		
<i>Berkeley:</i>		
Institute for Personality Assessment and Research: research	50,000	135
Scripps Institution of Oceanography: research	8,000	184
Forest Experiment Station: N. Mirov; research	7,300	221
Plant Pathology: W. C. Snyder; travel	5,000	222
Economics: N. Buchanan; travel	4,200	247
H. Ellis; travel	1,500	247
President A. Carleton, Aleppo College, Syria; visiting professorship	3,000	262
<i>Los Angeles:</i>		
A. E. Fessard, Collège de France; travel	2,385	147
STANFORD UNIVERSITY		
Food Research Institute: research	500,000	233
J. Davis; research and travel	11,500	265
S. D. Zagoroff; research	7,500	245
Experimental Biology: research	250,000	189
American Studies: K. Nakaya, Tokyo University; research	6,000	289
Hoover Institute and Library: H. G. Angelo; research	3,250	261
Pacific Spectator: R. C. North, editor; research	2,500	306
Biology: E. L. Tatum; travel	2,300	160
SCRIPPS COLLEGE		
Purchase of Printing Equipment	5,000	321

	<i>Amount \$ page</i>
OCCIDENTAL COLLEGE	
History: research	50,000 286
COLORADO	
UNIVERSITY OF COLORADO	
Child Research Council of Denver: research	5,000 147
CONNECTICUT	
YALE UNIVERSITY	
History: R. W. Turner; research	10,000 294
Economics: H. C. Wallich; research	4,850 245
Chinese Literature: Chih-tsing Hsia; research	4,000 293
Philosophy: P. Weiss; research	3,000 302
Radiotherapeutics:	
C. L. Smith, Cambridge University, England; travel	600 180
HARTFORD SEMINARY FOUNDATION	
Arabic and Islamic Studies: K. Cragg; research	3,000 290
DISTRICT OF COLUMBIA	
AMERICAN COUNCIL OF LEARNED SOCIETIES	
Dictionary of American Biography	30,000 287
AMERICAN PSYCHIATRIC ASSOCIATION	
Mental Hospital Design, Construction and Equipment: study	140,000 97
AMERICAN PSYCHOLOGICAL ASSOCIATION	
Joint Committee with the Society for the Study of Evolution:	1,000 225
Conference on the evolution of behavior	
THE BROOKINGS INSTITUTION	
Problems of the Sterling Area: W. W. Stewart; research	7,500 245
LIBRARY OF CONGRESS	
Cordier's "Bibliotheca Sinica": T. L. Yuan; study	9,000 293
Bibliography on Recent Indian History	600 292
MIDDLE EAST INSTITUTE	
Law in the Middle East: study	2,000 290
SOCIETY OF AMERICAN FORESTERS	
Survey of Forestry Research	30,000 217
FLORIDA	
UNIVERSITY OF FLORIDA	
Ecology: W. C. Allee; research	6,000 181
UNIVERSITY OF MIAMI	
Marine Biology: research	75,000 183

	<i>Amount \$</i>	<i>page</i>
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HAWAII**UNIVERSITY OF HAWAII**

Marine Biology: research and equipment	10,000	187
College of Agriculture: travel	3,000	224

ILLINOIS**UNIVERSITY OF CHICAGO**

Committee on Statistics: A. Wallis; research	135,000	271
Workshop in Money and Banking: research	50,500	269
Philosophy: C. Morris; research	21,000	300
Cowles Commission for Research in Economics:		
H. S. Houthakker; research	15,700	240
Experimental Ecology: Th. Park; research	9,600	181
Adjustment During the Middle Years of Marriage:		
E. W. Burgess; study	8,500	254
Center for the Study of American Foreign Policy:		
H. J. Morgenthau; research	7,500	261
Committee on Social Thought: S. R. Letwin; research	5,000	265
J. Frank; research	1,500	306
Psychology: S. O. Lesser; research	1,800	306
Economics: L. M. Goreux; research	1,250	246

UNIVERSITY OF ILLINOIS

Bacteriology: H. O. Halvorson; research	27,000	175
Entomology: G. S. Fraenkel; research	25,000	182
American Studies: program in Kyoto	18,200	284
Neuropsychiatric Institute: equipment	4,000	147

LOYOLA UNIVERSITY

Industrial Relations: Rev. Th. V. Purcell, S.J.; study	6,500	255
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INDIANA**INDIANA UNIVERSITY**

Linguistic Institute: seminars	2,500	321
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UNIVERSITY OF NOTRE DAME

Russian Church History: E. Denissoff; research	8,000	320
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IOWA**STATE UNIVERSITY OF IOWA**

Genetics: E. Witschi; research	22,680	155
Fellowships for Creative Writing	40,000	303
History: W. O. Aydelotte; research	4,000	299
Australian Literature:		
M. C. Carroll, Jr.; research and purchase of books	1,800	306

	<i>Amount \$ page</i>
KENTUCKY	
LOUISVILLE PHILHARMONIC SOCIETY, INC.	
Composition, performance and recording of new works by living composers	400,000 306
MAINE	
ROSCOE B. JACKSON MEMORIAL LABORATORY	
Genetics: research	50,000 138
MARYLAND	
JOHNS HOPKINS UNIVERSITY	
Institute of the History of Medicine: support	200,000 70
McCollum-Pratt Institute: W. D. McElroy; research	115,000 167
School of Hygiene and Public Health: exchange program with the University of the Philippines	12,000 79
School for Advanced International Studies:	
P. Linebarger; research	9,905 261
Chemistry: E. V. McCollum; research	5,000 174
Committee for Planning a Center of Advanced International Studies in Washington, D. C.: support	4,500 261
COMMISSION ON CHRONIC ILLNESS	
Conference on Care of the Long-Term Patient: support	18,865 102
MARYLAND STATE PLANNING COMMISSION	
Maryland Committee on Medical Care: surveys on medical care problems in Maryland	5,000 104
MASSACHUSETTS	
FLETCHER SCHOOL OF LAW AND DIPLOMACY	
H. C. Hawkins: research	45,000 236
	1,800 236
HARVARD UNIVERSITY	
Laboratory of Social Relations: N. Gross; study	57,000 248
R. F. Bales; research	52,500 248
Research in methodology	4,500 273
Law School: L. L. Fuller and D. F. Cavers; study	28,400 263
Kwang Lim Koh; travel	3,480 270
Graduate School of Business Administration:	
Kress Library Catalogue	10,000 247
Philosophy: Papers of Charles S. Peirce; study	10,000 301
J. Wild; research	2,000 301
Russian Research Center: T. Sosnovy; research	9,000 247
Postgraduate Medical Institute of the Massachusetts Medical Society: research	7,500 90
Psychology and Psychiatry:	
B. F. Skinner and H. C. Solomon; joint study	5,000 146

GEOGRAPHICAL DISTRIBUTION OF GRANTS **435**

Amount \$ page

Harvard Medical School: R. Ford; travel	2,075	90
Population Dynamics in India: pilot study	68,450	140
MARINE BIOLOGICAL LABORATORY		
Operations: Study of the Laboratory	3,500	188
MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
Humanities: teaching	19,300	315
Crystallography: M. Buerger; research	10,800	173
SIMMONS COLLEGE		
Public Health Nursing: teaching	40,000	76
SMITH COLLEGE		
Genetics: A. F. Blakeslee; research	9,000	159
TUFTS COLLEGE		
Philosophy: G. B. Burch; travel	8,750	302
Biology: C. C. Roys; travel	2,100	187
MICHIGAN		
UNIVERSITY OF MICHIGAN		
Research Center for Group Dynamics: research	48,900	272
Psychology: Th. M. Newcomb; research	24,500	251
Survey Research Center: labor organizations; research	23,000	252
School of Public Health:		
Bureau of Public Health Economics: C. Metzner; research	8,500	104
Epidemiology: Th. Francis, Jr.; travel	1,125	92
WAYNE UNIVERSITY		
Chemistry: C. Djerassi; research	10,000	170
MINNESOTA		
UNIVERSITY OF MINNESOTA		
Plant Pathology, and Agronomy and Plant Genetics: research	60,000	211
Social Disorganization: A. M. Rose; research	15,075	253
MISSISSIPPI		
UNIVERSITY OF MISSISSIPPI		
School of Medicine:		
Preventive Medicine: Th. J. Brooks, Jr.; travel	1,400	92
MISSOURI		
UNIVERSITY OF MISSOURI		
History: L. E. Atherton; travel	3,600	246

		<i>Amount \$ page</i>
NEBRASKA		
UNIVERSITY OF NEBRASKA		
Nebraska Agricultural Experiment Station: J. E. Livingston; travel	1,250	222
NEW HAMPSHIRE		
DARTMOUTH COLLEGE		
Economics: D. Marx, Jr.; study	15,120	241
NEW JERSEY		
AMERICAN PHILOSOPHICAL ASSOCIATION		
Western Division: conference of the Committee to Advance Original Work in Philosophy	600	303
Eastern Division: conference	500	303
INSTITUTE FOR ADVANCED STUDY, PRINCETON		
History and Government: G. F. Kennan; research	15,000	258
Mathematics: B. B. Mandelbrot; research	5,000	225
Conference on Broader Training of Philosophers in Social Sciences	1,000	302
PRINCETON UNIVERSITY		
Psychology: perception research	75,000	145
School of Public and International Affairs, Office of Popula- tion Research: F. W. Notestein; research	40,000	252
Industrial Sociology: M. M. Tumin; research	5,015	255
Economics and Administration in the Underdeveloped World: Sir Th. Gregory; travel	3,175	246
History of Economic Thought: J. Viner; research	2,215	246
Contemporary Literature: R. P. Blackmur; travel	1,000	306
NEW YORK		
ALBANY MEDICAL COLLEGE		
Preventive Medicine: J. Garth Johnson; travel	900	87
AMERICAN CONSULTANTS		
South Asian Languages: research	2,500	291
ASSOCIATION OF AMERICAN UNIVERSITIES		
Reprinting and Distribution of Statement	3,000	328
BALLET SOCIETY, INC.		
The von Laban Dance Notation System: A. Hutchinson; study	4,800	312
BARNARD COLLEGE		
Electronic Music: research	3,240	313
CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE		
Conference of Institutes of International Relations Leaders	10,000	261

	<i>Amount \$</i>	<i>page</i>
CHINA FOUNDATION FOR THE PROMOTION OF EDUCATION AND CULTURE		
Institute of History and Linguistics of the Academia Sinica: materials	10,000	293
THE CITY CENTER OF MUSIC AND DRAMA, INC.		
Opera and ballet development	200,000	308
COLGATE UNIVERSITY		
Geography of Korea: S. McCune; study	500	262
COLUMBIA UNIVERSITY		
American Press Institute: South Asian journalists; travel	31,880	317
Biography of Booker T. Washington: M. James; study	10,000	288
School of International Affairs: D. Fosdick; research A. S. James Baster; research	10,000 6,625	261 248
College of Physicians and Surgeons: travel	10,000	89
Bureau of Applied Social Science: F. C. Iklé; research	7,500	256
Bureau of Applied Social Research: K. Davis; research	4,500	255
China Under Hyper-Inflation, 1939-50: Shun-hsin Chou; study	7,000	248
Public Law and Government: F. L. Neuman; research	6,750	265
Industrialization of British Society: J. Bartlett Brebner; research and travel	4,000	299
Biomathematics: D. Rittenberg; travel	3,750	179
Language and Communication: J. Lotz; study	1,000	320
THE CONSERVATION FOUNDATION		
Research and administration expenses	75,000	220
CORNELL UNIVERSITY		
Medical College: Biochemistry; V. du Vigneaud; research H. N. Willard; travel	150,000 1,850	194 89
New York State College of Agriculture: Agronomy; research	80,000	212
Sociology and Anthropology: B. Ryan; research	64,900	271
Agronomy: F. S. Anthony; travel	500	224
COUNCIL ON FOREIGN RELATIONS		
The Sterling Area: study	50,000	238
HUNTER COLLEGE		
Union-Management Relations: H. Hoeniger; research	54,900	250
INSTITUTE OF INTERNATIONAL EDUCATION		
International Student Exchange Program	75,000	325
INSTITUTE OF JUDICIAL ADMINISTRATION		
Judicial Administration in the U. S.; research	250,000	326
GERMANISTIC SOCIETY OF AMERICA		
Western Germany Libraries: purchase of books	9,000	327

		<i>Amount \$ page</i>
GREATER NEW YORK COUNCIL FOR FOREIGN STUDENTS		
Problems of Foreign Students in the New York Area: study	7,000	328
MUSEUM OF MODERN ART		
Bibliography of Poetry Recordings: study	2,500	306
NATIONAL BUREAU OF ECONOMIC RESEARCH		
Soviet Economic Growth: research	275,000	234
Productivity: H. S. Davis; research	10,000	245
NATIONAL HEALTH COUNCIL		
Report of the President's Commission on the Health Needs of the Nation: purchase and distribution	10,000	104
NEW SCHOOL FOR SOCIAL RESEARCH		
Religion in Germany since World War II: C. Mayer; research	50,500	297
Institute of World Affairs: E. E. Yalden-Thomson; research	9,800	245
NEW YORK UNIVERSITY		
Psychology: M. Deutsch; research	9,150	254
National Income Estimates of Various Countries: P. Studenski and J. Wyler; research	8,900	245
NYU-Bellevue Medical Center: H. Bayne; travel	500	92
POLYTECHNIC INSTITUTE OF BROOKLYN		
Biophysics: D. Harker; research	65,000	170
THE ROCKEFELLER FOUNDATION		
Virus Research Program	300,000	104
THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH		
Biology: A. E. Mirsky; travel	2,000	180
SOCIAL SCIENCE RESEARCH COUNCIL		
Fellowships in Research Training	345,000	266
Inter-University Seminars	100,000	267
Fellowships in Legal and Political Philosophy	86,250	264
SYRACUSE UNIVERSITY		
Ethnography: D. G. Haring; research and travel	2,000	255
NORTH CAROLINA		
UNIVERSITY OF NORTH CAROLINA		
Division of Health Affairs: study of medical practice H. T. Clark, Jr.; travel	45,000 1,450	101 104
DUKE UNIVERSITY		
Parapsychology: J. B. Rhine; research	15,000	139

GEOGRAPHICAL DISTRIBUTION OF GRANTS

439

Amount \$ page

OHIO**OHIO STATE UNIVERSITY**

Japanese Rural Society: J. W. Bennett; research 7,000 254

PENNSYLVANIA**AMERICAN LAW INSTITUTE**

Model Criminal Code: study 53,000 250

HAVERFORD COLLEGE

Independent Reading and Intellectual Discourse: teaching 28,950 313

UNIVERSITY OF PENNSYLVANIA

Zoology: research 125,000 190

Wharton School of Finance and Commerce:

Industrial Research Unit 25,000 241

W. E. Fisher; research 3,375 255

American Civilization: research 5,500 289

Philosophy: microfilms of unpublished Leibniz manuscripts 2,500 302

UNIVERSITY OF PITTSBURGH

Graduate School of Public Health: H. S. Belding; travel 2,300 95

PUERTO RICO**ATENEO PUERTORRIQUENO**

Experimental Theater: equipment 2,250 321

UNIVERSITY OF PUERTO RICOSocial Anthropological Studies of Puerto Rico:
J. Steward; publication 2,500 253**RHODE ISLAND****BROWN UNIVERSITY**

Cuneiform Texts: A. Sachs; research and travel, and photographic equipment 9,425 320

Philosophy: C. J. Ducasse; travel 250 303

TENNESSEE**DEPARTMENT OF PUBLIC HEALTH**

Tuberculosis Study in Williamson County 21,000 131

UNIVERSITY OF THE SOUTH

Fellowships in Creative Writing 45,000 304

VANDERBILT UNIVERSITYSchool of Medicine:
Pediatrics; exchange program with Karolinska Institute 3,000 87

Library; Mrs. E. R. Cunningham; travel 600 94

	<i>Amount \$</i>	<i>page</i>
VIRGINIA		
SWEET BRIAR COLLEGE		
History: G. Masur; research	6,640	299
WASHINGTON		
UNIVERSITY OF WASHINGTON		
Biochemistry: H. Neurath; research	100,000	191
Far Eastern Department: E. Reifler; research	2,500	225
WISCONSIN		
LAWRENCE COLLEGE		
Phenomenology: H. Spiegelberg; publication	7,500	302
STATE HISTORICAL SOCIETY		
Draper Centennial: two symposia	5,000	290
UNIVERSITY OF WISCONSIN		
College of Agriculture: Biochemistry; research	150,000	195
Legal History: W. Hurst; research	76,000	262
Cytogenetics: C. L. Huskins; research	30,000	159
Genetics: J. Lederberg; research	25,000	156
Community Cultural Arts Program: study	15,000	311
American Phytopathological Society:		
Latin American scientists; travel	5,000	222
Wisconsin Idea Theatre: Ruth Herschberger; support	3,300	306
Economics: Shu-Chin Yang; research	2,500	246
Biochemistry: H. Lundegardh, Royal Agricultural College, Sweden; travel	2,000	170
Biochemistry: H. F. Deutsch; travel	1,075	169
NORTH AMERICA		
CANADA		
CANADIAN SOCIAL SCIENCE RESEARCH COUNCIL		
Special Fellowships in Social Sciences	131,250	267
HUMANITIES RESEARCH COUNCIL		
Development of Canadian Personnel in the Humanities	68,250	316
FRENCH CANADIAN NOVELIST		
R. Lemelin: travel	1,300	306
MCMASTER UNIVERSITY, HAMILTON		
Biophysics: S. Kirkwood; research	1,500	170
QUEEN'S UNIVERSITY, KINGSTON		
Fiscal, Monetary and Economic Policy: research	47,250	268
HÔTEL DIEU, MONTREAL		
Clinical Research: Chemistry; W. J. Nowaczynski; research	3,997	146

GEOGRAPHICAL DISTRIBUTION OF GRANTS 441

	<i>Amount \$</i>	<i>page</i>
MCGILL UNIVERSITY, MONTREAL		
Life of W. L. Mackenzie King: studies	70,000	296
MONTREAL GENERAL HOSPITAL		
Biochemistry: J. H. Quastel; research	30,000	166
UNIVERSITY OF SASKATCHEWAN, SASKATOON		
Ukrainian-English Dictionary: C. H. Andrusyshen	2,500	320
UNIVERSITY OF TORONTO		
Canadian Development Research	225,750	266
Near Eastern Studies: J. W. Wevers; travel	3,400	291
Biography of Sir John A. Macdonald: D. G. Creighton	2,000	300
MEXICO		
AGRICULTURAL OPERATING PROGRAM		203
NATIONAL EMERGENCY AGRICULTURAL EXTENSION PROGRAM	160,000	203
ANTONIO NARRO COLLEGE OF AGRICULTURE, SALTILLO, COAHUILA		
L. Martinez M.: travel	2,000	224
UNIVERSITY OF GUADALAJARA, JALISCO		
Physiology and Pharmacology: equipment	2,000	90
AMERICAN SCHOOL FOUNDATION, MEXICO CITY		
American School: building	10,000	328
MEXICAN-AMERICAN CULTURAL INSTITUTE, MEXICO CITY		
Fellowships in Creative Writing	28,020	304
NATIONAL UNIVERSITY OF MEXICO, MEXICO CITY		
Institute of Mathematics: purchase of books	650	224
Philosophy: L. Zea; travel	600	302
UNIVERSITY OF SAN LUIS POTOSI		
Physiology: equipment	2,000	93
WEST INDIES		
DOMINICAN REPUBLIC		
ENDEMIC DISEASE CONTROL SERVICE		
Development of the Health Sciences	2,000	147
HAITI		
Painting: Luce Turnier; equipment	150	313
JAMAICA		
UNIVERSITY COLLEGE OF THE WEST INDIES		
Medical School: travel and support	10,000	94
Anatomy: G. Bras; travel	1,900	94

	<i>Amount \$ page</i>
CENTRAL AND SOUTH AMERICA	
CENTRAL AMERICA	
CORN IMPROVEMENT PROJECT	30,000 208
COSTA RICA	
UNIVERSITY OF COSTA RICA, SAN JOSE	
School of Agriculture: equipment	10,000 224
ARGENTINA	
UNIVERSITY OF BUENOS AIRES	
Agronomy and Veterinary Medicine: M. Reichart; travel	1,125 222
MINISTRY OF AGRICULTURE AND ANIMAL INDUSTRY, CASTELAR	
Institute of Plant Science: J. Vallega; travel	2,500 221
BRAZIL	
STATE SECRETARIAT OF AGRICULTURE, SALVADOR, BAHIA	
Institute of Biology: Virology; F. J. Alice; equipment	4,700 223
UNIVERSITY OF BAHIA, SALVADOR	
Physiology: J. Novis; equipment	9,000 169
RURAL UNIVERSITY, BELO HORIZONTE, MINAS GERAIS	
Agriculture: J. F. Braga and L. M. Magalhaes; travel	3,800 223
UNIVERSITY OF MINAS GERAIS, BELO HORIZONTE	
Biochemistry: J. Baeta V.; equipment	10,000 178
GAMMON INSTITUTE, LAVRAS, MINAS GERAIS	
College of Agriculture: model farm; support	21,000 218
SUPERIOR SCHOOL OF AGRICULTURE, LAVRAS, MINAS GERAIS	
A. B. Coit, Jr.; travel	1,400 223
UNIVERSITY OF BRAZIL, RIO DE JANEIRO	
Center of Genetics Research: A. G. L. Cavalcanti; research	7,500 157
Institute of Biophysics: Cytology; H. Meyer; travel	1,080 168
VARGAS FOUNDATION, RIO DE JANEIRO	
Brazilian School of Public Administration: purchase of books	1,500 262
SOUTHERN AGRONOMIC INSTITUTE, PELOTAS, RIO GRANDE DO SUL	
Plant Pathology: J. A. Deslandes; travel	1,600 221
Exchange of personnel with Mexican Agricultural Program	322 223
SECRETARIAT OF AGRICULTURE, INDUSTRY AND COMMERCE, PÔRTO ALEGRE, RIO GRANDE DO SUL	
Animal Production: equipment	5,000 223
J. W. Costa; travel	2,500 223
Plant Production: A. M. Elias; travel	2,500 223

GEOGRAPHICAL DISTRIBUTION OF GRANTS 443

Amount \$ page

UNIVERSITY OF RIO GRANDE DO SUL, PÔRTO ALEGRE

Philosophy, Sciences and Letters: general scientific research	50,000	197
Genetics; A. R. Cordeiro; research	3,600	161
School of Agronomy and Veterinary Medicine: equipment	25,000	197
Institute of Physiology: P. R. Correa; research	10,000	169

ARARAQUARA RURAL HEALTH TRAINING CENTER, SÃO PAULO

Demonstration equipment	10,000	86
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INSTITUTE OF AGRONOMY, CAMPINAS

Microclimatology: equipment	20,000	213
Seed Laboratory: equipment	4,500	222

SECRETARIAT OF AGRICULTURE, SÃO PAULO

Animal Production: G. Bohstedt; consultation	3,000	223
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BIOLOGICAL INSTITUTE, SÃO PAULO

K. M. Silberschmidt: travel	360	223
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UNIVERSITY OF SÃO PAULO

Ribeirão Preto:

Medicine: Biochemistry, Histology and Embryology, Parasitology; research	50,000	196
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São Paulo:

Medicine: Biochemistry; I. Raw; research	3,000	179
Histology and Embryology; L. C. Junqueira, research	13,000	163
H. A. Rothschild; equipment	800	174

Philosophy, Sciences and Letters: Genetics; research	45,000	196
C. Pavan; travel	4,300	160
A. B. da Cunha; travel	2,350	160

Marine Resources and Experimental Biology:

P. Sawaya; travel	2,650	188
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Union Catalogue of periodicals in Brazilian libraries	1,100	224
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Veterinary Medicine: Animal Husbandry; research	30,000	196
J. S. Veiga; travel	715	188

Institute of Oceanography: equipment	9,150	188
thermometers	850	224

Escola Superior de Agricultura "Luiz de Queiroz," Piracicaba:

E. Malavolta; equipment	2,800	221
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Second Pan-American Congress of Agronomy: equipment	2,000	224
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CHILE

RURAL HEALTH AND NUTRITION SERVICE, SAN FELIPE, ACONCAGUA

Equipment and Supplies	1,000	147
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BACTERIOLOGICAL INSTITUTE, SANTIAGO

Poultry Pathology; E. Gallardo; equipment	7,200	187
Virology; R. Rodriguez and R. Palacios; travel	6,100	169

	<i>Amount \$</i>	<i>page</i>
CATHOLIC UNIVERSITY OF CHILE, SANTIAGO		
Medical School: Neurosurgery; J. R. Olivares; equipment	11,000	84
Anatomy; J. Vial; equipment	5,850	88
Physiology; J. Croxatto; travel	725	88
MINISTRY OF AGRICULTURE, SANTIAGO		
Agricultural Investigations: LaCruz Insectarium; equipment	10,000	222
Animal Industry:		
Institute of Veterinary Investigations; research	10,000	187
Parasitology: I. Tagle; travel	2,850	187
NATIONAL HEALTH SERVICES OF CHILE, SANTIAGO		
Medical Care: V. Ayub-Hauva; research and travel	4,200	88
UNIVERSITY OF CHILE, SANTIAGO		
Marine Biological Laboratory: P. Yanez; research	10,000	188
Medicine: Internal Medicine; H. Alessandri; equipment	7,500	88
Institute of Physiology; O. Cori; equipment	7,500	146
Parasitology; W. H. Taliaferro, University of Chicago;		
travel	1,200	89
Juan Noe Institute of Biology: cytology; G. Gasic; re-		
search	7,800	163
G. Hoecker; travel	500	168
genetics; D. Brncic; research	5,100	160
Psychiatric Institute; I. Matte; travel	3,312	94
A. Villalón, medical librarian; support	4,800	146
COLOMBIA		
AGRICULTURAL OPERATING PROGRAM	204	
INTER-AMERICAN SOCIETY OF PLANT BREEDERS, PLANT PATHOLOGISTS AND ENTOMOLOGISTS		
Meeting in 1955: general expenses	25,000	209
COLOMBIAN INSTITUTE OF COTTON DEVELOPMENT, BOGOTÁ		
Research	10,000	222
UNIVERSITY OF VALLE, CALI		
Medical Library: purchase of books	9,000	88
PERU		
UNIVERSITY OF SAN MARCOS, LIMA		
Institute of Andean Biology: nutrition; E. Picon; equipment	9,000	93
high altitude research; A. Hurtado; travel	575	88
Veterinary Medicine: J. F. Figueroa; travel	500	222
EUROPE		
AUSTRIA		
UNIVERSITY OF GRAZ		
Institute for Theoretical and Physical Chemistry:		
O. Kratky; research and equipment	8,000	174

	Amount \$	page
UNIVERSITY OF INNSBRUCK		
Institute of Pharmacology: equipment and travel	7,000	146
UNIVERSITY OF VIENNA		
Sociology: L. Rosenmayr; research	8,500	254
Institute of Economics; E. Lagler; research W. Weber, and K. H. Werner; research	2,200	245
Institute of General Biology: F. Mainx; research	1,500	246
Institute of Criminology: research	1,100	160
1,000	254	
BELGIUM		
UNIVERSITY OF BRUSSELS		
Chemistry: H. Chantrenne; research	4,000	174
UNIVERSITY OF LIEGE		
Biophysics: W. G. Verly; research	4,000	180
DENMARK		
UNIVERSITY OF AARHUS		
Chemistry: equipment and support	7,200	146
INSTITUTE OF ECONOMICS AND HISTORY, COPENHAGEN		
History of Prices in Denmark from 1660 to 1800: studies	2,000	244
NATIONAL HEALTH SERVICE OF DENMARK, COPENHAGEN		
K. H. Backer: travel	2,000	89
UNIVERSITY OF COPENHAGEN		
Sociology: K. Svalastoga; research	10,000	254
Linguistic Research: equipment	3,125	321
Institute of Cytophysiology: H. M. Kalckar; travel	1,300	169
FINLAND		
UNIVERSITY OF HELSINKI		
Medical School: teaching and research N. Pesonen; travel	67,500	74
Children's Clinic: Pediatric Research Laboratories; O. A. Forsander; travel	2,000	90
1,525	90	
UNIVERSITY OF TURKU		
Institute of Bacteriology: equipment	1,800	94
FRANCE		
ASSOCIATION D'HYGIÈNE SOCIALE DE L'AISNE		
Soissons Public Health Center: support	133,000	98
UNIVERSITY OF BORDEAUX		
Medicine and Pharmacology: Laboratory of Cardiology; R. Castaing; equipment	1,200	95

		Amount \$	page
UNIVERSITY OF MARSEILLE			
Medicine and Pharmacy:			
Laboratory of Biological Chemistry; equipment	6,000	179	
Sciences: Marine Station of Endoume; J. M. Pérès; research	5,000	187	
UNIVERSITY OF NANCY			
Medicine: Biological Chemistry; R. Wolff; research	3,000	169	
COLLEGE DE FRANCE, PARIS			
Biochemistry: J. Roche; research	15,000	176	
Linguistics: E. Benveniste; research	3,000	320	
CONGRESS FOR CULTURAL FREEDOM, PARIS			
International Conference on Science and Freedom: support	10,000	225	
ÉCOLE POLYTECHNIQUE, PARIS			
Laboratoire d'Econometrie: research and training	37,500	237	
NATIONAL FOUNDATION OF POLITICAL SCIENCES, PARIS			
Center for Economic Studies and Service for Studies of Economic Activity and the Social Situation: research	60,000	235	
UNIVERSITY OF PARIS			
Sciences: Laboratory of Physical Chemistry; R. Wurmser; research	15,000	186	
Institute of Statistics: M. Allais; research	1,800	246	
GERMANY			
DEUTSCHE HOCHSCHULE FÜR POLITIK, BERLIN			
Political Science: preparation of source books	17,940	258	
FREE UNIVERSITY OF BERLIN			
German Militarism: H. Herzfeld; research and travel	1,500	300	
INSTITUTE FOR POLITICAL SCIENCE, BERLIN			
National Socialist System: K. D. Bracher; research	20,800	257	
UNIVERSITY OF COLOGNE			
Institute of Physiology: M. Schneider; travel	2,250	89	
INSTITUTE FOR EUROPEAN POLITICS AND ECONOMICS, FRANKFURT			
Problems of European Integration: W. Karbe; research	20,000	256	
UNIVERSITY OF FREIBURG I/BREISGAU			
Clinical Neurophysiology: equipment	925	146	
HEALTH AUTHORITY OF THE FREE HANSEATIC CITY OF HAMBURG			
Academy of Public Health: H. Harmsen; teaching	35,000	83	
UNIVERSITY OF HAMBURG			
History: E. Zechlin; research and travel	5,500	299	
Linguistic and University Administration: B. Snell; travel	4,000	320	

GEOGRAPHICAL DISTRIBUTION OF GRANTS 447

	Amount \$	page
UNIVERSITY OF HEIDELBERG		
Institute of Psychosomatic Medicine:		
A. Mitscherlich, support	27,915	135
Alfred Weber Institute for Social and Political Sciences:		
research	17,300	260
University Hospital and School of Nursing:		
pediatrics; H. Opitz; travel	550	90
CHRISTIAN-ALBRECHTS-UNIVERSITÄT, KIEL		
Science and History of Politics: research	7,200	261
MARBURG UNIVERSITY		
Pathological Institute: H. Hamperl; travel	2,275	91
IFO-INSTITUT FÜR WIRTSCHAFTSFORSCHUNG, MUNICH		
Economics: research	27,000	239
UNIVERSITY OF MUNICH		
Internal Medicine: Th. von Uexküll; travel	2,400	92
FRIENDS OF EUROPEAN THINKING, INC., OFFENBURG		
Special edition of the "Merkur"	7,000	305
TECHNICAL INSTITUTE, STUTTGART		
Sanitary Engineering: F. Pöpel; research	72,000	73
SOCIETY OF FRIENDS OF LEIBNIZ COLLEGE, TÜBINGEN		
General education	6,000	316
GREAT BRITAIN		
BIRMINGHAM UNIVERSITY		
Psychiatry: J. Elkes; research	86,400	141
Medical Statistics: research	9,000	103
Chemistry: A. R. Peacocke; research	5,000	174
BRISTOL UNIVERSITY		
Anatomy: Experimental Histology and Physiology; J. M. Yoffey; research	6,200	169
research team; expenses	1,400	169
UNIVERSITY COLLEGE, CARDIFF, WALES		
European Christian-Social Movements:		
M. P. Fogarty; travel	1,000	262
Biophysics: X-ray Crystallography; A. J. C. Wilson; travel	500	174
WELSH REGIONAL HOSPITAL BOARD, CARDIFF, WALES		
Neuropsychiatric Research Centre at Whitchurch Hospital:		
support	26,400	140
CAMBRIDGE UNIVERSITY		
School of Biochemistry: research	25,000	165

	<i>Amount \$</i>	<i>page</i>
American History: F. Thistleton; research	6,500	289
Molecular Biology: Sir L. Bragg and M. Perutz; equipment	4,000	172
Human Ecology: seminar	3,000	146
Union List of Chinese Ts'ung-shu: P. van der Loon	1,800	293
Philosophy: P. Laslett; research	900	265
EDINBURGH UNIVERSITY		
Cytology: J. M. Mitchison; research	7,500	168
GLASGOW UNIVERSITY		
Surgery: C. F. W. Illingworth; travel	850	89
UNIVERSITY COLLEGE, HULL		
Economics and Business Administration: I. I. Bowen; travel	3,650	248
UNIVERSITY OF LEEDS		
Chemistry: F. S. Dainton; research	5,000	179
UNIVERSITY OF LIVERPOOL		
Physiology: R. A. Gregory; travel	575	91
ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX, LONDON		
British Union Catalogue of Periodicals	15,000	318
INSTITUTE OF BIOLOGY, LONDON		
Symposium, "Population Fluctuations in Man and Animals": travel	700	187
INSTITUTE OF PUBLIC ADMINISTRATION, LONDON		
Structure of Executive Government in the United Kingdom since 1918: study	8,100	261
MEDICAL RESEARCH COUNCIL, LONDON		
Vital Statistics: J. A. Heady; travel	2,200	91
MINISTRY OF LABOR AND NATIONAL SERVICE, LONDON		
Factory Department:		
East Lancashire Division: R. Murray; travel	2,350	95
J. H. F. Smith; travel	2,350	95
MINISTRY OF WORKS, LONDON		
Public Health Engineering: G. L. Ackers; travel	2,150	96
NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH, LONDON		
International Association for Research in Income and Wealth: training	35,000	242
Alexis de Tocqueville: P. Mayer; study	17,500	298
Acton Manuscripts: G. E. Fasnacht; research	4,500	265
ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS, LONDON		
Europe, the Middle East, Southeast and East Asia: research	72,000	259

GEOGRAPHICAL DISTRIBUTION OF GRANTS 449

	<i>Amount £</i>	<i>page</i>
History: A. J. and Mrs. Toynbee; travel	12,000	293
Theory of International Economic Policy: J. E. Meade; research	4,050	244
ROYAL SANITARY INSTITUTE, LONDON		
A. D. Ogden: travel	900	93
SOCIETY FOR GENERAL MICROBIOLOGY, LONDON		
Symposium on Autotrophic Microorganisms: travel	1,200	169
UNIVERSITY OF LONDON		
School of Hygiene and Tropical Medicine:		
Public Health Practice; research	61,920	80
Medical Research Council, Environmental Hygiene Research Unit; C. N. Davies; travel	1,925	146
University College: Eugenics, Biometry, and Genetics; H. Grüneberg; research	25,000	158
Botany; plant physiology; research	3,000	188
Anatomy; Dr. (Mrs.) Abercrombie; equipment	924	91
American History; J. R. Pole; research and travel	450	290
Institute of Psychiatry: H. J. Eysenck; research	23,400	133
School of Economics and Political Science:		
W. H. Morris-Jones; research and travel	5,925	261
L. C. Robbins; travel	1,900	247
D. Solomons; travel	1,300	248
M. W. Smith; research	1,000	292
Institute of Historical Research	3,000	299
St. Bartholomew's Hospital Medical School:		
Pathology; H. Lehmann; travel	2,505	94
Royal National Throat, Nose, and Ear Hospital and the In- stitute of Laryngology and Otology: Audiology Unit; Miss E. Whetnall; travel	2,400	93
Postgraduate Medical School: J. F. Goodwin; travel	2,400	91
Biology: A. V. Hill; travel	2,100	180
Middlesex Hospital Medical School:		
Physiology; W. F. Floyd; travel	1,825	92
UNIVERSITY OF MANCHESTER		
Organic Chemistry: E. R. H. Jones; research	45,000	165
UNIVERSITY OF NOTTINGHAM		
American Studies: material	5,000	289
OXFORD UNIVERSITY		
Anatomy: Neurohistology and Neuroanatomy; G. Weddell; research	43,500	143
University College: conference on American Studies; support	9,675	289
Sir William Dunn School of Pathology: purchase of equipment	7,500	164
Delegates of the Press: Muslim Architecture; K. A. C. Creswell; research	5,820	291

	<i>Amount \$ page</i>
American History: M. Beloff; research and travel	3,500 286
Urban History: A. Briggs; research and travel	3,400 299
Modern History: G. N. Clark; research and travel	3,300 299
Agricultural Economics Research Institute: travel	3,000 255
Biophysics: L. Stocken; travel	2,500 180
Agriculture: E. K. Woodford; travel	2,500 221
Turkish: G. Lewis; travel	2,000 291
Microbiology: D. D. Woods; equipment	1,800 180
International Administration:	
A. Loveday; research and travel	1,600 262
Industrial Economics: P. W. S. Andrews; research and travel	1,525 246
Economic History: J. J. Habakkuk; travel	1,300 246
Australian and American History: H. C. Allen; travel	1,550 289 600 289
History: H. A. R. Gibb; travel	350 291

GREECE**UNIVERSITY OF ATHENS**

Biochemistry: L. Zervas; research	3,000	178
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IRELAND**UNIVERSITY OF DUBLIN**

Trinity College: Social Medicine; W. J. E. Jessop; travel	1,175	93
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ITALY**INSTITUTE OF TECHNOLOGY, MILAN**

Institute of Sanitary Engineering: F. Cambi; travel	2,400	92
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UNIVERSITY OF MILAN

Institute of Genetics: C. Barigozzi; purchase of research equipment	2,500	160
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UNIVERSITY OF NAPLES

Sanitary Engineering: G. Ippolito; research	45,800	82
Institute of Genetics: G. Montalenti; study	3,600	133
Institute of Biological Chemistry: F. Fidanza; equipment	540	92

UNIVERSITY OF PADUA

Institute of Zoology and Comparative Anatomy: U. d'Ancona; equipment	5,000	168
Agriculture: L. Toniolo; travel	700	221

**SOCIETA ITALIANA PER LA ORGANIZZAZIONE INTERNAZIONALE,
ROME**

Dionisio Anzilotti; research	1,000	265
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UNIVERSITY OF ROME

Institute of Biological Chemistry: A. Rossi-Fanelli; research	7,500	178
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GEOGRAPHICAL DISTRIBUTION OF GRANTS 451

Amount \$ page

NETHERLANDS

NETHERLANDS INSTITUTE FOR SOCIAL RESEARCH, AMSTERDAM
Social Stratification and Mobility in the Netherlands: study 7,800 255

UNIVERSITY OF AMSTERDAM

Laboratory of Anatomy and Embryology: M. W. Woerdeman; research 15,000 161

UNIVERSITY OF LEIDEN

Laboratory of Experimental Histology: P. J. Gaillard; equipment 15,000 162
 Organic Chemistry: E. Havinga; research 7,500 179

UNIVERSITY OF Utrecht

Laboratory of Physiological Chemistry: H. G. K. Westenbrink; purchase of research equipment 2,500 179
Biophysics Research Group: J. B. Thomas; travel 2,350 188

UNIVERSITY OF WAGENINGEN

Plant Pathology; C. J. P. Spruit; travel 1,200 188

NORWAY

INTERNATIONAL SOCIOLOGICAL ASSOCIATION

Second World Congress; travel 2,650 255

UNIVERSITY OF OSLO

Sociology: K. D. Naegele; visiting professorship	4,800	256
Institute of Economics: research	3,000	243
American Studies: S. Skard; travel	1,000	290

SWEDEN

UNIVERSITY OF LUND

Physiology: Endocrinology; G. Kahlson; research 12,640 143
American Studies: purchase of books 3,000 290

KAROLINSKA HOSPITAL, STOCKHOLM

Nursing: G. Dahlstrom; travel 3,150 95

KAROLINSKA INSTITUTE, STOCKHOLM

Institute of Anatomy:
Electron Microscopy; F. S. Sjöstrand, research 24,000 176

STOCKHOLM SCHOOL OF ECONOMICS

Knut Wicksell; T. Gårdlund; study 6,500 245

UNIVERSITY OF STOCKHOLM

Radiobiology: G. Hevesy; research 4,200 177
 Economic History: E. Söderlund; travel and research 3,000 246

	<i>Amount \$ page</i>
UNIVERSITY OF UPPSALA	
Institute of Physical Chemistry:	
Molecular Biology; S. Claesson; research	35,000 185
Institute of Medical Chemistry: E. Stenhammar; research	9,000 178
Hamlin Garland: L. Ahnebrink; research	500 290
SWITZERLAND	
CENTRE EUROPÉEN DE LA CULTURE, GENEVA	
International Conference: support	10,000 313
ECONOMIC COMMISSION FOR EUROPE, UNITED NATIONS, GENEVA	
International Economic Equilibrium: A. Kervyn; travel	800 247
UNIVERSITY OF GENEVA	
Institute of Educational Sciences:	
Child Psychology; B. Inhelder; travel	2,550 96
Institute of General Botany:	
Plant Biochemistry; F. Chodat; research	2,000 170
Genetic Epistemology: J. Piaget; research	1,800 302
Graduate Institute of International Studies:	
Ch. P. Kindleberger; visiting professorship	1,600 247
International Economics; M. Heilperin; lectures	1,250 247
FEDERAL TECHNICAL INSTITUTE, ZURICH	
Institute of Plant Physiology: F. Ruch; equipment	4,000 179
UNIVERSITY OF ZURICH	
Institute of Chemistry: M. Viscontini; travel	700 169
AFRICA	
EGYPT	
COLLEGE OF AGRICULTURE, ALEXANDRIA	
Genetics: A. El-Tabey Shehata; travel and research	1,700 160
UNIVERSITY OF ALEXANDRIA	
Medicine:	
Hygiene and Preventive Medicine; M. A. Abbasy; travel	2,900 95
MINISTRY OF EDUCATION, CAIRO	
University Practice and Administration; travel	17,500 327
GOLD COAST	
MEDICAL SERVICES OF THE GOLD COAST, ACCRA	
Sanitary Engineering and Public Health Administration:	
L. G. Eddey; travel	2,200 89
NIGERIA	
UNIVERSITY COLLEGE, IBADAN	
Medicine: travel and equipment	10,000 95

GEOGRAPHICAL DISTRIBUTION OF GRANTS 453

	<i>Amount \$ page</i>
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Virus Research: P. J. Mason; travel	2,200 133
NEAR EAST	
SECOND CONFERENCE PRELIMINARY TO THE PROPOSED CONFERENCE ON	
THE INTERPRETATION OF ARAB TRADITION, THOUGHT, AND OUTLOOK	3,000 290
IRAQ	
MINISTRY OF EDUCATION	
Near East Studies: N. Hani; travel	3,000 291
ISRAEL	
HEBREW UNIVERSITY, JERUSALEM	
American Studies: visiting professorship	5,000 289
University Building Program: D. W. Senator; travel	5,000 320
History: R. Koebner; travel	2,100 300
LEBANON	
AMERICAN UNIVERSITY OF BEIRUT	
Medicine: Medical Division; endowment	500,000 71
Cardiology; R. A. Tabbara; research and travel	1,300 88
Semitics: A. Frayha; travel	3,000 291
Arabic Studies: N. A. Faris; travel	575 291
TURKEY	
UNIVERSITY OF ANKARA	
Letters: American Literature and History; teaching	21,000 285
Islamics: A. Sayili; travel	525 300
TURKISH AMERICAN UNIVERSITY ASSOCIATION, ISTANBUL	
Conference on the Interpretation of Present-Day Turkish Life and Problems	1,355 290
TURKISH NURSES ASSOCIATION AND ADMIRAL BRISTOL HOSPITAL SCHOOL OF NURSING, ISTANBUL	
Miss E. Deniz: travel	1,275 94
UNIVERSITY OF ISTANBUL	
Law: University Administration; H. Timur; travel	750 328
FAR EAST	
AUSTRALIA	
UNIVERSITY OF ADELAIDE	
Biochemistry: P. M. Nossal; equipment	3,000 179

	<i>Amount \$ page</i>
AUSTRALIAN NATIONAL UNIVERSITY, CANBERRA	
Microbiology: F. J. Fenner; travel	1,850 88
UNIVERSITY OF MELBOURNE	
Psychiatric Teaching: S. Sunderland; travel	1,150 91
GOVERNMENT OF WESTERN AUSTRALIA, PERTH	
Public Health: medical laboratories; W. A. Young; travel	1,350 147
CEYLON	
UNIVERSITY OF CEYLON, COLOMBO	
Contemporary Buddhism: G. P. Malalasekera; travel	750 302
INDIA	
UNIVERSITY OF BOMBAY	
Seth Gordhandas Sunderdas Medical College:	
Pharmacology; equipment	5,800 93
Chemical Technology:	
Biochemistry; A. Sreenivasan; equipment	5,400 179
Economics: C. N. Vakil; travel	525 247
INDIAN CANCER RESEARCH CENTER, PAREL, BOMBAY	
Tissue Culture Laboratory: K. J. Ranadive; equipment	2,300 95
DECCAN COLLEGE, POONA, BOMBAY	
Conference on Indian Language Problems and research:	
support	9,800 291
Postgraduate Research Institute; equipment	500 291
INDIAN COUNCIL OF MEDICAL RESEARCH, DELHI	
Postgraduate Medical Fellowships	121,000 75
Seth Gordhandas Sunderdas Medical College (Bombay):	
Experimental Surgery Unit; P. K. Sen; equipment	3,500 90
Medical College (Madras):	
Pharmacology; M. N. Guruswami; equipment	2,000 90
Lady Hardinge Medical College (Delhi):	
Physiology; B. K. Anand; equipment and supplies	950 90
INDIAN COUNCIL OF WORLD AFFAIRS, DELHI	
Political History of India: V. P. Menon; study	43,890 294
Library: purchase of books	4,000 262
Surveys and Documents: S. L. Poplai; travel	2,075 262
JAMIA MILLIA ISLAMIA, DELHI	
History and Philosophy: S. A. Husain; studies	10,000 299
MALARIA INSTITUTE OF INDIA, DELHI	
F. W. Knipe; teaching material	2,500 147
UNIVERSITY OF DELHI	
Philosophy of Values: A. S. Ayyub; research	5,500 302

GEOGRAPHICAL DISTRIBUTION OF GRANTS 455

	<i>Amount \$</i>	<i>page</i>
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Thoracic Surgery: Y. Sachdeva; travel	4,000	88
CHRISTIAN MEDICAL COLLEGE, LUDHIANA, EAST PUNJAB		
Preventive Medicine: C. E. Taylor; research	3,000	89
MAHATMA GANDHI MEMORIAL MEDICAL COLLEGE, INDORE, MADHYA BHARAT		
Anatomy: R. P. Singh; equipment	5,000	95
Pharmacology: B. C. Bose; travel	3,500	91
MEDICAL COLLEGE AND HOSPITAL, NAGPUR, MADHYA BHARAT		
Medical Education: G. L. Sharma; travel	3,700	92
INDIAN COUNCIL OF MEDICAL RESEARCH, COONOOR, MADRAS		
Nutrition Research Institute: C. Gopalan; travel	950	94
KUMBAKONAM, MADRAS		
Plant Breeding and Genetics: M. S. Swaminathan; travel	500	222
GOVERNMENT GENERAL HOSPITAL, MADRAS		
Neurosurgery Unit: B. Ramamurthi; equipment	2,000	96
CHRISTIAN MEDICAL COLLEGE, VELLORE, MADRAS		
Pathology: equipment	10,000	89
Neurosurgery and Neurology: J. Chandy; travel	4,000	89
INDIAN INSTITUTE OF SCIENCE, BANGALORE, MYSORE		
Biochemistry: J. Ganguly; equipment	5,600	178
mysore state public health department, mysore		
Public Health Laboratory Methods and Research: S. Ananthaswamy; travel	1,200	147
UNIVERSITY OF MYSORE		
Teachers Training College:		
Educational Philosophy: A. C. Deve Gowda; travel	3,900	302
Philosophy: N. A. Nikam; travel	750	302
SAWAI MAN SINGH MEDICAL COLLEGE, JAIPUR, RAJASTHAN		
Animal experimentation: equipment	22,345	84
UNIVERSITY OF RAJPUTANA AND SAWAI MAN SINGH MEDICAL COLLEGE, JAIPUR, RAJASTHAN		
Medical Education: S. K. Menon; travel	3,575	93
TRIVANDRUM MEDICAL COLLEGE, TRAVANCORE-COCHIN		
Pathology: M. Thangavelly; travel	2,300	93
Anatomy: equipment	1,800	93
TRIVANDRUM SCHOOL OF NURSING, TRAVANCORE-COCHIN		
Lillian A. Johnson: teaching material	7,500	147
	2,500	147

		<i>Amount \$ page</i>
MUSLIM UNIVERSITY OF ALIGARH, UTTAR PRADESH		
Art Education: teaching material	1,500	313
GOVERNMENT OF UTTAR PRADESH, LUCKNOW		
Rural Research and Action Center: building	35,000	219
LUCKNOW UNIVERSITY, UTTAR PRADESH		
King George's Medical College: Pharmacology; equipment	7,500	96
Medical Education; V. S. Mangalik; travel	3,525	96
Anatomy; D. Narayan; travel	3,547	96
WEST BENGAL		
Buddhadeva Bose; travel	3,550	306
ANATOMICAL SOCIETY OF INDIA, CALCUTTA, WEST BENGAL		
Conference on Teaching and Research in Indian Medical Colleges: support	2,000	88
JAPAN		
KYUSHU UNIVERSITY, FUKUOKA		
Medical School:		
Laboratory of Clinical Physiology; equipment	9,440	91
KYOTO UNIVERSITY, KYOTO		
Kyoto University-Doshisha University Committee:		
American Studies program	14,000	284
Archaeology of Korea: purchase of material	10,500	292
NAGOYA UNIVERSITY, NAGOYA		
Biological Institute: T. Yamada; research	10,000	168
INSTITUTE OF PUBLIC HEALTH, TOKYO		
Building and equipment	72,050	78
INTERNATIONAL HOUSE OF JAPAN, INC., TOKYO		
W. and Mrs. Gropius; travel	6,500	313
JAPANESE NURSING ASSOCIATION, TOKYO		
Library: equipment	4,685	96
JAPANESE RED CROSS CENTRAL HOSPITAL, TOKYO		
School of Nursing: teaching material	8,200	96
KEIO UNIVERSITY, TOKYO		
Japan Library School: scholarships	7,500	91
Medical School: Preventive Medicine and Industrial Hygiene; S. Harashima; travel	3,000	91
OCHANOMIZU UNIVERSITY, TOKYO		
Biochemistry: K. Anno; equipment	3,000	178

	Amount \$	page
RESEARCH INSTITUTE OF POPULATION PROBLEMS, TOKYO		
Purchase of Books	1,500	255
Population Study: A. Okasaki; travel	775	255
ST. LUKE'S COLLEGE OF NURSING, TOKYO		
Educational Program: equipment	4,200	93
TOKUGAWA INSTITUTE FOR BIOLOGICAL RESEARCH, TOKYO		
Microbiology: H. Tamiya; research	25,000	215
H. Tamiya; travel	1,700	224
TOYO BUNKO		
Seminar on Recent Chinese History; support	1,000	293
KOREA		
KOREAN LANGUAGE SOCIETY, SEOUL		
Korean Dictionary: support	33,000	319
ANDERS K. JENSEN		
Educational and Community Leadership: survey	1,800	293
NEW ZEALAND		
UNIVERSITY OF OTAGO, DUNEDIN (University of New Zealand)		
Dunedin Hospital: Pediatrics; M. McGeorge; travel	2,250	92
PAKISTAN		
UNIVERSITY OF THE PUNJAB, LAHORE		
University Administration: M. Bashir; travel	500	320
PHILIPPINES		
PHILIPPINE NORMAL COLLEGE, MANILA		
Drama Program: teaching	7,200	321
UNIVERSITY OF THE PHILIPPINES, QUEZON CITY		
Institute of Hygiene:		
visiting professors from Johns Hopkins University	18,300	79
Sociology: J. E. de Young; support	8,000	256
Social Sciences and Humanities: purchase of books	3,000	270
	1,500	320
TAIWAN		
GOVERNMENT OF TAIWAN, TAIPEH		
Department of Education:		
Health Education; Yen-seng Ching; travel	4,550	94
NATIONAL TAIWAN UNIVERSITY, TAIPEH		
History: Li Chi; travel	3,500	293

Index

INDEX

- AARHUS, University of, Denmark
 biochemistry, 378
 chemical laboratory equipment, 146
 psychiatry, 359
- Abbasy, Mohamed Abdo, 95
- Abercrombie, M. J., 91
- Ackers, George Lloyd, 96
- Agricultural Experiment Station, El Rubi, Colombia, 387
- Agricultural programs, 153-154, 198-208, 385
 Latin American scholarships, 385
- Ahnebrink, Lars, 290
- Aitken, Thomas H. G., 65
- Alabama, University of, Birmingham, 378
- Alessandri, Hernan, 88
- Alice, Fulvio J., 223
- Allais, Maurice, 246
- Allee, W. C., 182
- Allen, H. C., 289
- American Academy of Arts and Sciences, Boston, Massachusetts, 390
- American Association for the Advancement of Science, Washington, D. C.
 Gordon Research Conferences, 374
- American Board of Commissioners for Foreign Missions, Boston, Massachusetts, 403
- American Council of Learned Societies, Washington, D. C.
 Dictionary of American Biography, 287-288, 403
 Encyclopedia of Islam, 403
 fellowships, 333, 403, 405
 general support, 403
 Near Eastern language translations, 403
Pacific Coast Committee for the Humanities, 403
study of personnel in the humanities, 403
- American Institute of Architects, Washington, D. C., 48, 98
- American Law Institute, Philadelphia, Pennsylvania
 model criminal code, 250, 392
- American Library Association, Chicago, Illinois
- International Youth Library, Munich, Germany, 411
- American Museum of Natural History, New York
 social change in the Admiralty Islands, 392
- American Philosophical Association, Princeton, New Jersey, 303
- American Phytopathological Society, 222
- American Press Institute, New York
 see Columbia University, New York
- American Psychiatric Association, New York
 mental hospital architecture, 48, 97-98, 363
- American Psychological Association, New York
 code of ethical practice for psychologists, 392
 conference on evolution of behaviour, 225
- American Public Health Association, Washington, D. C.
 Subcommittee on Medical Care, 363
- American School Foundation, Mexico, D. F., 328
- American School of Classical Studies, Athens, Greece, 403
- American University of Beirut, Lebanon
 Arabic translations, 403
 medical faculty, 71-73, 371
 studies of modern Arab Middle East, 403
- Ames, Adelbert, Jr., 145
- Amherst College, Massachusetts, 373

- Amsterdam, University of, Netherlands
experimental embryology, 161-162,
378
- psychosomatic unit at Wilhelmina
Hospital, 362
- tissue research, 378
- Anand, B. K., 90
- Ananthaswamy, S., 147
- Anatomical Society of India, Calcutta,
88
- Anderson, Charles R., 65
- Anderson, Richmond K., 65
- Andrews, Philip W. S., 246
- Andrusyshen, C. H., 320
- Angelo, Homer G., 261
- Ankara, University of, Turkey
American studies, 55, 281, 285-286,
409
- Anno, Kimiko, 178
- Anthony, Frank S., 224
- Antonio Narro College of Agriculture,
Saltillo, Coahuila, Mexico, 385
- Araraquara Rural Health Training Cen-
ter, Brazil
demonstration equipment, 86-87, 366
- Arora, R. B., 85
- Association d'Hygiène Sociale de
l'Aisne, France
Public Health Center, Soissons, 98-
101, 364
- Association of American Universities,
New York, 328
- Association of Special Libraries and
Information Bureaux, London,
England
Union Catalogue of Periodicals, 318,
403
- Association pour la Santé Mentale de
l'Enfance, Paris, France, 367
- Ateneo Puertorriqueño, San Juan,
Puerto Rico, 321
- Atherton, Lewis E., 246
- Australian-New Zealand Social Science
Fellowship Committee, Mel-
bourne, 394
- Austrian College Society, Vienna
- Institute for Current European Cul-
tural Research, 404
- Aydelotte, William O., 299
- Ayub-Hauva, Victor, 88
- Ayyub, A. S., 302
- BACCHI, Oswaldo, 222
- Backer, Kaj Henning, 89
- Bacteriological Institute of Chile, San-
tiago, 387
- Baeta Vianna, José, 178
- Baird, Guy B., 150
- Baker, R., 142
- Balanchine, George, 309
- Bales, R. F., 249
- Balfour, Marshall C., 46, 64
- Ballet Society, Inc., New York
Dance Notation Bureau, 312-313
- Barigozzi, Claudio, 160
- Barnard College, New York, 313
- Barnes, Douglas, 150
- Bashir, M., 320
- Basle, University of, Switzerland, 399
- Baster, A. S. James, 248
- Bauer, Johannes H., 65
- Bayne, Helen, 92
- Beal, George J., xi, 59
- Beebe, William, 128
- Belding, Harwood Seymour, 95
- Belknap, Chauncey, xi, xiii
- Beloff, Max, 286
- Bennett, John W., 254
- Bennett, Merrill K., 234
- Bennington College, Vermont, 392
- Benveniste, Emile, 320
- Berlin, Free University of, Germany,
411
- Bern, University of, Switzerland
Theodore Kocher Institute, 378
- Bevier, George, 60, 65
- Birmingham University, England
biochemistry, 378
- Department of Experimental Psychi-
atry, 141-143, 361
- Department of Medical Statistics, 103
- Blackmur, Richard P., 306

- Blain, Daniel, 97
 Blakeslee, Albert F., 159
 Bohstedt, Gustav, xi, xiii, 150, 223
 Bordeaux, University of, France, 409
 Borlaug, Norman E., 150
 Bose, Bimal Chandra, 91
 Bose, Buddhadeva, 306
 Boush, G. Mallory, 61, 150
 Bowen, I. Ian, 248
 Bowles, Chester, xii
 Bracher, K. D., 257
 Brackett, Elizabeth W., 64
 Bradfield, Richard, xiii, 60, 150, 212
 Bradley, P. B., 142
 Braga, Joaquim Fernandes, 223
 Bragg, Sir Lawrence, 173
 Bras, Gerrit, 94
 Brazil, University of, Rio de Janeiro
 Center of Genetics Research, 157-158, 378
 Faculty of Philosophy, 391
 Institute of Biophysics Research, 378
 Brebner, J. Bartlett, 299
 Briggs, Asa, 299
 Bristol, University of, England, 409
 British Columbia, University of,
 Vancouver, Canada, 399, 409
 British Medical Research Council, *see*
 Medical Research Council, London, England
 British Museum, London, England, 404
 Brncic, Danko, 160
 Bronk, Detlev W., x, xii, 59
 Brookings Institution, Washington,
 D. C., 392
 Brooks, Thomas J., Jr., 92
 Broustet, P., 95
 Brussels, University of, Belgium
 biochemical embryology, 378
 Department of Social Medicine, 367
 neurophysiology, 359
 Buchanan, Norman S., 247
 Buerger, Martin, 173
 Bugher, John C., 65
 Buller, Roderic E., 60, 150
 Burch, George B., 302
 Burden, Robert P., 65
 Burden Neurological Institute, Bristol,
 England, 360
 Burgess, Ernest W., 254
 Burnett, Sir Macfarland, 105
 Buttrick, Wallace, 35
 CALIFORNIA, University of, Berkeley
 biochemistry, 378
 Citrus Experiment Station, Riverside,
 389
 Institute of Industrial Relations, 400
 personality assessment, 135-138, 357
 Scripps Institution of Oceanography,
 La Jolla, 50, 184-185, 378, 379
 Slavic studies, 409
 White Mountain Research Station,
 391
 California Institute of Technology, Pasadena
 chemical biology, 42, 192-193, 373
 Earhart Plant Research Laboratory,
 50, 214-215, 389
 Cambi, Franco, 92
 Cambridge University, England
 biologically important materials, 379
 Cavendish Laboratory, 379
 cell physiology, 379
 Department of Applied Economics,
 400
 Department of Human Ecology, 146
 Downing College, 409
 history of English criminal law, 400
 neurophysiology, 361
 School of Biochemistry, 165-166, 379
 University Chemical Laboratory, 379
 X-ray crystallography, 172-173, 379
 Canadian Institute of International
 Affairs, Toronto, 392
 Canadian Social Science Research Council, Montreal
 fellowships, 267, 333, 394
 research and publication, 394
 Cantril, Hadley, 145
 Cardiff City Mental Hospital, Wales,
 360

- Carleton, Alford, 262
 Carlsberg Foundation, Copenhagen, Denmark, 373
 Carnegie Endowment for International Peace, New York, 261
 Carr, Henry P., 65
 Carroll, Martin C., Jr., 306
 Carter, Joseph C., 65
 Casals-Ariet, Jordi, 65
 Castaing, Robert, 95
 Catholic University of Chile, Santiago
 Department of Neurosurgery, 84, 366
 Medical School, 366
 Causey, Ottis R., 65
 Cavalcanti, A. G. Lagden, 158
 Cavers, David F., 264
 Centre Européen de la Culture, Geneva, Switzerland, 313
 Centre National de la Recherche Scientifique, Paris, France
 equipment for Institute of Genetics, Gif, 373
 scientific conferences, 390
 Chandy, Jacob, 89
 Chantrenne, Hubert, 174
 Chary, Arturo, 211
 Chavarria-Aguilar, Oscar, 291
 Chicago, University of, Illinois
 American agriculture, 400
 applied statistics, 391
 Cowles Commission, 240-241, 400
 History of Public Administration in the United States, 400
 mathematical statistics, 271, 400
 non-directive psychotherapy, 357
 philosophy, 300-301, 409
 population ecology, 181, 379
 race relations, 400
 Workshop in Money and Banking, 269-270, 400
 Child Research Council of Denver, Colorado, 147, 355
 Chile, University of, Santiago
 experimental cytology, 163-164, 379
 School of Public Health, 366
 China Foundation for the Promotion of Education and Culture, New York, 293
 Ching, Yen-seng, 94
 Chodat, Fernand, 170
 Chou, Shun-hsin, 248
 Christensen, J. J., 212
 Christian-Albrechts-Universität, Kiel, Germany, 261
 Christian Medical College, Ludhiana, India, 51
 Christian Medical College, Vellore, India, 89
 Christie, Amos, 87
 City Center of Music and Drama, Inc., New York, 56, 283, 308-310, 404
 Claesson, Stig, 185, 186
 Clafin, William H., Jr., x, xii
 Clark, Dean A., 59
 Clark, G. N., 299
 Clark, Henry Toole, Jr., 104
 Clark, Le Gros, 143
 Clarke, Delphine H., 65
 Cobb, William C., 61
 Coit, Albert B., Jr., 218, 223
 Colegio de México, Mexico, D. F., 404
 Colgate University, Hamilton, New York, 411
 Collège de France, Paris
 biochemistry, 176, 373
 equipment for experimental monkey station in Algeria, 360
 Cologne, University of, Germany, 409
 Colombian Agricultural Program, 204-208, 387
 international cooperation, 210
 Maize Collection Center, Medellín, 210
 Colombian Institute of Cotton Development, Bogotá, 222
 Columbia University, New York
 American Press Institute, 317-318, 404
 biography of Booker T. Washington, 288-289, 404
 Bibliography of the Research in Tissue Culture, 1900-1950, 373

- brain chemistry, 356
 College of Physicians and Surgeons, 89
 Department of Biochemistry, 373
 enzyme research, 373
 Far Eastern studies, 392
 genetics and experimental zoology, 373
 immunochemistry, 373
On Social Survival, 392
 Russian Institute, 392
 social science training, 392
 Teachers College, 365
 urban land use and housing facilities, 392
 Commission on Chronic Illness, Baltimore, Maryland
 care of the long-term patient, 48, 102-103, 363
 Commission on Financing Higher Education, New York, 40, 42
 Committee on Research in Economic History, Inc., Cambridge, Massachusetts, 393
 Compton, Karl T., x, 59
 Conference on interpretation of Arab tradition, 280, 290, 404
 Congress for Cultural Freedom, Paris, France, 225
 Connecticut Agricultural Experiment Station, New Haven, 373
 Conservation Foundation, New York
 utilization of natural resources, 50, 52, 220-221, 390
 Copenhagen, University of, Denmark
 biochemistry, 379
 biological uses of isotopes, 379
 Child Guidance Clinic, 359
 genetics of mental defect, 359
 linguistic research, 321
 physiology, 379
 Cordeiro, A. R., 161
 Cori, Osvaldo, 146
 Corn improvement project, Central America, 208-209, 384
 Cornell University, Ithaca, New York
 biochemistry, 42, 194-195, 374
 civil liberties study, 393
 community action, 393
 electron microscope laboratory, 374
 enzyme chemistry, 374
 food crops, 50, 212-213, 389
 history of modern science, 404
 Maize Genetics Cooperation project, 374
 Medical College, 364
 research techniques for studies of underdeveloped areas, 271-272, 393
 Southeast Asian studies, 404
 Costa, Julio Wilson, 223
 Costa Rica, University of, San José, 224
 Council on Foreign Relations, Inc., New York
 history of United States foreign relations during World War II, 393
 international relations, 393
 political implications of economic development, 393
 study of sterling area, 54, 238-239, 393
 Cox, Eugene E., 4
 Cox Committee, 3, 4, 5
 Cragg, Kenneth, 290
 Creighton, D. G., 300
 Creswell, K. A. C., 291
 Crete, Greece
 survey of, 393
 Croxatto, Hector, 88
 Cunningham, Eileen R., 94
 Curtis, J. Montgomery, 317
 da CUNHA, Antonio Brito, 160, 161
 Dahlstrom, Greta, 95
 Dainton, F. S., 179
 Dalhousie University, Halifax, Nova Scotia, 358
 Dance Notation Bureau, New York
see Ballet Society, Inc.
 D'Ancona, Umberto, 168
 Darley, Ward, xi, xiii, 64
 D'Arms, Edward F., 276

- Dartmouth College, Hanover, New Hampshire
pilot study of ocean transport, 241, 393
- Davies, Charles Norman, 146
- Davis, Hiram S., 245
- Davis, Joseph S., 234, 265
- Davis, Kingsley, 255
- Dawson, R. MacGregor, 296
- Deane, Herbert A., 228
- Deccan College, Poona, India, 291
- Delaware, University of, Newark
American studies, 409
study of income tax returns, 400
- Denisoff, Elie, 320
- Deniz, Esma, 94
- Department of Public Health, Mysore State, India, 363
- Deslandes, Josué Augusto, 221
- Deutsch, H. F., 169
- Deutsch, Morton, 254
- Deutsche Hochschule für Politik, Berlin, Germany
development of political science, 258-259, 393
- DeVinney, Leland C., 228
- deYoung, John E., 256
- Dickey, John S., x, xii
- Dictionary of American Biography*, 287-288, 403
- Dieterich, Bernd, 74
- Dingle, John H., xi, xiii, 64
- Divisia, François, 237
- Division of Rural Endemic Diseases, Bolivia, 359
- Djerassi, Carl, 170
- Dodds, Harold W., x, xii
- Dortmund Center for Social Science Research, Germany, 394
- Doshisha University, Kyoto, Japan
American studies, 55, 281, 284-285
- Douglas, Lewis W., x, xii
- Downs, Wilbur G., 47, 65
- Ducasse, C. J., 303
- Duke University, Durham, North Carolina
- parapsychology, 139-140, 356
- physical biochemistry of proteins, 374
- state per capita incomes, 394
- Dulles, John Foster, 59
- Durham, University of, England, 409
- du Vigneaud, Vincent, 194, 195
- ECOLE Polytechnique, Paris, France
Laboratoire d'Econométrie, 237-238, 394
- Ecole Pratique des Hautes Etudes, Sixth Section, Paris, France, 399
- Economic Commission for Europe, United Nations, Geneva, Switzerland
in-service training scholarships, 394
study of the European economy, 394
- Eddey, Leslie George, 89
- Edinburgh, University of, Scotland
Department of Animal Genetics, 379
Department of Chemistry, 379
Faculty of Medicine, 368
- Efferson, John Norman, xiii
- Elias, Aureo M., 223
- Elkes, J., 142
- Elliott, Shelden D., 326
- Ellis, Howard S., 247
- Elmendorf, John E., Jr., 60, 65
- El-Taby Shehata, Ahmed, 160
- Emerson, Edward, 59
- Endemic Disease Control Service, Dominican Republic, 147, 358
- Engle, Paul, 303
- European symposia on medical education, 370
- Evans, Roger F., 228
- Eysenck, H. J., 133
- FAHS, Charles B., xi, xiii, 276
- Fatis, Nabih A., 291
- Fasnacht, G. E., 265
- Federal Technical Institute, Zurich, Switzerland
chemistry of physiologically important compounds, 374
electron microscopy, 374

- Laboratory of Organic Chemistry, 374
Fellowships, 56-57, 331-344
American Council of Learned Societies, Washington, D. C., 56, 333, 403, 405
Australian-New Zealand Social Science Fellowship Committee, Melbourne, 394
Canadian Social Science Research Council, Ottawa, 56, 267, 333, 394
Economic Commission for Europe, United Nations, 394
Humanities, 331, 333, 405
Institut de Science Economique Appliquée, Paris, France, 395
list of fellows during 1953, 334-344
Medical Library Association, Detroit, Michigan, 371
Medical Research Council, London, England, 56, 333, 371
Medicine and Public Health, 331, 333, 371
National Research Council, Washington, D. C., 56, 333, 371, 390
National Theatre Conference, 56, 333
Natural Sciences and Agriculture, 331, 333, 390
Rockefeller Foundation, 371, 390, 394, 405
Social Science Research Council, New York, 56, 264-265, 266, 333, 395
Social Sciences, 331, 333, 394
State University of Iowa, Iowa City, 303, 405
University of the South, Sewanee, Tennessee, 304, 405
Fenner, Frank John, 88
Fessard, Alfred E., 147
Fidanza, Flaminio, 92
Figueroa (Infante), Juan Francisco, 222
Financing Higher Education in the United States, 40
Finean, J. B., 142
Fisher, Waldo E., 255
Fletcher School of Law and Diplomacy, Medford, Massachusetts
United States commercial policy, 54, 236-237, 395
Florey, Sir Howard, 164
Florida, University of, Gainesville
agricultural counselor, 389
animal ecology, 181-182, 380
Floyd, William F., 92
Fogarty, Michael P., 262
Forand, Aime J., 4
Ford, Richard, 90
Forsander, Olof Anders, 90
Fosdick, Dorothy, 261
Fosdick, Raymond B., 19, 34
Fox, Denis L., 184, 185
Fraenkel, G. S., 182, 183
Francis, Thomas, Jr., 92
Frank, Joseph, 306
Frankenberg, Lloyd, 306
Frayha, Anis, 291
Freiburg i/Breisgau, University of, Germany, 146
Freire, José Pericles, 86
Friedman, Milton, 269
Friends of European Thinking, Inc., Offenburg, Baden, Germany, 305
Friis, Astrid, 244
Fuller, John L., 138
Fuller, Lon L., 264
GAILLARD, P. J., 162
Gallardo, Eliseo, 187
Gammon Institute, Lavras, Minas Gerais, Brazil
College Farm, 218, 386
Ganguly, Jagannath, 179
Gårdlund, Torsten, 245
Gasic, Gabriel, 163, 164
Gasser, Herbert S., x, xii
General Education Board, New York, 3, 12-15, 411
Geneva, University of, Switzerland
Institute of Human Genetics, 362
organic chemistry, 380

- Georgia State College for Women, Mill-edgeville, 356
- Germanistic Society of America, Inc., New York
scholarly publications, 327, 412
- Gibb, H. A. R., 291
- Gibler, John W., 150
- Gillette, H. Malcolm, xi, xiii, 59
- Gilpatrick, Chadbourne, 276
- Gleason, Lowell S., 60, 150
- Gokhale Institute of Politics and Economics, Poona, India, 395
- Goodwin, Angier L., 4, 5
- Goodwin, John Forrest, 91
- Gopalan, Coluther, 94
- Goreux, Louis M., 246
- Gowda, A. C. Deve, 302
- Grant, John B., 64
- Grant, Ulysses J., 150
- Grants in aid
emergency scientific equipment, Netherlands, 372
- Humanities, 405
- Medicine and Public Health, 372
- Natural Sciences and Agriculture, 390
- Rockefeller Foundation, 412
- Social Sciences, 395
- Grassberger, Roland, 254
- Greater New York Council for Foreign Students, 328
- Greenfieldt, John H., 61
- Gregg, Alan, xi, xiii
- Gregory, Roderic Alfred, 91
- Gregory, Sir Theodore, 246
- Gropius, Walter, 313
- Gropius, Mrs. Walter, 313
- Grüneberg, Hans, 158
- Guadalajara, University of, Jalisco, Mexico, 90
- Guruswami, M. N., 90
- HABAKKUK, H. J., 246
- Hahn, Richard G., 60, 65
- Halvorson, H. O., 176
- Hamperl, Herwig, 91
- Hani, Nasir, 291
- Harashima, Susumu, 91
- Haring, Douglas G., 255
- Harker, David, 170
- Harmsen, Hans, 83
- Harrar, J. George, xi, xiii, 150, 209
- Harrison, Wallace K., x, xii
- Harvard University, Cambridge, Massa-chussetts
adult development, 356
- biochemistry of vision, 375
- biophysical chemistry, 375
- Confluence, an International Forum*, 405
- Department of Dermatology, 364
- economic research program, 395
- enzyme chemistry, 374
- Graduate School of Business Administration, 247, 395
- Graduate School of Education, 405
- Laboratory of Human Development, 395
- Laboratory of Social Relations, 273
behaviour patterns, 356
- comparative values, 395
- motivated perception, 395
- school superintendents, 249-250, 395
- small groups, 248-249, 395
- Law School, 232, 263-264, 396
- legal medicine, 364
- Massachusetts Medical Society, 90
- papers of Charles S. Peirce, 301
- personality development, 356
- population dynamics in India, 51, 140, 356
- psychiatry, 356
- public health nursing, 77
- Research Center in Entrepreneurial History, 395, 402
- Russian language, 405
- School of Public Health, 364
- state election statistics, 396
- tissue structure, 374
- Harvey, A. McGehee, xi, 64
- Haskins Laboratories, New York, 375
- Haverford College, Pennsylvania

- general education, 313-314, 405
Havinga, Egbertus, 179
Hawaii, University of, Honolulu
College of Agriculture, 224
marine biology, 187
Hawkins, Harry C., 236
Hayes, Guy S., 65
Hays, Brooks, 4
Hays, Wayne L., 5
Heady, James Austin, 91
Health Authority, Free Hanseatic City
of Hamburg, Germany
Academy of Public Health, 83-84, 367
Health Insurance Plan of Greater New
York, 363
Hebrew University, Jerusalem, Israel,
289
Heidelberg, University of, Germany
Alfred Weber Institute for Social and
Political Sciences, 232, 260, 400
Institute of Psychosomatic Medicine,
135, 360
Physiological Institute, 368
School of Nursing, 368
Heidrick, Lee E., 150
Heilperin, Michael, 247
Helsinki, University of, Finland
basic medical sciences, 74-75, 367
Helsinki Institute of Industrial Hygiene,
Finland, 367
Henry E. Huntington Library and Art
Gallery, San Marino, California,
406
Herring, Pendleton, 5
Herschberger, Ruth, 306
Herzfeld, Hans, 300
Hevesy, George, 177
Hill, Archibald Vivian, 180
Hill, Rolla B., 60, 64
Hilleboe, Herman E., xi, xiii, 59, 64
Hirsch, G. P., 255
Hirst, Esther M., 65
Hoecker, Gustavo, 168
Hoeniger, Heinrich, 250, 251
Horrax, Gilbert, 84
Hoskins, Harold, 72
Houthakker, H. S., 240
Hsia, Chih-tsing, 293
Humanities, Division of
surveys, studies, and conferences, 405
Humanities Research Council of Can-
ada, Toronto
development of humanities program,
316-317, 406
Hunter College, New York
collective bargaining, 250-251, 396
Hurst, Willard, 263
Hurtado, Alberto, 88
Husain, S. Abid, 280, 299
Huskins, C. Leonard, 159, 160
Hutchinson, Ann, 313
Hydrick, John L., 60, 65

ICELAND, University of, Reykjavik
Institute of Experimental Pathology,
391
IFO-Institut für Wirtschaftsforschung,
Munich, Germany
research program in economics, 239-
240, 396
Iklé, Fred C., 256
Illingworth, Charles Frederic William,
89
Illinois, University of, Urbana
action of insecticides, 389
American studies, 55, 281, 284-285,
410
brain chemistry, 357
insect nutrition, 182 183, 380
microbiology, 175-176, 380
Neuropsychiatric Institute, 147
Indian Cancer Research Center, Bom-
bay, 363
Indian Council of Medical Research
medical fellowships, 75-76, 370
Indian Council of World Affairs, Delhi
library development, 262
recent Indian history, 56, 280, 294-
296, 406
Indiana University, Bloomington
genetics, 375
Linguistic Institute, 321

- Indiana University—*Continued*
 psychotherapy, 356
- Inhelder, Bärbel, 96
- Innis, H. A., 267
- Innsbruck, University of, Austria, 146
- Institut de Science Economique Appliquée, Paris, France
 methodology of social accounting, 396
 training scholarships, 395
- Institute for Advanced Study, Princeton, New Jersey, 302
 program of study and writing, 396
 research in history and government, 258, 396
- Institute for European Politics and Economics, Frankfurt, Germany
 German political attitudes, 232, 256–257, 396
- Institute for Political Science, Berlin, Germany
 rise of National Socialism, 52, 257–258, 396
- Institute of Agronomy, Campinas, Brazil
 microclimatology, 50, 213–214, 386
 plant viruses, 386
- Institute of Agronomy of the South, Pelotas, Brazil
 exchange of scientific personnel, 223
- Institute of Andean Biology, University of San Marcos, Lima, Peru, 359
- Institute of Biology, London, England, 187
- Institute of Biology and Technological Research, Curitiba, Brazil, 391
- Institute of Economics and History, Copenhagen, Denmark
 history of prices and wages in Denmark, 244, 396
- Institute of Experimental Psychology, Florence, Italy, 361
- Institute of Hygiene and School of Engineering, Zagreb, Yugoslavia, 369
- Institute of International Education, New York
- international student exchange, 325–326, 412
- Institute of Judicial Administration, New York, 326, 412
- Institute of Preventive Medicine, Leiden, Netherlands, 369
- Institute of Public Administration, London, England, 261
- Institute of Public Health, Tokyo, Japan
 training facilities and equipment, 78–79, 370
- Institution of Civil Engineers, London, England, 368
- Instituto Tecnológico y de Estudios Superiores, School of Agriculture, Monterrey, Mexico, 385
- Inter-American Institute of Agricultural Sciences, Turrialba, Costa Rica, 384
- Inter-American Society of Plant Breeders, Plant Pathologists, and Entomologists, 209–210, 387
- International African Institute, London, England, 397
- International Health Division
 history of, 412
- International House of Japan, Inc., Tokyo, 412
- International Press Institute, Zurich, Switzerland, 412
- International Sociological Association, 255
- Iowa, State University of, Iowa City
 fellowships in creative writing, 56, 282, 303, 305, 405
 genetics of sex determination, 155–156, 377
- Iowa State College, Ames
 physiological genetics, 375
 protein chemistry, 375
- Ippolito, Girolamo, 82
- Italian Institute of Historical Studies, Naples, 406
- JACOBSON, Dora, 143

- James, Marquis, 288
 Jamia Millia Islamia, India, 280, 299
 Janney, John H., 65
 Japanese Nursing Association, Tokyo, 96
 Japanese Red Cross Central Hospital School of Nursing, Tokyo, 96
 Jensen, Anders Kristian, 293
 Jessop, William John Edward, 93
 Johns Hopkins University, Baltimore, Maryland
 Center of Advanced International Studies, 261
 Department of Political Economy, 397
 exchange of public health faculty, 79-80, 365
 Institute of the History of Medicine, 70-71, 365
 McCollum-Pratt Institute, 167-168, 375
 School of Hygiene and Public Health, 365
 Johnson, Harald N., 65
 Johnson, J. Garth, 87
 Johnson, Lillian A., 65, 147
 Jones, E. R. H., 165
 Junqueira, Luiz Carlos, 163
- KAHLSON, Georg, 143
 Kahn, Robert L., 252
 Kalckar, Herman M., 169
 Karbe, Walther, 256
 Karolinska Institute, Stockholm, Sweden
 biochemistry, 375
 Department of Experimental Surgery, 369
 Department of Physical Cell Research, 375
 Institute for Cell Research, 375
 international exchange in pediatrics, 87
 Medical Nobel Institute, 375
 molecular biology, 176-177, 375
 morphology and cytology, 375
 neurophysiology, 362
- Kaufert, Frank H., 218
 Kaur, Rajkumari Amrit, 124
 Keele, Harold M., 4
 Keio University, Tokyo, Japan
 Department of Medicine, 370
 Japan Library School, 406
 Japanese Medical Library Association, 91
 Kennan, George F., 258
 Kenyon College, Gambier, Ohio
 fellowships in creative writing, 282, 305, 406
Kenyon Review, 406
 Kerr, J. Austin, 65
 Kervyn, Albert, 247
 Kimball, Lindsley F., xi, xiii
 Kimberly, John R., x, xii, 58
 Kindleberger, Charles P., 247
 King George's Medical College, Lucknow University, India, 96
 Kirkwood, S., 170
 Kirstein, Lincoln, 309
 Knipe, Frederick W., 65, 147
 Koebner, Richard, 300
 Koh, Kwang Lim, 270
 Kokernot, Robert H., 60, 65
 Korean Language Research Society, Seoul
 Korean dictionary, 319-320, 406
 Koya, Yoshio, 78
 Kratky, Otto, 174
 Krug, Carlos A., 214
 Kyoto University, Japan
 American studies, 55, 281, 284-285, 406
 Korean archaeology, 292, 406
 Kyushu University Medical School, Fukuoka, Japan, 91
- LAGLER, Ernst, 245
 Laird, Reggie J., 150
 Lane, Frederic C., 228
 Laslett, Peter, 265
 Lataillade, Louis, 99, 100
 Latin-American Agricultural Information Center, 386

- Laura Spelman Rockefeller Memorial, 18-19, 21, 326
- Le Bon Secours School of Nursing, Geneva, Switzerland, 369
- Leavell, Hugh R., xi, 64
- Lederberg, Joshua, 157
- Lehigh University, Bethlehem, Pennsylvania, 407
- Lehmann, Hermann, 94
- Leiden, University of, Netherlands, 162, 380
- Lemelin, Roger, 306
- Lesser, Simon O., 306
- Letwin, Shirley Robin, 265
- Lewis, Geoffrey, 291
- Li, Chi, 293
- Library of Congress, Washington, D. C., 292, 293, 407
- Liège, University of, Belgium
Laboratory of Neuroanatomy, 359
- Linebarger, Paul, 261
- Little, C. C., 138
- Livingston, J. E., 222
- Loeb, Robert F., x, xii
- Logan, John A., 65
- London, University of, England
biologically important molecules, 380
Galton Laboratory, 361
Institute of Historical Research, 299
Institute of Psychiatry, 133-134, 361
research in biophysics, 380
University College, 188
mammalian genetics, 158-159, 380
medical student selection, 368
- London School of Economics and Political Science, England
Department of Sociological and Demographic Research, 397
expansion of school plant, 397
- London School of Hygiene and Tropical Medicine, England
public health programs, 80-81, 368
- Loomis, W. F., 150
- Lotz, John, 320
- Louisville Philharmonic Society, Inc., Kentucky, 56, 283, 306-308, 407
- Loveday, Alexander, 262
- Lovett, Robert A., x, xii
- Lund, University of, Sweden
American studies, 290
endocrinology, 143, 362
Institute of Genetics, 388
- Lundegårdh, Henrik, 170
- Lyle, Floyd, 61
- MacKINNON, Donald W., 136
- MacKinnon, Frederick B., 264
- Mackintosh, James M., 81
- MacLellan, Neil B., 60, 150
- Magalhaes, Leonidas Machado, 223
- Magoon, Estus H., 65
- Maier, John, 65
- Mainx, Felix, 160
- Malalasekera, G. P., 302
- Malaria programs, 354
- Malavolta, Euripedes, 221
- Manchester, University of, England
chemistry of biologically important materials, 165, 380
Department of Organic Chemistry, 380
experimental health center, 364
Faculty of Economic and Social Studies, 400
- Mandelbrot, Benoit B., 225
- Mangalik, Vanmali Sharan, 96
- Mangelsdorf, P. C., xi, 150
- Marine Biological Laboratory, Woods Hole, Massachusetts, 188, 375
- Marseille, University of, France, 179
- Marshall, John, 276
- Martinez Medina, Lorenzo, 224
- Marx, Daniel, Jr., 241
- Maryland State Planning Commission, 104
- Mason, Peter Jaspar, 133
- Massachusetts General Hospital, Boston
endocrinology and metabolism, 356
enzyme chemistry, 375
- Massachusetts Institute of Technology, Cambridge
biology, 42, 376

- foreign language instruction, 315-316, 407
mathematical biology, 356
physical chemistry of protein solutions, 376
X-ray crystallography, 173, 376
Masur, Gerhard, 299
Matte, Ignacio, 94
Mayer, Albert, 219
Mayer, Carl, 280, 297
Mayer, Peter, 298, 299
Mayo, Leonard, 103
Mayor's Advisory Committee for the Aged, New York, 397
McCloy, John J., x, xii, 59
McCollum, E. V., 174
McCoy, Oliver R., 65
McCune, Shannon, 262
McDougall, William, 139
McElroy, William D., 167
McGeorge, Murray, 92
McGill University, Montreal, Canada
Department of Psychiatry, 358
Institute of International Air Law, 397
Institute of Islamic Studies, 407
physiological basis of behavior, 358
studies in the life of W. L. Mackenzie King, 296-297, 407
McGregor, F. A., 296
McIntosh, William A., 65
McKelvey, John J., Jr., 150
Meade, James E., 244
Medical College, Trivandrum, South India, 93
Medical Library Association, Detroit, Michigan, 371
Medical Research Council, London, England
fellowships, 333, 371
scientific equipment, 360
Melbourne, University of, Australia
Department of Physiology, 371
Menon, S. K., 85, 93
Menon, V. P., 280, 295, 296
Metzner, Charles, 104
Mexican Agricultural Program, 198-203, 385
exchange of scientific personnel, 223
extension service, 203-204, 385
facilities at La Piedad, Guanajuato, 385
Maize Collection Center, Chapingo, State of Mexico, 210
State of Mexico program, 385
Mexican-American Cultural Institute, Mexico, D. F., 56, 283, 304-305, 407
Meyer, Hertha, 168
Miami, University of, Florida
marine biology, 50, 183-184, 381
Miami University, Oxford, Ohio, 397
Michigan, University of, Ann Arbor
group action study, 251, 401
Research Center for Group Dynamics, 272-273, 401
Survey Research Center
economic behavior, 401
employee productivity and morale, 401
study of labor organizations, 252, 401
theory of language and symbolism, 410
Middle East Institute, Washington, D. C., 290
Miller, Harry M., Jr., 150
Ministry of Agriculture, Bogotá, Colombia, 387
Ministry of Agriculture, Mexico, D.F.
agricultural extension service, 203-204, 385
Ministry of Agriculture, Santiago, Chile, 222
Ministry of Economy, Quito, Ecuador, 388
Ministry of Education, Cairo, Egypt
university commission, 327-328, 412
Ministry of Health, Lima, Peru, 359
Ministry of Public Health, Montevideo, Uruguay
Research Institute of Biological Sciences, 376

- Ministry of Social Welfare, Oslo, Norway, 362
- Minnesota, University of, St. Paul
human genetics, 357
social disorganization, 253, 401
wheat and its pathogens, 50, 211-212, 389
- Mirov, Nicholas T., 221
- Mirsky, A. E., 180
- Missouri, University of, Columbia, 401
- Mitchison, J. M., 168
- Mitscherlich, Alexander, 135
- Modern Language Association of America, New York, 407
- Moe, Henry Allen, x, xii
- Montalenti, Giuseppe, 133
- Montreal General Hospital, Canada
Research Institute, 166-167, 376
- Moore, Robert A., xi, xiii, 59, 64
- Morgan, Hugh, 59
- Morgenthau, Hans J., 261
- Morison, Robert S., 64
- Morris, Charles, 300, 301
- Morris-Jones, W. H., 261
- Mosely, Philip E., 228
- Munich, University of, Germany
America Institute, 410
experimental zoology, 381
- Murray, Robert, 95
- Muslim University of Aligarh, India, 313
- Myers, Will Martin, xiii, 212
- Myers, William L., x, xii
- NAEGELE, Kaspar D., 256
- Nakaya, Kenichi, 289
- Naples, University of, Italy
sanitary engineering, 82-83, 369
- Narayan, Dharan, 96
- National Bureau of Economic Research, New York
finance and fiscal policy, 397
Soviet economic growth, 52, 54, 232, 234-235, 397
- National College of Agriculture, Chapingo, State of Mexico, 385
- National Council of The Churches of Christ in the United States of America, 397
- National Department of Sanitary Engineering, Chile, 359
- National Diet Library, Tokyo, Japan, 407
- National Foundation of Political Sciences, Paris, France
structure of the French economy, 235-236, 397
- National Health Council, New York, New York, 104
- National Health Department, Denmark, 359
- National Health Department, Finland, 360
- National Institute of Anthropology and History, Mexico, D.F., 407
- National Institute of Cardiology, Mexico City
equipment, 366
neurophysiology and pharmacology, 358
- National Institute of Economic and Social Research of Great Britain, London
de Tocqueville papers, 298-299, 407
general support, 398
- International Association for Research in Income and Wealth, 242-243, 398
- National Research Council, Washington, D. C.
- American Institute of Biological Sciences, 376
- Commission on Human Resources and Advanced Training, 412
- Committee for Research in Problems of Sex, 356
- Committee on Development of Biology, 376
- fellowships
medical sciences, 333, 371
natural sciences, 333, 390

- Welch, 333, 371
U. S. National Committee of the International Union of Crystallography, 376
National School of Agriculture, La Molina, Peru, 388
National School of Hygiene, Bogotá, Colombia, 366
National School of Nursing, Colombo, Ceylon, 370
National Theatre Conference, 333
National University of Colombia
Faculty of Agronomy, Medellín
agricultural training, 387
equipment, 387
student dormitory, 387
teaching and research, 387
Faculty of Agronomy, Palmira
equipment, 388
student dormitory, 387
teaching and research, 388
National University of Mexico, Mexico, D.F.
Institute of Chemistry, 376
Institute of Mathematics, 224
Netherlands Institute for Social Research, Amsterdam, 255
Neumann, Franz L., 265
Neurath, Hans, 191, 192
New Dramatists Committee, Inc., New York, 408
New England Center Hospital, Boston, Massachusetts, 365
New England Medical Center, Boston, Massachusetts, 357
New School for Social Research, New York
recent German history, 280, 297, 408
New York University, New York City, 357
Newcomb, Theodore M., 251
Niederhauser, John S., 150
Nikam, N. A., 302
North, Robert C., 306
North Carolina, University of, Chapel Hill
health and medical care program, 364
mathematical and experimental genetics, 390
survey of general medical practice, 48, 101-102, 364
Northwestern University, Evanston, Illinois, 376
Nossal, Peter M., 179
Notre Dame, University of, South Bend, Indiana, 401
Nottingham, University of, England, 289
Novis, Jorge, 169
Nowaczynski, Wojciech J., 146
OCCIDENTAL College, Los Angeles, California
southwestern U. S. and Mexican studies, 55, 286-287, 408
Ogden, Albert Denton, 93
Ohlson, Virginia M., 65
Okasaki, Ayanori, 255
Oklahoma, University of, Norman, 401
Olivares, Juan Ricardo, 84
Olivecrona, Herbert, 84
Oliver, Wade W., 64
Opitz, Hans, 90
Oregon, University of, Eugene
Medical School, Portland, 357
Oslo, University of, Norway
incidence of mental illness, 362
Institute of Economics, 243-244, 401
plant physiology and X-ray crystallography, 380
respiratory physiology at Ullevaal Hospital, 362
O'Toole, Donald L., 4
Oxford University, England
American history, 286, 410
Conference on American studies, 289
Department of Human Anatomy
microscopy and microspectroscopy, 381
peripheral nerve studies, 143-145, 361

- Oxford University—*Continued*
 Dyson Perrins Laboratory of Organic Chemistry, 381
 Nuffield College, 401
 Sir William Dunn School of Pathology, 164, 381
 X-ray crystallography, 381
- PACIFIC Science Association, Washington, D. C., 412
- Paine, Janet M., 59
- Palacios, Raul, 169
- Pan American Institute of Geography and History, Mexico, D.F. Commission on History, 404
- Paris, University of, France
 biochemistry, 381
 energy transfer in photosynthesis, 50, 186-187, 381
- Park, Thomas, 181
- Parker, Dorothy, 150
- Parran, Thomas, x, xii
- Pasteur Institute, Paris, France
 Virus Research Division, 355
- Pavan, Crodowaldo, 160
- Pavia, University of, Italy, 361
- Payne, George C., 60, 64
- Peacocke, A. R., 174
- Penfield, Wilder, 84
- Pennsylvania, University of, Philadelphia
 manuscripts of Gottfried Leibniz, 302
 modern Indian languages and literatures, 410
 population and economic growth in the U. S., 401
 science in American civilization, 289
 Wharton School of Finance and Commerce, 241-242, 401
 zoology, 190-191, 381
- Pennsylvania State College, State College, 377
- Penrose, Stephen, 72
- Pérès, J. M., 187
- Perry, Jesse P., Jr., 150
- Perutz, Max, 173
- Pesonen, Niilo, 90
- Peterson, Osler L., 65
- Petrie, Asenath, 134
- Pfost, Gracie, 5
- Philippine Normal College, Manila, 321
- Philippines, University of the, Quezon City
 books in the social sciences and humanities, 270, 320
 Institute of Hygiene, Manila, 79-80, 370
 library development and research, 410
- Piaget, Jean, 302
- Picon, Emilio, 93
- Pisa, University of, Italy, 361
- Pitner, John B., 150
- Pittsburgh, University of, Pennsylvania
 chemistry of fats and proteins, 381
 pulmonary physiology, 381
- Pöber, R., 142
- Pole, J. R., 290
- Polk, Judd, 239
- Polytechnic Institute of Brooklyn, New York
 determination of protein structure, 170-172, 377
- Pomerat, Gerard R., 60, 150
- Pöpel, Franz, 73, 74
- Poplai, S. L., 262
- Poppen, James L., 84
- Princeton University, Princeton, New Jersey
 genetics, 377
 Institute of International Studies, 398
 literary criticism, 408
 Near Eastern studies, 408
 Office of Population Research, 51, 252-253, 398
 psychology of perception, 145-146, 357
 seminars in criticism, 408
 social physics, 391
- Puerto Rico, University of, Rio Piedras
 social anthropological studies, 253, 402
- Purcell, Theodore V., 255

- Purdue University, Lafayette, Indiana, 377
- QUASTEL, Juda H., 166, 167
- Queen's University, Kingston, Ontario graduate training program in economics, 268-269, 398
- RAMAMURTHI, B., 96
- Ranadive, Kamal J., 95
- Raw, Isaias, 179
- Reece, B. Carroll, 4, 5
- Reece Committee, 3, 5, 10, 22
- Reichart, Manfredo, 222
- Reifler, Erwin, 225
- Research Institute of Population Problems, Tokyo, Japan, 255
- Rhind, Flora M., xi, xiii
- Rhine, Joseph B., 140
- Richardson, Ralph W., Jr., 150
- Richter, Derek, 140, 141
- Riet Correa, Pery, 169
- Rio Grande do Sul, University of, Porto Alegre, Brazil
research and teaching, 197, 386, 391
- Rittenberg, David, 179
- Robbins, Lionel C., 247
- Roberts, Dean W., 103
- Roberts, Lewis M., 150
- Robinson, Edward, xi, xiii
- Roche, Jean, 176
- Rochester, University of, New York, 382
- Rockefeller, John D., 7, 12, 29, 39
- Rockefeller, John D., 3rd, x, xi, xii, xiii
- Rockefeller Institute for Medical Research, New York, 372
- Rodenhiser, Herman Alonzo, xiii
- Rodriguez, Ramón, 169
- Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine
genetics and social behavior, 138-139, 357
- Rose, Arnold M., 253
- Rosenmayr, Leopold, 254
- Rossi-Fanelli, Alessandro, 178
- Rothschild, Hanna, 174
- Roudinesco, Jenny, 99
- Royal Institute of International Affairs, London, England, 232
A Study of History, 55-56, 293-294, 408
area studies, 55, 259-260, 398
history of the war and peace settlement, 398
The Theory of International Economic Policy, 244, 398
- Royal Statistical Society, London, England, 398
- Roys, Chester C., 187
- Ruch, Fritz, 179
- Rupert, Joseph A., 150
- Ruppel, Robert F., 150
- Rural Health and Nutrition Service, San Felipe, Aconcagua, Chile, 147, 359
- Rural University of the State of Minas Gerais, Brazil
Schools of Agriculture and Veterinary Medicine, 386
- Rusk, Dean, x, xi, xii, xiii, xv
- Russell, Paul F., 65
- SACHDEVA, Yudhveer, 88
- Sachs, Abraham, 320
- St. Luke's College of Nursing, Tokyo, Japan, 93
- St. Thomas' Hospital Medical School, London, England, 360
- St. Vladimir's Orthodox Theological Seminary and Academy, New York, 408
- Salzburg Seminar in American Studies, Inc., Austria, 413
- San Luis Potosí, University of, Mexico, 93
- San Marcos, University of, Lima, Peru
Faculty of Veterinary Medicine, 388
- São Paulo, University of, Brazil
cytochemistry, 163, 382
Department of Physics, 382
Instituto Agronómico, Campinas, 386

- São Paulo, University of—*Continued*
 Instituto Biológico, 386
 Oceanographic Institute, 188, 224
 radioactive isotopes, 382
 School of Agriculture, Piracicaba, 386
 scientific research, 196–197, 382, 386,
 391
 Second Pan-American Congress of
 Agronomy, 224
 Union Catalogue of periodicals, 224
 Sasse, Bruce E., 65
 Sawai Man Singh Medical College,
 Jaipur, India
 research equipment, 84–85, 370
 Sawaya, Paulo, 188
 Sayili, Ayden, 300
 Schneider, Max, 89
 Schwartz, Louis B., 250
 Scott, John P., 138
 Scripps College, Claremont, California,
 321
 Scripps Institution of Oceanography
see California, University of
 Secretariat of Agriculture, State of Rio
 Grande do Sul, Brazil, 223
 Sen, P. K., 90
 Senator, D. W., 320
 Seth Gordhandas Sunderdas Medical
 College, Bombay, India, 93
Sewanee Review, 304, 410
 Sharma, Govind Lal, 92
 Shedd, Margaret, 304
 Sheffield, University of, England, 382
 Shryock, Richard, 70, 71
 Sigerist, Henry, 70
 Silberschmidt, Karl M., 223
 Simmons College, Boston, Massachusetts.
 public health nursing, 76–77, 365
 Simpson, Richard M., 4
 Singh, R. P., 95
 Sjöstrand, Fritiof, 176, 177
 Skard, Sigmund, 290
 Skiles, Robert L., 150
 Skinner, B. F., 146
 Smith, Cyril L., 180
 Smith, Donald L., 60, 150
 Smith, Geoffrey S., x, xii
 Smith, Hugh H., 64
 Smith, James Herbert Francis, 95
 Smith, Marian W., 292
 Smith College, Northampton, Massa-
 chusetts
Genetics Experiment Station, 159,
 377
 Smithburn, Kenneth C., 47, 65
 Snell, Bruno, 320
 Snyder, William C., 222
 Social Science Research Council, New
 York, 5, 26
 Committee on Cross-Cultural Edu-
 cation, 413
 conferences and planning, 399
Current Digest of the Soviet Press, 399
 "Economic Growth: The Problem and
 its Setting," 399
 fellowships, 333, 395
 legal philosophy and political the-
 ory, 233, 264–265
 social sciences, 266
 general support, 399
 grants to aid research, 399
 monographs based on the 1950 cen-
 sus, 399
 summer seminar program, 267–268,
 399
 Società Italiana per la Organizzazione
 Internazionale, Rome, Italy,
 265
 Society for Experimental Biology, Eng-
 land, 377
 Society for General Microbiology, Eng-
 land, 169
 Society of American Foresters, Wash-
 ington, D. C.
 survey of forestry research, 217–218,
 389
 Society of Friends of Leibniz College,
 Tübingen, Germany, 316
 Söderlund, Ernst, 246
 Soissons Public Health Center, France,
 48, 98–101

- Solomon, H. C., 146
 Solomons, David, 248
 Sosnovy, Timothy, 247
 Spears, Monroe K., 304
 Spiegelberg, Herbert, 302
 Sproul, Robert G., x, xii
 Spruit, C. J. P., 188
 Sreenivasan, Arunachala, 179
 Stakman, E. C., xi, 60, 150, 209
 Stanford University, California
 biochemical genetics, 377
 biochemical research, 377
 biochemistry of nucleic acids, 377
 biology, 42, 189-190, 377
 Far Eastern and Slavic studies, 408
 Food Research Institute
 capital fund, 399
 research program, 42, 52, 231, 233-
 234, 399
 training in agricultural economics
 research, 399
 physical biochemistry, 377
 research in communication and psy-
 chiatry, 413
 Stanley, Wendell M., 169
 State Historical Society, Madison, Wis-
 consin, 290
 State Historical Society of Colorado, 399
 State Institute of Public Health, Stock-
 holm, Sweden, 369
 Stenhammar, Einar, 178
 Sternberger, Dolf, 260
 Stevens, Robert T., 58
 Steward, Julian, 253
 Stewart, John B., 60, 228
 Stewart, Walter W., 245
 Stocken, Lloyd, 180
 Stockholm, University of, Sweden
 biochemistry, 382
 radiobiology, 177, 382
 Struthers, R. R., 64
 Studenski, Paul, 245
A Study of History, 293-294, 408
 Suhr, Otto, 258
 Sulzberger, Arthur Hays, x, xii
 Sunderland, Sydney, 91
 Superior Institute of Public Health,
 Rome, Italy, 361
 Svalastoga, Kaare, 254
 Svedberg, The, 185
 Swaminathan, M. S., 222
 Swarthmore College, Pennsylvania, 399
 Swerling, B. C., 234
 TABBARA, Riad A., 88
 Tagle, Isaias, 187
 Taliaferro, William H., 89
 Tamiya, Hiroshi, 216, 224
 Tappan, Paul W., 250
 Tatum, E. L., 160
 Tavistock Institute of Human Rela-
 tions, London, England, 360
 Taylor, Carl E., 89
 Taylor, Richard M., 60, 65
 Technical Institute, Stuttgart, Germany
 sanitary engineering, 73-74, 367
 Temkin, Owsei, 71
 Tennant, Mary Elizabeth, 64
 Tennessee Department of Public Health
 Williamson County Tuberculosis
 Study, 131-133, 355
 Texas, University of, Austin
 genetics, 382
 law-science program, 357
 Thangavelu, Mahalingam, 93
 Theiler, Max, 47, 65
Theory of International Economic Policy,
 The, 244
 Thistlethwaite, Frank, 289
 Thomas, Jan Bartholomeus, 188
 Thompson, Kenneth W., 60, 228
 Timur, Hifsi, 328
 Todrick, A., 142
 Tokugawa Institute for Biological Re-
 search, Tokyo, Japan
 mass cultivation of microorganisms,
 50, 215-217, 377
 Tokyo University, Japan, 409
 Toniolo, Lucio, 221
 Toronto, University of, Canada
 laboratory of experimental clinical
 neurology, 358

- Toronto, University of—*Continued*
 problems of Canadian development, 54, 266-267, 402
 School of Nursing, 365
 Slavic studies, 402, 410
 teaching and research in medical care, 364
 Toulouse, University of, France, 410
 Toynbee, Arnold, 56, 293, 294
 Toynbee, Mrs. Arnold, 56, 294
 Toyo Bunko, Tokyo, Japan, 293
 Tufts College, Medford, Massachusetts, 377
 Tumin, Melvin M., 255
 Turkish American University Association, Istanbul, Turkey, 280, 290
 Turku, University of, Finland, 94
 Turner, Ralph, 294
 Turnier, Luce, 313
- UMEHARA, Sueji, 292
Union Catalogue of Periodicals, 318
 University College, Dublin, Ireland, 377
 University College, Ibadan, Nigeria, West Africa, 95
 University College of the West Indies, Jamaica, 94
 University Nursing School, Montevideo, Uruguay, 366
 University of the South, Sewanee, Tennessee
 fellowships in creative writing, 56, 282, 304, 305, 405
The Sewanee Review, 304, 410
 Uppsala, University of, Sweden
 biochemistry, 383
 chemistry of large molecules, 178, 382
 Institute of Physiology, 383
 photosynthetic activity, 50, 185-186, 382
 proteins and polysaccharides, 383
 Utah, University of, Salt Lake City, 383
 Utrecht, University of, Netherlands
 biophysics and biochemistry, 383
 Institute of Clinical and Industrial Psychology, 369
- Uttar Pradesh, India, Government of
 pilot development project at Etawah, 389
 Rural Research and Action Center, 219-220, 389
- VAKIL, C. N., 247
 Valle, University of, Cali, Colombia, 88
 Vallega, José, 221
 Vanderbilt, Arthur T., 326
 Vanderbilt University, Nashville, Tennessee
 Institute of Research and Training in the Social Sciences, 402
 international exchange in pediatrics, 87, 365
 School of Medicine, 354
 van der Loon, P., 293
 Van Dusen, Henry P., x, xii
 Van Dyke, George E., 59
 van Wesep, Henry B., 61
 Vargas Foundation, Rio de Janeiro, Brazil, 262
 Veiga, João Soares, 188
 Velez, Alfredo, 211
 Verly, Walter G., 180
 Vial, Juan, 88
 Vienna, University of, Austria
 economic situation of Austrian peasants, 245, 402
 fellowships in child psychiatry, 367
 Institute of Criminology, 254, 402
 Villalón, Alberto, 146
 Viner, Jacob, 246
 Virus studies, 46-47, 104-131, 355
 arthropod-borne viruses, 47, 106-113
 biochemical studies, 116-120
 field stations, 123-131
 laboratory studies, 113-123
 mosquito and tick studies, 120-123
 Viscontini, Max, 169
 von Uexküll, Thure, 92
- WALLGREN, Arvid, 87
 Wallich, Henry C., 245

- Walter and Eliza Hall Institute, Melbourne, Australia, 363
- Walton Smith, F. G., 183
- Warren, Andrew J., xi, xiii, 64
- Washington, University of, Seattle
Far Eastern Institute, 411
physical biochemistry of proteins, 191-192, 383
- Washington University, St. Louis, Missouri
biochemical research, 383
experimental embryology, 383
School of Medicine, 365
- Watson, Robert B., 46, 65
- Weaver, Warren, xi, xiii, 150, 210
- Webb, Vanderbilt, xi, xiii
- Weber, Wilhelm, 246
- Wechsler, Herbert, 250
- Weddell, Graham, 143, 144
- Weir, John M., 65
- Weiss, Paul, 302
- Welch, William H., 70
- Wellhausen, Edwin J., 150
- Welsh Regional Hospital Board, Cardiff
Neuropsychiatric Research Centre, 140-141, 361
- Went, Frits, 215
- Werner, Karl Heinz, 246
- Wernimont, Kenneth, 150
- Westenbrink, H. G. K., 179
- Western Reserve University, Cleveland, Ohio, 357
- Wevers, John W., 291
- Whetnall, Edith, 93
- Whitman, Loring, 65
- Wild, John, 301
- Willard, Howard Nelson, 89
- Williams, John H., 239
- Willits, Joseph H., xi, xiii, 228
- Wilson, Arthur J. C., 174
- Wilson, D. Bruce, 60, 65
- Wisconsin, University of, Madison
American civilization, 411
bacterial genetics, 156-157, 383
biochemistry, 42, 195-196, 383
Community Arts program, 56, 284, 311-312, 411
cyogenetics, 159-160, 383
enzyme chemistry, 383
Enzyme Institute, 383
law and the lumber industry in Wisconsin, 402
Law School, 232, 262-263, 402
metabolism of plant tissues, 383
physical chemistry of proteins, 383
- Witschi, Emil, 155, 156
- Woerdeman, M. W., 161
- Wolcott, Jessie P., 5
- Wolff, René, 169
- Wood, W. Barry, Jr., xii
- Woodford, E. K., 221
- Woods, D. D., 180
- Woods Hole Oceanographic Institution, Massachusetts, 383
- Worcester Foundation for Experimental Biology, Massachusetts, 384
- Work, Telford H., 65
- Worth, C. Brooke, 65
- Wortman, L. Sterling, Jr., 150
- Wurmser, René, 186
- Würzberg, University of, Germany, 360
- Wyler, Julius, 245
- YALDEN-THOMSON, Mrs. Edith Elbogen, 245
- Yale University, New Haven, Connecticut
biochemical research, 384
carbon 14 dating laboratory, 413
communication and attitude change, 402
contemporary history, 294, 411
Department of Botany, 384
history of medicine, 365
Institute of International Studies, 402
physical chemistry of proteins, 384
- Yamada, Tuneo, 168
- Yanez, Parmenio, 188
- Yang, Shu-Chin, 246
- Yellow Fever, 355
- Yellow fever programs, 355
- Yerkes, William D., Jr., 150

- Yerkes Laboratories of Primate Biology,
Orange Park, Florida, 358 ZAGOROFF, S. D., 245
 Yoffey, J. M., 169 Zea, Leopoldo, 302
 Young, Ernest C., xi, 150 Zechlin, Egmont, 299
 Young, William Arthur, 147 Zervas, L., 178
 Yuan, T. L., 293 Zoological Station of Naples, Italy, 384
 Zurich, University of, Switzerland, 362