

The
Rockefeller Foundation

Annual Report
1938

THE
FOUNDATION

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¹ Died February 28, 1938.

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LEFFERTS MASON DASHIELL

On February 28, 1938, Lefferts M. Dashiell, treasurer of The Rockefeller Foundation since 1932, died suddenly at his home in Fair Haven, New Jersey, of a heart attack. Prior to becoming treasurer of the Foundation Mr. Dashiell had been its assistant treasurer for eighteen years. Thus his service to the organization had spanned almost the entire period of its existence.

Mr. Dashiell was born in Minneapolis on July 15, 1874. After his graduation from Brown University in 1897, he entered business in the financial district of New York. He became associated with the Foundation in 1914 by appointment as its assistant treasurer. He served in that capacity under Louis Guerinéau Myers until the death of the latter in 1932. Thereupon Mr. Dashiell was elected treasurer. He was also treasurer of The Rockefeller Institute for Medical Research, of the General Education Board, of the China Medical Board, Inc., of the Spelman Fund of New York, of The Davison Fund, Inc., and of the Bureau of Social Hygiene.

Transparent integrity and an inherent sense of responsibility and trusteeship are indispensable qualities in a treasurer, and these Mr. Dashiell possessed to a unique degree. Indeed these qualities were part of the man himself—indomitable traits that were reflected in his thoughts, words, and deeds.

He was an individual of frankly expressed loyalties, but this frankness was combined with a wide tolerance and a calmly judicial mind. He was not given to prejudging a person or a situation, and his even temper and quiet friendly manner attracted and encouraged the confidence of others. He was self-effacing, never crowded anybody for place or preferment, was generous in his recognition of merit in others. In brief, he was a very human man, a delightful companion, a completely dependable friend.



Photograph Excised Here

Lefferts Mason Dashiell

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 period January 1, 1938, to December 31, 1938, together with detailed reports of the Secretary and the Treasurer of the Foundation, the Director of the International Health Division, the Directors of the Medical Sciences, the Natural Sciences, the Social Sciences, and the Humanities, and the Vice-President in charge of the program in China.

Respectfully yours,

RAYMOND B. FOSDICK
President

THE
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PRESIDENT'S REVIEW
FOR 1938

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PRESIDENT'S REVIEW

THE YEAR IN BRIEF

DURING 1938 The Rockefeller Foundation appropriated a total sum of over \$15,000,000. Of this amount, speaking in terms of rough classifications, \$3,800,000 was given to the medical sciences, \$3,800,000 to the social sciences, \$3,000,000 to the natural sciences, \$2,500,000 to public health, \$1,000,000 to the humanities, and \$300,000 to rural reconstruction in China.

The Foundation's income during 1938 amounted approximately to \$7,000,000. In appropriating \$15,000,000 it was necessary, therefore, not only to use up the balance carried over from earlier years, but to dip into the principal fund to the extent of \$3,755,000. The details of the Foundation's finances during 1938 appear on pages 79 to 80 and 381 to 478 of this report.

In carrying out its 1938 program the Foundation operated in forty-two countries in all parts of the world. Eighteen of these countries were in Europe, five in Asia, two in Africa, five in South America, ten in North and Central America and the West Indies, and two were islands of the Pacific.

Twenty-five per cent of the money given went

to foreign countries, and the remainder, 75 per cent, was for work in the United States.

It was found advisable in 1938 to make large appropriations to four different institutions. Two of these grants were for current support over extended periods and two were for endowment. These account, in part, for the relatively large total of funds appropriated during the year. To the China Medical Board, the Foundation gave \$1,580,000, under an earlier authorization, for expenditure over a period of approximately four years. Previously the Foundation had made annual appropriations to this Board toward the maintenance of the Peiping Union Medical College. Support over a relatively long period has now been given to enable both the Board and the College to plan with reasonable assurance for the immediate future.

To the University of Chicago, the Foundation appropriated \$1,500,000 for the endowment of biological research. The Foundation has made grants for the current maintenance of this work for a number of years, and the program has so clearly demonstrated its quality that stabilization of Foundation support seemed wise.

To the American University of Beirut, the Foundation appropriated \$1,000,000 toward the endowment of its medical school, including nursing and premedical subjects. This action has been

in contemplation for a number of years, and it is now believed that the University is in a position to raise the supplementary sums required and thus make a substantial addition to its resources.

To the Spelman Fund of New York, the Foundation appropriated \$2,000,000 for use over a five-year period in support of the Fund's program in public administration. Both the Foundation and the Spelman Fund are interested in research and training in public administration. The Foundation has given assistance to academic institutions, the Fund to nonacademic institutions. The latter type of program promises significant results and inasmuch as the resources of the Spelman Fund were practically exhausted, the Foundation made it possible for this experienced organization to continue its work over the next five years.

Among other large appropriations and pledges made during the year were the following:

Yale University: Support of the Institute of Human Relations	\$700,000
Washington University School of Medicine (St. Louis): Maintenance of its Departments of Medicine, Surgery, Pediatrics, and Obstetrics	400,000
Graduate Institute of International Studies, Geneva: General expenses	315,000
State Institute of Public Health, Stockholm: Half the cost of construction and equipment	270,000

University of Toronto School of Nursing: Endowment	\$255,000
University of North Carolina: for work in drama: Endowment (\$150,000); cur- rent expenses (\$33,000)	183,000
Social Science Research Council: Confer- ences and planning in connection with research in the social sciences	150,000
University of Chicago: Support of psy- chiatric teaching and research	150,000
The Johns Hopkins University School of Medicine: Support of the Insti- tute of the History of Medicine	150,000
Washington University School of Medi- cine (St. Louis): Support of the De- partment of Neuropsychiatry	150,000

Except in the field of public health, the Foundation is not an operating organization. It conducts no researches of its own. Its activities are confined to grants to other agencies — universities, laboratories, and research institutes — and to the training, through fellowships, of competent personnel in the various fields of knowledge.

A MILLION VACCINATIONS

Two years ago in this REVIEW it was reported that jungle yellow fever, spread by some vector other than the *Aedes aegypti* mosquito (formerly called the *stegomyia*), had been discovered in wide

areas of South America. In the last two years outbreaks of this disease have been observed from 7°30' North Latitude to 27° South Latitude; from the eastern slope of the Andes to the mouth of the Amazon; at altitudes varying between sea level and 5,000 feet; in regions of dense jungle growth and in prairie districts where the infected forests cover not more than 5 per cent of the land area; in sparsely populated regions and in heavily populated agricultural districts; in the form of epidemic waves and under conditions suggesting permanent local endemicity. Jungle yellow fever has proven to be not only a constant source of virus for the reinfection of towns but also an important public health problem in its own right.

In any discussion of jungle yellow fever emphasis must be given to the fact that this term is one of epidemiological significance only. Clinically, pathologically, and immunologically, it has so far been impossible to differentiate jungle yellow fever from the classical aegypti-transmitted variety. Strains of virus isolated from jungle cases differ no more from strains isolated from urban cases than do these latter from each other. Jungle strains can be transmitted in the laboratory by *Aedes aegypti* just as the urban strains can be transmitted by various species of jungle mosquitoes found in Africa and by others found in South America.

Field observations have, during the past four years, failed to indicate that any of the minor aegypti-transmitted outbreaks during this period have been due to virus coming from a previous aegypti-transmitted infection. Rather these observations have suggested in each instance that the town had been invaded by a virus from near-by jungle districts. Were it not for the existence of the jungle infection, yellow fever might have disappeared permanently from the Americas in 1934. Although the clinical picture of yellow fever is the same whether the infection develops in the town or in the jungle, the epidemiology of the two types is quite different. Aegypti-transmitted yellow fever is generally acquired indoors; it tends to involve all nonimmunes of all ages living in infected houses, and spreads from place to place along the routes of human travel. The disease follows a mosquito-man-mosquito cycle and is easily controlled by reduction of the numbers of the mosquito vector.

Jungle yellow fever, on the other hand, is usually acquired in or at the edge of the forest during working hours by those whose occupation takes them to the woods. It does not tend, in the absence of aegypti, to involve other members of the household living under the same roof with infective cases. Exceptions to this rule generally indicate that the other members of the household

also visit the jungle, or even that the house itself is in very intimate contact with the forest. The disease in man is apparently an accidental one occurring in the course of some cycle of infection in the jungle of which man is not an essential part. The infection apparently spreads throughout jungle areas without relation to routes of human travel. The only reasonable hope of prevention lies in individual immunization by vaccination.

A year ago the Foundation announced the successful development in the laboratories of its International Health Division of an effective virus (known as 17 D) for vaccination against yellow fever. By the end of 1937, 40,000 persons, largely in Brazil, had been vaccinated, and subsequent tests showed that full or partial immunity had been acquired in over 90 per cent of the cases. During the week ending December 10, 1938, the number of people vaccinated passed the million mark, the total for the year being 1,059,252. This result was made possible by the vigorous initiative and the generous cooperation of the Brazilian Government. The wide use of virus 17 D among exposed populations during active outbreaks of jungle yellow fever in 1938 has resulted in a mass of field observation almost as conclusive as laboratory experiments. Local physicians and field workers report a sudden reduction in observed cases in infected districts shortly after

mass vaccination and cite instances in which individuals who failed to be inoculated contracted the disease later in infected forests, while vaccinated members of the same groups escaped. Field experience suggests that the protective effect of vaccination begins not later than a week after inoculation, although laboratory tests fail to show demonstrable antibodies as early as this. Eight cases of yellow fever were reported during the year from among those who had been vaccinated. Investigation, however, showed that in six of these cases the onset of the disease was within four days of vaccination.

The duration of the immunity induced by virus 17 D can be determined only by future studies. Of twenty-one persons whose blood was tested one year after vaccination, nineteen were found to be still immune. Monkeys vaccinated two and a half years ago are still completely immune. The average duration of postvaccination immunity must be determined by fundamental investigations before a reasonable vaccination program covering a period of years can be drawn up for exposed populations.

While vaccination promises to be of great aid in preventing the transfer of yellow fever by the human host from one locality to another, it cannot of course eliminate the virus in the jungle nor block its dissemination through contiguous forests

in the tropics. Lurking somewhere in these forests are unknown vectors and other hosts than man; and a great deal of work remains to be done before they can be accurately identified. Field work by the members of the Foundation's staff during 1938 resulted in the capture of three species of mosquito, other than *aegypti*, infected with yellow fever virus. Moreover, the bodies of howler monkeys were discovered in the woods where they had died at the time human infections of yellow fever were occurring in the same areas. Up to the present all attempts to isolate yellow fever virus from wild animals have failed. Investigations regarding immunity to yellow fever in several thousand wild animals captured in infected forests have given some very interesting results but final interpretation cannot at the moment be made. It has been reasonably established that the discovery of protective substance in the blood of monkeys indicates that the animals have had yellow fever. Protection tests on the blood of 1,212 monkeys captured in Brazil and Bolivia have yielded 189, or 15 per cent, of positive results. While it is too early to decide upon the role of these animals in the epidemiology of jungle yellow fever, the available data leave little doubt that monkeys are infected in the woods at the time human cases occur.

It is difficult to fit all the observed facts into any simple mosquito-monkey-mosquito cycle of

infection, and the search is continuing for other factors. Jungle yellow fever occurs under such a wide variety of natural conditions that it seems reasonable to anticipate that no single set of factors, operative throughout, will be discovered.

Meanwhile it is a pleasure to report that no case of aegypti-transmitted yellow fever was observed in any locality in the Americas in 1938. This is the result of hard-won knowledge and eternal vigilance. As one looks back to the early beginnings of the fight against yellow fever under the leadership of pioneers like Walter Reed and Carter and Finlay and Gorgas, it is possible to see how great the advance has been. We know now that the solution of the mystery is much more complex than Reed and his associates imagined. But although yellow fever is still a serious public health problem, there are substantial grounds for believing that the battle is at least half won. Unless the disease should break out in some country like India, for example, where it has never before been found, the future would seem reasonably assured.

THE THREAT TO THE WESTERN HEMISPHERE

If Orson Welles, in his now famous broadcast of October 30, 1938, had announced not that the Martians had landed in New Jersey, but that a

mosquito called *Anopheles gambiae*, a native of Africa, had arrived on the American continent, there would have been no public alarm. Indeed it is doubtful if there would have been any public interest. But *Anopheles gambiae* is potentially a much more dangerous invader than the Martians would have been. H. G. Wells's Martians, it will be remembered, were unable to adjust themselves to life on this planet and quickly died. *Anopheles gambiae*, striking from Equatorial Africa, has invaded South America and is making itself very much at home in Brazil.

Who is this new invader of the Western Hemisphere and how did it get here? *Anopheles* mosquitoes are malaria carriers; the *Anopheles gambiae* is the most dangerous member of a dangerous family. Although the species has hitherto been reported from Algeria and Morocco, and from Southern Arabia as well, its principal home is the African tropical belt, extending from the southern border of the Sahara Desert south to the Zambesi River. It is the scourge of Central Africa, a carrier of a serious and often fatal type of malaria, sometimes complicated by the so-called "blackwater" fever. Until 1930 this species of mosquito was not known on this side of the Atlantic. In that year, however, or shortly before, it crossed the ocean, apparently by airplane or on one of the fast French destroyers which at that time were work-

ing in connection with the French air lines between Dakar in West Africa and Natal in Brazil. The species was first discovered in 1930 within the city limits of Natal by Dr. Raymond C. Shannon, a member of the Foundation's staff, during a routine mosquito survey in connection with the Yellow Fever Service. The seriousness of its presence was immediately recognized, but it was hoped that the invasion might be localized by natural conditions unfriendly to the invader.

These hopes were disappointed. In 1930 and 1931 there occurred in the vicinity of the breeding area in Natal an outbreak of malaria of a severity unprecedented in the annals of the city. The Yellow Fever Service was compelled to undertake gambiae control in order to maintain an efficient staff for its own work. By 1931, following prevailing winds, gambiae mosquitoes had traveled up the coast 115 miles. Two years of severe dry seasons seemed to check the invasion, and then, with the recurrence of normal rainfall, the onward flight started again.

In recent years severe epidemics of gambiae-carried malaria have occurred in localities over two hundred miles west and north of Natal. In the Jaguaribe Valley of the State of Ceará alone there were over fifty thousand cases of malaria in 1938. Over 90 per cent of the population was affected, with mortality in certain districts esti-

mated at 10 per cent. So disabling and widespread was the epidemic that, in some parts, crops were not planted and salt production was greatly reduced because of lack of labor. It is estimated that as a result of the ravages of this mosquito nearly every person in these affected areas will be on government relief in 1939.

George E. Vincent, formerly president of the Foundation, in his report for 1928 wrote, "It has been said that a good malaria fighter must 'learn to think like a mosquito.' He must ask: Which of many kinds of anopheline mosquitoes shall I try to imagine myself? How far is it possible to fly? When and where is food to be had? Which blood is to be preferred, human or animal? How can one get into a screened house? Where shall one rest after a good meal? Where is the best place to deposit eggs? Is the water of the right kind and temperature? Is it stagnant or flowing? Is there vegetable growth to protect eggs and larvae from fish?" Fortunately, through the work of the Foundation's staff and others in Africa, much is known about the *gambiae*. It breeds prolifically and rapidly, requiring only seven or eight days to develop from egg to adult, a fact that makes breeding possible in very temporary water collections. It has variable breeding habits, but seems to prefer stagnant, sunlit water. It has a high infection rate. During the outbreak in the city of

Natal in 1930, 62.8 per cent of 172 specimens of *gambiae* caught and dissected were found to be infected with malaria, a rate higher than anything hitherto known in the Americas. The *gambiae* seems to prefer human to animal blood; of over a thousand specimens tested in 1931, 82.3 per cent contained human blood. It is a domesticated insect; it usually bites indoors, not outdoors. Fairly reliable flight records show a distance of over three miles.

Late in 1938 representatives of the Brazilian Health Service and of the Foundation staff investigated the infected area in North Brazil. They visited São Gonçalo and Baixa Verde, both of which have had heavy outbreaks of malaria following the introduction of *gambiae* to the region; and the lakes about Assú. They also went up the Jaguaribe River through Jaguaribe Mirim, Ouro Branco, and Icó, to Lavras. This visit confirmed the seriousness of the situation. Once the *gambiae* gets into a river valley it spreads up the valley unless blocked at some point by natural or artificial barriers.

With the assistance of The Rockefeller Foundation an anti-*gambiae* service is now being organized. Except for the distribution of quinine by field personnel working in infested districts, this service will not have the responsibility for medical care of the sick in dispensaries or otherwise.

Inasmuch as there is insufficient time to develop a separate agency, it will be organized as a part of the existing local Yellow Fever Service. This affiliation will make possible the utilization of the wide experience of the Yellow Fever Service in the infested area and will provide a group of trained men accustomed to working under discipline. It is hoped by this method to confine the gambiae to the relatively arid areas which it now occupies, and possibly even to exterminate it there. If the gambiae should break through to the well-watered Parnahyba and São Francisco River Valleys, it is feared that it would be impossible to prevent its spread to a large part of South, Central, and perhaps even North America. The Parnahyba Valley is 500 miles from Natal; the gambiae mosquitoes are already nearly halfway there.

In 1938 the International Health Division of the Foundation set aside \$100,000 for expenditure in 1939 on the problem of the gambiae in Brazil. The Government of Brazil has also earmarked substantial sums. Funds will be released for control measures as soon as the plans of attack are drawn.

A MORAL EQUIVALENT FOR WAR

“Human nature being what it is there must either be adventures of peace or adventures of war.”

Perhaps no group of men have been more successful in finding in their own activities a moral equivalent for war than public health workers. Their lives are spent on the firing line and they know the drama of advance and retreat, of successful strategy and of failure, against mankind's most persistent and relentless enemy.

In its public health work The Rockefeller Foundation maintains its own scientific staff. While it supports, through grants, the public health activities of other institutions, for the most part it pursues its own program in the field, operating on a world-wide basis. This program dates back to the creation of the Foundation in 1913—and even earlier, through the activities of the Rockefeller Sanitary Commission.

In 1938 the technical staff of the International Health Division of the Foundation consisted of seventy-two people: sixty doctors, five sanitary engineers, two public health nurses, two entomologists, a biochemist, a physicist, and a zoologist. Of this total, twenty-nine were stationed in the United States, Canada, and Mexico; twelve in South America; seven in the Caribbean region; sixteen in Europe, Africa, and the Near East; five in India; and three in the Far East and the South Pacific region.

The heart of this far-flung program is the labo-

ratory. Unless field work in public health goes hand in hand with increasing knowledge it becomes stagnant and stereotyped. The work in yellow fever, for example, could never have progressed, either in revealing new and dangerous aspects of the disease, or in gradually perfecting the safeguard of vaccination, if it had not been for the strong reliance placed on laboratory technique.

In 1938 the laboratories of the International Health Division, located in New York, had under investigation the following specific subjects: yellow fever; influenza, the common cold, and related infections of the upper respiratory tract; malaria; and physicochemical studies of the nature of viruses. In addition, the laboratories serve as a center for the training of personnel, the maintenance of standards, and the scientific coordination of the Division's field work in the thirty-eight countries where it is now operating.

During the year the International Health Division carried on its yellow fever work not only in Brazil and in near-by countries of South America, but also in Africa, with headquarters at Entebbe, Uganda. Malaria investigations or control operations were conducted with Foundation cooperation in Florida, Chicago, Mexico, Panama, Cuba, Italy, Albania, Cyprus, Greece,

Portugal, Egypt, and Madras. Other diseases studied in 1938 were tropical anemia, rabies, syphilis, and tuberculosis. Investigations in mental hygiene were supported in Tennessee and Maryland with a view to determining whether there is an opportunity for effective work by health departments in this field. A unique project was continued in the Fiji Islands, where a school is maintained for the training of native medical practitioners for service in the islands of the South Pacific. Moreover, two comparatively large grants were made by the International Health Division: (1) \$270,000 to the State Institute of Public Health in Stockholm, representing approximately half the cost of building and equipment; this Institute will provide educational and laboratory facilities in developing a national program of public health; (2) \$255,000 to the University of Toronto, for endowment of the School of Nursing.

Within the field of public health the activities of The Rockefeller Foundation are constantly shifting as old programs are completed and new opportunities discovered. A fundamental policy is to limit the work to exploration, pioneering, and experiment, avoiding prolonged support of any activity which has become routine.

The expenditures of the International Health Division in 1938 approximated \$2,500,000.

PRIVATE VERSUS PUBLIC SUPPORT OF MEDICAL RESEARCH

A recent writer has suggested that scientific research should not be left to the uncertainty of private philanthropy but should be made a responsibility of the government. Without attempting to argue the theory implied in this broad contention, it is interesting to analyze what is happening in the field of medical research. While exact statistics are wanting, it seems evident from those available that tax sources today in the United States are providing as much money for research in medicine as all other sources put together, excluding industry, but including private hospitals and universities, foundations, and individual donors.

This somewhat astonishing statement becomes credible when one considers not only the sums devoted directly to research by the Federal Government through the Division of Animal Industry of the Department of Agriculture, the Children's Bureau of the Department of Labor, the National Institute of Health of the United States Public Health Service, the National Cancer Institute, and the special grants of the WPA, but also the monies spent by states and cities on medical research through local laboratories. Each of the states of the union maintains a laboratory division in its department of health, and in many

of these active investigation is under way. The best illustration, perhaps, is the Division of Laboratories and Research in the New York State Department of Health. New York City and Detroit are examples of local governments maintaining excellent laboratories in which important research activities are being carried on.

Moreover, it must be remembered that tax-supported state universities have the same interest in research as the privately endowed institutions. Of the seventy-seven medical schools in the United States recognized by the American Medical Association, thirty-five are maintained by taxation. In this connection it should be noted that the trend is in the direction of larger funds for research in tax-supported institutions as against diminishing funds in private institutions. A recent study shows that for the eight-year period ending in 1936, research funds in all fields of knowledge decreased 16 per cent in the leading private institutions of the United States and increased 41 per cent for the same period in the state institutions.

In other words, with the declining yield from investments on the one hand, and with the widening activities of public agencies in health and education and welfare on the other, the trend toward greater governmental participation in the costs of research is inevitable. When one considers that 70 per cent of the hospital beds of the coun-

try are paid for by government, and that of the billion dollars or more for annual hospital maintenance, 46 per cent comes from taxes and 46 per cent from patients, as against only 8 per cent from endowment funds, gifts, community chests, and other private sources, the development toward a larger degree of government support of medical research is understandable.

The experience of Europe in medical research is interesting and perhaps significant. The great majority of continental universities belong to the governments and are responsible to the ministries of education. Institutes of medical research have likewise been traditionally supported by special government grants. In France the Pasteur Institute is the only important exception to this generalization. In Germany, whatever may be the present or future state of science, the world should remember with appreciation the enlightened attitude which flourished there under the state support at a time when medical research breathed but feebly elsewhere.

England has outstanding private institutions like the Universities of Oxford and Cambridge and the component medical divisions of the University of London, in all of which medical research of a high type is carried on; but at the moment a large measure of support and initiative is provided by the Medical Research Council, a

government organization established in 1920 which receives £195,000 a year from the Treasury. This fund the Council expends on direct research projects, fellowships, grants in aid, and institutional support. Under the progressive leadership first of Sir Walter Fletcher and later of Sir Edward Mellanby the Council not only has avoided the dangers of political influence but has maintained a standard of quality and imagination in its work which today gives Great Britain a leading place in medical research.

With the need and the promise of research in medicine as real as they are in our generation, the question of private versus public support would seem to be of secondary interest. At least the argument belongs in the field of public policy rather than in the field of medicine. Whatever the source of funds for research, medicine is bound to profit. Walter Reed and his colleagues blazed the trail in yellow fever with funds furnished by the War Department, while Theobald Smith initiated his epoch-making studies of protozoal diseases as an associate of the Department of Agriculture. On the other hand, the work of Whipple and Minot in anemia, of Avery in pneumonia, of Banting in the discovery of insulin — to mention only a few out of many — has been done with the support of private funds.

Moreover, a spirit of cooperation and reciproc-

ity has been exhibited by both sides. The large private foundations have not hesitated to aid government institutions, state and federal, in the support of significant research undertakings. On the other side, through WPA grants and through the allocation of the research funds of the National Cancer Institute, the Federal Government has shown the same liberal attitude, making no distinction between privately endowed and tax-supported institutions.

That both public and private research have their own peculiar weaknesses is admitted. Generally speaking, the salaries in tax-supported institutions are too low, and the best talent is apt to be attracted to the private institutions or to industry. Moreover, there is at least the possibility that public opinion, impatient for quick results, may insist that tax money be directed to immediate utilitarian ends. In cancer research, for example, there might conceivably be pressure to look for a "cure"; whereas in the opinion of many scientists the attack on this problem must be through slow studies on the fundamental biology of growth. Again, government-supported research usually follows the tradition of government budgeting: i.e., the purpose of the appropriation is first determined, then the amount to be spent is fixed, and finally the personnel is selected. Privately supported research can, and

frequently does, reverse this process by first finding the able men, and then building the research project, whatever it may be, around their special talents. First-class brains are not made to order nor can they always be found for particularized tasks.

On the other side of the picture, it is a question how much longer, under present economic conditions, private research institutions can continue to secure adequate support from private sources. Private organizations cannot dream of matching the sums for research to which government has access. Within the year, by a single appropriation, Congress made available for research in cancer a sum of money for annual expenditure that is comparable in amount to all the grants from private sources in the United States put together. The actual decrease of research funds in private institutions presents a problem of crucial importance which is involved with larger questions relating to the whole future of universities, institutes, and laboratories dependent on private sources for support. As far as medical research is concerned — limiting the discussion to this one field — it would be a tragic outcome if through lack of adequate funds the initiative and intellectual leadership which these private institutions have given to medicine were gradually crippled or curtailed. Without in any way minimizing the

value and significance of publicly supported research, it is undoubtedly a fair statement that in private institutions originality, spontaneity of thought, variation, independence, conviction, and tenacity have had a peculiarly rich soil in which to flourish.

Both types of institution, public and private, have a contribution to make. Both movements are of the greatest scientific and social importance. Each supplements the other. Neither could occupy the whole field. To think of them as competing interests is to misunderstand their qualities. There is too much work to be done and this golden age of medical research in which we are now living promises too bright a future to justify any present charges of encroachment from either side.

APPROPRIATIONS FOR THE YEAR IN THE MEDICAL SCIENCES

During 1938 the Foundation appropriated in the medical sciences a total of approximately \$3,800,000. This does not include the appropriation to the China Medical Board described on page 6, which was made under a previous authorization.

Since 1932 the major activity of the Foundation in the medical sciences has been in psychiatry, neurology, and related subjects. In the medical

sciences as in other divisions, however, the Foundation has not considered it wise to confine its program rigidly to the subjects adopted for special emphasis. Indeed, during 1938, in addition to the appropriations for psychiatry, approximately twice as much was given for development and research in other fields. Of the total of \$3,800,000 appropriated during the year, roughly \$1,200,000 was devoted to the general field of mental hygiene; \$2,600,000 went for other types of support. This ratio does not mean that the Foundation's primary and long-time emphasis has been altered. It means rather that the Foundation does not hesitate to step outside its own self-imposed limitations if more significant opportunities appear.

The principal grants in 1938, other than in the field of psychiatry and neurology, were in connection with the general development of certain departments in the medical schools of five universities: Washington University in St. Louis, the Johns Hopkins University, the American University of Beirut, the University of Oregon, and Stanford University. For this purpose a total of \$1,725,000 was appropriated. Yale University was given \$700,000 for the use of its Institute of Human Relations. The Foundation's grant was designed to stabilize the finances of the Institute and to enable it to work out a program at a per-

manent level of support. An appropriation of \$66,000 was made to the Research Council of the Department of Hospitals of New York City toward the cost of research in chronic diseases over a period of three years. This project is based upon the cooperation of Columbia University with the City Department of Hospitals. A research staff from the University, already organized, will work in the 1,500-bed hospital which is being erected on Welfare Island for the care of patients with chronic diseases.

The principal appropriations in 1938 in the field of psychiatry and neurology were as follows: (1) \$150,000 was given for the support, over three years, of the Department of Neuropsychiatry in Washington University, St. Louis. An essential feature of the plan is the cooperation of neuro-anatomy and experimental psychology with clinical psychiatry. (2) The London County Council was given \$127,500 for support, over a period of five years, of the psychiatric research carried on by Maudsley Hospital, London. This Hospital offers advanced training to the personnel of the entire hospital system of the Council (35,000 beds). It teaches psychiatry to medical students and is the principal English center for refresher courses in psychiatry for panel practitioners. (3) An appropriation of \$100,000 was made to Columbia University in support of teaching and re-

search in neurology over a period of five years. The recent merger of the Neurological Institute with the Presbyterian Hospital, affiliated with Columbia University, provides an opportunity at the Medical Center for close cooperation between teaching and research in neurology on the one hand and the work of the various departments of the Medical School on the other. (4) McGill University in Montreal was given \$51,000 for expenditure over four years in support of studies of epilepsy and dementia to be carried on in the Neurological Institute of the University.

TASKS AHEAD FOR MEDICINE

The reason that The Rockefeller Foundation, in the medical sciences, is concentrating its efforts on mental hygiene is because it believes that at the moment that field represents one of the most underdeveloped areas in all medicine. In no other field is the need more desperate or the potentialities for useful advances more promising. It is not necessary to recall the fact that cases of mental and nervous diseases occupy more hospital beds in this country than all other diseases combined. One has only to look about him at the tragic examples of human maladjustment and inadequacy in everyday life. Because the field is relatively so difficult, it has lagged far behind other developments in medicine. It has been invaded

all too often by the incompetent practitioner or the charlatan. One wonders if even its terminology is much more accurate or significant than the terminology of general medicine in the period when doctors discoursed learnedly of the body's "humours."

But with all the need that exists in this field it would be foolish to shut one's eyes to the fact not only that other fields are also backward but that science is on the threshold of great events in medicine; adequate support in a dozen different areas might well bring results of incalculable benefit to human health and welfare. Cancer is of course one of these areas that immediately comes to mind. Obstetrics is another because the maternal mortality rate in the United States remains a national disgrace. No single organization, whether it be a foundation or even a government, can begin to meet all the needs and opportunities that present themselves on every side. On the other hand, no organization working in the field of medical research can fail to be aware of the inviting paths along which, with trained personnel and adequate financing, substantial progress could be made.

A complete or comprehensive list of these promising paths would of course lie beyond both the limitations of this REVIEW and the competence of the writer; but it is possible to mention

a few of them which in recent years have been brought persuasively to the attention of The Rockefeller Foundation. The funds of the Foundation could not possibly be spread to cover them, but in our opinion they represent unique opportunities in teaching and research where large sums could effectively be spent.

1. *Chemotherapy.* The recent amazing development and application of sulfanilamide, and the earlier successes of salvarsan in syphilis and of tryparsamide in African sleeping sickness, suggest the possibility of a broad frontal attack, through organic chemistry, upon some of the hidden secrets of chemical substances. The possibility, indeed the probability, that further chemical compounds, synthesized in the laboratory, will have specific action on the infective organisms causing particular diseases in man and animals, opens a door to a future of immense significance. Work of this type is well under way in Germany, and in Great Britain an annual grant from the government of £30,000 was recently made to the Medical Research Council to develop research in chemotherapy on a comprehensive scale. In the United States research in this field could be greatly stimulated, and funds of considerable magnitude over a period of years could profitably be employed.

2. *Dermatology.* No organ of the body is more

vital than the skin, which protects other organs from external injuries and particularly from the effects of temperature variations. In view of this fact it is a matter of concern that dermatology has lagged so far behind many other branches of clinical medicine. While this may be due in part to difficulties inherent in the subject, it is obvious that in America at least the lack of adequate facilities for study in the way of well-organized clinics and laboratories has been an important factor. Though active research on skin diseases is going on in several medical centers in this country, we have no departments or institutes of dermatology which would compare favorably with the best in Europe. The recent weakening of the great German and Austrian centers of dermatological teaching and research through the displacement of eminent men in this field makes it all the more important that American efforts be strengthened.

3. *Pharmacology.* Though no subject in medicine would seem more important than pharmacology, which deals with the action of drugs and their use in disease, this field of medicine is hampered by lack of adequate financial support. In twenty-five recognized American medical schools there are no separate departments of pharmacology, the subject being combined for economic reasons with physiology or biochemistry. In many other

schools where there is a separate division, the subject receives but meager support. This situation is doubtless responsible for the failure of pharmacology to attract recruits and for the shortage of outstanding younger men to fill professional chairs which are becoming vacant. Larger support is needed not only to promote fruitful research in this important field but also to improve the teaching on the applied side — the administration of drugs — which is notably weak in most American medical schools.

4. *Legal or Forensic Medicine.* This subject, which may be defined as the application of expert medical knowledge to the administration of justice, is in most places in the United States paralyzed in its development by the existence of the coroner system. It is a curious fact that in spite of the insistent teachings of popular murder mystery stories to the effect that intelligence and technical skill are requisite for the unraveling of crime, the American public proceeds on the assumption that almost anybody can be named coroner and thereby have the responsibility of determining the cause of death of any victim of violence, or of any unexplained death. The medical profession shares with the legal profession serious responsibility for the backwardness of this field, and the status of legal medicine in the United States makes a shabby comparison with that in Switzerland, Denmark, Scotland, or Germany. A foundation

devoting its attention to the development of this subject would find that a beginning had already been made at one or two American universities, but it would need to be prepared to foster and develop teaching and training in this field over perhaps fifteen or twenty years.

5. *Industrial Medicine.* There are no medical schools in the United States with departments of industrial hygiene which are fully adequate for the instruction of physicians going into this field, or competent to provide expert advice and direction to industries confronted with the health problems of their personnel—problems which often derive from the nature of the industry itself. With the support of sufficient funds, such departments could easily and effectively be developed, and the result would be a clear-cut and much-needed accomplishment. It is noteworthy that in the comprehensive plans for the protection of the health of its people, the Russian Government is giving special attention to industrial medicine. Effective institutes for the study and prevention of industrial diseases have been established at Moscow and Leningrad, and a great museum designed to show health hazards in mines and factories has been organized at Kharkov. Similarly the Kaiser Wilhelm-Institut für Arbeitsphysiologie at Dortmund, Germany, is without parallel in the United States.

6. *Dentistry.* Although America leads the world

in dentistry, it is a leadership based more upon ingenuity of a mechanical sort than upon the amount or character of research done on the anatomy, pathology, or physiology of the oral cavity. Almost no dentists are trained in such a way that they can do research of a quality comparable to the research in medical schools on medical and surgical problems. Until our dental schools are brought more closely into line with our medical schools, much of the mechanical brilliance of American dentists will remain that and nothing more, and the essential curative and preventive measures will go unstudied.

Owing largely to the support and stimulus of the Carnegie Corporation an auspicious beginning in this field has been made. But the field is vast, and large sums are necessary adequately to cover it.

7. *Public Health.* If it is assumed that the support of departments of preventive medicine and public health in American medical schools is in any sense proportionate to their opportunities for social service, this assumption should be immediately corrected. Relatively few of the seventy-seven recognized medical schools in the United States which are producing the doctors for the future have adequate instruction in preventive medicine and public health. Large sums could effectively be employed over the next ten or fifteen years to

advance the status of preventive medicine by the simple process of giving students in medical schools adequate training in the subject.

8. *The Diseases of Advancing Years*. Here is a field of research, at present inadequately supported, but one that is sure to be of increasing importance as the population gains in the number and proportion of older people. The circulatory failures, high blood pressure, chronic kidney disease, rheumatism, and the faults of nutrition in elderly people are only a few examples of subjects in a wide and at present largely neglected area. Concentration on this group of diseases, backed by sufficient funds, would undoubtedly prove highly productive.

MOLECULAR BIOLOGY

Many of the brilliant advances of science can be described in terms of the progressive discovery of smaller and yet smaller units of nature. From the atoms of Democritus to the atoms of the nuclear physicist is a far cry, not only in time but in the very character of the contrasting concepts, and a guiding principle in the long sequence of experiments which has brought us from the one to the other has been the natural philosopher's persistent desire to find the ultimate littleness of things.

In this search progress has been made at an uneven rate. During the nineteenth century, when

biology was proclaiming the cell as the unit not only of the structure but of the physiological activity of the living organism, the physical sciences had already advanced to a point where they were dealing with the molecule and the atom. In the twentieth century, the physical sciences have probed inside the atom, have blasted it apart, and have identified several of its constituent elements. In that progress toward greater refinement of detail, the biological sciences have also shared. Using many of the delicate and exact instruments which the physicist devised in his attack on inorganic material, they are beginning the description and analysis of biological phenomena, not in terms of cells as units, but in terms of genes and other critically important subdivisions of cells; and recently even in terms of molecular structure and forces. This marks, for the biological sciences, an advance which may prove to be as revolutionary and significant as the discovery of the living cell in the nineteenth century. A new biology—molecular biology—has begun as a small but significant salient in the whole field of biological research.

Biology has always had to wait on the development and application of the physical sciences before it could go very far along the road. Without physical optics there would have been no microscope, and until the perfection of the microscope

the biologist was in the main limited to what his unaided senses told him. It was by means of the compound microscope that the development of the cell theory was made possible in the nineteenth century. Similarly it is by means of the new tools and techniques developed in many instances by the physical sciences that the door to a biology of molecules has only recently been opened. The fundamental interrelation of all knowledge was never more dramatically illustrated. The fallacy of the argument for a moratorium on research in physics and chemistry was never so adequately exposed. Biology and medicine can go just so far, and then they must wait for new ideas, fresh techniques, and more powerful instruments. These techniques or instruments may well be developed in a chemical or physical laboratory, in an astronomical observatory, or in the brain of a mathematician. Neither the physicist nor the astronomer nor the mathematician is necessarily thinking of biology, nor is he necessarily interested in it. But success in pushing out the boundaries of knowledge in any one discipline is bound to have its repercussions in all.

The new tools which biology is using today are many and varied. No longer is the microscope limited by the wave length of ordinary light. The ultramicroscope and the ultraviolet microscope have brought new magnification. Within the last

year, the electron microscope, which uses electrons instead of light rays, has produced magnifications far in excess of any optical system, and may have important uses in biological research. With the aid of the ultracentrifuge, an instrument capable of over a thousand revolutions per second, biologists are learning about minute particles dispersed in the blood and other body fluids, particles which they have not been able to separate out by any other means. The spectroscope, long employed to identify the elements in the distant stars, is revealing the presence of minute amounts of biologically important chemicals and is helping to explain the chemical composition of organic compounds. The x-ray, which has discovered so much concerning the atomic structure of solids, is now being used for delicate measurements in the field of living material.

Using as tracers two types of "tagged atoms," scientists are learning new facts about metabolism. Readily identifiable, these tagged atoms can be traced in their course through the living organism. Such techniques as electron diffraction, electrophoresis, double stream refraction, and methods using optical means are also bringing new precision to biological research. Similarly important contributions are being made by colloidal chemistry, surface chemistry, and modern structural organic chemistry.

It is with the aid of such new devices that biology is off on fresh trails. It should not be expected, of course, that continual fragmentation will of itself necessarily reveal the true inner meaning of life processes. A living organism may well be something more than the sum of its parts. Mistakes, moreover, will undoubtedly be made; hypotheses will be built up and then discarded; even facts will turn out to be facts only of the time, place, and circumstance of their appearance. But the pursuit of knowledge will continue — a long climb toward a clearer understanding of the nature of life itself.

During 1938 the Foundation made a number of grants for the development of projects in this new field of "molecular biology." Two were made to Washington University, St. Louis. One of \$50,000 was for support, over a period of five years, of research in general physiology and experimental embryology. The research program will employ a variety of these newer experimental techniques in the detailed study of nerve and muscle action, and in developmental mechanics. The other, of \$17,000, was for support, over a three-year period, of research in biochemistry, with particular reference to the metabolism of carbohydrates and the chemical reactions in living muscle. To the University of Leeds, England, the Foundation appropriated \$51,000 toward the expenses, over a period

of five years, of research on the x-ray analysis of biological tissue. New York University was given \$25,000 in support of research, over a period of five years, using the technique of micromanipulation on cellular physiology.

A number of other grants were made for work which included important elements relating to this general topic. Three will illustrate one type of such grants. To the University of California, the Foundation appropriated \$30,000 toward expenses in connection with the installation of a cyclotron. Two grants were made in support of research employing the two different varieties of "tagged atoms": Columbia University was given \$71,500, over a period of five years, toward the cost of research with the aid of chemical isotopes; and a grant of \$35,000 was made to the University of Rochester toward the cost, over a period of three years, of research with radioactive isotopes. In addition, reference should be made to the various appropriations in support of bio-organic chemical research, described in the following section.

OTHER APPROPRIATIONS IN EXPERIMENTAL BIOLOGY

The Foundation's largest commitment during 1938 in the field of the natural sciences was a conditional appropriation of \$1,500,000 to the University of Chicago toward the establishment of a

\$2,000,000 endowment fund for research in the biological sciences. To provide for the support of biological research during the three years in which the University is raising its share of the permanent fund, the Foundation made an additional grant of \$180,000. The Division of Biological Sciences of the University of Chicago occupies a prominent position in American science. Its field is a wide one, the departments of biochemistry, physiology, anatomy, pharmacology, bacteriology, and psychology, as well as zoology and botany, cooperating to develop a balanced and integrated research program.

Harvard University was given \$100,000 for expenditure over seven years toward the cost of research in the Department of Physical Chemistry in its Medical School. This study will provide quantitative data on the chemical and electrical behavior of proteins and lipoids. A grant of \$75,000 was made to the University of Illinois in support, over five years, of studies in nutrition, with particular reference to the function of the amino acids. The University of Stockholm was given \$37,400 for its institute of experimental biology, part for the completion of the new building, and the balance for additional personnel and the expenses of conferences. A grant of \$40,000 was made to the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Maine, toward the

cost of a building to house the Laboratory's unique stocks of specialized and standardized mice, which are supplied to research workers throughout the country.

The Foundation has a particular interest in the development of the organic chemistry of natural substances. During 1938 four appropriations were made in this general field, two to institutions in the United States and two abroad. Cornell University received \$31,400 for research over a period of three years on the biochemistry of proteins, peptides, amino acids, hormones, and related compounds. The grant is designed to provide additional workers and equipment. Harvard University was given \$22,500 to support research over three years in its Department of Chemistry on the heats of organic reactions. This study seeks particularly to obtain information on molecular structure and upon the rearrangements which take place when various molecules react chemically.

To the Laboratory of Organic Chemistry in the Eidgenössische Technische Hochschule, Zurich, the Foundation gave \$58,800 toward support, over a five-year period, of research on the constitution and synthesis of physiologically active compounds. This study is concerned with the analysis and synthesis of the sex hormones, sterols, and polyterpenes. The Imperial College of Science and

Technology of the University of London received \$61,200 for research over a seven-year period in its Department of Organic Chemistry on vitamins, sterols, and related compounds. Here the Foundation's grant will help to provide spectroscopic equipment and additional personnel.

"THE RETREAT FROM REASON"

To speak of research in the field of international relations in such an anxious and disillusioned hour as this may seem almost like a jest. Everywhere reason is on the defensive and we live in danger that mass hysteria will completely overwhelm it at a time when it is most needed as a safeguard. If there have always been wars and rumors of wars, never before has there existed the possibility of such material havoc and cultural disintegration. It may be, as a recent writer has said, that this arid period in which we are living is the watershed between two forms of civilization, and that the future beckons to a Promised Land more pleasing than we dream. This optimism is creditable, but for the moment at least the world is facing a cultural crisis in which reason is everywhere in retreat.

Never has there been a greater need of intelligent understanding of the social forces that are moulding the future. Such an understanding must be based on realities, and not on intuition or

wishful thinking. If the problems arising out of human relations are to be solved at all, it will be through the same scientific approach to facts, made in the same dispassionate spirit of inquiry, which has given man command over his physical environment. That this course presents infinite difficulties no one will deny, but along this road lies the only ultimate hope.

Acting upon this faith, which to some may seem to burn with a feeble flame, many devoted organizations throughout the world are working directly on the problem of international relations, and The Rockefeller Foundation has been glad to continue its support in this field. Its grants have been limited to objective research, for the most part in connection with institutions to which it has contributed for a number of years. It has proceeded upon the theory that even in a time of misunderstanding and hate, facts can be used as powerful leverages. Facts of course have their limitations in any attempt quickly to mould the course of human events. Thomas Huxley once remarked that there is nothing more tragic than the murder of a big theory by a little fact, but he hastened to add that nothing is more surprising than the way in which a theory will continue to live long after its brains have been knocked out. So in the area of international affairs outworn theories and old patterns survive in the face of their demonstrated inadequacy. However, unless

those of us who think of the human spirit in terms of freedom are to adopt a defeatist position, there must be faith to believe that the cumulative effect of an intelligent and informed democratic participation in foreign affairs may change the dark picture of the future.

The principal grants made by the Foundation in this field in 1938 are as follows:

International Information Committee, Stockholm: Research program (to cover three years)	\$ 25,000
Institute of Pacific Relations: Research in Far Eastern issues	90,000
Council on Foreign Relations: Study groups and research program (to cover five years)	75,000
Council on Foreign Relations: American Coordinating Committee, in connection with the International Studies Con- ference (to cover two years)	24,000
Geneva (Switzerland) Graduate Institute of International Studies (to cover five years)	315,000
Centre d'Études de Politique Étrangère, Paris (to cover four years)	102,000
Institute of Economics and History, Copenhagen (to cover three years)	18,000
Foreign Policy Association: Research Department (to cover three years)	75,000
Institute of Pacific Relations: Ameri- can Council (to cover two years)	30,000
Institute of Pacific Relations: Pacific Council (to cover two years)	80,000
	<hr/>
	\$834,000

OTHER WORK IN THE SOCIAL
SCIENCES

At the same time that it has aided research in international relations, the Foundation has given support to the study of equally pressing social and economic problems. It must be sadly admitted that in this whole area of activity no body of generalized knowledge and no accepted scientific principles are available such as have been developed in mathematics or physics or chemistry. The physical sciences have centuries of experimentation behind them; the social sciences are just emerging from *a priori* and deductive methods. Even today a good deal that masquerades under the name of social science is metaphysics, as obsolete in its approach as was Francesco Sizzi's logic against Galileo's discovery of the satellites of Jupiter. "The satellites are invisible to the naked eye," he said, "and therefore can have no influence on the earth, and therefore would be useless, and therefore do not exist." This same logical method, long outmoded in the physical sciences, is traceable in some weighty books on economics and political science written as late as 1938.

It is a mistake of course to believe that the social sciences can be forced into exactly the same pattern as the natural sciences. The two sets of disciplines parallel each other for part of the dis-

tance but not for the whole distance. The extent to which they do parallel each other is important; the improvements in method to be made in the social sciences are quite as far reaching as those which, over the last century, have been made in the natural sciences. But for the rest of the way social science has to do with conceptual schemes and considerations of value with which the physicist or the chemist is not concerned. These considerations influence the manner in which the individual systematizes and weighs his facts, once they have been established, with the result that the obstacles to productive research in the social sciences are infinitely more real and difficult than any which the physical scientist has to encounter.

However, with all the complexity and backwardness of the field a very definite and promising beginning has been made. Indeed the progress that has been achieved, particularly since the opening of the century, is impressive. Two distinct lines of activity seem to be possible, both extremely difficult and each perhaps as important as the other. One has to do with the development of the social sciences as instruments for the attainment and diffusion of knowledge. This involves the improvement of techniques, tools, and skills and of methods and ways of working, as well as the training of adequate personnel. This line of activity is the fundamental spade work, the build-

ing of the foundations for what is really a new science.

The second line of activity is the utilization of these improved techniques in an attempt to throw light on current and continuing problems of public importance. That these attempts will be immediately successful or that they promise at once to lead modern society out of the wilderness, no informed person will claim. Nevertheless, in a modest way they represent genuine contributions to human welfare and knowledge. A recent statement by the Social Science Research Council, commenting on a number of studies undertaken within the last few years, illustrates this point as follows:

The study of government statistics resulted, at a sharply reduced cost, in better statistics, of greater utility to the government and to the public as well as to students, and at a saving of expense and annoyance in reporting by business. The study of population redistribution provided knowledge that caused immediate revision of the programs of the Federal Housing Authority, the Farm Settlement Administration, and the Tennessee Valley Authority, and has continuing repercussions. The Social Trends study has unquestionably had and has a wide influence on thought in this country. The study of government personnel has become almost a bible to those throughout the United States interested in improvement of the public service. The study of the operations of the Agricultural Adjustment Administration provided a means of continuously informing responsible officials of the evolving effects of policies and actions. . . . The social security studies are producing

important improvements in administration and substantial savings in expense at the one end, and at the other, information of value to the formation of policies, such as the recent figures showing the number of persons covered by the old-age pension law. . . . The testimony of officials, after all allowances, remains impressive as to the value of these enterprises.

The Foundation has been interested in both lines of activity discussed in the foregoing paragraphs, although the two are often interlinked and exact classification is not always easy or even accurate. Using these two objectives, however, as rough categories, in 1938, under the heading of general development, the Foundation appropriated \$150,000, over three years, to the Social Science Research Council for maintenance of its regular work of research planning and conferences, and gave \$75,000, over four years, to the same organization for grants in aid in the stimulation of research. The amount of \$225,000 was appropriated for fellowships and research aid grants in an attempt to develop the essential groundwork upon which adequate social studies can be built.

Under the second general classification noted above the appropriations made by the Foundation in 1938 are illustrated by the following examples:

1. A grant of \$50,000 was made to the Geneva Research Center in Switzerland, for the organization and direction

of an international study of the control devices and restrictions under which trade between the nations of the world is now operating. Twenty-five agencies of economic research scattered throughout the world are collaborating in this study, with responsibility for synthesis resting with the Geneva Research Center.

2. An attempt has been made to interest capable students of social science in public service careers. This may be illustrated by citing a grant of \$105,000 to the National Institute of Public Affairs in Washington, an organization that annually selects some fifty promising graduates of American colleges and universities and arranges to have them spend an "internship" year of practical experience working within a division of the Federal Government.

3. Funds have been furnished to provide training facilities, especially in social science, to those who already are in public employment. A grant of \$36,000 was made to the University of Southern California for improving the teaching materials of a program which offers inservice training to those already in the employment of the State, the cities, and the counties in Southern California. The sum of \$20,000 was given to Harvard University to allow it to continue a practice, inaugurated under a former grant, of bringing in as consultants to research seminars, organized around topics of major public concern, public officials who have practical knowledge and first-hand experience.

4. A grant of \$20,000 was given to the Social Security Committee of the Social Science Research Council for studying the administrative aspects of state unemployment compensation. Larger sums for the general expenses of this Committee's secretariat had been furnished in earlier grants from the Foundation.

In rough figures, \$3,800,000 was spent by the Foundation in 1938 in support of the social

sciences, of which \$2,000,000 was given to the Spelman Fund, as has already been mentioned; a little over \$800,000 to work in international relations; and the balance, nearly a million dollars, in the two lines of activity noted above.

CULTURAL INTERCHANGE: THE FAR EAST AND LATIN AMERICA

In general, the Foundation, operating internationally, is not concerned with geographic considerations. Projects are selected for support not because of location in any particular country, but because, regardless of location, they give promise of advancing knowledge in a given field. Two large geographical areas of Foundation interest, however, i.e., the Far East and Latin America, present, to some extent at least, an exception to this rule. The Far East is one of the oldest interests of the Foundation. To work in the Far East, principally in China, the Foundation to date has appropriated about \$49,000,000. The greater part of this sum has been in connection with the Peiping Union Medical College, with the development of premedical education, and more recently with the Foundation's program for rural reconstruction in China, a program which, though harassed by war, is still continuing.

Toward work in Latin America over the last twenty years the Foundation has appropriated

approximately \$9,500,000. Most of this money has been spent in the field of public health, the study and control of yellow fever absorbing a large proportion of it. Although this work in the Far East and in Latin America has brought, we believe, important by-products in better international understanding, the Foundation in recent years has felt that there was an opportunity, perhaps, to make a more direct contribution to this end by an attempt to stimulate what may be called cultural relations with these two vast areas.

That very remarkable Chinese philosopher, Hu Shih, who is now serving as the Ambassador of his country to Washington, said recently: "I am here to testify that the influence of cultural relations between nations is far more effective and far more lasting than gunboats." With this comment there are few who would disagree. Friendly relations between nations must be based on an intelligent understanding of the contribution which each is in a position to make to the other. Too often cultural values have been conceived as something that one nation offers to another, and the other, if it is enlightened, thankfully accepts. But this one-sided arrangement, if it works at all, is apt to produce unhappy results. Moreover, it sacrifices at the start half the advantages that could accrue. One of the errors in missionary en-

deavor has always been its ignorance of the value of cross-fertilization.

During the present chaotic conditions in China the Foundation has increased rather than diminished its contributions to enterprises whose purpose is the promotion of cultural interchange with the Far East. Because of the disturbed situation all the appropriations made in 1938 had to go to American institutions. In other words, for the moment at least, out of necessity the emphasis is on the promotion of understanding by Americans of the cultural values of the East. Grants of \$25,000 each were made to Columbia University and to the University of Chicago for the purchase of books and other teaching materials in Far Eastern subjects. Grants of \$15,000 each were made to the University of Pennsylvania, to Princeton University, and to Cornell University to enable these institutions to secure staff members competent in various aspects of Far Eastern studies.

Similarly \$7,500 was given to the American Council of Learned Societies toward the expenses of its summer seminars in Far Eastern subjects over the three years beginning in 1939. The American Council of Learned Societies and the Institute of Pacific Relations have cooperated with several universities in summer seminars or institutes aimed to provide study of Far Eastern

subjects not generally available in university curricula. As a result of these sessions, teachers from many institutions have been able to enrich their offerings in this field.

The recent Lima Conference has drawn nationwide attention to the importance of Latin-American relations. There are, of course, wide variations not only between the Latin-American countries themselves, but even more between Latin-American countries and the United States. Historically and culturally South America has closer ties with Europe than with us. There is a very genuine basis, however, for the ideals which underlie the Pan-American movement. Not only do North, Central, and South America occupy one hemisphere, but all of the peoples in that hemisphere have recently faced, or are still facing, pioneer conditions. All of them are inheritors and trustees of fresh lands and vast natural resources. Compared with the older European civilizations, the nations of the Western Hemisphere are perhaps freer from tradition and readier for new experiments in cultural and social living. In any event, the opportunity for cultural interchange between the nations of North and South America is obvious, and the possibilities that may come of this development in terms not only of sympathetic understanding but of a new and more vital cultural life seem to be real and tangible.

The Foundation's particular interest in cultural interchange with Latin America began tentatively in 1935. During 1938 four modest grants were made in this general field, three of them to institutions in the United States and one to an organization in Europe. Here again, as in the Far East, it is just as important that other nations should understand South America as it is that South America should understand other nations. The sum of \$16,000 was given to the University of New Mexico for the development of its library resources in connection with studies of the history and culture of the Southwestern United States and Latin America. An appropriation of \$15,000 was made to the American Council of Learned Societies, over a period of five years, toward the expenses of its *Handbook of Latin American Studies*. The aim of this handbook, which has been published annually since 1936, is to give immediate access to such scholarly work relating to Latin America as is produced in all the countries of the world.

A grant of \$10,000 was made to Tulane University toward the expenses of cataloguing the collections of the museum of its Middle American Research Institute. Finally, \$12,000, over three years, was given for the support of studies in Latin-American literature by the Children's Literature Section of the International Bureau of

Education in Geneva, Switzerland. These studies will make available in three languages the best of the literature for children published in the Western Hemisphere.

MOTION PICTURES AND PUBLIC DEMAND

Modern invention has necessarily widened the field of the humanities. The old classical definitions have to be revised, or if they are still valid they have to be applied to contemporary conditions which are far removed from the days when the humanities meant only *litterae humaniores*. New techniques like those used by the film and the radio are altering our patterns of thinking and our standards of aesthetic appreciation. A foundation with a declared interest in the humanities must necessarily give some consideration to the dramatic shifts that are occurring in the cultural life of the world as a result of radio and motion pictures.

Some of the questions to be faced in regard to motion pictures were recently summed up in a lecture on the film and society by a former British fellow of the Foundation, Mr. Thomas Baird:

The cinema follows public demand. In doing so, it follows public opinion and it seems almost too much to expect of the present organization of the cinema and of society that the cinema should lead public opinion. We occasionally read attacks on the system which censors

films, on those decrees which insist what should be left out of films. There is an even deeper-seated censorship exerted by mass opinion which insists what must be *in* films — that inarticulate psychological demand of the people to have their desires made into the ready-made experiences of the cinema. . . . It seems a fair judgment to say that the whole film industry has been built up to meet the demand of a public whose appetite has been increased by what it fed on.

The cinema must first be conceived as an industry selling entertainment on an unprecedented scale. Any industry, if it is to survive, must give the public what it needs or wants or thinks it wants. . . . The cinema follows rather than leads public opinion, and this following technique is not altogether of its own choosing. The cinema comes in the wake of ideas and decorates what has already been built in the public mind. . . .

Had the cinema no obligation to balance its books, and had the best minds of our time had access to its machinery, there is no saying what revolution it could achieve in the minds of men. But the shackles are always there — the public, the box office, the high cost of production. It is easy to say that the public must be educated to want better films, but that, I suggest, is a reform which would cut more deeply into the life of the nation, into the homes and kitchens and into the factories and the warehouses than it would into the making of films. The other alternative is to find some way of breaking the vicious circle of public demand and high cost of production.

If Mr. Baird's views are valid, what can any outside organization properly and wisely do to help make motion pictures the cultural force they might be in society?

An obvious answer is to finance the production

of better films. But as Mr. Baird points out, film production is a costly business that lives on the returns of giving the public what it wants. In fact, the costs of production are such that the entire income of a foundation could be swallowed up by a relatively small production program; for there is as yet no assurance that what are thought to be better films would find a public demand that would bring returns. Obviously, therefore, it would be impossible for a foundation to embark on any significant production program.

A possible approach is to help in making more articulate what public demand for films is—i.e., public opinion as to what should be *in* films. Does what the public thinks it wants in films take fully into account what films might offer? What resources are there as yet untapped which would discover wants that the film as yet has left unsatisfied? In short, do wants exist which the film can satisfy, and in satisfying carry to the public a more valid picture of the world today and what is known of it?

In 1938 the Foundation made a number of inquiries to see if light could be thrown on such questions as these. The recent success of several films which have dealt with science suggested a beginning in that field of knowledge. The Foundation therefore sought the advice of a group of scientists on how the findings and methods of

science could be interpreted. The hope is that efforts of this kind may aid film makers, and others as well, in exploring public demand for a valid and useful exposition of the part that science is playing.

As an experiment, too, the Foundation gave assistance to the newly established American Film Center, an organization which is advising on the production of films portraying aspects of life which the film as yet has barely touched — such as present-day activities in public health, agriculture, education, and public administration. A want for such films is supposed to exist on the part of an audience that does not seem as yet sufficiently large to justify production. The work of the Film Center will serve to test the validity of this supposition.

In this field, as in every other, the fundamental need is trained personnel. During 1938 there were active a total of nine Foundation fellowships for special training in the field of the motion picture. Two fellows were working on documentary film projects; five were studying the film in relation to instruction in drama; one was preparing himself to give college courses on the film; and one, after study in the London Film Centre, was investigating the possibilities of using motion pictures for the purpose of training in public administration.

OTHER APPROPRIATIONS IN THE HUMANITIES

In spite of the competition of the motion picture and the radio, there has been in recent years an amazing growth in amateur drama throughout the country. Because the Foundation believes that this development offers, in a democracy, a significant opportunity for a wide participation in cultural expression, it has had an active program in drama. Aid has been given to a limited number of outstanding university centers for the training of future leaders. To the University of North Carolina, the Foundation in 1938 gave \$33,000 in support, over a period of three years, of its work in drama, and pledged \$150,000 for the endowment of that work; to Western Reserve University, the Foundation gave \$35,000 to enable its Department of Drama and Theatre to remodel its existing building and erect a wing to house workshops and classrooms. Typical of the Foundation's interest in community drama was an appropriation of \$15,000 to the Carolina Art Association in Charleston. This grant will assist in the creation not only of a noncommercial players' group recruited locally, but of a technical staff to direct productions and train students and apprentices.

The National Theatre Conference is a cooperative organization of directors of community and university theatres. To this organization the

Foundation appropriated \$15,000 for general expenses and for the creation of a revolving fund to assist the amateur stage in securing plays for noncommercial use at reasonable royalties. To the Authors' League of America, the Foundation gave \$25,000 to establish a fellowship fund from which small grants might be made to young playwrights of demonstrated ability.

A new and inexpensive way of reproducing printed material is by microphotography. To encourage this development, the Foundation made two grants in 1938 — one of \$6,000 to Harvard University for the production of microfilm copies of foreign newspaper files; and the other of \$35,000 to the Library of Congress for equipping and operating a laboratory of microphotography.

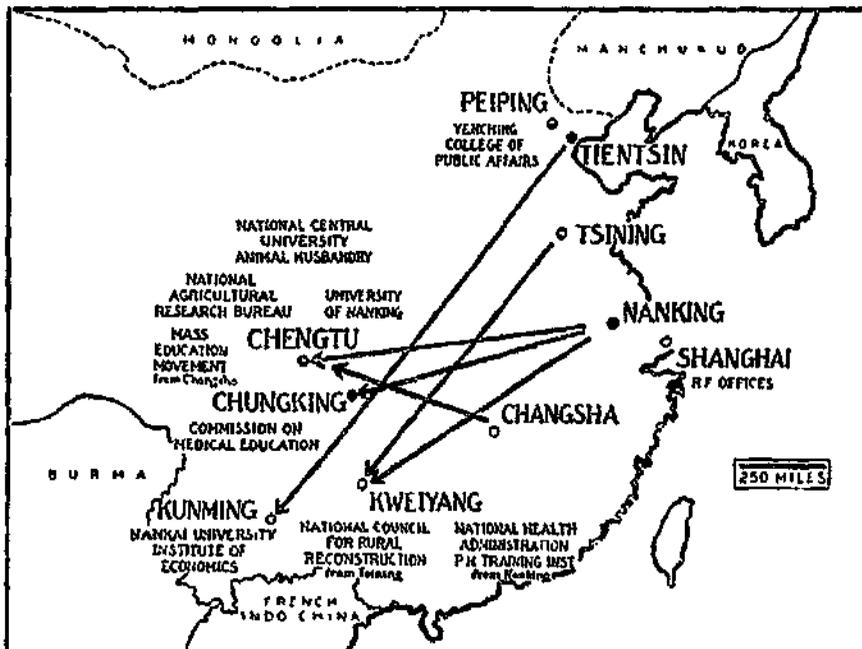
Two grants related to work on source materials. The American Museum of Natural History was given \$6,500 for extending its collection of materials on the arts of the American Indian; Princeton University was given \$50,000 to enable it to complete its monumental Index of Christian Art.

Three appropriations made during the year were in connection with older or more general interests of the Foundation. The American Council of Learned Societies was given \$90,000 in support over a three-year period of its activities as a national representative of scholarly work in the humanities. An appropriation of \$23,500 was

made to the American National Committee on Intellectual Cooperation for the use of its subcommittee on copyrights. The American School of Classical Studies in Athens received \$25,000 for fellowships in archaeology in connection with the excavation of the Athenian Agora.

THE PROGRAM IN CHINA

The tragedy that war brings to the intellectual life of a nation is vividly illustrated by what has happened in China. According to a recent survey, there were in China, a year and a half ago, 114 universities, colleges, and professional schools. Of the eighty-two that were located in cities and towns which have since been swept by war, only



six are operating as usual; forty-one have moved to new locations in the interior provinces, some of them merging to form new consolidated institutions; and of the remaining thirty-five, the survey makes the astonishing report: "Whereabouts unknown." Inasmuch as fifty-two of the eighty-two were either destroyed or damaged, it seems likely that some of these "lost" schools have ceased to exist. Apart from colleges and universities, many valuable public and private libraries have been destroyed, including the priceless Sinological Library at Nanking, which housed rare manuscripts of ancient Chinese literature as well as some of the earliest printed works.

In addition to its support of the Peiping Union Medical College, opened in 1921, the Foundation since 1934 has been contributing to a series of projects in China related to rural reconstruction and public health. Toward this work a total of \$1,200,000 over the last four years has been appropriated almost wholly to Chinese institutions. Although many of these institutions were included in the orgy of destruction, and although most of them have been forced to find new homes in other sections of China, the amazing fact remains that all the projects in this rural reconstruction work are still functioning.

The map on the opposite page shows the present location of these projects. Yenching Uni-

versity of Peiping, to whose College of Public Affairs the Foundation is contributing, is carrying on its work in Peiping. Other institutions have been forced to migrate. Retreating before the advancing Japanese troops, the migrations have been to the west and the south — to the Provinces of Hunan, Kwangsi, Kweichow, Yunnan, Szechwan. The National Council for Rural Reconstruction, formerly at Tsining, is now at Kweiyang. The Chinese National Association of the Mass Education Movement, at Changsha in 1936, is now working in Kwangsi, Kweichow, and Szechwan Provinces, with headquarters at Chengtu. Several projects have moved from Nanking. The National Agricultural Research Bureau of the Ministry of Industry and Agriculture is now at Chengtu. The Public Health Training Institute of the National Health Administration of China is now at Kweiyang. The Commission on Medical Education is now at Chungking.

The National Central University in Nanking, in whose work in animal husbandry and veterinary medicine the Foundation is interested, was repeatedly bombed; two laboratories were burned to the ground; one women's dormitory and two men's dormitories were destroyed; and the library and the auditorium were badly damaged. The portion of its work under Foundation support is now being carried on at Chengtu. The University

of Nanking, to whose Department of Agricultural Economics the Foundation is contributing, suffered only minor damage, but conditions were so disrupted that it was impossible to carry on there, and the University was transferred to Chengtu. Nankai University at Tientsin, to whose Institute of Economics the Foundation is making annual grants, was completely wiped out, every building being totally destroyed, with a money loss estimated at \$5,000,000. The University, however, has shown an amazing will to survive. It has now established itself at Kunming, where it is incorporated into the National Southwest Associated University.

In support of these projects in this program for rural reconstruction, the Foundation in 1938 appropriated a total of \$170,100. During the year \$60,000 was also given for fellowships and \$10,000 for research and developmental aid grants in China.

In addition to the appropriations for its China program, the Foundation gave \$85,000 to the Associated Boards for Christian Colleges in China for emergency aid to mission colleges. Of the nine colleges aided under this grant, only three — Yenching University at Peiping, West China Union University at Chengtu, and the University of Shanghai — remain at their original locations. The University of Shanghai, however, has lost

the use of its campus and is now in the International Settlement. Cheeloo University has moved from Tsinan to Chengtu; the University of Nanking and Ginling College from Nanking to Chengtu; Hua Chung College from Wuchang to Kweilin; Fukien Christian University from Foochow to Shaowu; and Lingnan University from Canton to Hongkong.

KEEPING THE LINES OPEN

“As good almost kill a Man as kill a good Book,” wrote Milton in the *Areopagitica*. “Who kills a Man kills a reasonable creature, God’s Image; but he who destroys a good Book, kills reason itself. . . . We should be wary therefore . . . how we spill that seasoned life of man preserved and stored up in Books; since we see a kind of homicide may be thus committed, sometimes a martyrdom, and if it extend to the whole impression, a kind of massacre, whereof the execution ends not in the slaying of an elemental life, but . . . slays an immortality rather than a life.”

This stirring faith in the dignity and freedom of scholarship, once thought to be the common possession of the Western world, needs reassertion in times like these. We are witnessing an amazing paradox. Whereas new and swift means of communication have shrunk time and space to dimensions that seem to make a world community

necessary and inevitable, an intensified nationalism is trying to set up barriers against the exchange not only of goods but even of knowledge and ideas. All around us the walls are closing in on an ever smaller world of the spirit. In some respects we are witnessing a return to the Middle Ages. One of the hopeful factors of that period was the itinerant scholar. Now, when the intellectual life of the world is being cramped by boundary lines, the itinerant scholar again assumes a peculiar importance. Until normal relations on an international basis can be fully resumed, he must bear, as he has in the past, part of the responsibility for keeping the lines open.

Since 1915, both directly and through representative national agencies in various countries, the Foundation has given fellowships to 6,266 individuals from seventy-four countries. During the year 1938 the Foundation supported 592 fellowships, at a cost of approximately \$754,000. Of the total number of these fellowships, 446 were administered directly by the Foundation. The fields represented by these fellowships were as follows: public health, 106; public health nursing, forty-seven; medical sciences, sixty-eight; natural sciences, eighty-one; social sciences, sixty-one; humanities, seventy-three; and the program in China, ten. The other fellowships supported during 1938 were awarded by other agencies. The

National Research Council was responsible for seventy-three, the American Council of Learned Societies for two, the Social Science Research Council for thirty-two, the Peiping Union Medical College for eighteen, the Medical Research Council of Great Britain for thirteen, and the American School of Classical Studies, Athens, for eight. The 592 fellows supported in 1938 were citizens of forty-seven countries; 385 of them pursued their work in countries other than their own.

APPLICATIONS DECLINED DURING 1938

This heading, *Applications Declined*, which has been used in the REVIEW for many years, may perhaps give an inaccurate impression of the procedure and method of the Foundation. The Foundation's activities are not limited or defined by the applications which it receives. A large amount of the time of Foundation officers is spent outside the office, gaining acquaintance with what is going on in research centers or in field demonstrations, not only in this country but frequently throughout the world. Consequently a substantial proportion of the grants which the Foundation makes are not based upon "applications" at all; they are developed in the field as a result of discussion between representatives of the Foundation and of a particular institution. In such cases, the re-

quests, when received are merely formal confirmations of proposals which have already been explored.

It is true, of course, that many applications are received during the year, by letter and otherwise — many more than can possibly be considered favorably. The Foundation is not a general philanthropic organization. In order to obtain results which are consistent, well planned, and lasting, it has selected certain fields of work for special attention. As a result, many proposals cannot be assisted, not because they are lacking in merit or excellence, but because they fall outside the areas of work in which the Foundation is attempting to be of service.

With this preliminary explanation, it may be said that during 1938 the Foundation was obliged to decline a total of 2,032 applications for aid. Some of these applications were within areas of established Foundation interest but were declined because other opportunities for similar assistance seemed more promising. A large proportion of the applications could not be considered because the type of assistance requested did not come within the scope of Foundation policy. The Foundation does not make gifts or loans to individuals, or finance patents or altruistic movements involving private profit, or contribute to the building or maintenance of churches, hospitals, or other local

institutions, or support campaigns to influence public opinion on any social or political questions, no matter how important or disinterested these questions may be.

The applications declined during 1938 may be classified under the following headings: fellowships, travel, and training grants, 593; research projects, 313; development of educational institutions and projects, 222; local institutions (including hospitals, churches, libraries, theatres, museums, and welfare organizations), 204; personal and medical aid, 146; European refugees, 112; cures, remedies, and the investigation of theories, 112; publications, ninety-seven; public health projects, forty; continued aid to projects previously supported, twenty-three; conferences and meetings, eight; miscellaneous, 162.

REPORT OF THE SECRETARY

SECRETARY'S REPORT

THE members and trustees of The Rockefeller Foundation during the year 1938 were:

John D. Rockefeller, Jr., *Chairman*
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Harold W. Dodds Thomas I. Parkinson
Lewis W. Douglas Alfred N. Richards
John Foster Dulles John D. Rockefeller, 3rd
Raymond B. Fosdick Walter W. Stewart
Douglas S. Freeman Harold H. Swift
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The officers of the Foundation were:

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Warren Weaver *Director for the Natural Sciences*
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Wilbur A. Sawyer, M.D. *Director, International Health Division*
Norma S. Thompson *Secretary*
Lefferts M. Dashiell¹ *Treasurer*
Edward Robinson² *Treasurer*
George J. Beal *Comptroller*
Thomas M. Debevoise *Counsel*
Chauncey Belknap *Associate Counsel*

¹ Died February 28, 1938.

² As of October 15, 1938.

SUMMARY OF APPROPRIATIONS ACCOUNT

FUNDS AVAILABLE		FUNDS APPROPRIATED	
Balance from 1937..	\$5,393,944	Appropriations	
Income for 1938....	7,087,106	Public Health....	\$2,725,000
Unexpended bal- ances of appropri- ations and author- ization allowed to lapse, and refunds on prior year grants.....	862,522	Medical Sciences.	5,344,700
Transferred from Principal Fund in accordance with resolutions of trustees, April 6 and December 7, 1938.....	3,755,000	Natural Sciences.	2,829,870
		Social Sciences...	3,762,500
		Humanities.....	999,500
		Program in China.	325,100
		Miscellaneous....	50,000
		Administration	
		Scientific Divi- sions.....	544,325
		General.....	286,092
			<hr/>
			\$16,867,087
		Less appropriations for which funds were previously authorized.....	1,920,000
			<hr/>
			\$14,947,087
		Authorizations for later appropri- ations by the Ex- ecutive Commit- tee.....	251,491
			<hr/>
			\$15,198,578
		Balance available for appropriation in 1939.....	1,899,994
			<hr/>
	<hr/>		<hr/>
	\$17,098,572		\$17,098,572
	<hr/>		<hr/>

PRINCIPAL FUND

Book value as of December 31, 1937.....	\$150,259,942
Add:	
Amount returned to principal from Contingent Pro- jects Account in accordance with resolution of the trustees, April 6, 1938.....	1,500,000
	<hr/>
	\$151,759,942
Deduct:	
Amount withdrawn from principal for transfer to Ap- propriations Account in accordance with resolutions of the trustees, April 6, 1938 (\$2,500,000) and De- cember 7, 1938 (\$1,255,000).....	3,755,000
	<hr/>
Principal Fund as of December 31, 1938.....	<u><u>\$148,004,942</u></u>

INTERNATIONAL HEALTH DIVISION

INTERNATIONAL HEALTH DIVISION

SCIENTIFIC DIRECTORS

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Ernest W. Goodpasture, M.D. Thomas M. Rivers, M.D.
Kenneth F. Maxcy, M.D. Felix J. Underwood, M.D.

The Director of the Division

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Alexander W. Burke, M.D.	Monroe D. Eaton, M.D. ³

¹ Resigned September 30, 1938.

³ Appointed July 1, 1938.

² Appointed associate director April 1938.

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J. Austin Kerr, M.D.	Mary E. Tennant
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Frederick W. Knipe	Thomas B. Turner, M.D.
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Estus H. Magoon	D. Bruce Wilson, M.D.
Alexander F. Mahaffy,	Daniel E. Wright
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¹ Appointed July 1, 1938.

² Resigned September 13, 1938.

³ Resigned August 31, 1938.

⁴ Appointed October 1, 1938.

⁵ Resigned July 1, 1938.

⁶ Retired February 28, 1938.

INTERNATIONAL HEALTH DIVISION

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INTERNATIONAL HEALTH DIVISION

SCOPE OF PROGRAM

THE primary activities of the International Health Division of The Rockefeller Foundation in the public health field are (1) a search for new knowledge directly applicable to disease prevention, (2) cooperation in investigations of diseases of importance to public health, and (3) demonstrations of the applications of new knowledge. If these activities are to produce practical results, trained personnel must be made available for public health positions. The International Health Division is therefore in various ways taking steps to support the public health education of workers in key positions.

In 1938 the budget of \$2,200,000 of the International Health Division was made up of amounts designated under six major headings: (1) Laboratories of the International Health Division at The Rockefeller Institute for Medical Research, \$100,000; (2) Control and Investigation of Specific Diseases and Deficiencies, \$579,640; (3) State and Local Health Services, \$229,010; (4) Public Health Education, \$240,745; (5) Field Service, \$752,000; (6) Fluid Fund, \$298,605.

The fluid fund, a sum available for allotment outside of fixed items or as additions to them, enables the Division to undertake new activities or enlarge old ones as special opportunities arise during the year. It affords the elasticity essential to progress in the pioneering work of the Division. The item for field service provides for salaries, commutation, and travel, and also for other expenses connected with the maintenance, transportation, and office expenses of a staff which in 1938 conducted work in thirty-seven countries. Research work in laboratories, field work in control of diseases, aid to state and local health services and public health education are discussed in succeeding sections, with emphasis first on the role of the laboratory.

LABORATORY RESEARCH

The Foundation's program of research into the nature of virus diseases, centered in the laboratory of the International Health Division at The Rockefeller Institute for Medical Research in New York, has recently opened some promising avenues of approach. New serological types have come to light, new diseases peculiar to animals seem to offer new opportunities for the study of baffling human infections, and ingenious and powerful tools of research lately have been introduced.

A year ago it was believed that one type of

influenza, called epidemic influenza, was caused, like yellow fever, by a single type of virus. Several strains of this virus were known, but it was supposed that these varied in minor aspects only and that basically all were of the same general type. Today, as a result of researches carried forward during 1938, we know that the problem is more complicated. The virus of the influenza prevalent in one epidemic outbreak may be powerless to render immunity against the virus of another outbreak. The study of some thirty strains indicates that there are definitely different serological variants. Each will immunize against itself but may confer little or no protection against other strains of influenza virus. Apparently the prevention of influenza may require the use of polyvalent vaccines in which many known strains of influenza virus are incorporated.

A number of patients afflicted with what seemed to be an atypical form of pneumonia have furnished valuable material for laboratory study. Lobar pneumonia is usually caused by a bacterium, the pneumococcus, and yet in none of these patients was any pneumococcus found. Although eight species of animals have been inoculated with material from these patients, no etiological agent has yet been discovered.

Recent investigations of the common cold show that its virus is unique; it is not merely a variant

of influenza. These studies are being facilitated by the availability of a test community at Yorktown Heights in Westchester County, New York, but the research has been hampered by the lack of suitable experimental animals. Dr. A. R. Dochez, working at Columbia University, reports that he has been unable to detect susceptibility to the common cold in any animal except the chimpanzee. Until a relatively small, cheap animal is available, the research will be limited.

A program through which it is hoped to discover additional animal carriers of disease was recently inaugurated by the International Health Division. In Brazil and Colombia, where field studies of yellow fever have been under way for years, it is the practice to capture wild animals and test their blood for evidence of past experience with yellow fever. By testing them for other virus diseases, additional instances of animal susceptibility to human diseases may be found. If these studies should turn up a rodent responsive to the common cold, for example, the finding would be a boon to the laboratories. This program of animal capture and test, already under way in South America, is being extended to Westchester County, and to the Alabama district where rabies is being studied.

The only animals known to be vulnerable to infantile paralysis are humans and monkeys, and

an intensive search is now being made to extend the list. Recently, in the New York laboratory, a virus isolated from mice was found to produce the same symptoms in mice that infantile paralysis produces in man. The mouse virus appears to be of the same size as the agent of infantile paralysis, but tests show that its immune serum is not able to protect against human infantile paralysis. Although we must recognize the new find as a different ailment, the close parallelism in the symptoms encourages the researchers to believe that it will help them in their attacks on the human disease.

The ultimate goal is prevention. The extensive program of vaccination against yellow fever is a current example of what the microbe fighters would like to do against every form of infectious disease. The fact that there is only a single type of yellow fever virus makes a problem relatively simple in comparison with that of immunizing against influenza, for example, with its unknown number of different serological types. The surest present method of influenza prevention appears to be this procedure: to isolate the virus at the outset of an epidemic, and then use that representative type to inoculate against the disease.

Two main objectives guide the program of the International Health Division in these researches: (1) to devise means for easy and prompt diag-

nosis, and (2) to develop means of preventing the diseases.

The great handicap is ignorance of the nature of the virus itself; and this applies not only to influenza but also to every other virus disease that plagues humanity. What sort of thing is the virus, how large, how heavy, how shaped, how constructed, of what materials?

A new attack on these questions is under way with the assistance of two powerful new tools of research—one perfected in the laboratory of the International Health Division, the other imported from Sweden. The latter is electrochemical in its operation of separating minute particles having different electrical properties even though of the same weight. The former harnesses the pull of centrifugal force to various purposes.

The very minute entities known as viruses appear to be of dimensions smaller than the wave lengths of visible light, hence there is not much ground for hope of detailed visual studies. Faced by this situation, medical researchers have turned to indirect means of examining the invisible.

A first problem is to isolate the virus. It exists in the blood serum of the afflicted person or animal, but there are hundreds of other substances also in blood, including many complicated protein compounds, and to separate the virus from this heterogeneous mixture is no simple

problem of chemical analysis. Some investigators use collodion filters arranged in a graduated series according to fineness of pores, but what is sifted out by this process is still a conglomerate. The first effective device was developed about fifteen years ago by Professor The Svedberg working at the University of Uppsala in Sweden.

Svedberg was impressed by the phenomenon of sedimentation. If you have a mixture containing particles of different masses, there will be a fixed order in which the particles settle. In a suspension of muddy water, for example, the fragments of rock, being heavier, will drop first. Then particles of coarse sand will deposit, followed by lighter sand grains. Finally, after several hours, particles of clay will have sedimented; and, if the mixture stands longer, still finer clay will form a top layer. But no matter how long the solution stands, there are some motes that will never settle; they are too light for gravity to overcome the buoyant effect of random collisions with the perpetually moving water molecules. If gravitation were stronger, more would separate. If the experiment could be removed to the planet Jupiter, where gravity is nearly three times that on the Earth, some of the finer particles would settle.

Nothing can be done about gravitation, but centrifugal force offers a close parallel, and for several decades chemists have used whirling de-

vices as a means of causing colloidal substances to sediment. Until recently these devices were handicapped by deleterious heating which generated from air friction. It was Professor Svedberg's achievement to design a whirligig of form so compact, of metal so tough, of driving parts so ingenious, and, most important of all, with rotor so surrounded by a hydrogen atmosphere, that for the first time proteins were isolated by centrifugal force. He called his apparatus the "ultracentrifuge."

It is an improved ultracentrifuge that has been developed in the laboratory of the International Health Division. Though following the basic principle of Svedberg's original design, the new apparatus embodies many changes. The rotor is differently shaped, is made of the lighter duralumin alloy instead of steel, is driven by air instead of by a jet of oil, and as it whirls in a very high vacuum it rides on an almost frictionless cushion of compressed air. Another innovation is an optical system which enables the operator to read the results of an experiment directly, instead of, as heretofore, only by complicated indirect readings and computations involving hours and sometimes days. All in all, the new instrument is a far more powerful, versatile, and useful mechanism than the ultracentrifuge which was tried in the laboratory previously.

To separate virus from a mixture, the fluid containing it is placed in a small celluloid receptacle, which locks into a slot within the rotor. The container holds half a cubic centimeter, a portion of serum weighing one-sixtieth of an ounce avoirdupois. Such is its weight at rest. But when the ultracentrifuge is whirling 60,000 revolutions a minute, that sixtieth of an ounce presses outward as though it weighed a seventh of a ton! Under the surge of this tremendous force, the particles of virus, and of other substances held in solution or suspension, are thrown toward the rim of the whirling mechanism. And they sediment against the wall of the container in the order of their weights, the heaviest particles first. From a photographic record of the boundaries of these various strata, the biochemist determines the weights of the particles.

But suppose two different substances have particles of the same weight—what then? This is actually the case with several compounds, and the ultracentrifuge can make no separation of such mixtures.

Fortunately, particles of varied nature but equal weight may differ in electrical properties; and Arne Tiselius, a young physical chemist in Svedberg's laboratory, and a former fellow of The Rockefeller Foundation, found a way to make use of these differences. In his apparatus,

the solution to be analyzed is studied in an electric field. The rate of migration of the particles can be accurately determined and under proper conditions the mobility is a fixed characteristic of a given substance. Thus, a particle whose own charge is positive travels toward the negatively charged pole, and one having two charges moves faster than a particle endowed with only one positive charge. This phenomenon of "electrophoresis" has been known for some time, but Tiselius was the first to invent a means of performing the process at a temperature just above the freezing point of water, thus preventing troublesome convection currents incident to heating.

A member of the staff of the International Health Division returned from Sweden in October 1938, bringing an electrophoresis apparatus. This reinforces the ultracentrifuge. Electrophoresis is used to isolate viruses, antibodies, etc., from other substances. After separation, a specimen of the electrically homogeneous material is tested by the ultracentrifuge for particle weights, sizes, shapes, and other structural properties.

In the laboratory of the International Health Division an effort was made during 1938 to improve the method of preparing yellow fever vaccine, with the hope that if a practical, convenient method were found it might prove useful in work-

ing with other viruses. The method developed aims at the preparation of vaccine in large quantities under uniform conditions, which was impossible previously. Vaccine was furnished from this laboratory for use in Colombia, Panama, Venezuela, Costa Rica, and for use by the United States Public Health Service.

A question commonly asked is: How long will the immunity following yellow fever vaccination last? Since vaccination by the present method was begun at the end of 1936, no definite answer can as yet be given. It is known, however, that monkeys vaccinated by this method two and a half years ago are still solidly immune today, and from the observations on humans during this relatively short time there is reason to hope that the immunity will usually last for several years and perhaps in some instances for life.

Certain fundamental investigations were continued with a view to obtaining a better understanding of the changes that occur in the virulence of yellow fever virus when this virus is maintained under varying conditions. These included the cultivation of the virus in the presence of various types of embryonic tissues of chickens, as well as mammals. Although no radical discoveries were made, there are indications that eventually methods may be evolved which should prove useful in the entire virus field, especially in the

study of strictly neurotropic viruses such as poliomyelitis, rabies, and encephalitis.

The studies in malaria in the Division's New York laboratory were chiefly in the domain of chemotherapy and immunology. In the field of chemotherapy it is generally doubted whether any known drug in itself cures malaria completely. Quinine and some related synthetic compounds will effectively curb an acute attack of the disease. However, some weeks later a high percentage of treated individuals usually have relapses and require more treatment. There is a continued search for more effective medication.

One possibility that suggested itself was the drug sulfanilamide, which has been widely used for many infectious diseases within the past three years. In fifty patients with induced malaria the use of this new therapeutic agent was found to be without beneficial results. The same negative results were obtained when the drug was used in an attempt to cure bird malaria in canaries and chickens. On the other hand, exceedingly small amounts were found sufficient to sterilize the blood of rhesus monkeys with chronic *Plasmodium knowlesi* or monkey malaria, one of the most virulent of all malaria infections. The importance of this observation is that for the first time it was possible to eradicate a malaria infection completely in an experimental animal. This drug,

therefore, adds an important tool for the study of malaria. Although to date its efficacy has been demonstrated in the treatment of animal malaria only, nevertheless the results suggest the possibility that a similar or closely related compound may be equally effective against human malaria.

The immune reactions of any disease in man or animal are of fundamental importance because frequently they are the only means of ascertaining progress, rationalizing treatment, and determining aftereffects. Experimental studies in malaria during the past year have demonstrated for the first time that monkeys upon recovery from acute *Plasmodium knowlesi* infections contain in their blood serum recognizable immune substances or antibodies. Some of the antibodies thus far identified in malaria are capable of protecting a normal animal against death. Knowledge concerning the presence or behavior of these immune substances is essential for the understanding of the effects of the malaria parasite on the host. Much of the experimental work in animals has already been confirmed in man.

CONTROL AND INVESTIGATION OF SPECIFIC DISEASES

YELLOW FEVER

Something has been said in the foregoing section on recent progress in yellow fever laboratory

research, and in pages 8 to 14 of this report, in the President's Review of the work of the Foundation during the past year, an account has been given of the vaccination campaign in Brazil. During the year 1938 final unification of the government service for the control of yellow fever throughout the country was obtained in Brazil. This furnishes the occasion for a brief review at this point of the long campaign in Brazil against yellow fever in which the International Health Division of The Rockefeller Foundation has participated since 1923.

The first record of yellow fever in Brazil dates from 1686 when the first outbreak of this disease to be described by a physician anywhere occurred in Pernambuco. From the early eighteenth century to the middle of the nineteenth century yellow fever was not a recognized problem in Brazil. Following what was apparently a reintroduction of the disease in 1849, outbreaks were recorded for all the principal ports of Brazil.

The first attempt to control yellow fever by antimosquito measures was made under the direction of Emilio Ribas in Santos, then recognized as one of the most pestiferous seaports on the Atlantic seaboard of South America. A short time later the much more difficult problem of cleaning the city of Rio de Janeiro was undertaken by Oswaldo Cruz. No locally infected cases of

yellow fever are known to have occurred from 1908, the year of success of the Oswaldo Cruz campaign, to 1928, when the city was again unexpectedly infected. In the meantime a program for the elimination of yellow fever from the principal cities and ports of the Amazon Valley was successfully carried out in 1911 and 1912.

In 1918 the federal health authorities decided to clear Northeastern Brazil of yellow fever for all time. The attempt was unsuccessful, and in 1923 The Rockefeller Foundation began its collaboration in the control of yellow fever in Brazil. Early efforts gave very promising results, but eradication was not secured. This came as a distinct disappointment to those who had seen similar measures applied in other countries, resulting in the complete disappearance of the disease. The unexpected outbreak of yellow fever in Rio de Janeiro in 1928 gave rise to the organization, under the direction of Dr. Clementino Fraga, of a thoroughgoing control campaign in the Federal District, in which at one time some 10,000 men were employed.

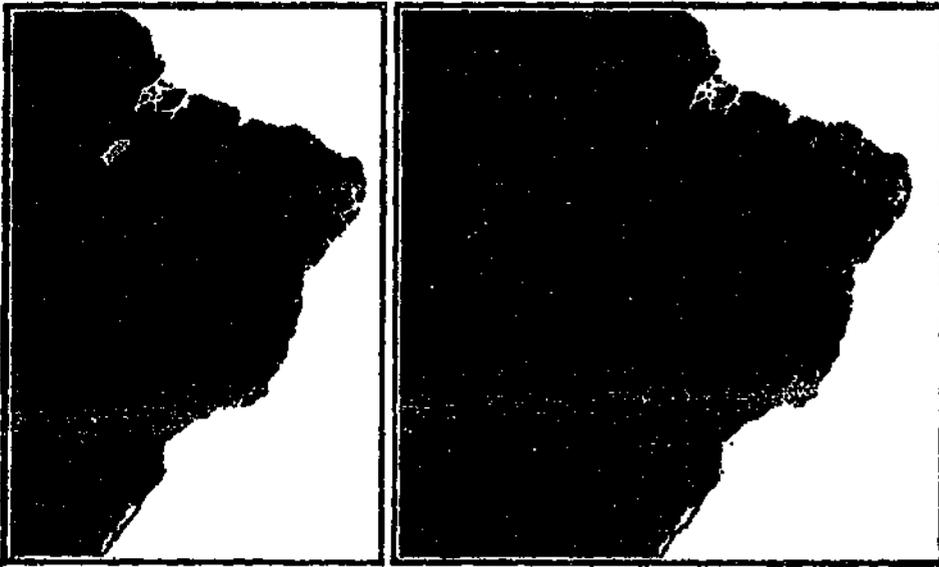
Late in 1930 the first steps were taken to unify the administration of all yellow fever services in Brazil. In the Federal District the work remained in the hands of the federal health authorities, but responsibility for the control of the disease in the rest of Brazil was placed with the Cooperative

Yellow Fever Service, maintained jointly by the Government of Brazil and the International Health Division of The Rockefeller Foundation. Finally, on January 1, 1932, the responsibility for the Federal District was also assumed by the Cooperative Service.

Advances in the study and control of yellow fever have been possible during recent years largely because there has been a single, complete service responsible for all phases of the problem, with adequate funds and authority and with complete liberty of action. The responsibility has been concentrated in the hands of a single organization, which has, for all practical purposes, been free to work and study at any place in Brazil where yellow fever has appeared.

Uniformity of work throughout the large areas under control has been secured by the preparation of a service manual, giving detailed instructions of organization and administration. Personnel has been selected, and continues in the service, on the basis of proven ability.

Urban yellow fever control work, since 1930, has been limited to antilarval measures, directed principally against the aquatic forms of the *Aedes aegypti* mosquito, inasmuch as aegypti-transmitted yellow fever disappears from a community within six weeks after the breeding index of this species has been satisfactorily reduced.



1930

1938

Distribution of antimosquito services in Brazil.

Measures which interfere with individual liberty, such as isolation of the sick, medical vigilance over contacts, quarantine of passengers from infected districts, and fumigation of houses have never been used by the Cooperative Yellow Fever Service.

Certain modifications in antilarval work have been made during recent years, with surprising results. The routine application of oil to all water containers found with mosquito larvae, coupled with adult mosquito captures for the discovery of hidden breeding foci, has practically eliminated *Aedes aegypti* breeding from all of the principal cities and towns of Brazil, and has made possible

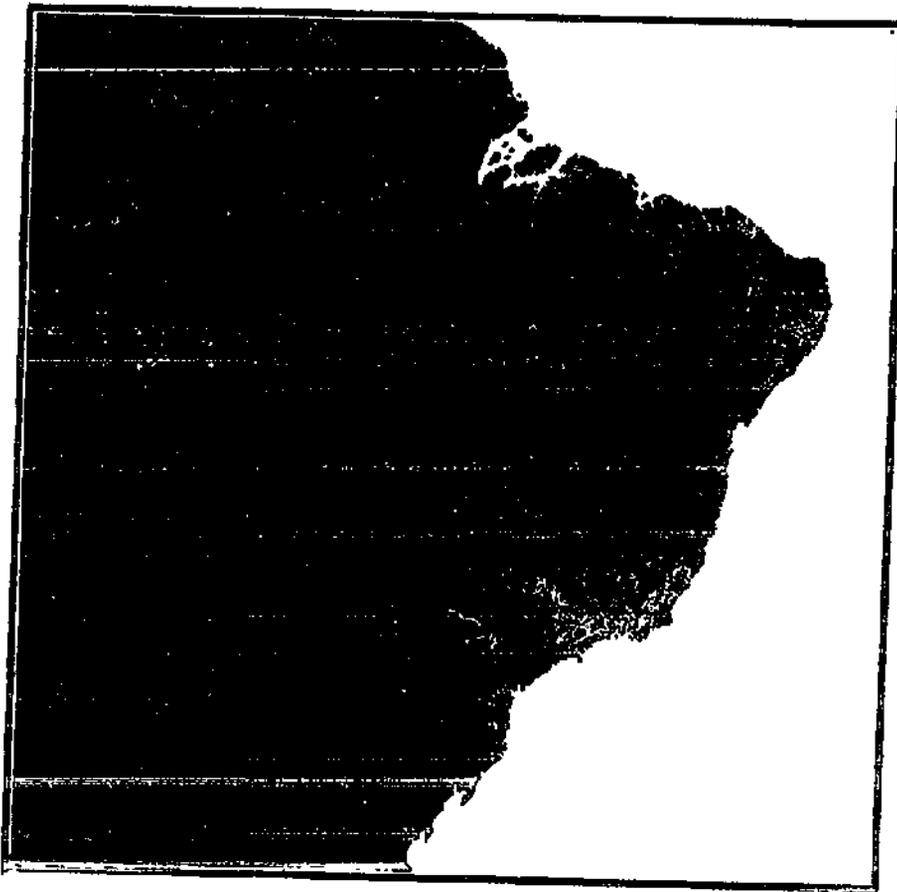
great economies in the service. The use of fish in water containers, always expensive, has been largely discontinued; the cycle of house visits has been lengthened from a week to two weeks, then to a month, and in some cases even to longer periods of time, with complete safety. It has been shown that the presence of adult mosquitoes is a much more sensitive index of mosquito production than is the larval index previously used, and that negative capture results may well serve as the basis for discontinuing, at least temporarily, the expensive routine house-to-house visits of the inspectors. The distribution of antimosquito services in 1930 and 1938 is shown in the maps on page 103.

Special field studies, based on the knowledge that the liver of a person who has died of yellow fever generally shows characteristic lesions, and that the blood of a person who has suffered from yellow fever contains antibodies capable of protecting susceptible animals from otherwise fatal infection with the virus of yellow fever, has revealed two previously unknown aspects of yellow fever epidemiology in Brazil.

First, yellow fever long existed in the interior of Northeastern Brazil as a rural disease transmitted by *Aedes aegypti*, producing fatal cases, mostly in children. It was only in August 1934, some time after the antimosquito measures had

been extended to many strictly rural areas, that examination of liver specimens ceased to reveal fatal cases in the rural regions of this part of Brazil. The map below shows posts for the collection of liver specimens in operation during 1938.

Secondly, yellow fever has been found throughout many regions of Brazil, including enormous areas always considered free of the disease, as a new epidemiological entity to which the name of



Viscerotomy posts in operation in Brazil
during 1938.

“jungle yellow fever” has been given. This jungle yellow fever which occurs in the absence of *Aedes aegypti*, and attacks almost exclusively persons who go into the forest, is important not only as a reservoir of virus for the reinfestation of cities and towns, but also as a cause of death among the populations exposed to jungle conditions, in such widely separated regions in Brazil as Acre, Santa Catarina, and the Ilha de Marajo at the mouth of the Amazon River.

The early failures to eliminate yellow fever from Brazil were apparently due to the continuance of aegypti-transmitted yellow fever as a rural disease in Northeastern Brazil, and to the existence of the unrecognized jungle yellow fever. The first difficulty, that of rural aegypti-transmitted yellow fever has been solved, but the solution of the jungle problem is more difficult. The prevention of aegypti-transmitted yellow fever is relatively easy, but no one who knows at first hand the jungle areas of South America seriously considers attempting the control of the insects and animals responsible for maintaining the virus of yellow fever in those areas. Even vaccination, which might, under certain circumstances, be useful in the elimination of urban yellow fever, which cannot exist in a highly immune population, cannot be expected to limit the dissemination of the virus in jungle districts.

Man is not an essential factor in the spread of the virus in the jungle, and a victim of jungle yellow fever often receives his infection under conditions precluding the possibility of another human case having been the source of virus for the infection of the vector transmitting virus to him.

Immunization in regions subject to jungle yellow fever can be used only for the direct protection of such individuals as are vaccinated. Since there is then no hope, even with the perfection of mass vaccination, of ridding the continent of the virus of yellow fever, the sanitarian of today is forced to consider yellow fever as a constant and permanent threat which, with improved methods of communication, is within striking distance of all towns and cities on the continent where aegypti are permitted to persist.

MALARIA WORK IN CUBA AND ELSEWHERE

Malaria is being attacked in many countries and from many sides. Methods of mosquito control as the basis of all antimalaria work have become more effective and less expensive. Different species of anopheline mosquitoes, and even their races or varieties, are given extensive study with regard to their power of conveying malaria and their habits in nature, so as to make malaria control more discriminating and for that reason

increasingly efficacious. A unique drive has begun with Foundation cooperation in Brazil to eliminate the very dangerous malaria vector *Anopheles gambiae* from South America before it has time to make a good start and spread to a large part of the continent. The work in connection with this mosquito has been described on pages 14 to 19 of this report.

An interesting experiment has been going forward in Cuba. Seven thousand trees were set out recently west of Havana. Planted along the banks of fifteen miles of small streams, they are the latest weapons in the campaign for mosquito control being waged by the Malaria Commission of Cuba. The plantings are not merely experimental, but are based on two years of careful trials in which the effect of shade on the spread of the *Anopheles albimanus* mosquito was conclusively demonstrated.

These "white-handed" *Anopheles*—so named because they are distinguished by white spots on some of their legs—are the principal carriers of malaria in Cuba, and for three years the Foundation has been cooperating with the Cuban Secretariat of Health and Welfare in efforts to rid an area west of Havana of these and other malaria vectors.

A small sluggish watercourse near Havana provided the setting for the first experiment. Nor-

mally the water is green with a film of the common alga *spirogyra*; the mosquito lays eggs in this film of surface vegetation; and here the larvae hatch out as wiggletails, living and feeding within the network of algae. The stream drifted its full course in sunlight, and the problem was to determine the effect of shade on the proliferation of mosquitoes. So a shed thatched with palm leaves was built over a section of the waterway. The first effect was the disappearance of the algae. Within a week the green scum had gone from that area of the water which was under the shelter, though it continued to flourish in other areas where the sunlight was uninterrupted. Soon it was noticed that, following the disappearance of the vegetation, the mosquito larvae had disappeared also from the shaded water.

There were small fish in the stream; the absence of the *spirogyra* left the larvae without the protection of its entangling threads, and the fish ate the defenceless wiggletails.

But perhaps this was not the whole story. Another experiment was set up to see how necessary the fish are. Over a rainwater pool in which there were no algae and no fish, although the wiggletails of *Anopheles albimanus* were in lively evidence, a palm thatch roof was built, and within a few days the mosquito larvae disappeared entirely. Moreover, no other larvae of this species

appeared. Even in the absence of fish and other devouring animals the insects languished and died.

As a final test two tubs of fresh water were seeded with spores of the algae. One tub was set out in full sunlight, the other under a grove of palm trees. Algae soon sprouted and spread a green scum over the sunlit tub, mosquitoes laid their eggs there, and larvae hatched out and flourished. But no algae grew in the tub under the tree; and, although larvae of the *Anopheles albimanus* immediately developed in the shaded water, they presently disappeared and no more were seen. It seemed as though a condition had been set up in the shaded tub, which made life impossible for *Anopheles albimanus*. Whether the mother mosquito lays her eggs only in the sunshine, or whether the shutting off of sunlight from the water destroys the microscopic diatomic organisms on which larvae feed, or whether some other effect explains the early disappearance of the wiggletails is not clear, although it has been demonstrated that *Anopheles albimanus* cannot long survive deprivation of sunlight. The practical outcome of these experiments was the planting of the 7,000 trees along watercourses near Havana.

In planning the planting program, careful search was made for an appropriate tree. Certain

qualifications were set up. It must be a variety that is easy to procure, easy to propagate, of rapid growth, with evergreen foliage, not economically valuable for either timber or fruit. Such a tree was found in *Ficus benjamina*. This tropical fig tree grows throughout the West Indies. It has the peculiar property of throwing out aerial roots. In order to sprout a new plant, it is only necessary to select a well-developed limb of a growing tree, cut into the bark of the limb until the growing tissue is reached, and then surround the cut with a bag of wet soil. In a few days rootlets will begin to grow out of the cut into the soil, and within two months the bag will be completely filled with well-developed roots. Then the limb may be sawed off and planted, and thus a new tree equivalent in growth to an eight-year seedling will have been obtained. It is in this way that the 7,000 trees were procured for the planting last spring.

This Cuban campaign against malaria is centered in an area of about 104 square miles west of Havana, where eighty thousand inhabitants live. Today, after three years of concerted effort, mosquitoes are rapidly disappearing from the area. And the work is being accomplished, not by means of palliative expedients such as larvicides, but in large part by devices which, once installed, may be regarded as permanent.

These include (1) the lining of necessary ditches with concrete surfacing, (2) the flooding of brackish swamps with sea water by means of specially constructed tidal gates, (3) the installation of subsoil drainage, and (4) the filling of low spots where standing water accumulates. To these four methods of mosquito control is now added this fifth method—the use of trees to deny the white-handed *Anopheles* his place in the sun.

Malaria control work and investigations in which the International Health Division is cooperating range all the way from India to Florida. In addition to control measures in Cuba and Brazil, work of one kind or another against malaria has during 1938 received support in Albania, Italy, Portugal, Cyprus, Greece, Egypt, India, Panama, Mexico, Cuba, Costa Rica, Florida, and New York.

The study of malaria in man, in the Division's laboratories in New York and in Tallahassee, Florida, is revealing new facts about the nature of malaria immunity, the treatment of malaria, and the reactions of the human body and the malaria parasites to each other. Man, monkeys, and chickens are the subjects in these promising experiments. One of the malarial parasites proving useful in these studies is a new species discovered by a staff member in an Oriental pheasant at the Bronx Zoo.

Malaria control in Panama, since its beginning in 1931, has progressed through general studies of the incidence of the disease, experiments with Paris green mixtures, and demonstrations of the value of land drainage, to the point where extensive drainage measures are being conducted upon a large scale as a means of permanent malaria control. The training of subordinate personnel in all aspects of study and control measures has been a part of the cooperative work. Malaria studies are now limited to preliminary and concurrent investigations to check the efficiency of control measures. A malaria demonstration is also going on in Costa Rica. The major efforts concern drainage.

In Albania the International Health Division has cooperated in the organization of a hygienic section of the Health Department. This includes a malaria bureau, the Tirana Health Service, an epidemiological service, and a department of sanitary engineering.

In Italy two studies are nearing completion: (1) a final measurement of the effect of gambusia (small fish) on anophelism in Istria, and (2) the problem of the occurrence of malaria in a rural area about the city of Milan.

In Cyprus, after a preliminary survey made during the summer of 1935, further experiments have been conducted in connection with control

of the chief vector, *Anopheles superpictus*, and in connection with *Anopheles elutus*, the second malaria vector, which is important in marshy areas. So far tiling and flushing of the mountain streams appear to be the most hopeful procedure in connection with *Anopheles superpictus*.

In Greece, in 1938, assistance was continued to the Division of Malaria of the Athens School of Hygiene. Country-wide blood and spleen examinations initiated in 1933 went forward. Ten anti-larval programs begun between 1931 and 1937 were continued, and new programs of this kind were undertaken in fifteen additional areas.

A survey of malaria in Egypt made a few years ago indicated that the disease is widespread in the Nile Valley and in certain regions near rice plantations. There is encountered here the problem of man-made malaria similar in nature to that noted in Portugal, where malaria likewise is associated with rice culture. Irrigated rice fields and irrigated cane fields are also a source of malaria in the State of Morelos, Mexico, where *Anopheles pseudopunctipennis* is the only malaria vector found.

In India a malaria laboratory has been established at the King Institute, Guindy, and a field station at Pattukkottai, southeast of the city of Madras. Observations are also going forward in another field area, Ennore, twelve miles north of



Photograph Excised Here



Photograph Excised Here

Yellow Fever Service in-
spector, Federal District,
Rio de Janeiro, Brazil.

Monkey trap, Curralinho,
Brazil.



Photograph Excised Here

Oxcart water delivery, Brazil. Another source of
aegypti mosquito production.

the King Institute. The aims of the program are to determine feasible methods for the control of rural malaria at a cost within the means of the people and to train local men in government service for malaria control work.

INFLUENZA AND OTHER DISEASES

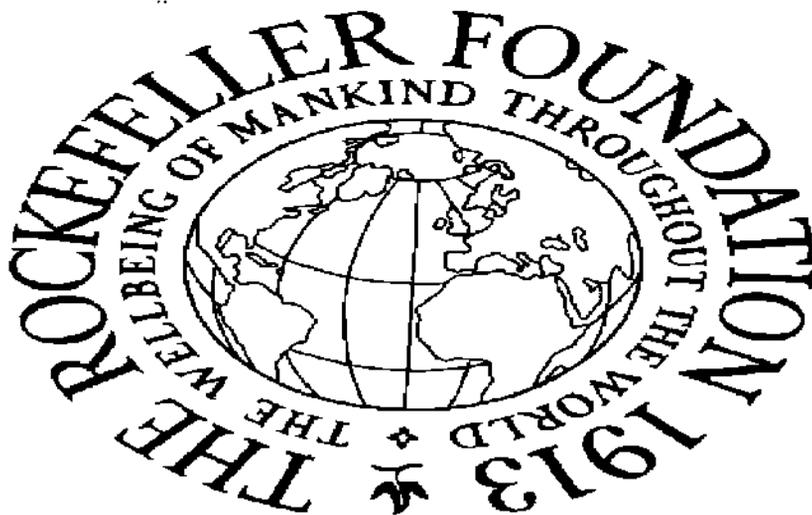
Along with malaria and yellow fever, influenza continues to be subjected to major attack by the International Health Division. In the work of the Division less attention than before is given to intestinal parasites, including hookworm, and more to syphilis and rabies. Work on scarlet fever, tuberculosis, and mental hygiene is continuing without diminution. During 1938 some aid was also given to work on sylvatic plague.

In a speech made before the Pan American Sanitary Conference in Bogotá in 1938, the Director of the International Health Division pointed out that every country with a bacteriological laboratory should undertake investigations of epidemic and other influenzas in an effort to clear up the nature of the disease, study its distribution, and find methods of control. The influenzas and the common cold, all supposedly initiated by virus infection, form a group of infectious diseases which are extremely widespread and capable of occasional disastrous pandemics. It would be a reflection on medical science and



Photograph Excised Here

Cuba Malaria Commission. Shading by trees as an antimosquito measure.



Photograph Excised Here

Sources of mosquito breeding in Egypt.

public health if a pandemic of influenza should again find the scientific world totally unprepared to investigate effectively or to resist.

In addition to basic studies at the laboratories of the International Health Division in New York financial assistance has been provided for studies of influenza at the University of Pennsylvania; the Minnesota State Department of Health; the California Department of Public Health; the Westchester County Health Department, New York; New York University College of Medicine; and the State Hygienic Institute at Budapest, Hungary.

An influenza study has been in progress at the University of Pennsylvania since 1936. This study is under the direction of Dr. Joseph Stokes in the Department of Pediatrics of the School of Medicine of the University.

The establishment in the United States of recognized centers or laboratories associated with state health departments for research on influenza is an important development in the extension of the influenza study program of the International Health Division. Minnesota was selected as one place for such investigations. Strains of the virus of the influenza which occurs there will be obtained, and these will be compared with other strains. Work has begun at the influenza laboratory situated in the main laboratory building of

the State Department of Health on the campus of the University of Minnesota, and four strains of influenza virus have been established in mice. An outbreak of fifty-six cases of mild influenza-like respiratory infection among the students of the University Farm campus which occurred in January 1938, was investigated. The epidemic was not caused by the virus of epidemic influenza. A study of isolated cases and a survey of influenza among the inmates of the School for Feeble-minded at Faribault were also completed. The second center of this type to receive aid is the one in California, where support was given to the Department of Public Health for a building site, a laboratory building, laboratory equipment, and operating expenses. The purpose is to study the strains of influenza virus that occur in California and to carry out epidemiological and clinical studies.

The towns of Shrub Oak and Yorktown Heights, New York, were selected as experimental communities for a study of respiratory diseases due to viruses. The work has been set up as a specialized service of the Westchester County Health Department with technical supervision by the International Health Division representatives. Census has been taken of past clinical histories of the residents, and blood specimens have been collected and analyzed for the

purpose of assembling data and ascertaining the normal status of respiratory diseases. This serves as a base line for the study of future epidemics and for the evaluation of such control measures as may be undertaken eventually.

The purpose of the grant to New York University College of Medicine was to enable Dr. Thomas Francis, Jr., to pursue his studies of influenza and allied respiratory diseases after he took charge of the Department of Bacteriology there in the fall of 1938. The close interrelationship between that Department and the wards of Bellevue Hospital presents an unusual field for this work. A wide range of influenza research is under way, including investigation of serological reactions, tissue immunity, active immunity, persistence of virus, development of skin tests, projection of efforts along the line of preventive inoculation with modified virus or by intranasal instillation.

The Division aided in the establishment of an influenza center at Budapest as part of its program of research on influenza as a disease in continental Europe. The main objectives of the center are to obtain virus strains, transmit to mice newly inoculated strains, determine the relation of these to English and American strains, and make experiments in the protection of human beings by vaccination under controlled conditions.

For a number of years certain types of tuberculosis work in the United States, in the Caribbean area, notably Jamaica, and in various districts of Central Europe have received support from the Division. Dr. E. L. Opie has acted as adviser in connection with the tuberculosis program in Jamaica since its inauguration in 1928, and also in regard to other tuberculosis studies. Aid was given also to research work in tuberculosis at Cornell University Medical College, immediately under the supervision of Dr. Opie. The chief investigation at Cornell has been an experimental study of protective inoculation against tuberculosis proceeding parallel with a similar study at Kingston, Jamaica. The material used for inoculation is prepared in the laboratory of Cornell University. These studies in progress in the laboratory at Cornell are in large part concerned with the resistance against tuberculosis induced by inoculation with heat-killed tubercle bacilli combined with certain oils. The experiments in progress are directed toward determining the effect of varying mixtures of tubercle bacilli and oil on resistance to tuberculosis. Other studies on the pathogenesis of tuberculosis and its relation to sensitization and antibody formation are also in progress.

At the request of the Jamaica Government cooperative studies of tuberculosis were initiated

in 1928, with the object of developing methods for the control of the disease in the Island. On the basis of information obtained from these studies over a period of years, a control program was formulated. The program provided for the organization of tuberculosis work in hospitals, parish infirmaries, and dispensaries. The cooperative tuberculosis work, particularly the traveling x-ray unit now taken over by the government, has stimulated island-wide interest in the tuberculosis program. Greatly increased facilities for the diagnosis and treatment of ambulatory tuberculosis patients have been provided. The results of studies in the Kingston Mental Hospital may be summarized as follows: (1) The onset rate and death rate from tuberculosis is higher among tuberculin-negative admissions than among persons admitted with a hypersensitive reaction to tuberculin. (2) Persons who, on admission, react weakly to tuberculin have not as great a protection against tuberculosis as have those who are admitted with a strong reaction. (3) Vaccination with heat-killed tubercle bacilli confers some protection against tuberculosis for a period of approximately eighteen months.

During this past year the Division's tuberculosis research in Jamaica has been chiefly concerned with studies of the effects of vaccination of tuberculin-negative individuals with heat-

killed tubercle bacilli. Effort has been directed toward improving the technique in the administration of this vaccine, and to this end special studies have been carried out since February 1938 in a rural school in Manchester Parish. Here a new technique of vaccination, with one injection only, has been employed. This method has resulted in a high degree of sensitivity with small resulting scar. It is planned to extend the new vaccination method to the general population.

Support has been given to a study in rural tuberculosis in Williamson County under the direction of the Tennessee State Health Department. Its objectives are: (1) to investigate factors relating to the breakdown of individuals with the adult type of tuberculosis; (2) to follow up systematically children in close contact with tuberculosis to determine the evolution of tuberculosis infection in childhood; (3) to make clinical and epidemiological investigations of tuberculosis in the old-age group, including follow-up of children in contact with these cases, analyses of sputum, etc.; (4) to appraise case-finding and case-handling methods as they may be related to the study and general control program of the state; and (5) to use the study unit as a training base for personnel throughout the state.

Upon invitation from the Commissioner of Health of the Insular Department of Health of

Puerto Rico, a study of the tuberculosis program under way in the island was carried out between April 28 and May 30, 1938. The area of Caguas has been selected as a center where the suggestions regarding the finding of new cases through the examination of contacts and where the method of using sanitary inspectors for locating cases in rural districts can be tried out for a year.

Support was given during 1938 to the proposed model tuberculosis service of the Kips Bay-Yorkville Health Center, New York. This work, under the auspices of the Committee on Neighborhood Health Development for New York City, includes teaching, research, and the development of tuberculosis control measures.

The educational facilities of the Center with regard to tuberculosis are available to: (1) members of the medical and nursing staff of the New York City Health Department; (2) undergraduate medical students of Cornell; (3) outside physicians, and other persons officially accredited by the New York City Department of Health. There is instruction and training in methods of early diagnosis, case-finding and epidemiology, and in the administrative control of tuberculosis. All follow-up of contacts, determination of sources of infection, home studies, and nursing home visits are conducted from the Center. The present City Health Department Tuberculosis Clinic,

now operated at the New York Hospital, is to be transferred gradually to the Health Center building. The New York Hospital will admit into its Pulmonary Clinic all persons in the district who have clinically active tuberculosis; it will provide for clinical supervision and treatment of these patients; it will maintain nineteen beds for patients ill with acute tuberculosis; and, whenever beds are available, it will admit at the standard city welfare rate of pay, needy tuberculosis patients who are residents of the district. All Hospital clinic records of district cases are to be freely available to the Health Center and vice versa. The City Health Department makes available its other clinical services for special research or study problems bearing on the prevention and control of tuberculosis.

A study on rabies is being conducted by the International Health Division and the Alabama State Health Department at a rabies laboratory about five miles from Montgomery. The purpose of the study is to learn more about the epidemiology of rabies, including particularly the production of immunity and the determination of the degree of natural or acquired immunity in man and animals, as a basis for instituting an intelligent control program. At a conference, held on May 4 and 5 in Alabama, at which leading authorities in this field were present, it was brought

out that the development of a reliable method for immunizing dogs against rabies is an urgent need. Although the immediate attention now is on the development of an effective and reliable vaccination procedure for the protection of animals, much work has been done to establish the intracerebral mouse test as a confirmatory diagnosis in routine state laboratory work. This test makes possible an earlier confirmatory diagnosis of rabies.

A preliminary inquiry into the public health aspects of mental hygiene was begun in the Eastern Health District of Baltimore in October 1934. This project in mental hygiene functions under the Professor of Public Health Administration of the Johns Hopkins University. Work is carried on in close cooperation with the staffs of the Eastern Health District, the Henry Phipps Psychiatric Clinic, the Children's Hospital and other branches of the Johns Hopkins Hospital.

The purposes of this study are: (1) to determine the prevalence of mental disease and mental defects and dysfunctions in an urban population; (2) to disclose the economic, social, racial, and personal factors underlying these conditions; and (3) to devise and put into experimental operation as an integral part of the existing health services of the community administrative procedures designed to bring about effective management and prevention.

The following progress has been made during the first four years of work: (1) A competent study group has been assembled and trained in the work of the two fields, psychiatry on the one hand, and the statistical-epidemiological method on the other. (2) Accurate knowledge is for the first time available as to the prevalence of mental disorders in a large unit of population, and an analysis of this statistical material has yielded some interesting and possibly valuable indications of the incidence of these disorders in different groups of the population. (3) Preliminary studies of time changes in the prevalence of mental disorders have been undertaken, based on the four-year interval between the first and second surveys. (4) An interesting and most promising experiment in preventing the development of behavior problems in children is under way.

A similar study in a rural area is conducted jointly by the Tennessee State Department of Health and Vanderbilt University with the financial support of the International Health Division. The purpose is to develop a mental hygiene program in Williamson County, Tennessee, which will fit into the general program of a local health department. The principal objectives are to make a survey of mental health conditions in this rural community, to add to this survey what is known concerning the etiology of mental mal-

adjustment and ill-health, and to evolve practical methods for improving unsatisfactory mental health conditions. Dr. W. F. Roth, Jr., is director of the study, and Dr. F. H. Luton, associate professor of psychiatry at Vanderbilt University, serves as consultant psychiatrist.

The International Health Division is supporting a study of sylvatic plague and Rocky Mountain spotted fever which is being carried out by the Alberta and British Columbia divisions of epidemiology. Studies similar to those planned for Alberta and British Columbia have been inaugurated on the United States side of the border through the cooperation of the Federal Public Health Service and the northwestern state health departments. The laboratory examinations of Canadian material for spotted fever were made in the United States Public Health Service laboratory at Hamilton, Montana, and the Canadian plague material examinations in the federal laboratory at San Francisco.

Surveys in the United States have shown that sylvatic plague has spread inland from the Pacific Coast and that squirrels, wood rats, and field mice which harbor infected fleas act as hosts and disseminate the infection. In the western provinces of Canada the same type of squirrel as exists in the United States is found, and a few cases of the disease have already been discovered over the

Canadian border. A similar situation prevails with respect to Rocky Mountain spotted fever, a disease of rodents and small carnivora, transmitted to man by the wood tick. The United States Public Health Service already has a creditable appropriation for combating the diseases on the American side of the line. The provincial health authorities of these provinces plan to make careful surveys to appraise the danger of these diseases and to find a basis for the formulation of such control measures as may be warranted.

STATE AND LOCAL HEALTH SERVICES

While the International Health Division avoids long-continued support to routine health services, it does give assistance to governments in the establishment or development of essential divisions or sections of their health departments. As an illustration of how this type of aid operates we may cite a project in the Canadian Province of Nova Scotia, where five years ago the International Health Division, in response to a request of the new provincial Minister of Health, cooperated in making a study of the public health service.

The Nova Scotia project represents a type of service in which the Foundation, through its International Health Division, is actively engaged. In Brazil and other countries of South America, in Czechoslovakia and other countries

of Europe, in India and other lands of the Orient, the first step, upon acceptance of an invitation to assist in solving some public health problem, has been to survey the field and develop a plan of procedure built to the specific need. The second step has been to strengthen the personnel through training. The third has been to cooperate in the financing of the new program during the preliminary stages of adjustment. All three of these steps have been taken in connection with Nova Scotia.

The various natural areas of the Province were visited and appraised from the point of view of health administration. Statistics of illness and mortality were analyzed. Out of these and other studies a program of reorganization was drawn up.

The reorganization plans indicated greater emphasis on full-time health work as well as the need for a section of sanitary engineering within the department. Without this specialized service it was futile to expect adequate supervision of water supplies, milk supplies, and sewerage. The high prevalence of diarrhea and enteritis, for example, pointed to infected milk. Only by the extension of modern practices in the production of clean, safe milk, including pasteurization, could any permanent success be expected in the control of these and other milk-borne epidemics.

When the Department of Public Health de-



Photograph Excised Here

Counting out mosquito larvae for experiments
with salt solution, Albania.



Photograph Excised Here

Public Health Service, Netherlands India. Food covers
are made at home and at school.

cided to establish this Section of Sanitary Engineering, the Foundation agreed to provide a fellowship for training the section head. The future incumbent spent the year 1935-1936 in the Harvard School of Engineering, and afterward had several months of field experience in Alabama. His section has been operating since 1936, supported by a cooperative budget toward which the Foundation has been contributing on a tapering basis. Thereafter the Province assumes full support, its interest confirmed by a three-year demonstration of the public health value of sanitary engineering.

The establishment of two other specialized sections was recommended, one responsible for vital statistics, the other for epidemiology. In the final consideration of these items the Department decided that it could combine the two interests into a joint Section of Statistics and Epidemiology. Again the man to head the new work spent a fellowship year 1937-1938 at the Johns Hopkins School of Hygiene and Public Health, and on his return to Halifax the new section was organized and began to operate. As in the case of the other section, the Foundation is extending its support through the formative period by a grant which will end in 1942.

There was need also for integration of the municipal and rural health services with those of



Photograph Excised Here

Nurse instructs patient and family how to avoid the spread of tuberculosis infection. Cooperative Public Health Work, Cuba.



Photograph Excised Here

Marianao Health Unit, Cuba.

the provincial government. The plan was eventually to subdivide the whole of Nova Scotia into four local districts, each under the supervision of a full-time medical officer. The execution of this plan was begun by organizing Cape Breton Island and some adjoining communities into a test district. The chief health officer was given a year's training on a fellowship at the Toronto University School of Hygiene and upon his return to Nova Scotia the district was set up, a staff was organized, and the work rapidly extended. In September 1937 there were three full-time nurses on the Island. Now there are eleven, ten staff nurses and a supervisor. The health jurisdiction is divided into ten nursing districts which provide a generalized service, including the important fields of prenatal, maternal, infant, and preschool hygiene. A tuberculosis unit of forty-two beds in connection with St. Joseph's Hospital is nearing completion. Another will shortly be constructed. These additions will increase the number of beds available within the area for the care of the tuberculous to 150. Marked stimulus has been given procedures for the immunization of children against diphtheria, smallpox, scarlet fever, and whooping cough. Clinics for the administration of diphtheria toxoid were set up, and in Cape Breton County alone, 88 per cent of the 11,000 children received protection.

The success of this district health department as a demonstration of the value of full-time local services is evidenced by the fact that steps are under way to provide training for additional local health officers at Toronto and to establish four other local health districts. The International Health Division is assisting the financing of the Cape Breton Island district on a four-year budget which ends in 1941.

Sometimes the emphasis is on improvement in certain particular types of health activities such as sanitation or infant welfare work. This is the case in Costa Rica, where the Foundation is co-operating in providing equipment for a health unit and training station located in the town of Tres Rios, which is about eight miles from San José. An excellent building for the housing of this health unit has recently been completed. The National Health Department and the municipality of Tres Rios each contributed approximately \$20,000 toward its cost. This unit now serves as a training station for health officers who will have charge of other units in the country, for public health nurses, sanitary officers, and other personnel. The emphasis is on what is called practical sanitation, which has reached a high degree of perfection in Costa Rica and is now being carried out on a country-wide scale. The making of sanitation and drainage equipment from cement has

become one of the largest manufacturing enterprises in the country. It has moreover been placed on a self-supporting basis. This type of work makes it possible to carry sanitation into the homes of semiurban and rural communities where only the most elementary type of health work was formerly possible.

The program of other health work developed by the Tres Rios health unit is also outstanding. Three towns have been selected for conducting demonstrations in malaria control. Specialized equipment for tuberculosis work has been provided and it is intended to make attention to tuberculosis a special feature of local health work. The Tres Rios health unit bids fair to become an important center for training health workers. A reduction of nearly 50 per cent in the infant mortality in the canton of Tres Rios was one of the tangible results of the work put into effect last year.

The work in Costa Rica and Nova Scotia constitutes merely two incidental illustrations of the type of activity in which The Rockefeller Foundation is engaged in thirty-seven countries. The countries or states in which work was done, together with the proportion of the total budget provided by the International Health Division in the United States, Canada, and Mexico alone is given in the following table:

INTERNATIONAL HEALTH DIVISION AID TO STATE AND LOCAL HEALTH SERVICES IN THE UNITED STATES, MEXICO, AND CANADA, 1938

	Total Funds	Division's Contribution	
		Amount	Per Cent
UNITED STATES: Alabama: District Health Department; New York: Fulton - Montgomery Health District; Virginia: state health survey.	\$ 29,310.25	\$14,769.20	50.3
MEXICO: Central health office; training station; regional, state, and municipal health units; Xochimilco Unit.	73,971.50	17,575.00	23.0
CANADA			
Alberta: Division of Epidemiology			
British Columbia: Fraser Valley, Greater Vancouver, and Peace River health districts; Division of Epidemiology.			
Manitoba: Division of Vital Statistics.			
Nova Scotia: Section of Statistics and Epidemiology; Cape Breton District Health Unit.			
Ontario: Eastern Ontario Health Unit.			
Quebec: Trois Rivières City Health Unit; Divisions of Hygiene of Nutrition and Industrial Hygiene.	201,218.00	55,369.43	27.5

Outside of these North American countries, the International Health Division cooperated with local or central health departments in Cuba, Puerto Rico, Costa Rica, Nicaragua, Panama, Salvador, and Brazil. In Europe similar work was aided in Albania, Austria, Bulgaria, Denmark, Greece, Hungary, Italy, Portugal, Rumania, Sweden, and Turkey. Aid was also given to local health work in India, Java, South Sea Islands, and Egypt.

PUBLIC HEALTH EDUCATION

For the purpose of preparing personnel for specific posts in governmental health services in many countries in which the International Health Division has a program, fellowships and travel grants are awarded. In 1938 the number of International Health Division fellowship holders was 153. Thirty-two were from the United States, and 121 were from the following foreign countries: Canada, twenty-four; India, eleven; Brazil and Mexico, ten each; Panama, eight; Portugal and Turkey, six each; Rumania, five; China, Poland, and Venezuela, four each; Cuba, Finland, and Japan, three each; Ceylon, Colombia, Czechoslovakia, Greece, and Hungary, two each; Cyprus, Fiji, France, Great Britain, Guatemala, Java, New Zealand, Norway, Philippines, and Puerto Rico, one each. Travel or training grants enabling the recipient to visit and study health projects in his field of interest were made to forty persons: seven from the United States; six from India; four from Mexico; three from Great Britain; two each from Belgium, Greece, Poland, and Turkey; one each from Costa Rica, Cuba, Cyprus, Denmark, Finland, Honduras, Hungary, the Netherlands, New Zealand, Panama, Portugal, and Yugoslavia.

The amount set aside by the International Health Division for training through fellowship

and travel grants in 1938 was \$210,000. In many countries the success of the Division's program is in large part due to the availability of doctors, nurses, engineers, and statisticians who have been trained under fellowships. The training is an effective factor in the improvement of the public health outlook throughout the world.

As a further step in the improvement of public health education, schools and institutes of hygiene and schools of nursing are assisted in their programs of training for the public health field. A unique project which received support in the Fiji Islands, is a school for the training of native practitioners, for service in islands of the South Pacific. At various places throughout the world from Fiji to Sweden the International Health Division has cooperated with institutions helping to train men and women for the public health field. Two of these will be briefly described, one at Baltimore, Maryland, and the other at Stockholm, Sweden.

The Division has made a grant to the Johns Hopkins University for the purchase of property adjacent to the Johns Hopkins School of Hygiene and Public Health in order that the University in turn may present this to the city of Baltimore as a site for the health center building of the Eastern Health District of Baltimore. This health center has been outstandingly successful in pro-

viding practical field training for students of public health from the above-mentioned school. The district in which the health center is located provides a population group of over 100,000 especially suitable for study purposes because of the complete family records now available. It is proposed to house this center in a six-story building with the first floor for syphilis and tuberculosis clinics, the second for maternity, child hygiene, and dental clinics, the third for administrative offices and record rooms, the fourth for nursing activities, and the fifth and sixth for teaching and research work. Plans involve direct physical communication with the School of Hygiene building. In this building, to cost approximately \$300,000, are to be coordinated all the activities that have developed in the Eastern Health District. It is to be constructed and maintained by the city of Baltimore. The program of this health center includes six definitely outlined studies, toward two of which, the mental hygiene and the epidemiological study of syphilis, the International Health Division is giving financial assistance.

A grant of \$270,000 from Rockefeller Foundation funds, provided over and above the regular International Health Division 1938 budget, was made to the State Institute of Public Health of Stockholm. This fund is for aid toward the build-

ing and equipment of this Institute, and amounts to approximately 45 per cent of the construction and equipment costs. In general the activities of the Stockholm Institute of Public Health are similar to those of the schools of public health at Johns Hopkins and Harvard Universities. Teaching and research work dominate. In the Stockholm Institute, however, teaching covers a broader field. In addition to health officer training and specialization for degrees in hygiene, the Swedish Institute trains public health nurses and sanitary inspectors. It provides instruction in hygiene for undergraduate medical students of the Caroline Institute, which is the faculty of medicine of the University of Stockholm. It also investigates and gives advice regarding problems when requested to do so by the National Health Department, the National Industrial Board, or other government departments concerned with health. The Institute is also responsible for the education of the public in health preservation and disease prevention.

The Institute will be situated on the outskirts of Stockholm, where the new Caroline Institute and a large teaching hospital of 1,100 beds, as well as special institutions, such as the Radium Institute, are now in process of construction.

To the University of Toronto, the International Health Division gave \$255,000 in 1938 for the

endowment of its School of Nursing. The main objective of this School is to send out well-equipped public health nurses. The work of the School is an outgrowth of the Department of Public Health Nursing at the University. It has existed as a separate school of the University for about five years. The courses offered are: (1) One-year course in public health nursing for graduate nurses. (2) One-year course for hospital staff nurses in preparation for teaching and supervisory work. (3) Three-year course which leads to the School diploma. The purpose is to prepare a nurse well qualified for public health work, but at the same time the student is qualified for the general practice of nursing and to meet the requirements for nurse registration in the Province of Ontario. In addition, the School is a much-used center for educational work for both hospital and public health nurses throughout the whole Province.

In connection with this endowment of the Toronto University School of Nursing it is interesting to review the Foundation's participation through the years in projects for the advancement of nursing.

The first appropriation came in 1915, when \$600 was donated to the Nurses Association of China to provide for the translation of textbooks into the Chinese. From that small beginning, which constituted the total investment in this

field for that year, the interest has broadened until now there are sixteen countries of Asia, Europe, North America, Central America, and South America whose facilities for the training of nurses have been directly aided by Foundation grants. In some cases, schools have been established and buildings erected through these aids. In others, equipment and endowment have been provided for existing schools. And throughout the world there are 431 nurses who have been directly assisted through fellowships. All told, approximately \$910,164 has been invested in these fellowships, and \$5,455,291 in institutions.

The Foundation's major activities during its first decade were in the field of public health, and its interest in nursing has naturally concentrated on projects concerned with public health nursing. The first assistance extended in the United States began in 1918, through grants made to the National Organization for Public Health Nursing. Then in 1919 a committee was formed to survey the entire field, and its five years of inquiry, analysis, and report were supported by grants totaling \$55,000. The findings were published by the Macmillan Company under the title, *Nursing and Nursing Education in the United States*. This book had wide circulation and has greatly influenced the development of nursing standards and the improvement of training methods.

Other studies of nursing have been aided by the Foundation, both here and abroad. But fundamental to them all was this basic survey of 1919-1924 whose report showed up weak spots in nursing education and pointed the way to reforms. The public health nurse, it recommended, must be educated in methods of prevention as well as in those of cure. She must be trained not only to nurse the sick, but also to teach the elements of hygiene in the homes she visits. She must be thoroughly grounded in the principles of social case work, without which her efforts with families are necessarily halting and uncertain. The role is a triple one, combining the functions of nurse, teacher, and social worker.

Moreover, urged the report, the training of young women for this work must be set on a plane of professional education, with higher entrance requirements than were then the rule, with better teaching, fewer hours for service in the hospital and more hours for training in the school, and, above all, there must be provided "the endowment of nursing education as all other conceivable education has been endowed."

Principles such as these have animated and guided the development of training schools in the last decade and a half. In some instances the principles are still ideals awaiting attainment, but in others they have been wrought into actual prac-

tice. Undoubtedly the example of the schools assisted has had a far-reaching effect in raising the standards of nursing education generally.

In the United States the first grant to an institution was made in 1923: to Yale University for its School of Nursing. The next large grant was made in 1925 to Vanderbilt University. Other recipients include the D. Ogden Mills Training School for Nurses at Trudeau, New York, the George Peabody College for Teachers at Nashville, Skidmore College at Saratoga Springs, the University of Washington at Seattle, Washington University at St. Louis, and the Western Reserve University at Cleveland. In addition to the teaching institutions, grants have been made in New York to the Henry Street Settlement and to the East Harlem Nursing and Health Service, the latter an institution which has proved remarkably helpful in the training of nurses who are brought to New York on fellowships.

In Canada, apart from a small grant to the University of British Columbia for a field project in nursing, the Foundation's interest has been focussed on the University of Toronto, whose School of Nursing has become "a demonstration for Canada and the world."

Brazil has an excellent institution in its Anna Nery School of Nursing in Rio de Janeiro, to which the Foundation has made substantial con-

tributions. In Panama, the School of Nursing of Santo Tomás Hospital received a grant during the past year.

Europe has been a field of interest in nursing ever since 1917 and the days of the American Commission for the Prevention of Tuberculosis in France. Shortly after the World War, the Foundation's representative in public health nursing visited nine European countries to survey their nursing needs. Since then, with Foundation assistance, modern schools of nursing have been developed in Lyon (France), in Brussels (Belgium), in Cracow and Warsaw (Poland), in Prague (Czechoslovakia), in Cluj and Bucharest (Rumania), in Budapest and Debreczen (Hungary), in Zagreb (Yugoslavia), in Beirut (Lebanon). In London the Foundation provided a building and equipment for the school of nursing at the University College Hospital and assisted in providing a modern kitchen for St. Thomas's School of Nursing.

In the Far East the institutions which have been helped include the Siriraj Hospital School at Chulalongkorn University in Siam, the College of Nursing at St. Luke's International Medical Center in Tokyo, and, through appropriations to the China Medical Board, the nursing department of the Peiping Union Medical College.

It is impressive to review the many fine buildings that have been erected, the modern equipment that has been installed, the material resources that have been provided. And yet, very likely, the most valuable part of this international assistance lies in its intangible gifts of leadership and collaboration. Without that personal service, without the disinterested counsel of public health doctors, without the cooperation of the experienced nurses who went from America as advisers and active workers during the first year or two of the experiments in the Far East, in continental Europe, and in Latin America, public health nursing could not have advanced as far as it has in these last fifteen years of expansion.

THE MEDICAL SCIENCES

THE MEDICAL SCIENCES STAFF

During 1938

Director

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THE MEDICAL SCIENCES

THE Foundation in 1938 aided the building up of departments, the expansion of teaching, and especially the expansion of research in psychiatry and its allied fields. Each of these separate objectives is believed to serve the general purpose of the continuing program in psychiatry, that of finding, training, and encouraging capable individuals who are eager to work on the problems of nervous and mental disorders.

It is intended that these grants shall help put into effect the now generally accepted theory that teaching the point of view and the habit of thought of the psychiatrist is an essential part of an adequate medical education. Permeation of medical instruction by psychiatry not only brings this subject into better relationship with the other departments of medicine, but psychiatry itself is influenced and fortified by closer contact with biochemistry, endocrinology, genetics, and the other medical sciences. Much research in pathology, physiology, and anatomy is carried on for the specific purpose of discovering more about psychiatry and neurology. Studies in these fields and others which may not bear immediately on the problems of mental and nervous diseases may eventually throw new light on them. More of medicine can be related to psychiatry. For this

reason the Foundation has considered it not incompatible with its program to aid other potentially valuable research, especially new developments in medicine.

Appropriations for the medical sciences in 1938 amounted to \$5,344,700, which may be divided into the following general classifications: \$873,300 for psychiatry and allied fields, \$21,400 for public health teaching and research, \$200,000 for new developments in medicine, \$120,000 for fellowships administered directly by the Foundation, \$90,000 for small grants in aid, \$35,000 for emergency aid in China, and \$4,005,000 to meet commitments made under a former program. The latter figure is unusually large because of two items: \$1,000,000 to the American University of Beirut toward endowment of the medical sciences, nursing school, and premedical subjects, to terminate aid given during the past seven years; and \$1,110,320 to the China Medical Board, Inc., toward the budget of the Peiping Union Medical College, the balance of a pledge of \$2,000,000 made originally to cover a six-year period.

ESTABLISHMENT OR MAINTENANCE OF DEPARTMENTS OF PSYCHIATRY

UNIVERSITY OF CHICAGO MEDICAL SCHOOL

In 1938 the Foundation continued aid to the Division of Psychiatry in the Department of

Medicine of the University of Chicago by a grant of \$150,000 toward salaries of the staff and part of the cost of patients' care, for three years beginning July 1, 1938.

Before the Division of Psychiatry was established in 1935, the Department of Medicine included a Division of Neurology and Neurosurgery; psychiatry was represented in the Department of Pediatrics and the students' health service; and the Departments of Anatomy, Psychology, and Physiology were engaged in research closely related to neurology and psychiatry. Besides these activities, a fund had been available since 1921 from the Otho S.A. Sprague Memorial Institute for research in psychiatry. The establishment of a Division of Psychiatry allowed the Sprague Institute funds to be applied to their stated purpose, and provided a means of integrating the various other psychiatric efforts.

The fact that the unit has its offices, laboratories, a twelve-bed ward, and outpatient clinic in the University Hospital makes possible intimate relations with the other clinical subjects, particularly internal medicine, surgery, and neurology. The unit of fourteen full-time staff members is under the direction of Dr. David Slight.

Much emphasis is placed on the Division's function, concurrent with its task of teaching and research, of correlating psychiatric work in other

departments, and of inculcating in the clinical departments the habit of considering the psychological background of disease. The Division now collaborates in research with the Departments of Pharmacology, Physiology, Biochemistry, Neuroanatomy, and Pathology.

WASHINGTON UNIVERSITY SCHOOL
OF MEDICINE

In order to give psychiatry and neurology greater recognition, and to provide that the psychological factors in causation of disease should be adequately stressed, Washington University, St. Louis, established in 1938 a new full-time Department of Neuropsychiatry, with the aid of funds from The Rockefeller Foundation. The Foundation contributed \$150,000 for the three years, July 1, 1938, to June 30, 1941, and the University continues the maintenance given its hitherto small Department of Neuropsychiatry.

Three new professors have been engaged to represent the fields of neuroanatomy, clinical psychiatry, and experimental psychology. This combination of interests is planned to bring about cooperation with a rather large group of investigators who already are active in neurological research in the fields of physiology, biophysics, pharmacology, zoology, cytology, and surgery, and whose work provides an excellent foundation

for the research which will be undertaken in the new Department of Neuropsychiatry. The Child Guidance Clinic, which has been operating at the St. Louis Children's Hospital, will be expanded and better related to teaching and research under the Department of Neuropsychiatry. Cooperation with the George Warren Brown School of Social Service of the University also is planned.

About one floor of laboratory space in the Oscar Johnson Institute has been assigned for neuropsychiatric research. One half of the 200 beds in the new municipal psychopathic pavilion will be under the clinical direction of the Department of Neuropsychiatry of Washington University, and accessory laboratories will become available when this building is completed. Outpatient quarters have been provided in the University clinics, and twenty or more beds will be available at the Barnes Hospital.

EXPANSION IN TEACHING AND RESEARCH IN CENTERS OF PSYCHIATRY OR NEUROLOGY

COLUMBIA UNIVERSITY: COLLEGE OF PHYSICIANS AND SURGEONS

In March 1929 the Neurological Institute, a hospital for the treatment of nervous diseases, moved to its new quarters in the Columbia University Medical Center. Various units of the

Medical Center have been merged with the Presbyterian Hospital in the belief that responsibility for all hospital activities of the Center (with the exception of the State Psychiatric Institute) should rest in a single hospital organization. As of January 1, 1938, a similar coordination was effected for the Neurological Institute.

Consonant changes were made in the Department of Neurology, which since 1921 has constituted the professional staff of the Neurological Institute, to integrate neurology more closely with the other departments of the School of Medicine. The importance of neurology as a specialty is acknowledged by its status as a separate department. Nevertheless, the close relationship with, and dependence for investigation upon, the methods and techniques of research in the fundamental medical sciences is recognized. In order to link the Department of Neurology more closely to medicine, Professor Walter W. Palmer, executive officer of the Department of the Practice of Medicine, was appointed also executive officer of the Department of Neurology and medical director of the Neurological Institute; and Professor Robert F. Loeb was appointed professor of medicine in the Department of Neurology and associate medical director of the Institute.

Besides these changes, an assistant professor in neurophysiology and research associates in medi-

cine, neurochemistry, neuroendocrinology, and neurosurgery were added to the staff to make possible an expanded program of research in the reorganized department. With the Departments of Anatomy, Chemistry, Pathology, and Physiology, a comprehensive plan was evolved for fundamental cooperative research in these fields.

To cover the expenses of the research planned an addition of \$50,000 a year to the regular budget of the Department of Neurology was necessary. Toward this amount the Foundation granted in 1938, \$100,000 for a period of five years beginning July 1, 1938.

CORNELL UNIVERSITY

In 1938 the Foundation continued aid, begun in 1935, to studies of experimental neuroses in animals, conducted by Professor H. S. Liddell of Cornell University, by appropriating \$33,500, of which \$6,500 was to be applied toward the construction of a new laboratory, and \$27,000 toward research expenses over the three-year period beginning August 1, 1938. During the period of the Foundation's aid Professor Liddell has been able to increase his staff and expand his work through help from the University and other sources. Lately the work has been moved to a new laboratory on a farm purchased by the University.

The ultimate purpose of this research is to

throw light on some of the fundamental biological processes in human maladjustment, through long-continued and detailed studies of animals whose lives are carefully controlled and conditioned. With the conditioned reflex technique, a sheep, pig, or goat (the animals which Professor Liddell uses in his experiments) is confronted by situations of increasing complexity in respect to the significance of particular sounds and other stimuli, until its nervous system responds with a type of behavior analogous to a neurosis in a human being. Abnormal states which strikingly resemble the psychoneuroses in man have been produced, and have been alleviated by administration of the hormone cortin. Further studies are planned of the conditions that precede and lead to some forms of mental disorders, and experimental therapeutic procedures will be devised for their cure.

As a step toward applying the results of these studies to abnormal behavior in man, a member of Professor Liddell's unit will work during the year 1938-1939 at the Psychiatric Clinic of the Massachusetts General Hospital in Boston under the Direction of Professor Stanley Cobb of the Harvard Medical School

LONDON COUNTY COUNCIL:
MAUDSLEY HOSPITAL

The Maudsley Hospital, which contains now, without the expansion proposed or under way,

some 200 beds, is the principal psychiatric hospital in London. It is maintained by the London County Council, with the help of private patients' fees. Patients, who are admitted on a voluntary basis, represent a wide range of mental illness, and may be either major or minor cases, with the provision only that they are of such a type or in such a stage that improvement is considered possible. An unusual advantage for pathological research and for cooperation with the clinical research is afforded by the presence in this Hospital of the Central Pathological Laboratory which serves all the institutions under the care of the Mental Hospital Committee of the London County Council. The Hospital is organized for both teaching and research. In recognition of its function of teaching, the Maudsley Hospital is a school of the University of London, and the medical superintendent, Dr. Edward Mapother, and the director of the central laboratory, Dr. Frederick Golla, hold professorships in the University.

The Maudsley Hospital is the center for refresher courses for practitioners in England, and for postgraduate students from the dominions. In 1937 thirty such students came from Great Britain and Ireland, twenty-two from the dominions, and fifteen from foreign countries. The staff of the Hospital also teaches psychiatry to undergraduates at Kings College Hospital. Nine mem-

bers of the present staff have held fellowships from the Foundation.

Construction of a separate villa for private patients, and a special block for children has begun and is expected to be completed in 1939. Construction of a further addition, a neuropsychiatric wing, is planned.

In continuation of aid begun in 1935 the Foundation in 1938 granted £25,000 (\$127,500), over a period of five years beginning July 1, 1938, toward the expenses of a research unit at the Maudsley Hospital. This aid provides the salaries of two or three clinical investigators, three workers, in the Pathological Laboratory, and a fluid fund which may be used for temporary technical assistants, special apparatus, and laboratory supplies.

NEUROLOGICAL CENTER, BRUSSELS

The Brussels Neurological Center, an organization for the study and treatment of neurological diseases, was created in 1925. The aim of the director, Dr. Leon Laruelle, is to develop the Center as an international institute for research, and as a place for postgraduate training for Belgian physicians. The Center in 1937 was given official status by a royal decree making it an "institute of public utility." About two-thirds of the support for the Center comes from private contributions and fees of private patients; the

remainder is supplied by subsidies from the central government and the provinces.

An active program of research is carried on in neuroanatomy, neurophysiology, and neuropathology. In 1938 the Foundation contributed Belgian francs 360,000 (\$12,750), over the four-year period beginning February 1, 1938, toward the completion of Dr. Laruelle's anatomical studies, which by the use of longitudinal sections of the spinal cord and midbrain present a new technical approach; and toward research in neurophysiology in charge of Dr. Lucien Brouha.

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

Electrical phenomena at present offer the most precise and direct criteria of nervous activity. At the School of Medicine of Washington University, St. Louis, is a research group devoted to investigations in neurophysiology based primarily on the new technique which records action currents from the brain and nervous system by means of the cathode ray oscillograph and amplifier. In 1933 the Foundation aided this research for a period of five years in order that the activity of the group and the stimulus it afforded to other workers in the same field in the University and elsewhere might be continued. In 1938 the Foundation granted \$84,000 for a further period of

seven years beginning September 1, 1938, toward a budget which includes the salaries of the director and his associate, technical and secretarial assistance, and laboratory equipment and supplies.

The director, Dr. George H. Bishop, professor of biophysics, and Mr. Samuel H. Bartley, research associate in biophysics and psychology, are the nucleus of the group. Conducting most of their research in this laboratory are a neuroanatomist and a surgeon and neurosurgeon, whose salaries are provided by the Departments of Anatomy and Surgery, respectively. Members of the group have also conducted research jointly with members of the Department of Physiology, Bacteriology, and Biochemistry, as well as with workers from other institutions in two instances.

The research has included: analysis of the electrical activity of the cerebral cortex, with special reference to action currents of the retina, of the optic, the sensorimotor, and the olfactory areas; correlations between action currents and the functioning of the brain; studies of the relation between function and structure of the nervous system; and investigations of the relation between the central and peripheral nervous system through studies of sensation and circulation.

Collaboration of this group with other departments is expected to increase, and it is believed that cooperation with the men in the new Depart-



Photograph Excised Here

Laboratory of Physics and Physicochemistry, Neurobiological Laboratory, University of Marseille.



Photograph Excised Here

Four-bed ward, National Hospital,
Queen Square, London.

ment of Neuropsychiatry in Washington University will be of particular advantage.

EMMA PENDLETON BRADLEY HOME

A research unit at the Emma Pendleton Bradley Home, Providence, a fifty-bed institution, privately endowed, for the care of children suffering from neurological and behavior disorders, has been conducting investigations by means of the amplifier-oscillograph, or electroencephalographic method.

Although Dr. Herbert H. Jasper, who has been directing the work, has gone to a research post at the Neurological Institute of McGill University, certain of the studies are being carried on under other direction. The Foundation continued aid in 1938 by a grant of \$15,000 over a three-year period beginning September 15, 1938, to complete the studies planned.

The Butler Hospital, the Rhode Island Hospital, the State Hospital for Mental Diseases, and the State Infirmary cooperate by furnishing clinical material, especially dementia praecox cases, and records for study. Dr. Jasper was a member of the staff of the Psychology Department of Brown University, as is his successor, and graduate students from the University work at the Bradley Home. Dr. Arthur H. Ruggles, superintendent of the Butler Hospital for Nervous and Mental Dis-



Photograph Excised Here

Institute of Human Genetics, University of Copenhagen,
Denmark. *Below:* Histological Laboratory.

eases, is also superintendent of the Bradley Home, and assists the research unit in an advisory capacity.

Electric discharges from the brain are recorded through the amplifier-oscillograph system as they exist in those with definite pathological changes in the brain, birth injuries, encephalitis, tumors, etc., and mental cases without demonstrable organic changes, such as dementia praecox and behavior disorders in children. These records are analyzed in relation to clinical symptoms and normal electroencephalographic records, of which a large series is being built up to form a reliable basis for comparison.

McGILL UNIVERSITY FACULTY OF MEDICINE

Dr. Herbert H. Jasper of the Emma Pendleton Bradley Home demonstrated his methods and cooperated in some of the research at the Neurological Institute of McGill University, Montreal, during several visits. Dr. Wilder Penfield, director of the Institute, wished to supplement some of the neurophysiological research under his direction with electroencephalographic methods, and both he and Dr. Jasper realized the advantages of using the electroencephalographic technique in cooperation with a university faculty, including neurologists, neurosurgeons, physiologists, and

physicists. In consequence, Dr. Jasper was offered and accepted a post at the Neurological Institute.

Expenses of the contemplated studies were estimated for a period of four years. The budget included the salary of Dr. Jasper, necessary technical and other assistance, construction of quarters for the work, and installation of the equipment. An electroencephalographic machine already had been built. The Foundation in 1938 voted \$51,000 to provide Canadian \$12,500 a year for four years beginning July 1, 1938, toward the total budget.

The investigations will concern, besides other research, cerebral circulation in epilepsy and studies of dementia praecox.

MASSACHUSETTS DEPARTMENT OF MENTAL DISEASES: BOSTON STATE HOSPITAL

The Foundation aided in 1934 a research laboratory at the Boston State Hospital, a hospital of some 2,400 beds for mental disorders which operates under the Massachusetts Department of Mental Diseases. The grant made it possible for the director of the research, Dr. Abraham Myerson, to give at least half of his time to the work, and provided certain additional personnel. The State cooperated by providing new laboratories, equipment, and funds for certain other expenses. The Foundation continued aid in 1938 by a grant

of \$20,550 for a period of eighteen months beginning March 1, 1938, at the previous rate of \$13,700 a year

The Foundation has included in its program in psychiatry, aid to research in state mental hospitals in the hope that active and successful units may stimulate work of this kind in other state hospitals, where a wealth of clinical material is available. Such units make positions in state institutions more attractive to competent men, and are a factor in improving the care of patients.

The central motive of the research conducted by the unit at the Boston State Hospital is to discover whether, in the apparently healthy bodies of some persons suffering from mental disease, a basic physical disorder may be found. The problem is being approached in various ways. Some of these are: studies of the effects of certain drugs on the autonomic nervous system; of the mineral content of normal and pathological cells of the body, particularly those of the nervous system; of vitamin deficiency; of allergy in relation to brain disease; and of brain action currents by means of the electroencephalograph.

A clinical and therapeutic study is being made of the evolution of neuroses into the so-called psychoses. These investigations indicate that the dividing line between the neuroses and the psychoses requires further definition.

The unit has cooperated in its research with the Harvard Fatigue Laboratory and the Massachusetts Institute of Technology.

INSTITUTE FOR PSYCHOANALYSIS

Following a grant for three years made in 1935, the Foundation in 1938 appropriated to the Institute for Psychoanalysis, Chicago, over the five-year period, October 1, 1938, to September 30, 1943, \$120,000. Of this sum \$100,000 was to be used for general expenses, and \$20,000 was to provide a limited number of fellowships for the psychoanalytic training of teachers and investigators in psychiatry.

Besides training to qualified psychiatrists who wish to practice psychoanalysis, the Institute gives instruction also to physicians other than psychiatrists, and to workers in fields such as sociology, anthropology, education, social work, and criminology. During the past five years twenty-three psychiatrists have completed the course of instruction, and eighteen others are now in training. Over two hundred twenty-five patients have had analyses conducted or controlled by the Institute. Six fellowships have been granted from funds contributed by the Foundation to psychiatrists already engaged in research or teaching, who plan to devote themselves to academic or institutional work.

The Institute for Psychoanalysis carries on clinical research, particularly in the correlation of somatic and psychological disturbances.

The Institute has established interchange of consultation and lecturing services, or other forms of cooperation, with the University of Illinois, the University of Chicago, Northwestern University, the Institute of Juvenile Research, the Michael Reese Hospital, the Illinois State Hospitals at Elgin and Kankakee, the Menninger Clinic at Topeka, Kansas, and the Institute for Child Welfare of the University of California, Berkeley.

EDUCATION OF THE PUBLIC REGARDING PROBLEMS IN MENTAL HYGIENE

AMERICAN PSYCHIATRIC ASSOCIATION

To aid in the diffusion of present knowledge and practices in the prevention and care of mental disease, the Foundation in 1938 contributed to the American Psychiatric Association of New York \$9,000 for expenses incidental to the preparation of a symposium on mental hygiene given under the auspices of the Section on Medical Sciences of the American Association for the Advancement of Science at its meeting in December 1938. Dr. Walter L. Treadway, then assistant surgeon general of the United States Public Health Service, was chairman of the committee which prepared the program. The American

Psychiatric Association, in cooperation with the Mental Hospital Survey Committee, the National Committee for Mental Hygiene, and the United States Public Health Service, collaborated with the program committee.

The symposium was held in six separate sections during three days. The sessions dealt with the economic, sociological, and administrative problems of psychiatry, as well as with research and teaching. At the close, Dr. MacFie Campbell gave an address based on the salient points of these meetings before a general session of the Association.

For each of the sections, six to ten different authorities on the subject of discussion prepared papers. The papers were printed in brochure form and distributed in advance of the meetings as memoranda for study in preparation for the discussions. After formal talks by two or three speakers, the meeting was open to general participation.

The meetings of the American Association for the Advancement of Science were reported in *Science* and by the newspapers. The six brochures with the discussions added will be published and distributed by The Science Press. The novel method of preparing this symposium informed those in attendance at the meetings, and aided in a more general diffusion to others interested and

to the public, of present knowledge in regard to problems of psychiatry.

PUBLIC HEALTH TEACHING AND RESEARCH

DALHOUSIE UNIVERSITY FACULTY OF MEDICINE

The Department of Preventive Medicine of Dalhousie University operates a public health clinic in a building toward the construction and equipment of which the Foundation contributed in 1920. This clinic serves as an outpatient department for the other clinical departments of the University, as well as a health center for the city. In order that the University might make the greatest use of the health center, the Foundation in 1933 aided the Department of Preventive Medicine over a five-year period. An epidemiologist was added to the staff, and the teaching of preventive medicine was made more vivid and practical. The students could engage in field studies, and the Department became of increasing value to the locality and provinces which it serves. The city and the Province of Nova Scotia each have increased support, and contributions from the community chest and other sources evidence a growth in public interest.

Dalhousie University has the only medical faculty in the Maritime Provinces (Nova Scotia,

New Brunswick, and Prince Edward Island), and Newfoundland, and the number of students from these provinces is becoming so large that the number of outsiders who can be admitted is diminishing rapidly. While the provinces are pleased with this change in student body, the University in giving preference to applicants for admission from the Maritime Provinces loses the extra fees charged to outsiders.

Increased local and provincial interest should in time make up for this loss. In order that the development of the Department of Preventive Medicine may not be hampered during the period of adjustment, the Foundation appropriated in 1938 Canadian \$21,000 (\$21,400) for this work for the three years beginning September 1, 1938.

NEW DEVELOPMENTS IN MEDICINE

RESEARCH COUNCIL OF THE DEPARTMENT OF HOSPITALS OF NEW YORK CITY

Chronic diseases place a heavy burden on large municipalities. The number of patients with such diseases is growing because of the decrease in deaths from infectious diseases at all ages, and the consequent increase in the population in the older age brackets. Research in these maladies, such as chronic diseases of the heart, arteries, joints, lungs (nontuberculous), kidneys, and or-

gans of internal secretion has not received the emphasis which is warranted by their incidence and the economic loss to the community which long-continued disablement causes. Unquestionably, also, the problems of old-age pensions and sickness insurance as they are affected by chronic invalidism will increase the importance of research in this field.

At the invitation of the Department of Hospitals of New York City, a group of public-spirited citizens formed in 1935 a Research Council to foster research in the city's hospitals, and to receive and administer funds for this purpose. A Research Division of Chronic Diseases has been created. A scientific committee of representatives of the medical schools of the city and of the city Department of Hospitals guides the Council in scientific matters. According to a plan proposed to improve the care of the chronically ill, each of the five local medical schools would eventually take over a unit of the city's hospitals for chronic diseases. Each school would assume clinical services for teaching purposes, and be responsible for a research unit. The city's new 1,600-bed hospital on Welfare Island, which was expected to be completed in final detail by about July 1, 1939, will be conducted in affiliation with the medical schools of Columbia and New York Universities.

The first unit of the Research Division of Chronic Diseases was organized by the College of Physicians and Surgeons of Columbia University. It is now occupying a reconstructed building on Welfare Island which provides seventy beds and laboratory space, but will be moved into the new hospital as soon as the laboratory quarters are finished.

In order to provide the salary of a pathologist, additional instruments and material, and other expenses for this research unit, the Foundation appropriated in 1938, \$66,000 over a period of three years beginning March 1, 1938, to the Research Council of the Department of Hospitals of New York City.

NATIONAL COMMITTEE ON MATERNAL HEALTH

Following an initial grant in 1937 for one year, the Foundation appropriated to the National Committee on Maternal Health, New York, in 1938, \$18,000 over a period of three years beginning October 1, 1938, toward the general budget, which includes administrative expenses and a fund for research.

The central function of the National Committee on Maternal Health, is to select, plan, and supervise research projects in the medical aspects of maternal health, human fertility and sexual behavior, and related subjects. The Committee

seeks to coordinate the various interests in this field. Expert advice is available to the Committee through its own board of directors and other sources on such subjects as public health, gynecology, urology, medicine, psychiatry, biology, chemistry, pharmacology, and sociology.

Groups in Johns Hopkins University School of Medicine, Harvard Medical School, and Columbia University Medical School are now engaged in research projects supported and promoted by the Committee, under the general direction of the Research Secretary, Associate Professor Earl T. Engle of the Department of Anatomy, Columbia University.

COMMISSION ON GRADUATE MEDICAL EDUCATION

The Advisory Board for Medical Specialties was organized in 1933 to coordinate graduate education and certification of medical specialists in the United States and Canada. It reports to and functions in conjunction with the Council on Medical Education of the American Medical Association, and is supported by sixteen member organizations. Four of these organizations, the Association of American Medical Colleges, the American Hospital Association, the Federation of State Medical Boards, and the National Board of Medical Examiners are national, and represent

Hôpital de la Pitié,
Paris. Room for aural
examinations.



Photograph Excised Here

Exhibits of the per-
manent historical mu-
seum of the Institute
of the History of Medi-
cine, the Johns Hop-
kins University, Balti-
more, Maryland.



Photograph Excised Here



Photograph Excised Here

Simple structure used as laboratory for research in reflex
behavior, Cornell University Medical College.



Photograph Excised Here

University of Oregon Medical School, Portland. New library building on the extreme left. *Below:* Architect's drawing of library.

on the Board the viewpoint of medical schools, hospitals, and the state and national examining boards.

Basic requirements for proper training for the several specialties have been established in general terms by the Advisory Board for Medical Specialties in cooperation with the Council on Medical Education and Hospitals of the American Medical Association and the various American specialty boards. It is generally acknowledged that a need exists for more definite formulation of the principles of postgraduate medical training, which will help to coordinate the efforts of medical schools, hospitals, licensing bodies, and the various specialty boards as well. To meet this need the Advisory Board for Medical Specialties created in 1937 a Commission on Graduate Medical Education. This Commission will survey the whole field of postgraduate medical education, including opportunities for those in practice to keep abreast of new developments in diagnosis, treatment, and prevention.

Postgraduate education in the emphasized fields of interest of the Foundation's program in the medical sciences, psychiatry and neurology, and public health education, should profit from such a thorough consideration of this problem. The Foundation in 1938 granted \$36,000 to the Commission on Graduate Medical Education for

a period of three years beginning February 1, 1938.

DARTMOUTH COLLEGE: DARTMOUTH
EYE INSTITUTE

The unit known as the Dartmouth Eye Institute at Hanover, New Hampshire, is devoted to research in physiological optics. This research came about through the interest of Professor Adelbert Ames, Jr., in how the eye records the images which we see. Professor Ames went to Dartmouth after the World War and worked in cooperation with the Department of Physics. He soon gathered around him a group interested in physiological optics. This unit experimented with all sorts of measuring apparatus, improved existing instruments, invented new ones, and devised new ways to use them. Emphasis upon greater and greater precision soon began to yield new knowledge of the eye.

The group, with its new apparatus, verified the theoretical possibility that the images transmitted to the brain by the eyes might be of a different size and shape, an anomaly which has been named aniseikonia. This discovery was first reported before the Academy of Ophthalmology and Otolaryngology in 1931, and appeared in medical literature in 1932.

The research of the Eye Institute is not confined to aniseikonia. Many other investigations

are being made which include study of the various problems aniseikonia has revealed. A survey of the Dartmouth class of 1940 is being conducted by members of the Eye Clinic and the Department of Psychology in connection with investigations of the relation of certain conditions in the physiology of the eye to disabilities in reading and failure in academic accomplishment.

The Foundation has aided the research in physiological optics at Dartmouth College since 1934, principally for development of methods of diagnosis and treatment of aniseikonia. In view of the importance of the work of this group in the field of physiological optics, \$60,000 was granted in 1938 over the three years beginning September 1, 1938.

MASSACHUSETTS GENERAL HOSPITAL

Investigations at the Massachusetts General Hospital under Dr. Fuller Albright revealed that the excessive deposits of calcium and phosphorous found in the urine in cases of hyperparathyroidism frequently appeared to lead to kidney stones. In an approach to the problem from the opposite direction, it was found that from 5 to 10 per cent of patients with kidney stones had an underlying hyperparathyroidism. The investigators were confronted with the question of the relation of the parathyroid hormone to calcium

and phosphorus metabolism, and whether the other patients with kidney stones, those with no hyperparathyroidism, had some metabolic disease.

The research has led to a further study of the action and function of the parathyroid hormone, studies of calcium and phosphorus metabolism, and the relationship of the parathyroid hormone to certain types of bone disease. Spectroscopic analysis of the kidney stones by a medically trained physicist supplements the chemical investigations.

The Foundation first contributed (through the Division of Natural Sciences) in 1935 toward the salary of a physicist and for apparatus, for a period of three years. The Medical Sciences continued aid in 1938 by a grant of \$20,000 for the five-year period beginning September 1, 1938.

FELLOWSHIPS

From previous appropriations the Foundation administered in 1938 sixty-eight fellowships in the medical sciences. For fellowships during the year 1939 the Foundation appropriated \$120,000. Fellowships in the medical sciences are granted for training in research, and the program is so administered that, in the main, it supplements the general program of the Medical Sciences.

Of the sixty-eight fellowships administered directly by the Foundation, sixty-five were sup-

ported by funds from the Foundation and three from funds provided in 1937 by the General Education Board under a joint program which has been discontinued.

The subjects studied by the sixty-eight fellows who pursued their work during all or some part of 1938 were: neurology and related subjects, including neuropathology, neurophysiology, neuroanatomy, neurosurgery, clinical neurology, and biochemistry of the nervous system, thirty-eight; psychiatry, child psychiatry, and endocrinology in relation to psychiatry, including one who studied also neuropathology, eleven; experimental psychology, three; legal medicine, one; radiology, especially of the skull, one; nutrition in relation to alcoholism, one; endocrinology, four; physiology, one; and public health teaching, eight.

Fellowships in 1938 were granted to individuals in nineteen different countries, as follows: Belgium, China, Hungary, Iceland, Italy, Java, Lithuania, Peru, Poland, and Switzerland, one each; Finland, France, Latvia, and Portugal, two each; Germany, three; Japan and Sweden, four each; Great Britain, nineteen; and the United States, twenty. All except nine fellows studied in countries other than their own. These nine were from the United States and studied in other centers of their own country than those in which they

were stationed. The fellowships were divided as to countries of study, as follows: one in Belgium and England, one in Denmark and the United States, and one in the Netherlands; two in Canada, two in both Canada and the United States, two in Germany, and two in various European countries; three in France and three in the Scandinavian countries; thirteen in Great Britain; and thirty-eight in the United States.

From funds granted previously by the Foundation to the National Research Council for fellowships in the medical sciences eight fellowships were awarded in 1938, and twelve were continued into 1938 from the previous year. Of the total of twenty fellows, eighteen studied in the United States and two in England.

In 1938 the Medical Research Council of Great Britain, from funds contributed by the Foundation in 1937 for a period of three years, granted six fellowships, and continued seven fellowships from the previous year. These fellows studied in the United States, with the exception of one who studied also in Germany, and one who studied in Paris. The subjects of study included internal medicine and rheumatic fever, two each; infectious diseases, experimental cancer, neurology, radiology (therapy), surgery, pathology of chronic arthritis, cardiology, endocrinology, and virus diseases, one each.

A portion of the funds furnished to the China Medical Board, Inc., by the Foundation is designated each year for fellowships for members of the staff of the Peiping Union Medical College to study abroad, and for members of the staffs of other schools and hospitals in China to study at the Peiping Union Medical College. In 1938 the Peiping Union Medical College granted six fellowships to members of its staff, and financed six which extended into 1938 from the previous year. Nine of these fellows studied in the United States, one in Canada, and two in Europe. Ninety-nine individuals, six of whom were appointed research fellows of the College, from thirty-eight universities, colleges, hospitals, health departments, and other institutions in China studied at the College in 1938. Thirty-seven of these fellowships were in nursing.

GRANTS IN AID

From funds available for grants in aid in 1938 thirty-three studies received allotments totaling \$91,293.87, of which the smallest was for \$783.87 and the largest for \$7,500. Practically all of these grants were in the special fields of interest of the Division of Medical Sciences.

Twelve grants aided the work of former fellows of the Foundation and General Education Board, and three aided former fellows of the Medical

Research Council of Great Britain, which receives fellowship funds from the Foundation.

The thirty-three grants were distributed among the following eight countries: Czechoslovakia, one; Denmark, three; France, eight; Germany, two; Great Britain, thirteen; Peru, one; Switzerland, one; and the United States, four.

EMERGENCY AID IN CHINA

WEST CHINA UNION UNIVERSITY

SCHOOL OF MEDICINE

The Foundation appropriated in 1938 to West China Union University at Chengtu \$35,000 toward the building and equipment of an outpatient clinic for the School of Medicine. This is a project of a permanent nature which had been planned for some time, but which suddenly became an urgent emergency need.

West China Union University, a missionary institution in the ancient city of Chengtu in the western Province of Szechwan, China, has become during the past year the host of students from some thirty eastern universities and colleges which have found it impossible under present unsettled conditions to continue their work on their own campuses. Three hundred twenty-five students are enrolled in the School of Medicine which has usually about 170 students. Seventy students each are registered from the medical schools of

Cheeloo University, Tsinan, Shantung, and Central National University, Nanking. Staff members from these two medical schools have arranged to work cooperatively with the medical staff of West China Union University.

The University already had raised funds and had plans drawn for a medical center to meet the needs of its own work in the surrounding community. Chengtu is a city of over 600,000 population, now greatly augmented, in the center of the Chengtu plain with a population averaging over 1,100 to the square mile. The influx of refugees and others who wish to be far enough from the disturbances of war to continue constructive work, has necessitated immense development.

As it was necessary to supply immediately facilities for teaching clinical subjects, as well as to care for the sick and wounded among the refugees entering Chengtu, the authorities of the University decided to erect at once the building for the outpatient clinics of the proposed medical center. There were not sufficient funds in hand for the outpatient building and equipment, although funds designated for the hospital building had been secured. The Foundation's grant provided \$15,000 toward the outpatient building and \$20,000 toward equipment for two operating rooms, x-ray equipment for fracture service and bedside unit, laboratory and other equipment.

The task of organizing the suddenly expanded clinical work is entrusted to Dr. Sheo-nan Cheer, dean of Central National University Medical School.

CONTINUATION OF AID BEGUN UNDER FORMER PROGRAM

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

Since 1910 the School of Medicine of Washington University, St. Louis, has developed steadily in plant, equipment, and standards. Members of the staff have made important contributions to the progress of medical science; and the quality of the staff and facilities of the School have attracted students from nearly every state in the country. In the region of its influence in the Southwest, Washington University is outstanding.

The depression has affected the investments of the School to the extent that the budget has been cut about 19 per cent. While with drastic reductions the School has kept within the income which it receives, the effect of the budget reductions has been crippling to the departments of clinical medicine. A serious deterioration in staff would be practically certain if this curtailment should continue. With the decline in activity and quality in the general clinical departments, encouragement to the creation of a center for neuropsychia-

try, which the Foundation is aiding also, in this School would hardly be justified.

The authorities of the School of Medicine believe that substantial savings can be made by certain internal readjustments, but additional funds are necessary to preserve the standards of the School. The Foundation contributed in 1938 \$400,000, over a period of ten years beginning July 1, 1938, toward maintenance of departments in the School of Medicine of Washington University, especially medicine, surgery, pediatrics, and obstetrics.

JOHNS HOPKINS UNIVERSITY: INSTITUTE OF THE HISTORY OF MEDICINE

Much vitality has been given teaching and research in the history of medicine at the Johns Hopkins University School of Medicine by emphasis upon the relationship of medicine throughout its history to the general background of society.

Investigations of the Institute cover a wide range. At present they extend from Greek through early Middle Age and sixteenth and seventeenth century English to early American medical literature. More than one hundred articles by Dr. Henry E. Sigerist, director of the Institute of the History of Medicine, and his associates have been published since 1934 in the Bulletin of the Insti-

tute and various other scientific and scholarly publications. This group has published also several books and edited the Hideyo Noguchi Lecture series and other volumes.

The introductory course of the Institute, which is voluntary, is attended by practically all of the freshman students. Lectures on sociological medicine are frequently attended by outside physicians and the audiences often have been larger than the total enrollment of the School. The Institute has become a center of teaching in the humanistic aspect of medicine.

The Foundation continued support to the Institute in 1938 by a grant of \$150,000 for a period of ten years, beginning July 1, 1938, with the understanding that not more than \$15,000 should be available in any one year.

STANFORD UNIVERSITY SCHOOL OF MEDICINE

During the years 1930 to 1936 the Foundation contributed to fluid research funds in medicine at Stanford University, and subsequently to specific research in diseases of the kidney and the physiology of the nervous system. At a time of financial stringency, as at present, when funds for research are lacking, aid for this purpose is needed to retain junior staff and prevent discouragement among senior men who have research problems under way.

To meet the present need for research funds the Foundation appropriated in 1938 to Stanford University \$75,000 for a fluid research fund in the School of Medicine, to be used over the five-year period beginning September 1, 1938, annual payments of \$10,000 to be made without condition, with an additional \$5,000 to be paid annually on condition that \$5,000 be secured for the same purpose from other sources.

UNIVERSITY OF OREGON SCHOOL OF MEDICINE

The General Education Board contributed toward the development of the Medical School of the University of Oregon, Portland, during the years 1921 to 1929, for buildings and equipment and for the library; and in 1932 and 1935 the Foundation gave a total of \$15,000 for research.

In a cooperative agreement between the three States of Washington, Idaho, and Oregon, the University of Oregon assumes responsibility for maintaining adequately a school of medicine, and thus becomes the center of medical education in the Northwestern States.

The library of the University of Oregon Medical School furnishes an important service not only to the students and faculty, but to the medical profession of the State and the Northwest. In the year 1934-1935, 5,110 volumes were used by phy-

sicians in Portland, 1,602 volumes by physicians outside Portland, and 2,076 volumes by others who were not physicians. The number of volumes, which includes monographs, texts, and bound periodicals, has increased nearly 200 per cent since 1927, from 8,220 to 23,992. The increase in circulation has been even greater, from 13,720 in 1927 to 45,648 in 1937. This rapid growth has so taxed the facilities of the library that some of its volumes are not easily available, and full advantage of its resources can not be taken.

In view of the urgent need, and the exceptional use made of the library over such a large area, the Foundation in 1938 appropriated \$100,000 toward a total of \$200,000 for a new building. The additional \$100,000 needed, already has been pledged by a private donor. The building will contain, besides space and equipment for the library, an assembly hall to be used not only by the students and faculty but by medical societies of the region.

YALE UNIVERSITY: INSTITUTE OF HUMAN RELATIONS

The Institute of Human Relations at Yale University, established in 1929 with the aid of funds from The Rockefeller Foundation, was perhaps the first conscious academic attempt to promote on any considerable scale research which should help to coordinate man with his environment.

The Institute has worked out gradually its methods of approach to the general problem. The administrative policy has been to keep the Institute as closely related to the academic life as possible. The regular faculty members who have problems in the Institute's field participate in the work of the Institute and collaborate with the Institute's staff. The work began with the fusion of existing research projects in child study, psychiatry, and psychology, and the addition subsequently of new undertakings in anthropology, sociology, and other social sciences. As this pioneer effort has developed, changes have been made in the early plans. The Department of Psychiatry has been a part of the Institute. It was found, however, that it was not necessary to carry this whole Department on the budget of the Institute in order to secure the cooperation desired, and provision has been made to transfer the Department of Psychiatry to the budget of the School of Medicine beginning July 1, 1939.

It is the object of the Institute to keep its work fluid, and to function as an agent for the coordination of research which stretches over more than one departmental field, but which at the same time is pointed primarily toward problems of human behavior, individual and social, normal and abnormal. The departments now cooperating most actively are psychiatry, psychology, sociol-

ogy, and anthropology; and other departments cooperating in various degrees are pediatrics, anatomy, physiology, economics, education, history, and philosophy. The cooperative research is carried out in the Institute's own building of some 300 rooms.

In order that the work may become well established beyond the first experimental period, Foundation aid for which expires on June 30, 1939, \$700,000 was appropriated by the Foundation in 1938 as a final grant, with the expectation that the fund will be used, interest and principal, to provide approximately \$80,000 a year for ten years toward the budget of the Institute.

AMERICAN UNIVERSITY OF BEIRUT

The standards of the School of Medicine of the American University of Beirut, Lebanon, are similar to those of American medical schools approved by the Council on Medical Education of the American Medical Association.

The Foundation has contributed toward the School of Medicine of this University since 1924, principally for development of its teaching, but also toward the construction of certain much-needed buildings. In order to increase the opportunities for practical teaching in medicine and nursing, help was given in 1927 toward the establishment of a health center. In 1931 funds were

provided over a seven-year period for improvement of teaching (salaries sufficient to hold capable men and attract competent new staff members) in the medical sciences, nursing, and the premedical subjects. Twenty-one members of the staff have pursued special studies on fellowships from the Foundation, and several small grants in aid have been given for research of individual staff members.

Over the period of Foundation aid the School has outgrown its hospital facilities. The construction of a new hospital contemplated during the past seven years was not accomplished because economic conditions made the raising of funds too difficult. The authorities of the University now believe, however, that the funds needed can be secured. Recently the International College at Smyrna moved to Beirut and combined resources with those of the American University.

The Foundation in 1938 granted \$1,000,000 for endowment of the medical sciences, nursing school, and premedical subjects, on condition that the University secure on or before July 1, 1939, \$500,000, one half to be used for a hospital building and equipment, and one half for endowment of the hospital.

CHINA MEDICAL BOARD, INC.

The Peiping Union Medical College is financed chiefly by an endowment given by the Founda-

tion to the China Medical Board, Inc., upon its establishment in 1928. The Foundation agreed at that time to make supplemental appropriations for a period of four and a half years, and has since made additional grants to maintain the College budget at a satisfactory level.

In 1936 the trustees of the Foundation authorized their Executive Committee to appropriate sums annually to the China Medical Board, Inc., during the six-year period, July 1, 1937, to June 30, 1943, not to exceed a total of \$2,000,000 for the whole period. Against this authorization \$420,000 was appropriated in 1937 and \$469,680 in 1938. On December 7, 1938, the trustees of the Foundation appropriated the balance of \$2,000,000 pledged in one sum, a total of \$1,110,320.

The war has caused no serious interruption of the College routine. Although some students from distant provinces have had great difficulty in reaching Peiping, the College opened in September with an attendance of 107 medical students, about the same as in 1937, and thirty-nine student nurses. One hundred ten research fellows and graduate students reported for work, including eight graduate students in nursing.

THE NATURAL SCIENCES

THE NATURAL SCIENCES STAFF

During 1938

Director

WARREN WEAVER

Associate Director

FRANK BLAIR HANSON

Assistant Directors

HARRY M. MILLER, JR.

W. E. TISDALE

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THE NATURAL SCIENCES

FOR the support of its program in the natural sciences The Rockefeller Foundation appropriated \$2,829,870 in 1938. At the present time this program is confined almost entirely to experimental biology, and practically all the grants covered by the year's appropriations were for studies of the phenomena of life. Aid was given for explorations of a fundamental nature in the fields of zoology, physiology, nutrition, endocrinology, embryology, genetics, and those borderline areas in which physics and chemistry merge with biology. With the aid of the precise tools furnished by the modern laboratory these explorations are reaching deeper and deeper into the living organism and are revealing many facts about the structure and behavior of its minute intercellular substances. And gradually there is coming into being a new branch of science—molecular biology—which is beginning to uncover many secrets concerning the ultimate units of the living cell.

MOLECULAR BIOLOGY

NEW YORK UNIVERSITY: RESEARCH IN CELLULAR PHYSIOLOGY

Among the studies to which the Foundation is giving support is a series in a relatively new field, which may be called molecular biology, in which

delicate modern techniques are being used to investigate ever more minute details of certain life processes. One such study is under way in the Laboratory of Cellular Physiology at New York University. Here Professor Robert Chambers and his associates are working with an ingenious tool on living cells in an effort to find out more concerning the physical and chemical processes which take place within the cells and which enable them to live and grow. The instrument which they are using for this delicate work was devised by Professor Chambers himself and is called a micro-manipulator. It consists of two finely drawn glass needles mechanically mounted in such a way that they can be controlled to move precise but infinitesimal distances within the field of a microscope. The needles are prepared by softening glass rods in a Bunsen burner and drawing them out to points so sharp that they can be used under the microscope to take hold of a single tissue cell and remove it from its fellows, to stretch it, to cut out its nucleus, and even to remove those minute inner organs of the nucleus—the chromosomes—which determine the character of the new cells formed by the division of the parent cell. By means of a motion picture camera attached to the microscope, permanent records are made of many of the experiments.

Professor Chambers also makes delicate pi-

ettes by drawing fine glass tubing into hairline strands. He mounts these with his needles in the micromanipulator and uses them to inject chemicals into selected areas of a living cell and also to withdraw fluids from the cell for chemical analysis. These studies of cell substance and its behavior gain in interest when we remember the size of the object under examination. Cells naturally vary in size, but in general a representative cell is about one-tenth as large as the dot in this letter *i*.

The micromanipulator enables scientists to experiment on living matter in a way hitherto impossible. In the Laboratory of Cellular Physiology at New York University it is being used in a variety of studies. With its aid, one member of the staff is working on the surface of the cell. He discovered that when an oil drop of certain characteristics is brought in contact with the delicate membranous surface of a living cell, the drop will suddenly snap into the protoplasm. Since this extraordinary coalescence has been found to depend on the interfacial tensions of the drop and the cell, his study is providing a means of making precise measurements of physical properties of the living membrane. Another member of the Laboratory staff is working on the problem of diffusion, the process by which nutrients and other substances pass through the cell membrane. He is trying to find the physical explanation of this per-

sistently selective process. Still another worker is exploring the interior of the cell, particularly the chromosomes. By means of the micromanipulator he has been able to unwind some chromosomes to unusual lengths, and has found their material to be of extreme toughness.

In 1938 the Foundation made a grant of \$25,000 to New York University toward the salary of research assistants and the purchase of equipment and supplies for Professor Chamber's work for the five years beginning January 1, 1939.

UNIVERSITY OF LEEDS: X-RAY STUDIES OF THE STRUCTURE OF THE PROTEINS OF MUSCLE, NERVE, AND OTHER TISSUES

The material of which the cells of plant and animal bodies are made consists largely of proteins. A knowledge of the structure and behavior of these substances is therefore essential to the understanding of the processes by which the cells grow, reproduce, and maintain the integrity of the organism of which they form a part. But the study of the proteins has presented many obstacles, for ordinary chemical methods are inadequate to determine how these huge molecules are put together. The proteins are difficult to purify, easily susceptible to change, and extremely complicated. Within recent years, however, the application of physicochemical methods to pro-

tein analysis has done much to extend our knowledge of this class of substances, so basic in the construction and functioning of living matter.

At the University of Leeds Dr. W. T. Astbury, director of the Textile Physics Laboratory, is investigating protein structure with the aid of a powerful x-ray tube, of his own construction, which is specially suited to the study of the make-up of biological substances. He began his research with a series of studies on the structure of wool fibers, which consist largely of protein, as do also other outgrowths of the animal body, such as hair and nails.

Dr. Astbury's work showed that the characteristic elastic property of a wool fiber is due to the presence of long chain molecules of a protein called keratin, and that these long molecules are folded so that they may be stretched out somewhat as an accordion is extended.

It soon became clear that both the techniques and the specific findings of this study were applicable not only to wool fibers but to other biological material as well, and Dr. Astbury has extended many of his previous results on the keratin molecule of wool to the myosin molecule which is found in muscle. He has also begun exploratory researches on the structure of nerve fibers, chromosomes, and other tissues which evidence orientation of molecules.

The Foundation has contributed toward Dr. Astbury's studies at the University of Leeds since 1934. During the past year it made a grant of \$51,000 to the University toward the support of the work over the five-year period beginning October 15, 1938.

WASHINGTON UNIVERSITY: STUDIES IN CELL
PHYSIOLOGY AND EXPERIMENTAL EMBRYOLOGY

At the University of Washington, in St. Louis, the Foundation is giving support to three research programs in the Department of Zoology in which interest centers on the minute structure of cells and tissues and the relation of this structure to physiological functions. In one series of studies Professor F. O. Schmitt is using x-ray analysis, optical methods, and other techniques of physics and chemistry to learn the molecular make-up of cells and tissues of various kinds and to investigate the connection between molecular arrangement and cell and tissue function. Much of this work is being carried out on nerve tissue; and Professor Schmitt is also investigating nerve chemistry and metabolism. Another series, under the direction of Professor Viktor Hamburger, consists of research in experimental embryology, in which the development of the nervous system in chick embryos is an important subject of study. In a third series Professor Schmitt and Professor

Hamburger are collaborating in work in the borderland between general physiology and embryology. To aid in providing research assistance, equipment, and supplies for this work during the five years beginning July 1, 1938, the Foundation has made an appropriation of \$50,000 to the University.

If an x-ray beam is passed through matter and the emergent beam is allowed to fall on a photographic plate or film, a pattern characteristic of the substance is made on the plate or film. By x-ray analysis, therefore, a great deal can be learned about the molecular architecture of biological tissues. Through such analysis Professor Schmitt and his associates have gained a working knowledge of the arrangement of protein and lipid molecules in the sheath of soft white material (myelin sheath) which surrounds the central conducting portion of the nerve fiber. They have shown that this sheath is essentially a built up film in which lipid layers alternate with protein layers. The lipoids, substances resembling fats, constitute with proteins, water, and salts, the protoplasm of which animal and vegetable cells are made. At first Professor Schmitt analyzed normal resting nerves. Now a method has been worked out which makes it possible to stimulate the nerve and record its action potential while simultaneously exposing it to x-rays to obtain the

molecular pattern. This method will permit a study of possible changes in molecular arrangement that may occur during the passage of the impulse through the nerve.

Another important line of work is the experimental alteration of the condition of the nerve (as by drying, heating, the action of narcotics, etc.), and determining by x-ray analysis how much change in the normal molecular organization is possible without failure of nerve function.

To verify the x-ray analysis of the thickness of the lipid and protein layers of the myelin sheath it is proposed to build up, according to the Langmuir technique, artificial films of known numbers of layers of nerve lipid and protein and to measure the thickness by optical means.

For the accurate study of nerve metabolism a sensitive method of following the respiration of small amounts of tissue has been developed, and an improved technique has been worked out for the determination of the oxygen consumption of resting and stimulated nerves.

In the joint research program of Professor Schmitt and Professor Hamburger, the methods of modern experimental embryology, such as the transplantation of groups of cells in the fertilized egg which constitute the first trace of an organ, or the transference of such groups of cells to an artificial medium for growth, are being used for the

study of problems outside the realm of pure embryology, for it is obvious that certain structures produced in such ways will furnish valuable material for the study of fundamental physiological problems. In addition, the principles and methods of physics and chemistry are being used to clarify special problems of embryonic development. Of particular interest is the problem of the chemical nature of the embryo "organizer," that influence which arises in the tissue in a special region near the end of the embryonic gut, and which passes out to "organize" or determine and control the development of other regions of the embryo.

WASHINGTON UNIVERSITY: STUDIES OF CHEMICAL REACTIONS IN LIVING MUSCLES AND OTHER LIVING TISSUES

The Foundation also made an appropriation to Washington University during the past year for research on the chemistry of the living muscle and other living tissues. This grant, amounting to \$17,000, is for assistance to two pieces of work. One of these is the study of the chemical reactions occurring in muscles during the passage of the impulse in nerves and the resulting wave of muscular contraction. For the investigation of the details of these reactions in active living muscle Professor Frank Urban and Hubert Peugnet are

developing a technique which involves the illumination of the muscle with monochromatic light and the determination of the rapid variations in this light as it is momentarily affected by the formation of various chemical compounds within the active muscle. By the terms of the Foundation's grant \$5,000 was to be used by Washington University for the purchase or construction of a monochromator and accessory apparatus to furnish the intense monochromatic light required for this work.

The rest of the \$17,000 grant is to be available during the three years ending June 30, 1941, for the support of investigations under the direction of Professor C. F. Cori. These include studies of the metabolism of carbohydrates in mammalian muscle and other tissues, the enzymes involved in the breakdown of carbohydrates and the new formation of carbohydrates in the liver, and the influence of hormones upon these reactions. Professor Cori has been working with the enzymes of muscle concerned in the production of lactic acid from glycogen, the form in which carbohydrates are stored in the tissues. Lactic acid is formed from glycogen molecules broken down in the course of muscular work. Professor Cori has brought his investigations to the point where the reaction of two enzymes concerned in this process is known.

COLUMBIA UNIVERSITY: RESEARCH ON
METABOLISM WITH HEAVY ATOMS AS TRACERS

The protein molecules, which constitute so large a part of the cells of the living animal body, are constantly being broken up and reassembled. New material for building purposes is obtained from the proteins which the animal takes into its body in the form of food. Proteins are made up of groups of simpler substances called amino acids, of which twenty-two different ones are known. All of these are found in one or another of the proteins of the body.

The proteins in the food eaten by man and other mammals are split up into their constituent amino acids during their passage through the intestinal tract, with the aid of substances known as enzymes. The amino acids pass through the intestinal wall and are carried by the blood throughout the body. Some are converted into glycogen in the liver and others are built up into tissue proteins in the cells. Comparatively little is known, however, of the mechanism by which proteins are synthesized in the body or of the way in which those other important foods—fats and carbohydrates—are broken up and converted into storage material for the production of energy. For until very recently the biochemist and the physiologist were unable to follow directly in the body the course of any ordinary food products, since the

moment these substances pass the intestinal wall after absorption their products are mixed with large amounts of the same compounds already present in the body. But the discovery, by Professor H. C. Urey of the Department of Physics of Columbia University, of the existence of heavy atoms of hydrogen, oxygen, nitrogen, and carbon, that is, atoms of those elements carrying more than the usual atomic weight and therefore as readily identifiable as though they bore tags, has provided investigators with tools by means of which they are learning a great deal about the way the body converts food substances into the materials necessary to its existence.

Through the cooperation of Professor Urey and Professor Hans Clarke and his associates in the Department of Biochemistry at Columbia University, methods have been developed whereby it is possible to build into artificially prepared amino acids or other food substances heavy atoms of hydrogen, oxygen, nitrogen, or carbon, to serve as tracers in the study of the behavior of these substances. The heavy atoms do not alter the chemical or physical properties of the food substances, and the cells or enzymes treat them in the same way as they do the atoms of ordinary weight; but by delicate methods of analysis the chemist can detect the labeled atoms in the tissues and body fluids of the animal and can find out a good deal

about what happens to them in the course of metabolism.

With the use of food constituents containing heavy atoms Professor Clarke and his collaborators are investigating the metabolism of proteins, amino acids, and fats, and are carrying out experiments on sugar formation. In 1938 the Foundation made a grant of \$71,500 to Columbia University toward the support of this work during the five-year period ending June 30, 1943.

CORNELL UNIVERSITY: STUDIES OF AMINO ACIDS, PROTEINS, AND HORMONES

Through a grant of \$31,400 to Cornell University the Foundation is giving assistance during the three years ending August 31, 1941, to a program under the direction of Professor Vincent du Vigneaud, which divides into two main lines of study. One of these is concerned with the chemistry of hormones, chiefly insulin and the hormones of the posterior lobe of the pituitary gland; the other deals with protein structure and the chemistry and synthesis of certain amino acids, particularly those which contain sulphur. There is a close interrelation between the two lines of investigation, since, for example, the hormone insulin is a protein.

The insulin molecule is a complex structure of more than a thousand atoms, and Professor du

Vigneaud has proved that various subgroupings within its structure are held together by sulphur atoms. He has shown that when these sulphur linkages are disarranged the molecule is no longer able to oxidize sugar in the blood stream. Progress has been made in the analysis of insulin. Its ingredients have been determined and their relative proportions are known roughly, but the scientist has not yet been able to put these parts together in a test tube.

In connection with the second group of studies Professor du Vigneaud has been doing some especially important work with two amino acids, methionine and cystine, which are the body's chief source of sulphur supply and probably the forerunners of its sulphur compounds. Methionine is an essential element in the diet of mammals, without which body growth will not take place. Professor du Vigneaud has shown that from this substance the body can manufacture cystine. By feeding to animals artificially prepared methionine in which heavy hydrogen atoms were placed in predetermined positions which are ordinarily occupied by light hydrogen, he found that the body changes the methionine into cystine in one step and does not build up the one substance from the other atom by atom. Indeed, since it was possible to detect the location of the heavy hydrogen in the new structure (cystine) he was able to dem-

onstrate that this was intact in the same relative position it had occupied in the methionine, thus showing that the tissues did not tear down the methionine into its atoms and rebuild these one at a time into cystine, but that the methionine was converted into cystine in a single reaction. This discovery is an important step toward an understanding of the growth of living tissue.

UNIVERSITY OF CALIFORNIA: A CYCLOTRON FOR TAGGING ATOMS WITH RADIOACTIVITY FOR BIOLOGICAL AND MEDICAL RESEARCH, AND FOR RESEARCHES IN RADIATION BIOLOGY

In addition to the heavy atoms of carbon, hydrogen, oxygen, and nitrogen, which are so useful in tracing the progress of various substances through the animal body, biologists have other new atomic tools which enable them to follow the course of practically any element which may be introduced into the body. These are atoms of the different elements which are tagged with artificially produced high energy radiation; and like the heavy atoms they can be readily detected wherever they may be in the animal tissues or fluids. The radioactivity which is artificially induced in these atoms is short lived and harmless, and therefore substances containing the atoms can be fed to animals and humans for experimental purposes without danger.

The method of inducing radioactivity in stable elements was discovered by the Joliot-Curies in 1934, and soon the biologists were experimenting with artificially prepared radioactive elements as implements for their studies. Temporary radioactivity can be imparted to ordinary substances by subjecting them to eruptions from exploding radium or other naturally radioactive elements. But it was found that this method was not practical for supplying the large number of labeled atoms that research workers need, and physicists set about building powerful high voltage machines which would enable them to provide radioactive atoms of the different chemical elements in sufficient quantities to meet demands. The most widely used of these machines is the cyclotron, developed by Professor Ernest O. Lawrence of the University of California.

The cyclotron makes the tagged atoms by bombarding a chemical element with deuterons, the nuclei of heavy hydrogen, which have acquired tremendous speed by being whirled round and round between the poles of a magnet in an electric current which vibrates hundreds of times a second. When the deuterons have reached a maximum velocity they are directed toward the element, and when they hit it they send neutrons (particles neutral in their electric charge) flying out of it at terrific speed. When these neutrons

crash into an atom they alter its internal mechanism and cause it to become radioactive, thus giving it its tag.

Professor Lawrence is now building a new cyclotron for the research work of the biological and medical departments of the University of California. This will be the most powerful machine of its kind in the world, capable of producing up to twenty-five million volt neutrons. To enable the University to meet various expenses necessary to the completion of this machine the Foundation appropriated \$30,000 during the past year for its use as need arises.

UNIVERSITY OF ROCHESTER: PROVIDING RADIOACTIVE ATOMS FOR BIOLOGICAL AND MEDICAL LABORATORIES

At the University of Rochester a cyclotron was built under the direction of Professor Lee A. DuBridge of the Department of Physics, for research in the field of nuclear physics. In several other departments of the University workers were engaged in studies in which radioactive atoms would be of the greatest value, and the plan was proposed of running the cyclotron at night to produce tagged atoms for the biological and medical departments. This project required the employment of additional assistants in physics and some additional expenditures for supplies. To aid the

University in meeting the extra expenses which would be involved the Foundation appropriated \$35,000 for its use during the three years beginning July 1, 1938.

Tagged atoms provided by the Physics Laboratory are now being used in seven other departments of the University. In the Department of Pathology Dr. George H. Whipple, who has been studying iron metabolism for a number of years and whose work in this field was recognized by the award of the Nobel Prize in medicine in 1934, is employing radioactive iron to investigate the pathway of this element after it has been introduced into the intestinal tract, the duration of its stay in the liver, the rapidity of its turnover in the bone marrow, and its subsequent escape in hemoglobin in the red cells.

In the Department of Biochemistry Professor Walter Bloor and his associates are utilizing radioactive phosphorus to determine how phosphorus, so necessary to the health of the bones and teeth, is taken into the tissues of the body, how long it remains in the kidney, liver, muscles, brain, teeth, and bones, and when it is discarded in the wastes of the body. In the Department of Vital Economics, under the direction of Professor John Murlin, efforts are being made to determine how soon after feeding, and in what form, phosphorus and sulphur compounds appear in the digestive secretions

(the saliva, the gastric and pancreatic juices, and the bile), what factors influence the absorption of these compounds from the intestines, what is the route of their absorption, whether by portal blood, thoracic duct, or lymph, and how soon sulphur in various forms is built into the insulin molecule.

Dr. George Berry in the Department of Bacteriology is using radioactive viruses and bacteria in the study of the mechanism of infection and of resistance to disease, and radioactive viruses in research on virus-induced tumors and their relation to cancer. The fate of radioactive vaccine, myxoma, and other viruses is being traced in normal and immune animals, and radioactive antigens are employed to gain light as to the sites and mechanism of the formation of antibodies. The materials used for this work are purified preparations of viruses regenerated in host cells which previously have had radioactive substances incorporated within them; bacteria grown on media containing radioactive substances; and radioactive antigens of various sorts.

Professor Wallace Fenn is working in the Department of Physiology on the permeability of muscle, nerve, and liver cells to potassium, by injecting radioactive atoms of this substance and studying the extent to which these atoms exchange with ordinary potassium in the cells. He is also using radioactive sodium to investigate the

supposed impermeability to sodium of all cells except those of connective tissue. In the Division of Radiology, under Dr. Stafford L. Warren, radioactive sodium is being used to show the part sodium plays in the protection of the liver from damage in febrile states. Studies are also being made in this Division of the effects of the radiations of artificially produced radioactive atoms upon normal and tumor tissues.

In the Division of Biology Professor Curt Stern is investigating the part radioactive phosphorus may play in producing mutations in fruit flies. Nucleic acid, a phosphorus-containing organic compound, is a characteristic component of the chromosomes. Its relation to the genes, the minute carriers of cell heredity, is not clearly understood. Professor Stern is raising fruit flies on a diet containing radioactive phosphorus and is testing a large number of germ cells from these individuals for induced mutations. A positive result would open up a large number of problems related to hereditary changes and genic structure.

NUTRITION

UNIVERSITY OF ILLINOIS: THE ROLE OF AMINO ACIDS IN NUTRITION

Human diets consist of proteins, starches and sugars, fats, and the necessary vitamins and minerals. Of all these elements of the diet the proteins

are the most complex and the least understood. When protein food (lean meat, milk, eggs, cereals, etc.) is taken into the body it cannot be used directly but must, during the digestive process, be chemically broken down into simpler units, the amino acids. It is these amino acid derivatives which are, in turn, built up into the living substance of the body. To extend our knowledge of the way in which the proteins of animal and plant food become the proteins of our bodies is one of the most important problems in the whole field of nutrition. Since the first step toward the understanding of the process of protein formation in the body is a thorough knowledge of the amino acids, much attention is being given to the study of these substances. A number of the research projects in this field are receiving support from the Foundation; important among these is the work of Professor W. C. Rose of the Department of Chemistry of the University of Illinois, who for several years has been studying the relation of amino acids to nutrition and who has made outstanding contributions to knowledge of this subject.

Some of the amino acids which the body needs to build its living substance can be manufactured by the body itself; others cannot. Those which the body is unable to synthesize must be supplied by the proteins in the diet, and they are known as essential amino acids. The test of the efficiency of

food protein is its ability to supply the amino acids which the body is unable to build for itself. It was through a series of experiments begun by Professor Rose in 1931 that the amino acids essential to body growth were determined.

The work of previous investigators had established the existence of twenty-one amino acids, but the relative importance of these was largely unknown. Professor Rose and his associates fed to rats synthetic diets in which all protein was lacking, but in which the twenty-one then known amino acids were present. The rats failed to grow, and Professor Rose concluded that proteins must contain another amino acid in addition to the twenty-one which had been isolated and that this unknown substance was indispensable to growth. Further experiments led to the discovery and isolation of this amino acid (No. 22) to which he gave the name threonine. When he fed rats on synthetic diets containing this new food element the animals grew normally. The question then arose as to whether some of the other twenty-one amino acids were unessential for growth and life. After long research Professor Rose classified all the twenty-two amino acids present in protein food with respect to their importance in growth. He found that ten amino acids are indispensable for growth, while twelve may be excluded from the food without influencing this process.

Professor Rose now plans prolonged feeding experiments with various mixtures of amino acids to exclude the possibility of development in later life of diet deficiencies which do not reveal themselves in tests of two to six weeks duration. He will make comparative studies of the growth of animals on diets of ten and of twenty-two amino acids. By the use of diets suitably designed for the purpose he will endeavor to determine the origin of those amino acids which can be manufactured by the body tissues. Some of these undoubtedly arise from the indispensable amino acids; while it is possible that others may be synthesized from simpler compounds such as metabolic fragments of carbohydrates. Professor Rose will also test the amino acid requirements for reproduction.

The Rockefeller Foundation has contributed toward Professor Rose's work since 1935. Through a recent grant of \$75,000 this support will be continued over the five-year period ending August 31, 1943.

ORGANIC CHEMISTRY

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY,
UNIVERSITY OF LONDON: STUDIES OF
VITAMINS, STEROLS, AND SEX HORMONES

Among the striking achievements of recent years in organic chemistry have been the deter-

mination of the structure of the principal vitamins and the discovery of the nature of the sex hormones. These substances occur in nature in the most minute amounts, and their study, like that of those other infinitely small structures, the proteins and amino acids, has become possible only because of the accurate and delicate instruments and techniques which the modern physical and chemical laboratories have placed at the disposal of the research worker.

With the use of spectroscopic and microanalytic methods and other modern techniques, Professor I. M. Heilbron, formerly of the University of Manchester and now holding the Chair of Organic Chemistry at the Imperial College of Science and Technology of the University of London, has been making important contributions to knowledge of the evolution of vitamins A and D and the relation of vitamin D to the sex hormones. Recently he discovered by spectroscopic methods the existence of a new vitamin (A_2) which occurs in the liver oils of freshwater fish.

Professor Heilbron is tracing the steps by which vitamins A and D are built up from their most rudimentary forerunners in plants and animals. He has made a thorough study of the orange-red hydrocarbon, carotene, from which vitamin A is derived, and of the closely associated substance lutein. These compounds are widely distributed

in plants and animals. They are formed in green plants and in marine algae, and they are found in the milk of cows and the eggs of chickens which feed on grass and other green plants, and in the livers of fish that live on small marine animals that eat algae.

It has been found that vitamin D can be artificially produced by treating certain plant and animal compounds with ultraviolet light, and that in all matter in which this substance can be thus formed there is always present one of the group of solid higher alcohols known as sterols. It is evident therefore that the sterols are closely related to vitamin D. It has been shown too that there is an intimate connection between these substances and the sex hormones. Professor Heilbron is working on the algae as a source of origin of sterols and is tracing the presence of the sterols in plants and animals from their simplest form up through vitamin D and the sex hormones. He is also studying the quantity and role of pigment in algae in relation to sex.

The Rockefeller Foundation contributed toward Professor Heilbron's work along these lines at the University of Manchester, and in 1938 it made an appropriation of \$61,200 to the University of London in continuance of this support for a seven-year period ending September 30, 1945.

EIDGENÖSSISCHE TECHNISCHE HOCHSCHULE,
ZURICH: STUDIES OF STEROLS, SEX
HORMONES, AND POLYTERPENES

The Foundation made another appropriation in 1938 for the support of research on sterols, sex hormones, and substances related to vitamin A. This grant, which amounted to \$58,800, went to the Laboratory of Organic Chemistry in the Eidgenössische Technische Hochschule, in Zurich, for work under the direction of Professor L. Ruzicka during the five years ending March 31, 1943.

Professor Ruzicka was the first investigator to synthesize the male sex hormone, testosterone, and he has also synthesized three other sex hormones. He is now investigating extracts of the testes of sheep and other animals with the purpose of isolating the still unknown compounds which they contain, and he is building up new derivatives which promise to act as sex hormones.

Professor Ruzicka is also making an extensive study of the group of compounds known as the polyterpenes, to which vitamin A and the carotenes, the direct antecedents of this vitamin, belong. The constitution of the polyterpenes offers fundamental explanations of the carotenes and vitamin A, and it is possible too that vitamin E consists at least in part of a polyterpene group. Investigation of the relations existing between the

chemical constitution of the polyterpenes and their physiological action is therefore a fertile field for research.

The Hochschule's Laboratory of Organic Chemistry also has to its credit the synthesis of vitamin C and a compound which is apparently the hormone of the cortex of the adrenal gland. This work was done under the direction of Professor Ruzicka's former associate, Professor Reichstein.

CALIFORNIA INSTITUTE OF TECHNOLOGY:
DEVELOPMENT OF ORGANIC CHEMISTRY IN
RELATION TO BIOLOGICAL PROBLEMS

In December 1937 the Foundation trustees authorized the Executive Committee to appropriate to the California Institute of Technology sums not to exceed a total amount of \$300,000, during the six-year period beginning July 1, 1938, toward support of the development of chemistry in its relationship to biological problems, the amount to be available in any year of the period not to exceed \$70,000. In June 1938 the first appropriation in fulfillment of this commitment was made. It amounted to \$70,000 and has been budgeted by the Institute for the support of research in organic chemistry and in the structure of molecules of biological importance. It will be used to provide research assistance, equipment, and supplies.

For many years the California Institute of

Technology has been an important center for research in the physical and life sciences. It is now strengthening the relationship between its work in these fields by the development of a broad program in the organic chemistry of natural substances. It has recently completed a large addition to the Crellin Laboratory of Chemistry, which will be given over primarily to the work in organic chemistry.

PHYSICAL CHEMISTRY

HARVARD UNIVERSITY: CHEMICAL REACTIONS IN RELATION TO MOLECULAR STRUCTURE

In their search for information on the structure of the molecules of which matter is composed investigators are using a variety of techniques of physical chemistry. One method of learning something about these tiny particles is to measure the amount of energy which accompanies the transformation of one chemical substance into another, for when the quantity of energy involved in this process is known a great deal can be determined concerning the arrangement of the constituent parts of the molecules which make up the original substance and of those composing the substance produced by the change. The energy associated with large numbers of chemical reactions takes the form of heat, which can be accurately measured by means of a calorimeter. The data thus

obtained furnish a critical test of theoretical calculations of molecular structure.

At Harvard University Professor George B. Kistiakowsky of the Department of Chemistry, in consultation with President Conant, has for a number of years been carrying on researches of this kind on a considerable number of inorganic reactions in the gas phase. The success of these investigations led to plans for the extension of the method to the study of organic reactions in the liquid phase. To assist Professor Kistiakowsky in undertaking this new line of work The Rockefeller Foundation appropriated \$22,500 for his use during the period from July 1, 1938, to June 30, 1941. An important object of Professor Kistiakowsky's new studies will be to determine certain energies which will give information about the way in which proteins are constructed.

HARVARD UNIVERSITY: RESEARCH ON THE CHEMICAL AND ELECTRICAL BEHAVIOR OF PROTEINS

Another group at Harvard University—Professor E. J. Cohn and his associates in the Department of Physical Chemistry of the Medical School—is receiving Foundation assistance for studies of the proteins. The work of these investigators is concerned with the chemical and electrical behavior of the tissue proteins in the

body, especially with electromotive force measurements of the combining capacity of proteins for acids and alkalies and with the dielectric constants (inductive capacities) of protein solutions.

Proteins, amino acids, and peptides (combinations of two or more amino acids) all dissolve as ions carrying both positive and negative charges, and they all increase enormously the dielectric constant of water and other solvents.

Professor Cohn states that measurements of the dielectric constants of protein solutions leave the investigator no choice but to assume regions within the living organism with dielectric constants as much higher than that of water as the dielectric constant of water is above that of a vacuum. The new knowledge of the influence of the positively and negatively charged ions on the dielectric constants of solutions is of great aid in interpreting their behavior and in learning something about their structure.

The Foundation has contributed toward Professor Cohn's work since 1930. Its most recent grant, \$100,000, will be available during the seven-year period which began September 1, 1938.

NATIONAL RESEARCH COUNCIL: COMMITTEE ON EFFECTS OF RADIATION ON LIVING ORGANISMS

Ten years ago the National Research Council established a Committee on the Effects of Radia-

tion upon Living Organisms to stimulate research on the important matter of the relationship of visible light and other radiations to living tissue. In its early years the Committee received support from the General Education Board and the Commonwealth Fund. During that time it made contributions to a number of investigators for radiation experiments in the fields of genetics, cytology, and morphology. The results of these experiments were published in a two-volume work entitled *A Survey of Radiation*, to which some forty investigators contributed chapters. In 1934 and 1935 The Rockefeller Foundation provided funds to enable the Committee to make a survey of the research that was being done on the so-called mitogenetic radiation, that is, the supposed radiation of very low intensity given off by living cells. The Council has published a report on this project.

In 1935 the Foundation appropriated \$75,000 for the use of the Committee during the three years ending June 30, 1938, chiefly for support of investigations on the nature of the action of radiations on the protoplasm of the cell and its products. During each of the three years for which this fund was available the Committee made approximately twenty-four grants to investigators representing twenty-one institutions. In 1938 the Foundation made a grant of \$25,000 toward the Committee's program for another year.

GENETICS

UNIVERSITY OF WISCONSIN: RESEARCH
IN IMMUNOGENETICS

Recent advances in genetics are playing an important part in biological research. The newer knowledge of inheritance and mutations has given investigators fresh leads in their search for explanations of the differences and likenesses between species and between individuals within a species, and it is furnishing a basis for studies of the relation of immunological differences to differences in chemical structure.

A number of years ago Dr. Karl Landsteiner of The Rockefeller Institute demonstrated that there are various types of blood which differ in some subtle way and that the differences follow definite laws of inheritance. More recent studies by Professors M. R. Irwin and L. J. Cole of the Department of Genetics of the University of Wisconsin have indicated that this phenomenon is a very complicated one, which offers a starting point for important genetical research. It now appears that many, and perhaps all, genes are each specifically correlated with a constituent of the blood, the presence or absence of which can be demonstrated by means of agglutination tests.

Professor Irwin has developed serological methods by means of which he can identify the blood of various species of pigeon, can determine quan-

titatively the relative amounts of agglutinating substances specific to a species A, specific to a species B, common to the species A and B, and specific to the hybrid offspring obtained by crossing species A and B. By extensive biochemical and genetical experimentation sera can now be obtained for testing blood for the presence or absence of a single one of the chemical constituents which appear to be associated with the individual genes. This makes possible a serological-genetic determination of the extent of gene sharing by different species, and a genetical analysis within a species far more detailed and definite than can be accomplished in any other way.

Professor Irwin and Professor Cole are now studying in various species crosses, particularly of pigeons and doves, the divisibility and heritability of those agglutinable properties of the red blood cells of any species which differentiate it from another species. Their findings indicate that each species must have many pairs of genes which produce effects in the red blood cells. They now plan investigations to determine whether a relationship exists between these genes and those which affect physiological characters, such as size and disease resistance.

The Foundation has contributed toward research in genetics at the University of Wisconsin since 1934. During the past year it made an ap-

appropriation of \$25,650 to aid in providing research assistance, equipment, and supplies for Professor Irwin and Professor Cole during the five years beginning July 1, 1938.

COLUMBIA UNIVERSITY: RESEARCH ON THE GENETICS AND BIOCHEMISTRY OF CYSTINURIA

There are certain diseases which occur in man as a result of some hereditary defect of metabolism. One of these is cystinuria, which is characterized by the presence of cystine crystals in the urine and by cystine calculus (stone) formations in the kidney. Cystine is one of the amino acid constituents of protein. It can be built up in the body from another amino acid, methionine (see page 216), and certain investigators have suggested that cystinuria may be due to an inability to oxidize the methionine in the diet.

Cystinuria is of great interest to the biochemist from the standpoint of intermediary protein and sulphur metabolism, and to the geneticist because of its hereditary nature. There are several family histories known to investigators in which it can be traced through three and four generations. Urologists are interested in the disease from the point of view of stone formation.

Until recently experimental studies of cystinuria were impossible because no laboratory animals showed this defect of metabolism. Some three years ago, however, Professor Erwin Brand



Photograph Excised Here

Wenner-Grens Institute of Experimental Biology, University of Stockholm.

of the Department of Biochemistry of the College of Physicians and Surgeons of Columbia University discovered the disease in two pedigreed dogs. A systematic search in kennels over a wide area brought to light another case in a dog unrelated to the other two. Professor Brand and Professor George F. Cahill of the Department of Urology wished to breed these animals with their nearest kin and to continue the inbreeding of the offspring of these unions in the hope of establishing a pure breeding race of cystinuric dogs in which to study the genetics, the biochemistry, and the urological manifestations of the disease. To aid in providing the equipment, supplies, and assistance necessary for this project The Rockefeller Foundation made a grant of \$5,000 to Columbia University in 1936 and a grant of \$12,200 in 1938, each of these available over a two-year period.

Extensive breeding trials during 1937 led to the production of two cystinuric male dogs, one of which died. In a litter obtained in 1938 from the mating of the surviving cystinuric dog with a female of the same litter, two males and one female were found to have cystinuria.

ROSCOE B. JACKSON MEMORIAL LABORATORY:
STANDARDIZED MOUSE COLONIES FOR
RESEARCH PURPOSES

The Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine, is an outstanding center



Photograph Excised Here

Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine.
Research workers marking and recording mice.

for work in mammalian genetics. Since 1934 The Rockefeller Foundation has contributed toward its research program, which is particularly concerned with long-term studies of the physiological factors that influence continuing processes such as normal and abnormal growth. For these studies the Laboratory has developed over a period of years, by an accurately controlled system of breeding, many lines of specialized and standardized mice. It has one strain of these animals which has been inbred for well over a hundred generations. Highly standardized laboratory animals of this kind, that can be obtained only by long continued inbreeding in the course of which recessive traits will come to the surface and be discarded, are essential not only for genetical studies but for research on cancer and other diseases.

During the past few years the Laboratory has greatly extended its work of breeding standardized stocks of mice and has been furnishing large numbers of these animals to other laboratories and research workers throughout the United States. These have proved of such value in research projects of many kinds that requests for them have steadily increased. The Laboratory found that in order to meet the expanded demands of its own program and the outside requests, a small new building for breeding purposes was necessary. To enable it to erect this building

the Foundation made it a gift of \$40,000 during the past year. With adequate new quarters available for breeding and housing the mice, the Laboratory expects to furnish about one hundred and twenty thousand animals a year to investigators.

GENERAL RESEARCH IN EXPERIMENTAL BIOLOGY

UNIVERSITY OF CHICAGO: ENDOWMENT OF BIOLOGICAL RESEARCH

The Foundation made appropriations to several institutions during 1938 for the general advancement of research in biology. The largest of these was a conditional grant of \$1,500,000 to the University of Chicago toward the establishment of a \$2,000,000 endowment fund for research in the biological sciences. The terms of the grant require that the University obtain from other sources by June 30, 1941, the \$500,000 necessary to complete the fund.

The Foundation has aided biological research at the University of Chicago since 1929 through annual contributions. These have constituted what has been virtually a fluid research fund which the officers of the Division of Biological Sciences have apportioned among various of the Division departments to continue long-term research projects begun and partly financed by the University, and to make possible the initiation

of new projects of special promise. When the Foundation made its recent appropriation to stabilize this assistance in the form of endowment it also made a grant of \$180,000 toward the support of the Division's research work during the three years in which the University is raising its share of the endowment fund.

The research program of the Division of Biological Sciences places major emphasis on those studies which are basic to man's understanding of himself and to the maintenance of his physical and mental health. Many of the Division's departments share in the program, including the Departments of Zoology, Botany, Biochemistry, Physiology, Anatomy, Pharmacology, Bacteriology, and Psychology. The Division is also able to draw freely on the Departments of Physics, Chemistry, and Mathematics for assistance in its research projects.

UNIVERSITY OF STOCKHOLM:
INTERDEPARTMENTAL RESEARCH IN
EXPERIMENTAL BIOLOGY

Another interdepartmental program of biological research in which the Foundation has been interested for several years is a study of cell metabolism and cell respiration which is being carried out at the University of Stockholm in the Department of Experimental Zoology with the close cooperation of the Departments of Bio-

chemistry, Biophysics, Embryology and Genetics, and Medicine, and under the leadership of John Runnström, professor of experimental zoology and cell physiology. These cooperating departments have been housed in various buildings of the University group, so that the different projects comprising the joint program have been carried out in widely separated quarters, thus considerably handicapping the work. To remedy this disadvantage the University wished to build an institute of experimental biology to provide space for the research work of Professor Runnström and his collaborators. The Rockefeller Foundation agreed to assist in this undertaking, and in February 1937 it appropriated \$65,000 toward the construction and equipment of the building and \$24,465 for the support of the cooperative work over a five-year period.

By the time the construction of the institute was under way, building costs in Stockholm increased 30 per cent, and it was found that an additional sum of \$42,000 would be required to complete the building. A local donor provided half this amount, and in March 1938 the Foundation made a grant to the University covering the remainder of the sum. At the end of the year the building was nearing completion and plans were being made to open it for use in the spring of 1939.

Professor Runnström and his associates had

wished for some time to establish a closer collaboration between their departments and groups in other institutions carrying on studies in similar fields, particularly the groups headed by Professor Svedberg at the University of Uppsala, Professor Linderstrøm-Lang at the University of Copenhagen, and Professor Rideal at the University of Cambridge. This they believed could best be achieved through conferences and interchange visits of investigators in these fields in the several universities. To assist them in putting this plan into effect the Foundation made a grant of \$16,400 to the University of Stockholm in 1938 to supplement the grant of \$24,465 which it had made the year before for the support of Professor Runnström's work during the five years 1938-1942, with the understanding that of the total sum provided by the two appropriations \$10,500 would be available during this period for the expenses of conferences and exchange visits of research workers.

MARINE BIOLOGICAL ASSOCIATION OF THE
UNITED KINGDOM: ADDITION TO THE MARINE
BIOLOGICAL LABORATORY

For experimental biologists whose studies involve the use of animals that have their native habitat in the sea the Marine Biological Laboratory in Plymouth, England, offers unsurpassed

research opportunities, particularly for quantitative experimentation in physiology and for the comparative approach to physiological and biochemical problems. The Laboratory is open throughout the year and its staff, consisting of some twelve investigators, is continuously at work. In addition there is a great influx of scientists from other institutions in Europe and the United States during university vacation periods.

For some time the Laboratory's working space and facilities have been insufficient for the needs of its staff and the visiting workers, and its reference collection of fauna and flora has been inadequately housed. The Council of the Marine Biological Association, which administers the Laboratory, considered that the best way of meeting these difficulties was to construct a new floor above the central section of the main Laboratory building to consist mainly of workrooms for members of the staff and visiting investigators and a room for the accommodation of the reference collections. During the past year the Foundation appropriated \$11,220 toward the cost of this addition to the building and for new laboratory equipment.

The Plymouth Marine Biological Laboratory was founded in 1888 "to promote researches leading to the improvement of zoological and botanical science and to an increase of our knowledge as regards the food, life conditions, and habits of

British food-fishes and molluscs." In 1920 and 1925 its working space was enlarged to make room for a Department of General Physiology and in 1931 further additions to its buildings were made. In recent years its research program has materially altered, with the emphasis shifting to quantitative experimentation in physiology. Although some of its investigations are still in the interests of fisheries and are for the purpose of practical application in this industry, its specialization in experimental physiology brings the greater part of its work within the field of the Foundation's program in the natural sciences.

YALE UNIVERSITY: RESEARCH IN PRIMATE BIOLOGY

For a period of thirteen years the Institute of Human Relations of Yale University has been conducting, with support from The Rockefeller Foundation, a program of research on the life history, reproduction, social relations, and psychobiological characteristics of anthropoid apes. In 1925 the Foundation appropriated \$40,000 for studies in these fields at the Institute laboratory in New Haven for four years. In 1929 it appropriated \$475,000 to enable the Institute to establish and operate for ten years in Orange Park, Florida, a laboratory where chimpanzees could be bred and reared for the purposes of the research pro-

gram. A fortunate purchase of a chimpanzee colony already partly trained, and concerning which a good deal was known, greatly facilitated the early stages of the work. On June 30, 1938, there were forty-one chimpanzees in the colony. There have been twenty-five animals born at the station, and eighteen of these have survived.

Since the establishment of the Orange Park Station work has been carried out continuously both there and at the laboratory in New Haven. Certain members of the research staff remain regularly in New Haven or in Orange Park, but it is more usual for the workers to alternate their time between the two places.

When the program had been under way for ten years a committee of experts was appointed to appraise the work. This committee reported that the major practical objectives of the undertaking had been achieved in very considerable measure, for it had been convincingly demonstrated that chimpanzees, and also various other primates, may be kept and used satisfactorily in New Haven; that chimpanzees may be bred and reared without any peculiar difficulties in Northern Florida; and that these great apes may be used in varied experimental inquiries; further, that research objectives had been approached by attack on many specific problems—notably in the biology of sex, neural correlates of behavior, condi-

tions of behavioral modifications, and social factors in behavior; and that valuable information relative to the biology of the chimpanzee had accumulated steadily and at an increasing rate.

With the approaching termination of the ten-year period of cooperation between the Institute and the Foundation in this project, plans for the continuation of the program were carefully considered by the University. Results of the work up to that time showed the project to be of great scientific importance. It was felt, however, that there was need for certain changes of emphasis which would bring into prominence studies of those physiological, neurological, and biochemical problems for which the chimpanzee is uniquely important. To provide Foundation assistance for the development of research along these lines the Foundation trustees authorized the Executive Committee to appropriate funds up to \$189,000 for the use of the Institute during the five years beginning July 1, 1939.

GRANTS IN AID

In addition to appropriations to provide support for studies over varying periods of years, the Foundation makes smaller contributions, in the form of grants in aid, chiefly to investigators who need temporary short-term assistance to enable them to start promising new research projects or

to bring important pieces of work to completion. In 1938 it made fifty-seven such grants in the field of the natural sciences. These ranged in amount from \$350 to \$7,500 and totaled \$164,676. Fifty of them were for the assistance of work in experimental biology, five for projects in mathematics, one for research in physics, and one was an emergency grant to the American Documentation Institute in Washington, D.C., to assist it in developing a bibliofilm service for the duplication of scientific literature.

Of the projects in the general field of experimental biology receiving support, thirteen were in biochemistry, ten in genetics, nine in biophysical chemistry, five in molecular biology, three in embryology, two each in endocrinology, physiological chemistry, and experimental zoology, and one each in physical chemistry, surface chemistry, organic chemistry, and histology.

Of the total fifty-seven grants fifty-six were distributed among the following countries: the United States twenty-nine, Denmark five, England and France four each, Sweden three, Scotland and Switzerland two each, and Austria, Belgium, Bulgaria, Canada, Germany, Latvia, and Poland one each. One grant was provided to defray part of the traveling expenses of scientists planning to attend a series of conferences on genetics arranged by Dr. Boris Ephrussi of Paris

and Dr. N. Timofeeff-Ressovsky of Berlin for 1938 and 1939.

The Foundation appropriated \$160,000 in 1938 to finance similar grants in aid to be made during the following year.

FELLOWSHIPS

The Foundation grants a limited number of fellowships in the natural sciences to especially qualified young investigators to enable them to obtain advanced training in research. At the present time practically all awards of this kind are for work in experimental biology. They are made directly to the individual workers and are administered by Foundation officers. Eighty-one such fellowships were supported in 1938. Thirty-seven of these were granted during the year; forty-two were appointments continuing from previous years; and two were renewals of former grants.

The fellowships were held by citizens of seventeen countries and were apportioned as follows: the United States twenty-four, Great Britain sixteen, Sweden six, Germany, Hungary, and the Netherlands five each, France four, Czechoslovakia and Switzerland three each, Denmark and Finland two each, and Austria, Greece, Italy, Lithuania, Peru, and Yugoslavia one each.

Twenty-two of the fellows worked in the field of biochemistry, fourteen in physiology, six in

genetics, five in biomathematics, four each in cytology and plant physiology, three each in embryology, immunochemistry, biophysics, histology, and endocrinology, and one each in the physiology of nutrition, cell physiology, physico-biochemistry, microbiology, experimental morphology, tissue metabolism, physiological chemistry, nuclear physics, organic chemistry, the chemistry of tannins, and filtrable viruses.

The fellows carried on their studies in the following countries: the United States forty-one, Great Britain twenty-five, Denmark six, the Netherlands four, Sweden three, France two, and Argentina, Canada, Germany, Mexico, and Switzerland each one. Five of the fellows worked in more than one country.

In 1938 the Foundation appropriated \$140,000 for the support of its fellowship program.

In addition to granting fellowships to individual workers the Foundation contributes funds to the National Research Council for the maintenance of a fellowship program in the natural sciences. In 1938 the Council supported fifty-three fellowships with funds provided by the Foundation. Eighteen of these were in biology and agriculture, eleven in physics and astronomy, nine in chemistry, seven in mathematics, four in anthropology and psychology, and four in geology and geography.

THE SOCIAL SCIENCES

THE SOCIAL SCIENCES STAFF

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¹ Resigned April 6, 1938.

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THE SOCIAL SCIENCES

IN 1938 as in preceding years The Rockefeller Foundation recognized certain specific interests in appropriations made for research and training in the social sciences to institutions in the United States and abroad. Areas of special interest were social security, public administration, and international relations, while continuing support was given for fellowships, grants in aid, and for general work believed to be of fundamental importance in the development of the social sciences. Appropriations totaling \$3,762,500 may be classified as follows: for aid in research, education, and dissemination of information in international relations, \$834,000; in social security, \$99,000; in public administration, \$2,379,500, of which \$2,000,000 was given to the Spelman Fund of New York in support of a program supplementing the Foundation's own work in this area. For conferences and planning of the Social Science Research Council, for fellowships and grants in aid awarded by both the Foundation and the Council, a total of \$450,000 was appropriated.

The Foundation's support of work in international relations in 1938 was guided by the same objectives and directed into much the same channels as in earlier years. The larger amount appropriated during 1938 indicates no expansion in

program or principle of support; it represents the action taken to provide continuing support for several institutions which had been aided by the Foundation for some time under grants about to terminate.

The work of all divisions of the Foundation is international in scope and in many instances may safely be claimed to be effective in improving international relations, although the chief objective is the advancement of science. The fellowships given in each field of Foundation interest are found to break down national isolation and to aid in the development of world citizens.

In addition to undertakings of the Foundation which are in general directed toward the improvement of international understanding, there is within the division of the social sciences a program in international relations attempting to aid explicitly in the improvement of communication and understanding between countries and individuals, in the training of experts upon certain technical problems of international relations, in the facilitation of arrangements intended to give government officials access to technical advisers and materials, and in the dissemination of objective information to the general public whose intelligent participation in the determination of policy seems essential in democratic countries. Political events of 1938 appeared most inimical to progress toward

world understanding and better international relations. The Foundation continued, however, its support of certain centers of research and education in the belief that the rational and constructive approach to international problems would in time have its effect upon the trend of world affairs.

The program in social security has since 1935 recognized a twofold interest: the support of research which describes and measures the changes and analyzes the causes of instability in our economic system; and the study of measures seeking to develop more adequate protection for the individual against the hazards of sickness, accident, old age, and unemployment through social insurance and organized relief. The work supported is, therefore, research upon both the preventive and protective aspects of social security.

In the past year appropriations by the Foundation in the area of social security were small. On account of the incidence of terminating grants there were decreased requirements for new action in 1938. The support of a number of research organizations in the United States and Europe studying the business cycle and related phenomena of modern life continues to be a central interest of the program in the social sciences. And the Foundation is maintaining its aid to work which concentrates upon protective measures for

the benefit of the individual as offered by existing and proposed social legislation.

During the current year the Foundation continued to support both training and research projects related to public administration. Training programs operated upon both the pre-entry and the inservice levels. The aim of the pre-entry program is to interest college graduates of first-grade ability in public service careers and to offer them study opportunities, and through internships some actual experience, relevant to work for which they may subsequently qualify. The aim of the inservice training program is to offer comparable training facilities to ambitious men and women already in the service whose lack of specialized background may militate against their opportunities for advancement.

In aiding research programs, it has been the consistent aim of the Foundation to assist the movement which in democratic countries is changing public administration from a legalistic discipline, preoccupied with the intricacies of bureaucratic structure, to an objective and pointed study of the actual problems with which governmental agencies are faced. In pursuing this objective particular emphasis has been placed upon promoting free and continuing exchange of information between the government practitioner and the academic scholar. The effort has been

carried further in providing the means through which the two might actively collaborate in joint attacks upon important problems. And, inevitably, the emphasis upon actual management situations has encouraged attention to the substantive as well as the technical problems with which government is concerned.

The appropriation of \$2,000,000 made by the Foundation to the Spelman Fund was for the replenishment of its practically exhausted resources. The Spelman Fund has concentrated upon the support of nonacademic institutions with activities directed toward the improvement of personnel and services in the area of public administration while the Foundation's program has been chiefly concerned with academic institutions.

INTERNATIONAL RELATIONS

GRADUATE INSTITUTE OF INTERNATIONAL STUDIES

The Graduate Institute of International Studies (Institut Universitaire de Hautes Études Internationales) is an autonomous graduate school of the University of Geneva concerned with research and training in international relations. Its permanent staff, under the direction of Professors Paul Mantoux and William E. Rappard, is composed of a number of eminent scholars from the

fields of history, government, economics, and law drawn from Austria, Belgium, France, Germany, Italy, Switzerland, and the United States. Visiting professors from various countries and a number of special lecturers and scholars supplement the permanent staff, and bring the results of important research in the field of international relations to the students enrolled at the Institute. Most of the Institute's staff are members of the secretariat, the research bureaus, or the commissions of the League and of the International Labor Office. For the students such personal contacts are most valuable, as are also the documentary resources and libraries of the League and of the Office. The research carried on by the Institute's staff is based upon direct participation in the international activities which center in Geneva.

In view of its distinguished staff and strategic location, the Institute has become a recognized center for the study of contemporary problems. Students have been attracted to the Institute from forty-four countries, with the United States furnishing the largest representation.

By a grant of \$315,000 to be distributed over a period of five years beginning January 1, 1940, the Foundation is continuing the financial support given to the Institute since 1926 by the former Laura Spelman Rockefeller Memorial and later by The Rockefeller Foundation.

INSTITUTE OF ECONOMICS AND HISTORY:
INTERNATIONAL RELATIONS SECTION

The Foundation continued aid in 1938 to the International Relations Section of the Institute of Economics and History, Copenhagen, by a grant of \$18,000 to provide Danish Kr. 75,000 over a three-year period beginning October 1, 1938.

Established in 1927 for research upon problems of government and economics, the Institute has given special attention to international problems. The quarterly publication, *Economics and Politics*, devotes approximately half of each number to questions affecting international relations and makes periodic surveys of economic conditions in the United States, Great Britain, France, Germany, Denmark, and the other Scandinavian countries. A service of special value and interest to research workers, libraries, and other institutions maintained by the Institute is an index of the most important articles on international affairs which have appeared in about one hundred fifty Danish and foreign periodicals. This index is published on cards and sent regularly to subscribers.

In addition the training of university students in the field of international relations by means of study groups is an activity which the Institute hopes to emphasize. A by-product of this activity

has been the publication of three monographic studies based on the material collected by the groups.

It is of interest that the Danish Institute led the Scandinavian countries in creating a center of interest in international relations, and served as the model for the centers set up by Norway and Sweden.

The Institute has recently moved to new quarters on the campus of the University of Copenhagen adjacent to the Departments of History and Political Economy. Plans have been made to increase the number of the library's books, magazines, and newspapers relating to foreign affairs through an arrangement with the Danish public libraries. This library will be available to the general public.

INTERNATIONAL INFORMATION COMMITTEE

The International Information Committee of Stockholm was formed in 1937 to promote public interest and educate public opinion in foreign affairs, and to stimulate attention to international relations problems among young scholars and university students. The Swedish Coordinating Committee for International Studies, itself constituted to participate in the International Studies Conference, initiated the new organization with the Information Bureau on Peace Questions, the



Photograph Excised Here

Institute of Economics and History, Copenhagen, Denmark.

cooperative and adult education movements, and the Swedish universities represented.

The International Information Committee's offices are now established in rooms of the Information Bureau on Peace Questions with plans to build up an information center and to arrange lectures before various groups such as clubs, churches, trade unions, adult education groups, and the universities. Important activities include the organizing of study groups and the publication and distribution of scientific surveys and summaries on contemporary international problems written in a so-called "popular" style. Subjects for such a series have been selected. As part of the program to create interest in research on problems of foreign policy, the Committee plans to invite foreign authorities to lecture and to provide young students with scholarships for study abroad. Publication of articles resulting from the activities of the International Information Committee will appear in the periodical of the Information Bureau on Peace Questions. The Committee is also cooperating with the Institute of Economics and History in Copenhagen.

In 1938 the Foundation provided \$25,000 to purchase Swedish Kr. 90,000 over the three-year period beginning January 1, 1938, for the continued development of the International Information Committee.

CENTRE D'ÉTUDES DE POLITIQUE ÉTRANGÈRE

Aid which the Foundation has been giving to the Centre d'Études de Politique Étrangère, Paris, for the three years since its establishment in 1935 was continued by a grant of \$102,000 made in 1938 to provide French Frs. 2,550,000 over the period October 1, 1938, to December 31, 1942, at the rate of French Frs. 600,000 a year.

The membership which is as yet small and restricted to those who are able to make specific contributions to the Centre's studies, includes statesmen, professors, lawyers, engineers, journalists, educators, industrialists, bankers—in fact, represents practically all phases of French life. Through the study groups formed from its membership, the Centre seeks to stimulate the development in France of authentic information and objective thought on international problems. Some fourteen study groups, including two permanent committees—one for the study of problems of the Pacific, and one for Central Europe—have been constituted to consider different international problems subsequent to the establishment of the Centre. The published volumes resulting are: *Consequences of Japanese Economic Developments on the French Empire*, *Commercial Relations between France and the Danubian Countries*, *Evolution of Countries of Arabic Civilization*, *The Relation between the Raw Material Problem*

and Colonial Claims, Contemporary Egyptian Problems, The Organization of Social Sciences in France, and The Cameroons.

The Centre issues bimonthly a review, *Politique Étrangère*, and a monthly, *Chronologie Politique Internationale*, giving brief descriptions or extracts from important statements or messages which relate to significant international events of the month.

The Bibliothèque de Documentation Internationale de Vincennes with its 140,000 volumes cooperates closely with the Centre. The Centre's own library contains 600 volumes. An Information Service for members and others interested in foreign relations is being developed. The Centre plans to extend its work through branches in other French cities, the first of which have recently been established in Lyon, Strasbourg, and Toulouse.

In September 1938 the Centre moved into new and larger quarters, which will provide additional needed space for offices and for meetings.

COUNCIL ON FOREIGN RELATIONS

The Council on Foreign Relations, New York, is an unofficial group of nearly five hundred fifty men chosen as members by the Council's board of directors because of special qualifications through past experience or present position to contribute

to the discussions, study groups, and other activities of the Council.

It publishes quarterly a review, *Foreign Affairs*, with a circulation of over twelve thousand, and annually, *The United States in World Affairs*, a survey of international events of the year in which the United States has played a part or has a direct interest, and from time to time as events indicate, a *Political Handbook of the World*.

The Council's chief activity centers in the discussions of its study groups. Results of the discussions appear as articles in *Foreign Affairs*, as pamphlets, or, when they attain to the status of a comprehensive treatment of important questions, as books. A study group of the Council is at present investigating Anglo-American economic problems jointly with the Royal Institute of International Affairs in London. In inter-country study groups which bring together leaders of opinion across national frontiers the Council expects to find an effective method of approach to common problems without the constraints imposed upon official representatives. The results of such cooperative research will presumably be available to the official leaders in the respective countries and used to supplement and assist in the work of governments.

In 1938 the Foundation granted \$75,000 to be paid at the rate of \$15,000 a year for five years

beginning January 1, 1938, toward the development of its study groups and research program. There was an especial need for assistance to develop the joint research programs between the Council and groups in other countries. The recent financial aid was in addition to that given in 1935 which provided \$10,000 and \$5,000 respectively for the years 1938 and 1939 in support of the general research of the Council.

COUNCIL ON FOREIGN RELATIONS: AMERICAN COORDINATING COMMITTEE

Annual conferences upon problems of international relations begun in 1928 under the auspices of the International Institute of Intellectual Cooperation of the League of Nations, developed in 1931 into the permanent body known as the International Studies Conference. The Conference encourages organizations interested in scientific research, discussion, or information upon international affairs in a given country to group themselves into a national "coordinating committee," which represents the particular country at the biennial conferences and coordinates the studies which are carried on in the interim and furnish the basis of discussion at the meetings.

Until the organization of the American Coordinating Committee in 1936, the Council on Foreign Relations had served as the representative of the United States at the conferences held

since 1928. The Coordinating Committee now has offices in the Council building and the Council relieves the Committee of certain detailed administrative functions as well as of the holding and disbursing of the funds. Its permanent members are the Council on Foreign Relations, the Foreign Policy Association, and the American Council of the Institute of Pacific Relations. The Social Science Research Council appoints six representatives from various universities or research institutes to serve for two years and the chairman of the American National Committee on Intellectual Cooperation is an *ex officio* member.

At the plenary meetings of the International Studies Conference held in alternate years, a particular international problem is discussed on the basis of reports prepared in advance. The subject of the Conference to be held at Bergen, Norway, in 1939 will be "Economic Policies in Relation to World Peace." The American Committee will submit to this Conference reports dealing with (1) possible contributions to peace through changes in economic policies and practices; and (2) political and other procedures by which such changes may be effected.

The Foundation continued support begun in 1936 by a grant of \$24,000 to the Council on Foreign Relations for the work of the American

Coordinating Committee over the two-year period beginning January 1, 1938.

FOREIGN POLICY ASSOCIATION

Another group engaged explicitly in research and education in the field of international relations is the Foreign Policy Association, New York, which has a large membership throughout the United States. The members of its research staff visit and study abroad for firsthand impressions of current developments. Some of them have been Rockefeller Foundation fellows.

The Research Department analyzes and reports current international developments comprehensively and objectively and furnishes the material for the Association's two-page weekly newsletter, the *Foreign Policy Bulletin*, and the fortnightly *Foreign Policy Reports*. The latter are widely used in the academic world. The Association also maintains an information and publicity bureau which brings the results of research to the attention of Washington congressmen and press representatives. The *World Affairs Pamphlets*, edited in cooperation with the National Peace Conference, are in the form of a general survey of a broad problem. *Headline Books*, which are intended for the widest and most popular distribution, present graphic and concentrated treatment of timely problems.

Regular meetings of the Foreign Policy Associa-

tion are held in New York and also in the seventeen branches in other cities. These meetings are addressed by representative national and foreign speakers. Frequently the meetings are addressed by members of the research staff, who also are called upon to speak before schools and colleges, clubs, and labor groups and organizations. Foreign groups have been interested in having Foreign Policy Association staff members appear before them as speakers when on visits abroad.

The Foundation has supported the Research Department since 1933, and in 1938 extended this aid by a grant of \$75,000 for use over a period of three years.

INSTITUTE OF PACIFIC RELATIONS: STUDIES OF FAR EASTERN ISSUES

The Institute of Pacific Relations operates through national councils or other representative bodies in eleven nations bordering on the Pacific Ocean or exercising sovereignty over regions of the Pacific. Through its international secretariat, it has undertaken to organize a study of the issues which various peoples and governments affected by events in the Far East will face when a settlement of the present conflict in China eventually is made. Thirty-one individuals from the United States and other countries, qualified by knowledge and experience in Far Eastern affairs, have sig-

nified their interest in the undertaking and their willingness to serve as consultants.

Through its international secretariat the Institute has conducted and promoted research and discussion of foreign relations in the Far East since 1925. It is in close touch with Far Eastern authorities in all member nations, and already has a mass of data which can be utilized for this specific study. The national councils of the countries at present engaged in conflict have not withdrawn from the Institute, and contact with them has been continuous which will greatly facilitate the obtaining of recent and supplementary data.

In general the design is to provide information which will be of value to experts and negotiators at a conference on Far Eastern affairs when the setting is favorable for a negotiated peace. Published reports will be made available to the public, attempting to throw light on the problems involved in the future of China and of Japan, and to suggest those general or specific international arrangements which may be necessary to assure a lasting settlement in the Far East. Background material will involve a study of the interests of the Western Powers in the Far East, including pertinent facts and statistics.

In 1938 the Foundation appropriated \$90,000 to be available until December 31, 1939, for the expenses of these studies.

INSTITUTE OF PACIFIC RELATIONS:
PACIFIC COUNCIL

In 1938 the Foundation appropriated \$80,000 to the Pacific Council of the Institute of Pacific Relations for general administrative expenses, at the rate of \$15,000 a year, and for research, at the rate of \$25,000 a year, for two years.

The general budget for the Council provides for the expenses of triennial conferences; the editing of *Pacific Affairs*, a quarterly review, and of *Institute of Pacific Relations' Notes*, the organ of the Pacific Council and member organizations; the publication of the Council's many studies; as well as the usual expenses of administration and of travel of the secretariat to visit member organizations and branches. The eleven nations, with national councils, committees, or institutes for the study of international affairs, which are members of the Institute of Pacific Relations are Australia, Canada, China, England, France, Japan, the Netherlands, New Zealand, the Philippines, the U.S.S.R., and the United States. The representative of France in the Institute, the Committee for the Study of Problems of the Pacific, cooperated to form the Centre d'Études de Politique Étrangère in 1935 and now constitutes a permanent study group of the Centre.

At present the Pacific Council is mainly engaged on the special research project of the Insti-

tute dealing with the studies of Far Eastern issues. It plans to devote its regular program mainly to long-term investigations of other phases of international relations in the Pacific. Much work in translation and bibliography is planned upon the existing vast storehouse of important scientific material in Chinese, Japanese, and Russian literature.

AMERICAN COUNCIL OF THE INSTITUTE OF PACIFIC RELATIONS

The American Council, acting as the link between the Institute of Pacific Relations and the American public, has developed an active program of research and publication of its own, while contributing toward the research of the Institute, helping in preparations for the triennial conferences, and engaging in various activities directed toward the dissemination of information and the promotion of education upon questions of the Pacific. An important function of the Council has been the promotion of teaching and research, not only in Far Eastern international relations, but in Far Eastern history, economics, culture, and languages in colleges and universities of the United States.

Recent events have aroused American interest in the Pacific area, and the Council has been taxed to supply the information requested of it

on all kinds of Far Eastern questions. The libraries and staff of the three offices of the Council at New York, San Francisco, and Honolulu are consulted constantly by those who seek information on the Far East. Information is distributed through the Council's fortnightly review, the *Far Eastern Survey*, which has as subscribers business and banking firms, libraries, educators, students, publicists, and American and foreign government agencies and officials.

To meet the growing desire for information about Pacific affairs, in the spring of 1938 the American Council held seven conferences in different parts of the country on the Sino-Japanese war and American Far Eastern policy. A consolidated record of all the conferences was issued subsequently. Similar meetings are being held in 1939.

The Foundation appropriated \$30,000 in 1938 toward the general expenses of the American Council of the Institute of Pacific Relations during the years 1939 and 1940.

SOCIAL SECURITY

GENEVA RESEARCH CENTER

For the expenses of a special study of commercial policy to be conducted under the auspices of the Geneva Research Center, the Foundation appropriated \$50,000 to be available over a period

of approximately two years beginning October 15, 1938.

The essential purpose of the project will be to secure through an integration of separate national studies a detailed, authentic, and international picture of present trade regulation and commercial policy. Collaborative studies will be conducted simultaneously by institutes in Argentina, Australia, Belgium, Denmark, England, France, Germany, Italy, Japan, the Netherlands, Poland, and Sweden. Other countries may possibly participate. The work is in charge of Professor J. B. Condliffe of the London School of Economics, who is also chairman of the governing board of the Geneva Research Center, and rapporteur general of the International Studies Conference.

The studies plan to begin with the general trading relations of the individual countries in 1925, the date at which Germany regained her tariff autonomy and Great Britain returned to the gold standard, and to continue to the present with special emphasis on the depression years. The present situation will be studied in the historical perspective furnished by these detailed investigations and in relation to future possibilities. The completed national studies will be published and discussed at a conference in the summer of 1940. A final integration of the studies under Professor Condliffe's direction will complete the project.

UNIVERSITY OF LOUVAIN: INSTITUTE OF
ECONOMIC SCIENCES

In 1938 an appropriation of \$14,000 was made to the University of Louvain for the research program of the Institute of Economic Sciences in continuation of aid begun in 1933. This grant is available over the five-year period 1939 to 1943, inclusive, with the condition that not more than Belgas 20,000 shall be paid in any one year.

The Institute of Economic Sciences was established in 1928 under the leadership of a former Rockefeller Foundation fellow, Professor Leon H. Dupriez, the present director. Until a recent reorganization the Institute combined both research and the training of students, but is now devoted entirely to research.

Beginning in 1929 a monthly bulletin was issued, containing articles based on the general research program, and supplemented by current surveys of business conditions. One issue each year is devoted to an annual survey of the general economic situation of Belgium.

Present research is concentrated on building up an historical and statistical record of economic developments over the period of industrial expansion beginning about 1830 as a basis for generalization regarding the nature and reasons for fluctuations in economic activity. The studies analyze data on quantity changes in production in industries and

agriculture; the growth of means of transportation; retail and wholesale prices, prices of stocks and bonds, dividends and capitalization; wages; monetary changes; population growth; foreign trade. The Institute plans to subject existing theories to a thorough critical analysis in the light of the new findings.

**SOCIAL SCIENCE RESEARCH COUNCIL:
COMMITTEE ON SOCIAL SECURITY**

The Social Security Committee of the Social Science Research Council was aided by The Rockefeller Foundation in 1935 over the first three years of its existence when concentrated attention was given to research and studies by the Committee's own staff. In 1937 an additional sum was provided for the continuation of the work of the Committee on a reduced scale of activity for the two years ending June 30, 1940.

The present emphasis of the Committee's work is less on research by its own staff and more on the stimulation and planning of research in the social insurance and relief fields for the guidance and assistance of existing agencies. It consults with other research groups and reviews the proposals for projects which they submit. A list of suggested studies by graduate students has been compiled and circulated to university scholars.

In addition to its regular activities for which the Foundation provided in 1937, the Committee

engaged in activities such as the organization of conferences of experts, the employment for short periods of qualified persons to make exploratory studies as guides for other workers in the same field, and certain small studies to fill in gaps in larger research programs. For such purposes the Foundation in the spring of 1938 appropriated \$15,000 to be used over a period of approximately one year ending June 30, 1939.

SOCIAL SCIENCE RESEARCH COUNCIL: COMMITTEE ON SOCIAL SECURITY. STUDY OF ADMINISTRATIVE PROBLEMS

The Foundation granted in 1938 to the Committee on Social Security of the Social Science Research Council \$20,000 to continue studies in the administrative aspects of unemployment compensation an additional year, to December 31, 1939.

During 1938 the study was directed chiefly toward an analysis of the administrative experience of the states which started paying benefits at the beginning of the year. Since it was not possible to cover all of the twenty-three states paying benefits, a group of fifteen representative states was selected for a detailed study. The federal aspects of the problem were followed as well. Since no state other than Wisconsin had evolved what might be considered its permanent organization and procedure, the first year of experience

was insufficient as a basis for a thorough report on the problem, and the investigation, therefore, is being continued into 1939.

Federal and state officials have availed themselves extensively of the information which has been amassed, both through discussion and conference with the representatives of the Social Security Committee and reports prepared by them, such as *The Administration of Unemployment Compensation Benefits in Wisconsin* and the reports of studies made in England and Germany.

Another aspect of the Committee's work is the stimulation and guidance of research by other agencies and institutions in unemployment compensation, on which further emphasis is planned in 1939.

PUBLIC ADMINISTRATION

NATIONAL INSTITUTE OF PUBLIC AFFAIRS

The Foundation in 1938 continued its earlier support of the National Institute of Public Affairs in Washington by granting \$105,000 over a three-year period, for the Institute's experimental program in recruiting and supervising internships of a year's duration in the federal services. The National Institute of Public Affairs serves as a central administrative agency for graduate students who are preparing for public service careers

and who wish to have practical field experience in one of the federal services as part of their preliminary training. It also serves as a clearing house for information and as a liaison agency in matters relating to the recruitment and training of qualified personnel between the colleges and universities and the several establishments of the Federal Government.

In 1935, the first year the internship plan operated, the experimental training period for two groups of forty interns each was three months. The first regular internships began in 1936-1937 when thirty interns worked for the entire year. Forty persons were in training the following year and fifty, the maximum number which can be accommodated, are serving during the current year, 1938-1939.

The Institute does not itself act as a placement agency, and the internship experience in no way serves as a short cut through civil service or other induction requirements. Most of the interns, however, enter directly into the government service—federal, state, or local—although some continue graduate study before applying for public employment. Many of them are given appointments in the departments in which they have received their training.

The Institute selects the candidates from among the colleges and universities of the United

States and places, supervises, and assists the interns while they are in training. The candidates so far accepted have held baccalaureate degrees from forty-eight colleges and universities. No candidate is accepted without a personal interview, and consideration is limited to candidates receiving special recommendation from their colleges of graduation. During the year 1937-1938, interns worked in thirty different bureaus, sub-departments, offices of Senators and Representatives, or in other agencies of the government. Each intern is assigned to a government official as a full-time nonsalaried assistant. Weekly conferences for all the interns are held, at which leading administrators or others from government departments and activities are invited to talk. The interns may also pursue "after-hours" courses in public administration, or supplemental subjects, at the universities in Washington. At the end of the year the intern presents a completed research project closely related to the work he has done.

HARVARD UNIVERSITY: GRADUATE SCHOOL OF PUBLIC ADMINISTRATION

Early in 1937 funds were given by the Foundation to Harvard University for the purpose of bringing in practical administrators as consultants to aid in developing the organization and program of the Graduate School of Public Administration

for the ensuing two years. The Foundation supplemented this grant in 1938 by an appropriation of \$20,000 to finance the expenses of resident and visiting consultants who participated in the regular work of the School for the latter half of the academic year 1938-1939. A special endowment provides for the other expenses of the School, which now is housed in its own recently completed building.

On the basis of the preliminary conferences of the staff of the School with about seventy-five public officials during the spring of 1937, and experimental operation during the year 1937-1938, the School entered the year 1938-1939 with a tentative plan of procedure. The School serves not only the specially qualified Littauer fellows, but a selected group of graduate students in social science as well as a number of resident consultants who are mature representatives from the public services. The consultants are on leave from their posts for research and additional training, and also serve as temporary members of the faculty. The practice of inviting for short visits top-ranking public officials, scholars, journalists, business men, and others as senior consultants is an additional feature of the work.

The program at Harvard seeks to develop new and better techniques for dealing with problems of public administration quite as much as to train

public servants. The School also proposes to find means of putting the knowledge and facilities for research of the University at the service of government officials, to whom at the same time, it offers an opportunity to consider the fundamental principles of public administration free from the pressures of daily routine.

The Lucius N. Littauer fellowships are offered to those who have completed one or more years of graduate study in the social sciences, and preferably to those who have had additional experience in government service. Registration in the School is limited to Littauer fellows, but properly qualified graduate students in other schools and departments of the University may attend the Public Administration Seminars. The total enrolment in the seminars for the year 1938-1939 was 188. Fourteen Littauer fellows were appointed, ten of whom had held regular or internship positions in government service.

Typically, the members of the staff of the School of Public Administration are members of other graduate schools and departments of the University, although special Littauer School appointments were made in the case of Dr. Alvin H. Hansen, Littauer professor of political economy, and also in that of Dr. Heinrich Bruening, former chancellor of Germany, lecturer on government.

UNIVERSITY OF CHICAGO

Since 1932 the Foundation has contributed to the support of research and training in public administration at the University of Chicago, and in 1938, it continued this aid by a grant of \$75,000 for use over a three-year period.

The Department of Political Science, under Professor Merriam's chairmanship, has developed a broad program in the area of public administration. The funds furnished by the Foundation have been used principally to strengthen the faculty and to support a considerable volume of research.

Research has developed along five major lines: (1) search for significant principles in the borderland between public and business administration; (2) interrelationships of school systems and city governments; (3) studies of specific problems in public personnel management; (4) development of objective standards for the measurement of administrative efficiency; (5) restatement of the general body of theory and practice of public administration.

On the training side, the emphasis has been on the preparation of teachers and research workers rather than on practitioners in the public service. The University's public administration division has, however, prepared men and women for the administrative services of federal, state, and local government at the rate of seven or eight a year—

a number representing about one third of the graduate students who specialize in this field at Chicago.

There has been no attempt to offer vocational training or instruction. The courses in public administration are designed to give a close acquaintance with the literature, materials, and problems in the field and to develop the students' capacity for accurate and independent observation and analysis, rather than to teach detailed operating technique.

Of special advantage to the work at the University of Chicago is the opportunity for cooperation and interchange of views with practitioners in public administration afforded by the proximity of the Public Administration Clearing House and its affiliated organizations of public officials, which are located in a building on the University campus.

Temporary instructors and lecturers from other institutions are also brought in to supplement the regular teaching staff.

UNIVERSITY OF SOUTHERN CALIFORNIA:
SCHOOL OF GOVERNMENT

If the level of public administration in the United States is to be improved it is clear that attention must be given to administration of state and local, as well as federal affairs. The University of Southern California is one of the pioneer

institutions in the teaching of public administration as related to state and local government. The School of Government, established in 1929, furnishes undergraduate training for a degree of Bachelor of Science in Public Administration. It also awards the degree of Master of Science in Public Administration to qualified graduate students.

The program in Southern California, however, is known chiefly for the training offered to persons already in government service. Nearly six hundred such individuals are now registered in classes of the Civic Center Division located opposite the City Hall.

In 1938, with the aid of a grant from the Foundation of \$36,000 available over a period of three years, the School of Government undertook two projects designed to improve the training program in California, and to provide useful instruction materials for comparable problems in other areas. One project provided personnel for intensive work in developing teaching materials and texts needed for useful training to active or prospective public employees. The second project involved a study of the potential inservice student group in the Los Angeles area. Through this study an analysis will be made of the previous education and training of the public employees in the area, of the qualifications required for classified positions, promotion policies, procedures, and opportunities,

and the relation of these data to the development of the curriculum offered by the School.

THE AMERICAN UNIVERSITY

The current grant to The American University, Washington, D.C., for work in public administration relates to the development of a Latin-American program. For several years the University has been conducting inservice training courses upon a graduate level for employees of the Federal Government in Washington. A large proportion of the courses are professional and definitely related to problems faced by government administrative personnel. This general program, inaugurated through Foundation support, is now being carried forward by the University without outside assistance.

Recently a number of Latin-American nations, through their Washington representatives, expressed interest in the program and in the possibility of access to such training for a limited number of their own administrative officials. In both North and South America a considerable opinion believed in the potential usefulness of establishing international contacts and understanding upon the administrative level, where men are concerned with discovering the best methods for dealing with common tasks.

Accordingly arrangements were made for the

acceptance of nine Latin-American officials—four from Brazil, three from Mexico, and two from Nicaragua. It was for this purpose that the Foundation made a grant of \$18,000 for the expenses of a special unit which was set up to supervise these students. This grant was for a period of three years, beginning September 1938.

Dr. John C. Patterson is serving as director of this special unit which has been set up in the School of Public Affairs, where he has the assistance of an English tutor who aids the foreign students with any language difficulties which may be present. There is in the grant an allowance for traveling expenses which will enable the director to visit Latin-American countries to explain the educational resources of the American University program and to learn how it might be adapted to the needs of Latin America.

THE AMERICAN ASSOCIATION OF SCHOOLS OF SOCIAL WORK

In the past few years the role of government in public welfare activities has greatly expanded, and with it has come the need for large numbers of trained persons to assume these responsibilities effectively.

While public welfare agencies can make good use of professional personnel of varied competencies, it seems clear that training in a number of

the specific skills requisite to this field is essentially that offered in schools of social work, even though the curricula of many schools have been designed to meet the needs of workers in *private* social work rather than in *public* welfare. At present, over half of the graduates of schools of social work find employment in public welfare agencies.

The American Association of Schools of Social Work, an agency designed to determine and safeguard professional standards, recognized that its standards and the curricula of member schools should be reexamined in terms of this increased demand for public rather than for private welfare workers. For this purpose, it appointed a competent secretariat to assist its executive committee in an investigation to determine: (1) what public welfare jobs exist, and what skills and backgrounds are required for competent performance in them; (2) for which of these jobs the schools of social work are better qualified to prepare than other agencies; (3) what changes in curriculum and accrediting standards should be made in the light of this newly determined definition of the task of schools of social work; (4) what is the residual list of public welfare tasks for which the schools are not particularly well equipped to prepare candidates or for which they are not interested in offering training. For this list it should be recognized that other agencies than the schools of

social work would be expected to provide educational background.

The Foundation appropriated \$36,000 to the American Association of Schools of Social Work early in 1938 to be used, over a three-year period beginning approximately April 1, 1938, for the purpose of making this study.

SOCIAL SCIENCE RESEARCH COUNCIL: PUBLIC ADMINISTRATION COMMITTEE

Since 1935 the Foundation has provided the Public Administration Committee of the Social Science Research Council, in addition to other aid, with a fluid fund from which allotments could be made for organizing small projects or exploratory investigations which could not be fitted into the regular budget of the Committee. Early in 1938 the Foundation granted a further sum of \$15,000 to be available until April 1, 1939, as a fluid fund.

The Foundation provided financial support for the permanent secretariat of the Council's Public Administration Committee as an agency to act in a liaison capacity between practitioners in the field of public administration and academic scholars working with public administration problems. It was understood that the Committee would attempt to integrate and initiate research to be carried on either under its own direction or through existing agencies.

Because of the breadth of the Committee's program, the flexibility provided by the fluid fund grants was especially useful. To illustrate, through the use of fluid funds in recent years accurate records have been kept of the developing administrative procedure in such agencies as the Works Progress Administration, the National Recovery Administration, the Social Security Board, and of the operation of the first session of Nebraska's Unicameral Legislature. Exploratory surveys and memoranda have been prepared upon research possibilities in federalism, measurement standards, administrative law, and in a variety of other fields.

PACIFIC NORTHWEST COUNCIL OF EDUCATION, PLANNING, AND PUBLIC ADMINISTRATION

The Pacific Northwest Council of Education, Planning, and Public Administration was formed early in 1938 with a board of seven trustees, and incorporated under the laws of the State of Oregon. It is made up of individuals occupying important positions in government and educational institutions. Specifically, the Council grew out of meetings and conferences between educators of the region and the Pacific Northwest Regional Planning Commission and its program is an attempt to effect a continuous exchange between the practitioner and the academic scholar

and to provide for genuine collaboration between the two upon problems of importance in the area.

Approximately 50 per cent of the total land area of the four States comprising this region is under public ownership. Within the area, there are going forward huge programs in forest, grazing, and fisheries control, soil and water conservation, electric power development, and rural land zoning, in addition to the ordinary governmental activities on the federal, state, and local levels.

In general the Pacific Northwest may be regarded as an area of significant potentialities, and the great influx of population from the northern great plains dry area, together with the impressive Bonneville and Grand Coulee hydroelectric and irrigation developments provide a potential surplus of human and power resources which, if properly utilized, may contribute importantly to the prosperity of the region and of the nation. If, on the other hand, ways for using them effectively cannot be discovered they will constitute an incalculably serious drain. Added to this is the problem of how the forestry and fisheries industries may be made to provide a sustained yield over a period of years instead of an immediate but capital-exhausting profit.

It is with such problems that the Pacific Coun-

cil is dealing, and its effort will be to enlist the best resources, both governmental and academic, that are available for directly attacking them.

The Foundation appropriated \$74,500 for the three-year period beginning July 1, 1938, for administrative expenses of the Council, with payments not to exceed \$21,500 a year. An additional sum of \$10,000 for research and publication was also made available.

GENERAL WORK IN THE SOCIAL SCIENCES

SOCIAL SCIENCE RESEARCH COUNCIL

The Foundation in 1938 continued aid to the Social Science Research Council, New York, in the amount of \$150,000 to be used over the three-year period beginning July 1, 1938, for the general work of the Council, which consists principally of meetings and conferences of committees for the planning, formulation, and coordination of research.

The work of the Council is conducted through a system of committees, of which there are at present some twenty. A number of the committees are routine and policy making, such as the executive and problems and policy committees. Others are advisory, or have the direction of particular enterprises. The latter may conduct investigations of their own, or may encourage and aid in

planning or coordinating research carried out under other auspices.

The Council has continued two broad lines of activity. One places the emphasis upon improvement of the social sciences as instrumentalities for the attainment and diffusion of knowledge, and upon advancement of general knowledge of fundamental applicability to a variety of concrete problems; the other emphasizes the utilization of these resources for attack on current and continuing questions of public concern. As illustrations of the first line of activity the preparation of a number of analyses of outstanding scientific works published in recent years in America with a view to determining current criteria of good workmanship and the initiation of a series of conferences designed to permit the examination of conferences as a procedure in research may be cited.

The activities of the committees on social security and public administration, for instance, were directed toward the utilization of knowledge in the social sciences to these two important continuing problems. A number of the publications which resulted were of significant aid to federal and state agencies responsible for formulating policies and for administration in these areas.

FELLOWSHIPS

In 1938 the Foundation appropriated \$100,000 for fellowships to be granted during the year 1939,

and administered directly sixty-one fellowships in the social sciences from funds which had been provided previously. Of these sixty-one fellows, twenty-nine began their work in 1938 and thirty-two continued studies begun in the previous year.

The countries represented by the men and women who worked in the social sciences under this fellowship program, the fields in which they pursued their research, and the countries in which they studied are indicated as follows:

<i>Subject of Study</i>	<i>No. of Fellows</i>	<i>Country of Origin</i>	<i>No. of Fellows</i>	<i>Country of Study</i>	<i>No. of Fellows</i>
International Relations.....	15	Australia.....	3	England.....	8
Public Administration.....	5	Belgium.....	1	Germany.....	2
Economics.....	27	Bulgaria.....	4	Greece.....	1
Agricultural Economics.....	4	Canada.....	1	Japan.....	1
Sociology.....	3	Denmark.....	2	Netherlands.....	1
Social Work.....	3	France.....	3	Rumania.....	1
Cultural Anthropology.....	2	Germany.....	1	Sweden.....	2
Statistics.....	1	Great Britain.....	8	Switzerland.....	2
Political Science.....	1	Greece.....	1	Tanganyika Territory.....	1
		Hungary.....	1	United States.....	40
		Italy.....	1	Several European Countries.....	1
		Lithuania.....	1	Several South American Countries.....	1
		Mexico.....	2		
	61	Netherlands.....	1		
		Norway.....	2		
		Poland.....	4		
		Rumania.....	1		
		Sweden.....	2		61
		Switzerland.....	3		
		United States.....	15		
		Yugoslavia.....	2		
		League of Nations.....	2		
			—		
			61		

From funds provided by the Foundation for fellowships during the period April 1, 1938, to March 31, 1941, the Social Science Research Council administered fifteen postdoctoral research training fellowships and seventeen predoctoral field fellowships during the year 1938. Eleven of these fellows continued their work from 1937 and twenty-one began their studies in 1938. All fellowships of the Council were granted to citizens of the United States, who received research training in various fields of study in the United States and foreign countries, as is shown in the following tabulation:

<i>Subject of Study</i>	<i>No. of Fellows</i>	<i>Country of Study</i>	<i>No. of Fellows</i>
Economics.....	14	England and on the Continent	
Agricultural Economics.....	1	of Europe.....	16
Political Science.....	6	Guatemala.....	1
Anthropology.....	4	Mexico.....	1
History.....	3	Nigeria.....	2
Statistics.....	2	United States.....	12
Psychology..	1		—
Geography.....	1		32
	—		
	32		

The total number of individuals who have received fellowships from The Rockefeller Foundation and the Social Science Research Council is given in the following table which lists the new appointments in the years shown:

	1924- 1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Total
Rockefeller Foundation	177	43	44	73	60	44	53	35	22	24	29	604
Social Science Research Council	<u>61</u>	<u>25</u>	<u>28</u>	<u>25</u>	<u>30</u>	<u>15</u>	<u>13</u>	<u>13</u>	<u>19</u>	<u>12</u>	<u>21</u>	<u>262</u>
	238	68	72	98	90	59	66	48	41	36	50	866

GRANTS IN AID

The Foundation administered twenty-four grants in aid in the social sciences in 1938, the amounts ranging from \$700 to \$7,500 and totaling \$87,000. One hundred thousand dollars was appropriated to provide grants in aid in 1939. Practically all grants in aid made in 1938 were in the three fields of the Foundation's current emphasis in the social sciences: international relations, five; social security, fourteen; public administration, three. The Foundation made seven grants upon the recommendation of the League of Nations to permit travel and research opportunity to various state statistical officers in the general interests of the League's program for the improvement of national financial, commercial, and economic statistics. In accordance with an agreement with the League, requests from governments for aid to finance the cost of visits of statistical officers to study the statistics of other countries were referred to the Foundation.

In 1938 twenty-four grants in aid were distributed among eleven nations: Switzerland,

three; England and Yugoslavia, two each; Australia, Belgium, Canada, Denmark, India, Peru, and Rumania, one each; and the United States, ten. In addition to the grants which it administers directly, the Foundation provides sums specifically for grants in aid to be administered by the Social Science Research Council and designed to aid the research of individual scholars, usually of mature years. The awards are made by a committee of five appointed by the Council. No grant is for more than \$1,000 or longer than one year. In 1938 the Council made forty-two awards, thirty-nine new grants and three renewals to institutions or individuals in the United States.

In 1938 the Foundation made available \$75,000 to the Council for grants in aid to be awarded in the years 1939-1940, 1940-1941, and 1941-1942.

THE HUMANITIES

THE HUMANITIES STAFF

During 1938

Director

DAVID H. STEVENS

Assistant Directors

JOHN MARSHALL

IRVING A. LEONARD

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THE HUMANITIES

APPROPRIATIONS of The Rockefeller Foundation during 1938 for work in the humanities totaled \$999,500. The list of grants shows how this sum was used for the democratization of culture and the improvement of international communication. One phase of work benefited persons whose interests took them to such established institutions as universities, museums, and libraries. Another had the purpose of bringing large geographical areas, such as the Far East and Latin America, into closer cultural relations with our own and other countries. A third phase had the aim of bringing into freer use new technical devices that invention has given us for disseminating knowledge with a power once found only in the printed page.

In the abstract, this program is to bring to large numbers of people a broader choice among cultural values and greater freedom of individual thought and expression. Today new ways to reach the individual are available for these purposes. The printed page is no longer without rivals in its appeal to public attention. Also, the kinds of material supplied through various contemporary mediums are increasingly abundant. Choice of medium and of matter presents a double prob-

lem of selection. Therefore the humanist needs to have both medium and material at his command to a degree unknown before our time. Otherwise the conditions of cultural dissemination are unchanged. As the humanities are by nature expressions of individual experience in life, so their value to each person must come through individual choice. The fine judgment that the scholar develops from his knowledge of values is possible in less degree to everyone. Today the individual grows to new levels of appreciation in the arts by what he sees and hears far more than by what he does. The drama is still a universal medium of expression and participation; other contemporary arts affect the individual much less directly. The present situation is well described by Mr. Michael Stewart in one passage of his pamphlet, *Bias and Education for Democracy*:

For the present, four profitable lines of action may be mentioned. First, the continued study of the educational possibilities of broadcasting. Second, cooperation between the teaching profession and the film industry; the necessity for this has already been recognized by both parties. Third, the consideration of the kind of books provided for the use of young children. Fourth, the use of dramatic work among children, not only—as is sometimes done in history lessons—to help them memorize facts, but to present them.

Mr. Stewart is speaking of general education, but he states the case for the future of the humanities

in a democratic society. What he says of the youth is equally true of the adult in our world today.

The common stuff of humanistic expression is language. If we are to give to resources of human learning their fullest consequences, we are necessarily concerned with how language does its work internationally. As a result of this fact the program in the humanities has always carried projects of language study with a view to the improvement of communication. Much of the past work has been to improve ways of language learning as one means to better relations with the Far East, but opportunities of the same sort are equally evident in other quarters of the globe and at home. Another line of work for the future is study of what the public accepts passively from radio and film and what may be its undeveloped natural interests. Film and radio, and likewise the cheap printed book, are instruments of communication that demand testing by skilled workers in psychological analysis. These instruments should be used in educational practices of oral and visual communication in ways that will benefit all classes in their social and individual development.

Descriptive paragraphs on succeeding pages present some account of the projects that have had support during the year for diffusion of cul-

ture in modern society. A few grants are to planning agencies that effectively work for such purposes.

DRAMA

UNIVERSITY OF NORTH CAROLINA: A REGIONAL CENTER FOR DRAMA

During 1938 development of American drama has had aid under five grants of the Foundation. One is to the University of North Carolina, where the Foundation has assisted with the development of the drama program since 1934. This year the grant of \$183,000 has two purposes. The amount of \$33,000 is in support of the general program until 1941, to be used in decreasing annual sums for staff appointments, and to begin academic study on dramatic techniques for film production. The amount of \$150,000 is to be available, on condition that \$350,000 be secured from other sources, for housing and endowment of the work in drama and its allied arts at the University. Such a capital grant from the Foundation and other sources would give permanency to new work that has developed under term grants of the Foundation, thereby establishing the present schedule of activity both at the University and at the extension locations on Roanoke Island and in Asheville.

The University is now realizing large returns on

twenty years of work throughout the State of North Carolina to make dramatic expression a familiar social and educational experience for all. Community drama is fostered by full recognition of dramatic study in high school programs, and both community and school have the benefit of advisory service from the University. All communities of the State are kept in constant contact through extension services and frequent productions of school plays at the University. An example of participation by faculty and students is their work on *The Lost Colony*, played these past two summers for thousands of visitors.

One instance of the place drama holds in the life of the State of North Carolina appears in the success of the annual three-day festival at Chapel Hill, in which thirty-two schools participated this past year. The regional consciousness of the southeastern area of the country in all forms of fine arts is in large part due to the steady growth of interest in plays among young people as a result of direct participation in such activities as these annual gatherings of play folk at the University of North Carolina.

THE CAROLINA ART ASSOCIATION:
DOCK STREET THEATRE

Other evidence of the possibilities in the Southeastern States for developing the creative arts

appears in the establishment of the new Dock Street Theatre in Charleston, South Carolina. On February 12, 1736, a playhouse was opened on the site that now, two hundred years later, is occupied by a reconstruction of the old building. This will serve as a community center of drama, music, dance, film, and lectures.

This restoration was accomplished on federal funds with cordial cooperation of all educational and social groups in the city of Charleston and its environs. The completed building was turned over to the city authorities, and they in turn have leased it to the Carolina Art Association for operation. This organization, founded in 1858 "to promote the arts and their appreciation," has now this exceptional community center to serve all interests in the arts not met by the Association through its present gallery. The Association has secured increased support for the Dock Street Theatre through popular subscription for productions of stage plays and for film showings. Twenty-four hundred subscribers agreed to sponsor the series of plays to be produced by the Charleston playing company and visiting actors. The high quality of work assured in these productions is certain to encourage writing of plays for the Dock Street Theatre that will reflect the traditions of pioneer and modern life in the Southeastern States. The grant of \$15,000 from the Foundation

will meet the unusual expenses of the development during the three years ending in June 1941.

WESTERN RESERVE UNIVERSITY:
GRADUATE WORK IN DRAMA

For many years the city of Cleveland has had repertory productions of quality through the work of the Cleveland Play House and, in less degree, of the city group associated with Western Reserve University. The creation of a discriminating audience has led to greater use year by year of these two institutions for training in drama. Today the Cleveland Play House carries a considerable number of apprentices as helpers and learners, giving them practical experience in the theatre. The Department of Drama at the University meanwhile offers theoretical and practical courses in theatre and dramatic history, cooperating with the Play House in the training of its graduate students as directors, playwrights, and teachers.

In recent years the growth of the Department at Western Reserve University has compelled an increase in staff and an overhauling of the physical resources of the Department. The small theatre and offices quartered in a building originally erected for other purposes have been found entirely inadequate to care for the three phases of the training program demanded by the Uni-

versity, the Cleveland community, and the State of Ohio. The staff directs production of plays having casts of students and of adult groups. It maintains a library and information service for high schools and settlements, and constantly prepares for the special events of the school year through its service to a thousand high school teachers directing plays in other cities and towns.

The Foundation has aided the Department of Drama at Western Reserve University by small grants for special purposes. The grant of 1938 to the amount of \$35,000 was toward the reconstruction of Eldred Theatre, the University securing funds to complete the work according to requirements of the Department. The Theatre is now an example of economical and serviceable construction to meet the requirements of the University and the community. The stage is one of the largest in the city, with all essential equipment for training of advanced students. In other respects the building is planned to meet the needs of the Department for offices, workrooms, and library facilities.

**NATIONAL THEATRE CONFERENCE:
AN AGENCY OF COMMUNITY
AND UNIVERSITY DRAMA**

Through the work of a score of leaders in the noncommercial theatre, the National Theatre Conference was created in 1932 to give coherence

to the plans of all American theatres and acting groups that are not interested in professional aspects of drama. Under the leadership of the late Professor George Pierce Baker of Yale University and Mrs. Edith Isaacs of *Theatre Arts Monthly*, the plan was elaborated to give service to members from nine regional headquarters. As the plans progressed, it was clear to many that a small number of individuals carried the responsibility of advising and planning for a very large number of small groups. The function of the National Theatre Conference was defined more sharply as it became clear that broad plans could be brought to completion, but that administration of smaller concerns must necessarily fall to the care of other organizations. By 1938 the twenty-five members of the Conference had agreed on a revised plan of operation in which they cooperate as a planning body to make recommendations regarding the development of school, college, and community theatres. For example, the Conference accepted the responsibility of negotiating with publishers for advantageous royalties on plays having merit for nonprofessional use, and also it explored the ways to encourage writers by securing trial productions of their plays in various kinds of situations, thereby making the refinement of play material a natural function of the community and university theatre.

To aid the Conference in its new program the Foundation granted the amount of \$15,000. Of this sum the committee on the royalty project will have \$5,000 as the means of developing a plan to release plays to nonprofessional groups on a moderate scale of charges for production. The balance of the grant is to be used during the five years ending in June 1943, to carry the office expense of the Conference. Through the generosity of Western Reserve University the Conference has its quarters in the newly erected Eldred Hall. As members of the executive committee are in Cleveland, the location of the Conference offices at this central point for national service is particularly fortunate; the centering of national interests of the nonprofessional theatre in Cleveland has increased the importance of training and study programs of the University and the Play House.

AUTHORS' LEAGUE: FELLOWSHIPS FOR PLAYWRIGHTS

As the young playwright begins independent work he finds constant encouragement through membership in professional or academic groups. In many cases universities continue to guide the work of former students. The Dramatists' Guild, through the parent organization, the Authors' League of America, shows the same kind of inter-

est in the development of its younger members as does the National Theatre Conference for students in training at university or community centers. During 1937 Mr. John Golden created five fellowships for members of the Guild, and it is hoped that such encouragement of talent will be continued by older members. The interest of the Foundation in the same object was shown by the grant of a fellowship fund of \$25,000 for use during the three years from July 1, 1938, under provisions of award as determined by a special committee of the Dramatists' Guild.

LIBRARIES AND MUSEUMS

LIBRARY OF CONGRESS: MICROFILM

LABORATORY

Microfilm copying of material has become increasingly common in libraries that serve individual scholars and smaller libraries through the loan of scarce works; it is still more useful for reproduction of perishable documents, such as newspapers, or of rare works in foreign languages that cannot be purchased in original issues. The Library of Congress has increased its services rapidly by using microfilm as an alternative for photostatic copying and has promoted the use of this economical means of building up collections in other parts of the country.

To meet the demand for microfilm materials, the librarian found his normal source of funds inadequate and the equipment unsuited to production of the great number of film copies wanted by libraries. The Foundation has made a grant of \$35,000 to the Library of Congress to meet both of these needs. The sum of \$10,000 is to be for temporary financing of film copying to meet advance orders. The income from sales at rates within the reach of libraries or individual scholars will be returned to the fund, which presumably will be maintained undiminished by this means. The major part of the grant, amounting to \$25,000, is being used to install modern equipment for filming and processing. The laboratory and clerical services are maintained by the permanent staff.

HARVARD UNIVERSITY: MICROFILMS OF FOREIGN NEWSPAPERS

One of the most useful services to scholarship dependent on recent sources of information is to be supplied by the library of Harvard University through the delivery of microfilm copies of contemporary foreign newspapers. This is possible under a grant of the Foundation to the amount of \$6,000 and by use of university funds to produce master files for the Harvard library. Thirty to fifty foreign newspapers from all quarters of the

world will be received regularly and are at once reproduced for subscribing libraries both here and abroad. By mass production, costs can be kept low; and the schedule of charges will be reduced as the income from sales increases.

By demonstrating how cheaply a library can maintain a full file of newspapers, the plan will affect library practice generally with regard to what is now an inaccessible class of documents. At the same time it will bring immediately into use by scholars a body of evidence on foreign affairs that has not been available outside a few highly specialized research centers. The papers now being regularly reproduced at Harvard come from Australia, Canada, China, Japan, New Zealand, the Union of South Africa, seventeen countries of Europe, and four countries of South America.

Estimates indicate that at the end of three years this service will be self-sustaining. In the meantime the Foundations' contribution, amounting to \$6,000, available until June 30, 1941, will cover newspaper subscriptions and the cost of making the master microfilms.

PRINCETON UNIVERSITY: INDEX OF CHRISTIAN ART

During the year the Foundation made a grant of \$50,000 to Princeton University toward the

production of the Index of Christian Art, the sums provided during a seven-year period to be supplemented by funds from other sources. The amount assured to maintain the work on the Index will bring this unique source of data on art history into form for international use.

The Index, now in its twentieth year of compilation, contains data on the total content of Christian art within the first seven centuries. Work on the period ending in 1400 A.D. will be accelerated by use of new funds, and fresh sources of data will become contributory to the total body of evidence. This now gives an analysis of subjects represented in paintings, stone and wood sculpture, frescoes, and all the smaller objects related to the history of the Christian church. Much of the material for the record is drawn from manuscripts, and wherever practicable the record includes photographs for identification.

In its present state the Index is of constant use to scholars in all countries only by means of copies of separate items produced on special order, or by consultation of the original records at Princeton University. Under the new plans a complete film copy of the cards and photographs will be placed on deposit in the Library of Congress, and thereafter duplicate sets will be available at reasonable rates to any library. Annual additions to outlying depositories will give students of art history direct

access to the latest critical evidence from the work of scholars dealing with these fourteen hundred years of the Christian tradition.

AMERICAN MUSEUM OF NATURAL HISTORY:
MATERIALS FOR STUDY OF THE ART
OF THE AMERICAN INDIAN

In line with its interest in assisting museums in experiments in popularizing their exhibits and giving them greater educational value, the Foundation made a grant of \$6,500 in 1938 to the American Museum of Natural History in New York to enable it to assemble a master collection of photographs of objects showing the history of the arts and crafts of the Indian tribes of North America. The range of the objects to be included in this photographic series is from primitive work in stone, ivory, and pottery to the most recent work of the tribes in metals, pottery, and weaving. A large part of this material has been used by students of anthropology and ethnology, but it has never been brought together in a manner to make possible any esthetic evaluation of North American Indian work as a whole. With the aid of the photographic series this work can be studied in its entirety from the point of view of art.

The collection, which will be held at the American Museum of Natural History, will have im-

portant popular uses. It will be available to schools for study purposes, and to museums, which will find it of great assistance in giving their Indian materials effective and instructive presentation. Copies of the photographs as well as lantern slides will be for sale at moderate prices.

RADIO AND FILMS

MUSEUM OF MODERN ART: A LIBRARY OF MOTION PICTURE FILMS

The Foundation's largest contributions toward experiments in utilizing to greater advantage the educational and cultural possibilities of the motion picture have been made to the Museum of Modern Art in New York. A grant of \$120,000 in 1935 enabled the Museum to establish and support over a three-year period a Film Library whose function it is to collect and preserve noteworthy motion pictures of the past and present, and printed matter important to the understanding of the development of the motion picture; to carry on research on the films in its collection and on the history of the motion picture; and to make its films available for study to universities, colleges, and other educational institutions, and to film societies throughout the country. These exhibit for their members motion pictures not ordinarily shown in the theatres, with the aim of helping to create more discriminating audiences for

the motion picture. In 1938 the Foundation made an additional grant of \$70,000 to assist the Library in maintaining and extending its collections and in continuing its services to educational institutions during the two years ending June 30, 1940.

The Library has assembled a collection of about eight hundred films produced between 1895 and 1938 in the United States, England, France, Germany, Sweden, Italy, and Russia; and it is steadily adding to this number. It keeps in its archives a preservation print in addition to the negative of each picture, and stores these in separate vaults as a precaution against loss by accident of any part of its collection. Duplicate negatives are made up as the films deteriorate. It has also a large collection of books in all languages on the motion picture, as well as periodicals, manuscripts, photographs, and original sketches. All of these are available to the public.

The Library has prepared six series of two-hour film programs, thirty-five programs in all, for the use of educational institutions. These series are: "A Short Survey of the American Film," "Some Memorable American Films," "The Film in Germany and the Film in France," "The Swedish Film and Post-War American Films," "The Work of D. W. Griffith," "Non-Fiction Films." Each film in circulation is preceded by accurate explanatory titles and data.

Program notes, still pictures, and music are provided with each program.

The Library is now giving special attention to the development of courses on the motion picture for schools, colleges, and universities. An experimental course for which it has provided the material is now being given at Columbia University for advanced students. This is entitled "The History, Aesthetic, and Technique of the Motion Picture," and consists of twenty-nine three-hour sessions.

**WORLD WIDE BROADCASTING FOUNDATION:
PROGRAMS OF EDUCATIONAL AND
CULTURAL VALUE**

Three years ago The Rockefeller Foundation appropriated \$25,000 to enable the World Wide Broadcasting Foundation to experiment with radio programs of cultural and educational value. The Broadcasting Foundation has since received two additional grants from The Rockefeller Foundation for its experimental work: one of \$40,000 for use during the two years beginning July 1, 1936, and one of \$100,000 for the next two years. Of the latter sum, \$25,000 is to be paid unconditionally and \$75,000 on the basis of one dollar for each dollar collected by the Broadcasting Foundation from other sources.

The World Wide Broadcasting Foundation is a

noncommercial organization incorporated for the purpose of developing, producing, and broadcasting programs of an educational, artistic, and cultural nature, and for arranging interchanges of constructive radio programs throughout the world. For this it has use of the facilities of the shortwave station WIXAL in Boston. This station accepts no advertising and operates on a nonprofit basis for the service of the public. It is the only station in the United States with national coverage that is devoted exclusively to educational and cultural programs. Its license gives it the use of four short-wave frequencies. Recently the Federal Communications Commission assigned to it, on loan, two additional frequencies of the five reserved for Pan-American broadcasting.

Its broadcasts for English-speaking audiences include programs in drama, science, literature, and music; a current events round table conducted by Professor Elliott of Harvard; services of churches of various denominations; and practical courses in modern radio and the elements of aviation. Its foreign broadcasts comprise regular programs in Spanish and Portuguese for Latin America, and programs for Greece, the Scandinavian countries, France, and the Netherlands. Among the features of these programs are news reports and digests of American editorials on international affairs that endeavor to present a

balanced view of American opinion. A weekly program called "World Youth Speaks" brings to the microphone young people from all lands; these contribute their share to international friendship and world understanding.

A number of educational and social agencies cooperate in the programs. A list of colleges and universities participating now comprises most of the leading institutions of New England. Other organizations which have assisted include the Foreign Policy Association, the Institute of Pacific Relations, the International Chamber of Commerce, International House, and the Pan American Union.

LATIN-AMERICAN INTERESTS PROMOTING INTER-AMERICAN CULTURAL UNDERSTANDING

TULANE UNIVERSITY: CATALOGUING THE MUSEUM COLLECTIONS OF THE MIDDLE AMERICAN RESEARCH INSTITUTE

A plan for bringing the peoples of English-speaking North America and of Spanish-speaking Middle America into closer sympathy through interpreting to each the cultural backgrounds, the social institutions, and the problems of the other is being developed by the Middle American Research Institute of Tulane University in New

Orleans. This Institute is the outgrowth of the University's Department of Middle American Research, which was founded in 1924 for the study of the history, archaeology, geography, and linguistics of Mexico, the Central American republics, the West Indies, and the Bahamas. The broad purpose is to gather and disseminate knowledge of the cultural heritage and present-day life of this part of the American continent.

This purpose led to field and laboratory study resulting in considerable publication and in training of advanced students from various countries. The Department rapidly increased its library and museum collections. In 1938 the University created the present Middle American Research Institute, which now is undertaking a more intensive program. For study and interpretation the Institute has the objects from twenty-four field expeditions and gifts of material, books, and manuscripts on Middle American anthropology, ethnology, and art. Comparative studies are possible on the basis of smaller collections from the Southeastern United States and Northern South America. One pressing task is to make all of these resources readily available for research and instruction as well as for public exhibition. The first step to this end is to prepare a catalogue of the entire collection, now made up of some twenty thousand examples of pottery, textiles, and his-



Photograph Excised Here

New collection of sherds from the Republic of Honduras, Museum of the Middle
American Research Institute, Tulane University.

torical monuments, and a large stock of books, manuscripts, pamphlets, and maps.

The plan for this catalogue is a combination of methods used in library and museum work, to enable workers to find the essential data on any given item in a single place. Each card in the completed catalogue will carry the Institute's history of the object recorded; a small photograph of the object, or in some cases several photographs; and references to relevant facts in print. These individual histories will be corrected or extended as new light is thrown on relationships through further research. It is believed that two years will be sufficient time to document the present holdings and to prepare the new file of records. To enable the Institute to employ additional personnel for this work The Rockefeller Foundation made it a grant of \$10,000 for use during the two years ending December 31, 1940.

INTERNATIONAL BUREAU OF EDUCATION: LATIN AMERICA AND CHILDREN'S LITERATURE

Believing that an important contribution can be made to international understanding by putting into the hands of children throughout the world translations of the best young people's books of all lands, the International Bureau of Education, through its Children's Literature Section, is carrying out a program directed toward



Photograph Excised Here

Delegates and friends of the First Conference of the American Committees of International Intellectual Cooperation, Santiago de Chile, January 6, 1939.



Photograph Excised Here

Bureau of American Bibliography, National Central Library, London, England.

this end. For some years this Bureau in Geneva has centered on the collection, analysis, and display of children's books and periodicals for Europe. During that period it has been supplying librarians and educators with the latest information on materials in print for children, both original texts and translations, in some forty countries. It has also been providing American and European publishers with lists of the best children's books of these countries, with recommendations for translation. These lists include stories with authentic backgrounds that sympathetically portray the life of each country. Description of nature, customs, legends, biographies, and history come within the scope of its interest.

The Bureau is now preparing to extend services of this kind to Latin America. To enable it to do so, The Rockefeller Foundation appropriated \$12,000 for the staff and services required by this project over a three-year period.

Early in 1938 the Bureau began its survey of literature for children in Mexico, Central and South American countries, and the Spanish-speaking West Indies. It gathered information through correspondence with ministries of education, teachers' associations and individual teachers, librarians, authors, publishers, and others interested in the reading habits of children. Much of the data came from large libraries in Europe

and the United States. During the second year of the study the staff will analyze the data and choose books from its lists for exchange among the various countries. Translation into all appropriate languages for proper dissemination of the material will be secured as rapidly as practicable by aid of publishers. During the third year it will publish reports on the status of children's literature in the countries surveyed. This will result in production of selected lists of books for each country that indicate the contents of each book, the publisher, and the age for which the book is most suitable. Recommendations of books for interchange among countries and for translation will be presented in final form in these reports.

If a young people's literature of the kind recommended by the Bureau can be built up in every country of the Western Hemisphere, the children of the Americas will acquire a common background of stories and a knowledge of the life of young and old in the many countries that should lay the foundations of friendly and sympathetic understanding.

AMERICAN COUNCIL OF LEARNED SOCIETIES:
HANDBOOK OF LATIN AMERICAN STUDIES

Scholars of the United States and the Latin-American countries collaborate on an annual *Handbook of Latin American Studies* which will

enable persons throughout the Americas and elsewhere to keep currently informed of the results of research in the humanistic and social science fields in Latin America by scholars of all countries.

The handbook has been issued yearly since 1935 by the American Committee on Latin-American Studies, which draws its members from the American Council of Learned Societies and the Social Science Research Council. One of the members acts as editor-in-chief of the handbook and twenty-five others, who represent various interests in university work and in popular education, serve as contributing editors. The subjects covered by the handbook include anthropology, art, economics, education, folklore, geography, government, history, international relations, language, literature, and law. Each editor contributes a review of studies in his special field during the current year. The third issue of the book, that for the year 1937, runs to more than six hundred pages. The contributions are by more than thirty specialists, several of them Latin Americans.

The American Council of Learned Societies contributed toward the publication of the first two issues of the handbook with funds drawn from a grant which it had received from The Rockefeller Foundation for the work of committees in new fields of scholarship. Subsidy from this source could not be continued over a longer period. As

the sales of the book had not reached a sufficient number to make the project self-supporting the Foundation made an appropriation of \$15,000 to the Council to enable it to continue its aid toward the production of the handbook during the five years beginning March 1, 1938.

UNIVERSITY OF NEW MEXICO: EXTENSION OF LIBRARY RESOURCES

The State of New Mexico has many remnants of Spanish, Mexican, and Indian civilizations, and for this reason its University at Albuquerque has become a center of research in the history and culture of the Southwestern United States. In addition to its own faculty and graduate students, scholars coming to New Mexico from all parts of the country to make field studies depend upon it for research facilities. To meet the increasing demands upon its services the University has in recent years enlarged its physical equipment. A new library building is now nearing completion.

Because of its limited library budget the University has been unable to assemble an adequate collection of books on Latin-American subjects. It therefore is developing a plan of regional interchange or loan of books to enlarge its resources. The successful operation of such exchange depends upon proper bibliographical equipment. The first essential is a depository set of the cards in the Library of Congress catalogue, as there is

no set of these cards near enough to be accessible to persons working at the University. To enable the University to purchase and install a set of the cards the Foundation made it a grant of \$12,500.

As a recognized center of research in Hispanic American history and culture, the University is a repository of State historical documents. During the past three years great quantities of documentary material also have been gathered from all parts of the State for its library. These collections consist of public records, private papers, diaries, and letters, most of them relating to the period of American occupation. Other manuscript collections and photostat or film copies of manuscripts are being acquired. This material must be classified and catalogued before it can be made available for study. Toward the expenses involved in getting the collection ready for use the Foundation contributed \$3,500 at the time of its grant for the purchase of the Library of Congress cards. Thus its total contribution to the University during the year for the development of the library resources was \$16,000.

FAR EASTERN STUDIES

DEVELOPMENT OF CHINESE AND JAPANESE STUDIES IN AMERICAN UNIVERSITIES

To advance American understanding of the nations of the Far East through development of a

number of centers in the United States for teaching and research in the cultures, history, and languages of these peoples, the Foundation during 1938 made grants to five universities. These funds will enable them either to enlarge their collections of books and other source materials in Far Eastern languages or to finance temporarily new faculty appointments for the extension of Chinese or Japanese studies.

UNIVERSITY OF CHICAGO

To the University of Chicago the Foundation made a grant of \$25,000 for the purchase, over a five-year period, of standard works in the Chinese language necessary for the building up of a sound program of advanced work in Chinese history and literature. The University has provided excellent quarters for the Chinese library in the buildings of the Oriental Institute, to afford workers in Far Eastern and Near Eastern fields the advantage of association in their studies.

The Foundation has made previous grants totaling \$29,000 to the University to enable Professor H. G. Creel of the Department of Oriental Languages and Literatures to prepare a set of annotated books for the student of Chinese. This work is a direct outgrowth of his own research into the cultural history of ancient China. The first of the textbooks, the *Hsiao Ching* (Classic of

Filial Piety), has been published and is in use at the University.

COLUMBIA UNIVERSITY

Columbia University has reported greatly increasing demands for its books and periodicals on Far Eastern subjects through calls for inter-library loans, services to visiting scholars, reference work for various metropolitan organizations, as well as for the needs of its own students. The Foundation made an appropriation of \$25,000 to assist it in enlarging its collections of Far Eastern reference works and teaching materials, particularly of publications in the Chinese language. The Chinese library now numbers 45,000 volumes, but there is need for many of the older works, materials for the study of literature and drama, and larger files of official registers and gazettes, codes and legal works, and periodicals.

The growth of Far Eastern studies in the United States is reflected in the steady increase of offerings at Columbia University in Chinese, Japanese, and Russian. Eight faculty members now give their full time to instruction and research in these languages and literatures, and the budget of the Department of Chinese provides for a visiting professor in alternate years. Help of the Foundation on library facilities is therefore of benefit to a variety of interests that require ample

provision of source materials in the languages of the Far East.

CORNELL UNIVERSITY

Cornell University has good basic equipment for the development of Chinese studies in its endowed library of some twenty-three thousand Western books on China, developed under a bequest from Charles W. Wason of Cleveland, and in its manuscript and book collections in Chinese. Instruction will now begin on an enlarged schedule under a Foundation grant of \$15,000. Of this sum, \$3,000 is for the addition to the Chinese library of essential reference works and source materials for Chinese studies, and \$12,000 is to be used over a five-year period to supplement the salary of a new appointee to the Department of History who will give both graduate and special courses in Far Eastern history.

When the Wason library came into the possession of the University, in 1918, its nine thousand volumes provided one of the best resources in Western languages for work on China. Since that time the income from the library endowment, about \$2,000 a year, has been used to purchase important current publications on China in English and other Western languages, and also certain items in Chinese. At present the collection contains over eight thousand texts in Chinese.

When the necessary additions have been made to this section of the library, the University program will be well implemented for teaching and research in the general areas of Chinese studies.

UNIVERSITY OF PENNSYLVANIA

The University of Pennsylvania has one of the eight departments in American universities offering courses in Indic studies. It also has excellent facilities for work in the history and archaeology of the Near East and of Egypt. The Chinese section of its Museum includes a noteworthy collection of sculpture that has come to it through gift or purchase during a period of thirty years.

In response to a request from the University and the University Museum for aid in financing the appointment of a staff member to serve as curator of the Museum's Chinese collection and to give graduate and undergraduate courses in Chinese cultural history, the Foundation made an appropriation of \$15,000 to be available for the salary of the appointee during the period from September 1, 1938, to August 31, 1941. After the termination of this aid the University and the Museum will assume joint responsibility for the maintenance of the post. This new appointment will expand opportunities at the University for cooperative research on the common interests of scholars exploring the history and culture of Southern Asia.

PRINCETON UNIVERSITY

A grant of \$15,000 was made to Princeton University to enable its School of Public and International Affairs to appoint an instructor in Japanese history and economics in connection with its program of Far Eastern studies. The fund will be used on the salary of a new staff member during the five-year period ending June 30, 1943. A similar grant for work in Japanese brought material on economic studies of Far East countries to the Princeton School of Public and International Affairs. The fine beginning of Japanese studies was broken off abruptly by the death of Dr. Robert K. Reischauer; yet that initial drive toward practical research in Chinese and Japanese at Princeton persists.

For Chinese studies specifically the University has full access to the Gest Library, which is held by the Institute for Advanced Study as a resource of the University as well as of the Institute. Economic research is clearly indicated within the plans of both institutions in ways to draw on this Library for that special field, as well as for Far Eastern studies of general character.

AMERICAN COUNCIL OF LEARNED SOCIETIES:
SUMMER SEMINARS IN FAR EASTERN STUDIES

Among the productive activities in the development of American scientific study of the Far East

has been a series of summer seminars or institutes designed to provide instruction and research opportunities not available in regular university curricula. Such sessions, held at Harvard University (1932), Columbia University (1935), the University of California (1934 and 1937), and the University of Michigan (1936 and 1937), have been made possible through cooperation of the American Council of Learned Societies and of the Institute of Pacific Relations with these universities. The Rockefeller Foundation has made contributions to both organizations toward the provision of instruction in Far Eastern languages, cultural history, philosophy, art, and literature at these sessions. During the past year it made a grant of \$7,500 to the American Council of Learned Societies toward the general expenses of sessions to be held in the summers of 1939, 1940, and 1941. The first of the new sequence is to be at the University of California.

As these summer seminars have developed, they have assisted in the attainment of several objectives. They have given to persons ordinarily engaged in teaching such subjects as history, philosophy, or the fine arts in American universities and colleges a conspectus of the culture of the Far East; they have provided more advanced students with opportunity to study in their own specialties or to investigate related phases of these

cultures of which they had no specialized knowledge; and they have stimulated serious concern for popular and scholarly study of the Far East.

More than two hundred persons representing many universities have attended these seminars. The results of their experiences are evident in American academic life, in the form of better instruction and in the establishment of new courses. Experiments with language teaching are developing better techniques for learning the way of entry into Chinese, Japanese, and Russian studies. The aim of the seminars is to explore methods of opening the original materials to younger scholars by sound training in language quite as much as to draw attention to the subject fields required in any survey of Far Eastern culture.

FELLOWSHIPS

Seventy-three men and women, fifty-nine of them citizens of the United States, four from Canada, four from China, two from Puerto Rico, and one each from Chile, Hawaii, Japan, and Mexico, held Foundation fellowships during 1938 for study in those fields of the humanities that have development aid from the Foundation. Thirty-eight of the fellowships were initial awards and thirty-five were renewals from previous years.

Six general fields of activity were represented in the grants. Appointments were distributed as

shown by purposes: Dramatic arts, twenty-one; production of radio programs, sixteen; language study in preparation for work connected with the promotion of international cultural relations, particularly with the Far East, fourteen; motion picture production, thirteen; library administration, seven; and survey and study of Latin-American historical materials, two.

Sixty-one of the fellows spent the entire year in the United States. Of the others, two worked in England, three partly in England and partly in the United States, two in Mexico, two in Japan, one in China, one in both China and Japan, and one in Brazil, Venezuela, and Colombia.

In 1938 the Foundation appropriated \$75,000 for the support of fellowships in the humanities. All appointments were with reference to defined plans of work. All the applications for this assistance were from sources where such plans made training of personnel the essential first step.

GRANTS IN AID

Sums ranging in amount from \$300 to \$5,000 and totaling \$52,050 were given by the Foundation in 1938, as grants in aid to thirty-one individuals or institutions. These sums supported special studies, surveys, and other preparatory work contributing to the national and international activities of the humanities in the Foundation program.

Five of the grants were for projects to extend international library service, and four were for studies preliminary to projects for library reorganization. There were five grants to advance cultural interchange between America and the Far East; four for work bearing on the development of regional drama, and one for the completion of a book on stage techniques; four for study of the educational possibilities of radio programs; four for increasing the educational work of museums; two for investigating ways for a wider use of the motion picture in education; one to enable the American Council of Learned Societies to hold an institute of Latin-American studies during the summer of 1939 at the University of Michigan; and one to assist the Massachusetts State Department of Education in improving methods of teaching English to foreign-born adults.

GENERAL PROGRAM

AMERICAN NATIONAL COMMITTEE ON INTERNATIONAL INTELLECTUAL COOPERATION: COMMITTEE FOR THE STUDY OF COPYRIGHT

International copyright protection is provided at the present time under two different treaties, one the Convention for the Protection of Literary and Artistic Works, originally concluded at Berne in 1886, and the other the Convention concerning

Literary and Artistic Copyright, adopted at Buenos Aires in 1910 and generally known as the Pan-American Convention. The United States is a party to the Pan-American Convention, but alone among the English-speaking nations she has remained out of the Berne Convention. Of the countries of the American continents, only Canada and Brazil are members of this Convention.

In most respects the provisions of the two conventions are similar or identical, but there is one important difference between them: the Berne Convention guarantees automatic protection to the works of creative artists without any formal proceedings on their part, while the Pan-American Convention requires formal registration of the productions for which the writer or artist desires protection.

As the United States is not a member of the Berne Convention, her literary and artistic works are not protected in any of the English-speaking countries except by special agreement with the various countries individually. And as only American republics are parties to the Pan-American Convention, intellectual property of other nations is, in the absence of special agreements, protected on the American continents only in Canada and Brazil.

It is obviously of great importance to bring all nations into a universal system of international

copyright protection. In recent years earnest efforts to accomplish this have been made in America and Europe. Among the agencies taking an active part in this task is the American National Committee on International Intellectual Cooperation. In order to increase its services in this field, the Committee, early in 1938, with the aid of a small grant which it had received from The Rockefeller Foundation in 1937, set up a subcommittee for the study of problems arising under the two copyright conventions, particularly with reference to needs for coordination in the Americas. In 1938 the Foundation made a second grant to the Committee, to the amount of \$23,500, for expenses of its work until December 31, 1939.

During the early part of 1938 its Committee for the study of copyright gave close study to past legislation and opinion on domestic copyright. All interested groups were brought into conferences. These conferences dealt with the basic issues and also with those that have arisen by reason of mechanical inventions affecting rights to creative work. Serial publication and book form of issue; dramatization for film, stage, and radio; the use of music in recording and broadcast—these are a few of the newer sources of confusion in practice. Certain of the studies involved participating in European and international confer-

ences, as well as preparation of data on practice in all countries of this hemisphere.

The Committee embodied in two reports its findings on the copyright situation in the United States and on current practice throughout the countries of the three Americas. The Committee then prepared a resolution and draft protocol to the Pan-American Convention for the Eighth International Conference of American States meeting at Lima in December. These materials were transmitted by that Conference to the Pan American Union for presentation to the governments of the various American republics.

Further action toward agreement will be taken by sending a delegation to the sessions of the committees for International Intellectual Cooperation at Santiago in January 1939. The American Committee will also be represented at a conference which the Belgian Government is to call in 1939 with the object of finding a general formula for copyright protection as a preliminary to the meeting later in the year of the International Conference for the Revision of the Berne Convention.

AMERICAN COUNCIL OF LEARNED SOCIETIES: GENERAL PROGRAM

Toward the support of its general administrative offices the American Council of Learned Soci-

eties has in recent years received annually \$30,000 from The Rockefeller Foundation. A variety of special interests, such as its fellowship and development committees, are carried by contributions from several organizations, including The Rockefeller Foundation, and through cooperation of American and Canadian universities. In 1938 the Foundation appropriated \$90,000 for this basic expense of maintaining the Council during the three years beginning July 1, 1939.

The Council is a national organization for aiding American scholarship and research in the humanities. It is a representative body, acting as the agent of its twenty constituent societies, which have a membership of over fifteen thousand American scholars interested in the history and development of human culture. Members of the Council are elected by the societies (two from each) for four-year terms. Its administrative authority is an executive committee of five members working with its permanent secretary. The permanent secretary of the Council, Mr. Waldo G. Leland, is president of the International Commission of Historical Sciences and also of the International Union of Academies, which brings all learned societies of the world into cooperation through its publications and its annual meetings at Brussels.

Special committees of the Council operate to

promote sound teaching and research in various fields with particular emphasis on Latin-American, Far Eastern, and Slavic studies, and on undeveloped fields of American scholarship. Two important features of the work of the committees are assistance to younger men in their training and encouragement of cooperative work among scholars in universities. The Council also directs such long-term projects as the comprehensive *Dictionary of American Biography* and participates in similar undertakings of an international character.

FORMER PROGRAM

AMERICAN SCHOOL OF CLASSICAL STUDIES AT ATHENS: FELLOWSHIPS IN ARCHAEOLOGY

The uncovering of the ancient Agora of Athens, which has been in progress since 1929 under the auspices of the American School of Classical Studies, with support from personal gifts from Mr. John D. Rockefeller, Jr., is scheduled for completion in 1940. Throughout that period the Foundation has assured the training of young American scholars in the work by means of fellowships. It also has now provided for preservation in a new museum of all objects from the excavations.

Perhaps the most striking outcome of the excavation program has been the discovery of the

real antiquity of this site. The Agora was not only the market place of classical Athens; it was a center of human settlement for at least three thousand years before Christ, as is shown by the testimony of pottery, tools, and other objects from late neolithic times. Classical temples and other buildings of the Age of Pericles have survived for the most part only in their foundations; but underneath these, successive layers of earlier foundations and material have made it possible to trace the history of the site to contemporaries of the earliest Egyptian pyramid builders.

Many ancient wells were found filled with stones, broken sculpture, and other debris, the accumulations of thousands of years. Some were buried under floors and pavements. These wells were keys to historical sequences, for the successive layers of material yielded coins, lamps, and pottery of known periods. In this way several discoveries of sculpture were assigned to early Greek periods, items which if found alone would still be subjects of controversy. From the entire area the recovered items in 1938 include over 8,000 coins, 3,600 Greek and Roman lamps, 6,000 Greek inscriptions on marble stelae, 25 complete sculptured busts, and hundreds of pieces of broken statuary—some 38,000 catalogued objects in all. The Agora Museum, for which the city of Athens provides the site and The Rockefeller Founda-

tion \$150,000 for the building, will furnish a fireproof repository for these objects. Exhibition space and study quarters will afford free access for the public and the specialist to the results of this exhaustive record of human history.

From the beginning of the work on the Agora the American School of Classical Studies has had a fellowship program bringing younger American scholars to Athens for assignments at the excavation. At least six men have held fellowships each year. They have been responsible for directing sections of the excavation and for preparing reports on materials in their special fields. They thereby have made important contributions to the work and at the same time have gained valuable field experience. The Rockefeller Foundation has contributed to the fellowship program since 1929. During the past year it appropriated \$25,000 for the continuance of this support until June 30, 1940. This brings its total expenditures for such fellowships to \$112,800.

**SPECIAL RESEARCH AID FUND
FOR DEPOSED SCHOLARS**

SPECIAL RESEARCH AID FUND FOR DEPOSED SCHOLARS

IN 1938 the Foundation made twenty-one small grants from a Special Research Aid Fund to seventeen academic institutions toward the salaries of displaced European scholars who were appointed to positions in these institutions. Of the institutions aided fourteen were in the United States, and one each in England, France, and Norway. The amounts allotted ranged from \$450 to \$6,000, and totaled for the year \$70,040. The grants were toward the salaries of seventeen new scholars, and four who had previously received aid. Twelve of the scholars were German; eight, Austrian; and one, Italian. They were specialists in the following fields: natural sciences, one; social sciences, fourteen; and humanities, six.

The Foundation's purpose in this program is to ensure the continuance of important scientific work, interrupted for political, religious, or racial reasons. Many institutions have been glad to add deposed scholars to their staffs; the intellectual life of many countries has been enriched.

The Foundation aids institutions for a year, or in a few special instances, two or three years, while they are making adjustments to care for the

total salary of the scholar from their own budgets. All negotiations concerning the placement of the scholar are carried on between the institution and the scholar himself. The Foundation is not concerned until the institution makes an application for aid. Assistance is given only when there is a practical certainty, or, in exceptional cases, at least a strong possibility that the scholar will be established in a permanent position.

Since this program was begun in 1933 to the close of 1938 aid has been given for the placement of 168 scholars in eleven different countries. They represented the following fields: medical sciences, thirty-nine; natural sciences, thirty-six; social sciences, fifty-nine; and the humanities, thirty-four. The Foundation has appropriated a total of \$675,000 over this period, including \$50,000 provided in 1938.

CHINA PROGRAM

CHINA PROGRAM STAFF

During 1938

SELSKAR M. GUNN, *Vice-President of
The Rockefeller Foundation*

JOHN B. GRANT, M.D.

CHINA PROGRAM

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CHINA PROGRAM

THE trustees of The Rockefeller Foundation took special action in April 1938, approving continuance of the China program for the year 1938-1939. In May 1938 the sum of \$170,100 was appropriated to provide Chinese local currency \$547,000 and U. S. \$6,000 to be devoted to the several projects of the program for the year 1938-1939. An additional \$60,000 was provided for fellowships and \$10,000 for small grants to be allotted by the officers in China. A contribution of \$85,000 for emergency aid to nine institutions was made to the Associated Boards for Christian Colleges in China.

The military conflict caused widespread interruption and disturbance in the work of most of the institutions receiving help from the Foundation under its China program for rural reconstruction. The purpose of aid at this time, when few of the institutions can carry on academic work of a high technical grade, was to conserve the special capabilities and experience of the personnel which has been engaged in teaching and research in both academic and practical rural reconstruction. The work has been of such unusual character in its application to the particular problems of China that many of these individuals

could hardly be replaced, and it was feared that if they should become scattered during the present emergency, units of similar effectiveness could be developed again only after much time had been lost. In spite of the great disruption caused by removals over long distances and other vicissitudes, these institutions have become stabilized sufficiently to resume productive work.

In the sphere of practical application in the field, the opportunities for applying the techniques already worked out in administration and rural reconstruction have become immensely expanded because of the need of the government to mobilize all the country's resources and organize every means of production, including agriculture. The circumstances which have pushed these institutions into the southwest of China have brought the ideals and conceptions of China's reconstruction program to a somewhat isolated and primitive population which under normal circumstances probably would not have felt the full impact of the reconstruction work for some time to come. A widespread and rapid improvement in administration and agriculture in this region which will bring it into line with the more advanced eastern part of the country may be the result.

As most of the recipients of aid under the China program are educational institutions, the Foun-

dation's grants have been made to coincide with the school year. The following report, therefore, covers for the most part the year July 1, 1937, to June 30, 1938.

EDUCATION AND RURAL RECONSTRUCTION

NATIONAL COUNCIL FOR RURAL RECONSTRUCTION

The field work and the Rural Institute of the North China Council for Rural Reconstruction were conducted in Tsining, a county of Shantung Province, until December 1937, when the staff was forced to leave before the advance of military forces. The staff moved over a distance of more than 2,000 miles by inefficient transportation, first to Hankow, then to Chungking, and finally to Kweiyang. In April 1938 the provincial government of Kweichow assigned the district of Tingfan, about thirty-five miles south of the provincial capital, Kweiyang, to the Council as its field laboratory, and made an appropriation toward the work. The central secretariat of the Council set up new offices in Kweiyang, and the name of the Council was changed to the National Council for Rural Reconstruction.

Of the constituent institutions of the North China Council, Yenching University and the Peiping Union Medical College were too remote;

National Tsing Hua, Nankai, and Nanking Universities were too widely scattered; and the Chinese National Association of the Mass Education Movement was too occupied with emergency activities to continue effective cooperation with the Council's Rural Institute in the way originally planned. The Institute was reconstituted as the National Rural Service Training Institute (called also the National Rural Administration Training Institute). Although the original and primary objective of teaching and research on a university level had to be abandoned temporarily, the training of field personnel and technicians in rural reconstruction will be carried on. The form of organization was continued much as before, with the departments of civics, including social and civil administration, economics, education, social medicine, agriculture, and engineering.

Tingfan is a district of about 140,000 population with some 32,000 acres estimated under cultivation. Most of the agriculture is of the simplest type, with practically no mechanical aids. The backwardness of the province confronts the Institute with new and difficult problems. Nevertheless, measures to organize the county of Tingfan as a laboratory for experiments in rural reconstruction were begun without delay. Agreements for cooperation with national and provincial organizations were made. Positions in the county

government were taken over by members of the staff of the Institute. An experimental farm in cooperation with the Provincial Agricultural Institute of Kweichow was to be established; the Tingfan Junior Vocational School was put in charge of the Department of Agriculture of the Institute, and sixty-two credit cooperatives were organized. In cooperation with the National Health Administration a modern medical clinic was opened for the first time in Tingfan.

From funds appropriated for The Rockefeller Foundation's China program L.C. \$200,000 was allotted to the National Rural Administration Training Institute for the year July 1, 1938, to June 30, 1939.

CHINESE NATIONAL ASSOCIATION OF THE MASS EDUCATION MOVEMENT

Although headquarters of the Mass Education Movement are now in Chengtu, they were at Changsha in the Province of Hunan during the year 1937-1938. The national government's need to mobilize the resources of the people for military purposes offered an unforeseen opportunity to put into effect on a large scale administrative procedures which the Movement had worked out by practical experience. The Mass Education Movement conducted in cooperation with the provincial government of Hunan a complete reorganiza-

tion of the local governments of all of the seventy-five counties of the province. Promising candidates to fill the large number of positions created by this reorganization were given short courses of training in the Hunan Provincial School of Public Administration directed by the Movement. This School trained county magistrates and assistants, administrative supervisors, technical supervisors, community officials, training officers for the people's militia, and supervisors for women's work. After the emergency was met the School planned to reorganize on a permanent basis with courses from one to four years for the training of administrative and technical personnel for the province.

The county of Hengshan, the experimental laboratory in Hunan, was enlarged to include the prefecture of Hengyang of which Hengshan is one of eight counties. The Experimental Rural Normal School at Hengshan continued its training of leaders for rural reconstruction. A substation for research and experimentation was carried on in a smaller area, the county of Luhsi in the western part of Hunan.

Organization of Hsintu in Szechwan into a model county was continued, but reorganization of the province as a whole was retarded somewhat by the death of the governor and a consequent change in administration.

Leaders of the Movement rendered service and counsel at the request of the Central Government, and in the Province of Kiangsi helped to establish a Political Institute similar to the Hunan Provincial School of Public Administration.

From the Foundation's funds for the China program L. C. \$50,000 was allotted to the Chinese National Association for the Mass Education Movement for the year 1938-1939.

YENCHING UNIVERSITY: COLLEGE OF PUBLIC AFFAIRS

The removal of the Rural Institute of the North China Council from Tsining has eliminated the opportunity for field training of the students, as well as opportunities for field research by the faculty of the College of Public Affairs. Field work at Yenching University's own small center at the village of Ching Ho also had to be discontinued because of the disturbed conditions. Field training for a few individuals has been secured by obtaining for them posts with local organizations.

Enrollment in the College of Public Affairs fell off to 147 in the first semester, and 176 in the second semester of 1937-1938, as compared to 234 in the year 1936-1937. The courses at the College were arranged to harmonize with the field-training program which had been conducted by

the rural Institute at Tsining, in an attempt to maintain a minimum of cooperation with the National Council for Rural Reconstruction. Some of the Yenching University staff had remained with the Council and were working at Tingfan. Aside from the lack of a suitable rural laboratory, the training of students in public affairs at the University is not particularly affected. The results of research are being published in the *Yenching Journal of Social Studies*, the first issue of which appeared in June 1938, as had been planned.

For the work of the College of Public Affairs of Yenching University L.C. \$40,000 was contributed by the Foundation from the China program fund, for the year 1938-1939.

NANKAI UNIVERSITY:

INSTITUTE OF ECONOMICS

After the destruction of its plant Nankai University moved first to Changsha in Hunan Province. Here it united with Tsinghua and Peita Universities to form the Changsha Provisional University. After the fall of Nanking in December 1937, this cooperative university formed a more permanent organization, the National Southwestern Union University, and moved to Kunming, the remote capital of Yunnan Province. The new school was organized into four colleges,

arts, science, engineering, and law. The members of the staff of the Institute of Economics of Nankai University were incorporated into the College of Law, and Dr. S. C. Chen of the Institute was appointed dean of the College, which includes the departments of law, economics, commerce, and political science.

Some of the Nankai staff members who were at Tsining with the Rural Institute of the North China Council made the journey to Kweichow Province, and took up their work again with the National Rural Service Training Institute at Tingfan.

Over sixty students, about one-half of the undergraduate body, accompanied the Nankai Institute of Economics as it moved, and received instruction at Changsha and later at Kunming. Graduate training was suspended, but will be resumed at Kunming as soon as research facilities become available. Practically all research was interrupted. Many manuscripts and notes were lost. The library fortunately was saved, but because of difficulties of transportation it could not be shipped to Kunming during the year 1937-1938.

Toward the work of Nankai University's Institute of Economics during the year 1938-1939 the Foundation's China program provided L.C. \$20,000.

AGRICULTURAL PROJECTS

UNIVERSITY OF NANKING: DEPARTMENT OF
AGRICULTURAL ECONOMICS

The University of Nanking was one of the universities which moved to the campus of West China Union University at Chengtu, Szechwan Province. The Department of Agricultural Economics was rapidly reestablished, and instruction, research, and extension programs were adapted to the new area of work.

One of the two major research projects toward which funds received from the Foundation were applied, a study of farm business organization, is in process of completion. Most of this study was conducted in North China. The project included a study of farm management of eight localities, study of the cost of producing cotton in Hupeh, a study of farmers' diet, a study of farm accounting, and an economic study of farm implements in seven localities. The second major project, a study of currency and prices, is being continued to include data from Szechwan Province, such as wholesale prices and business activity in Chungking, the cost of living in Chengtu, types of farming, compilation of agricultural statistics, and an extensive study of farm prices in Szechwan.

Plans for the current year include a study of the wood oil industry, the marketing of farm prod-

ucts in Szechwan, and a study of citrus fruit selection and citrus fruit storage and marketing. Some of the Szechwan oranges are of the highest grade, but the total product is very uneven in quality.

The Department of Agricultural Economics is cooperating with a committee to promote the organization of farmers' associations for agricultural improvement through purchasing and marketing cooperatives, credit loan societies, etc., in the county of Wenkiang. It is cooperating also in a demonstration of extension methods in the county of Hsintu, the Szechwan laboratory of the Mass Education Movement.

The publication of the journal, *Economic Facts*, has been continued in Chengtu with difficulty and at increased expense. Numbers 8-11 appeared during the year 1937-1938.

The China program has allotted L.C. \$25,000 and U.S. \$6,000 to the Department of Agricultural Economics of the College of Agriculture and Forestry of the University of Nanking for the year October 1, 1938, to September 30, 1939.

NATIONAL CENTRAL UNIVERSITY: DEPARTMENT OF ANIMAL HUSBANDRY

Most of the departments of the National Central University moved to Chungking, but the Department of Animal Husbandry continued on to Chengtu where it could cooperate with the

Provincial Bureau of Animal Husbandry. Since the early part of 1938 when the Department of Animal Husbandry arrived in Chengtu, a survey of the types of hogs grown in Szechwan has been made in several representative counties, a survey of hog and pork prices, and of feed prices is under way. As hog bristles are an important product of Szechwan, a project to increase the number of white hogs to supply the more valuable white bristles as a by-product has been undertaken by the Department in cooperation with the Bank of China.

In cooperation with the substation of the Provincial Bureau of Animal Industry in Hsintu county, four swine-breeding service centers have been started. As the inflow of refugees will create a demand for food, the Department of Animal Husbandry is planning measures to increase the production of pigs by selective breeding, by disease control, proper care, and by stimulating the production of crops which can be used as feed.

For aid to this work during the period July 1, 1938, to June 30, 1939, L.C. \$10,000 was allotted from the funds of the China program.

NATIONAL AGRICULTURAL RESEARCH BUREAU

The National Agricultural Research Bureau moved from Nanking in November 1937 to Changsha, later to Liuchow, and to Chungking

in March 1938. Two lathes for the manufacture of sprayers, which were saved and transported with considerable difficulty were set up in a machine shop in Chungking. The insecticide laboratory was given space in the Agricultural Improvement Institute of Szechwan at Chengtu.

The Bureau is concentrating on the promotion of measures which will increase the production of food and industrial crops. The funds provided by the Foundation are being applied toward the Bureau's work in insect control. During the year 1937-1938 the Bureau began attacks on problems of insect control in Szechwan, Kweichow, Hunan, and Kwangsi Provinces. Technicians were provided to help the provincial governments of Hunan, Kwangsi, Kweichow, Yunnan, Szechwan, and Shensi in putting into effect a policy for insect control.

The training course of the Bureau was given during the year 1937-1938 in spite of the unusual circumstances. The fifteen students who traveled with the Bureau were taught technical courses at Changsha and general courses, including the technique of experimental methods, after their arrival at Liuchow.

Toward work in insect control under the National Agricultural Research Bureau the Foundation contributed through its China program L.C. \$30,000 for the year 1938-1939.

PUBLIC HEALTH AND MEDICAL EDUCATION

NATIONAL HEALTH ADMINISTRATION: TRAINING INSTITUTE

The National Health Administration Training Institute left Nanking for Changsha in November 1937. In February 1938 headquarters were established in Kweiyang.

The staff of the Training Institute in Kweiyang reestablished training for physicians, nurses, midwives, and sanitary inspectors on a provincial basis, and cooperated with the National Council for Rural Reconstruction in the demonstration county of Tingfan. Members of the senior staff aided in the teaching of bacteriology, parasitology, chemistry, and sanitation in the Kweiyang Medical College, formerly the Medical College of Wuhan University.

Measures taken to prevent and suppress epidemics have demonstrated to many localities in the southwestern provinces where little medical work had been done before, the great importance of health activities. New health projects were undertaken in various places in Hupeh, Kiangsi, Hunan, Kwangsi, Szechwan, and Yunnan Provinces. In Chungking the Municipal Hospital was reorganized and steps were taken to establish a Bureau of Health. In Kweiyang a Provincial

Health Commission prepared to establish a network of health centers throughout the province, as part of a five-year program of work in rural health. These projects assure a continuing demand for graduates of the National Health Administration Training Institute.

Toward the work of the Institute the Foundation contributed for the year 1938-1939, L.C. \$140,000.

COMMISSION ON MEDICAL EDUCATION

The principal task of the Commission on Medical Education, that of standardizing the curricula of government medical schools to give the type of training best fitted to meet China's needs has had to be abandoned for activities related to the emergency. Most of the thirty-one medical schools in China have moved, have combined with others, or have been suspended. The Commission has been of much help in the reestablishing of disrupted schools.

In carrying out its policy of conserving competent personnel, the Commission helped twenty-five teachers or investigators to continue their work; and through loans from a fund for this purpose, aided 137 students who were on the point of giving up their medical studies.

The Commission was not able to remove its library and some of its manuscripts from Nan-

king. Nevertheless seven textbooks were published during the year, and the personnel in Chungking has resumed the work of editing, compiling, and translating textbooks and medical literature.

The Commission continued to appoint medical graduates for postgraduate fellowships at those schools which were able to continue their teacher-training courses, chiefly at the Peiping Union Medical College. Fourteen nurses and midwives attended maternity and child health courses at the Central Midwifery School at Chungking under the auspices of the Commission.

The China program provided L.C. \$32,000 for the work of the Commission on Medical Education during the year 1938-1939.

FELLOWSHIPS

During the year 1938 ten fellowships were granted for study abroad under the China program. Six fellows studied in the United States; two in England; one visited Denmark, Russia, and Far Eastern countries; and one visited Java, British India, and Ceylon. Two each studied public administration and cooperation; and one each studied agricultural economics, composting as a public health and agricultural process, and plant pathology. Of the three who studied in medicine,

one each studied surgery, embryology, and anatomy.

In order to increase the number of individuals in training for work related to rural reconstruction, the Foundation under its China program has allotted funds each year to various institutions for local fellowships. In 1937 a total of L.C. \$202,220 was allotted for fellowships to be effective during the fiscal year 1937-1938. Because of the unusual conditions only L.C. \$76,985.54 of this sum was expended.

A total of 164 fellows worked during 1937-1938 under the auspices of the following institutions. North China Council for Rural Reconstruction (now National Council for Rural Reconstruction), twenty-three; National Association of the Mass Education Movement, thirty-seven; University of Nanking, Department of Agricultural Economics, six; National Health Administration Training Institute, fifty-eight; Commission on Medical Education, thirty-one; and Lingnan University, nine.

For fellowships to be undertaken during the fiscal year 1938-1939, funds were allotted in 1938 as follows: National Council for Rural Reconstruction, L.C. \$50,000; National Association of the Mass Education Movement, L.C. \$40,000; Yenching University, L.C. \$3,900; Nankai University, L.C. \$3,600; University of Nanking, L.C.

\$11,000; National Health Administration Training Institute, L.C. \$30,000; the Commission on Medical Education, L.C. \$20,000; and Lingnan University, Department of Biology, L.C. \$1,500.

The Foundation provided U. S. \$60,000 for foreign and local fellowships under the China program during the year ending June 30, 1939.

RESEARCH AND DEVELOPMENTAL AID

From a Research and Developmental Aid fund provided for small grants to be authorized by the officers in China, eleven small projects were aided. These grants ranged in amount from \$180 to \$3,333.33, and totaled \$19,883.32 in U. S. currency.

All of the grants were for work relating to rural reconstruction, and most of them were for small projects supplementary to the general work, but not included in the regular budgets of the institutions being aided under the China program.

The Foundation appropriated \$10,000 for the Research and Developmental Aid fund in 1938, in addition to \$10,000 which had been made available in 1937 for the same period.

EMERGENCY FUND

From an emergency fund available during the first quarter of 1938, the officers in China allotted

L.C. \$25,104.60 to the Commission on Medical Education, for use in its efforts to conserve medical teachers and students who without financial assistance might be forced to drop medical work. Funds which had been made available by the government could be used only in government institutions. The sum provided by the Foundation made it possible for the Commission to help teachers and students in private institutions as well.

EMERGENCY AID FOR FOREIGN COLLEGES IN CHINA

ASSOCIATED BOARDS FOR CHRISTIAN COLLEGES IN CHINA

The Foundation has made substantial contributions in the past to foreign missionary institutions in China for work in the natural sciences and in two instances for work in the social sciences. The Foundation is at present aiding the rural reconstruction work of two of these institutions and, to a lesser extent, a third through a small local fellowship program.

The income of these institutions has been much reduced because of the present emergency in China, and the enforced removal of the faculties and students of many to new locations has been an added expense. Additional funds were needed to maintain or to reestablish reasonable standards of operation during the year 1937-1938.

The Associated Boards for Christian Colleges in China represent in the United States twelve of these institutions. In the spring of 1938 the Foundation appropriated to the Associated Boards \$85,000 for allotment toward the general expenses of nine institutions, for the year 1937-1938. Any balance not allocated on October 1, 1938, was to be available for allotment in the year 1938-1939.

The allotments reported by the Associated Boards were as follows:

Cheeloo University	\$15,000
Fukien Christian University	6,000
Ginling College	12,500
Hua Chung College	3,000
Lingnan University	4,000
University of Nanking	26,000
University of Shanghai	4,000
West China Union University	7,500
Yenching University	7,000
	<hr/>
	\$85,000

REPORT OF THE TREASURER

TREASURER'S REPORT

IN the following pages is submitted a report of the financial transactions of The Rockefeller Foundation for the year ended December 31, 1938.

A summary of commitments and funds available for commitment follows:

Outstanding commitments, December 31, 1937		
Unpaid appropriations.....	\$22,258,156.96	
Unappropriated authorizations and pledges.....	3,319,697.00	\$25,577,853.96
Commitments during 1938		
Appropriations		
Public Health.....	\$ 2,725,000.00	
Medical Sciences.....	5,344,700.00	
Natural Sciences.....	2,829,870.00	
Social Sciences.....	3,762,500.00	
Humanities.....	999,500.00	
Program in China.....	325,100.00	
Miscellaneous.....	50,000.00	
Administration		
Scientific Divisions.....	544,325.00	
General.....	286,092.00	
		\$16,867,087.00
Less appropriations for which funds were previously authorized.....	1,920,000.00	
		\$14,947,087.00
Plus authorizations for later appropriation by the Executive Committee.....	251,491.00	15,198,578.00
		\$40,776,431.96

LESS

Payments during the year		
1938.....	\$12,759,730.74	
Sum of unused appropriations and authorizations allowed to lapse.....	841,513.20	\$13,601,243.94

Outstanding commitments, De- cember 31, 1938		
Unpaid appropriations.....	\$25,384,000.02	
Unappropriated authoriza- tions and pledges.....	1,791,188.00	\$27,175,188.02

FUNDS AVAILABLE FOR COMMITMENT

Balance, December 31, 1937.....		\$5,393,943.76
Add		
Income received during 1938...	\$7,087,106.56	
Refunds received during 1938..	21,008.94	
Lapses during 1938.....	841,513.20	
Amount transferred from Princi- pal Fund in accordance with trustees' action		
At meeting of April 6, 1938.	2,500,000.00	
At meeting of December 7, 1938.....	1,255,000.00	11,704,628.70
		\$17,098,572.46
Deduct		
Net commitments during 1938 as shown on previ- ous page.....		15,198,578.00
Balance, December 31, 1938.....		\$ 1,899,994.46

The balance in Principal Fund, December 31, 1937, amounted to \$150,259,942.09. Transactions during the year resulted in a decrease of \$2,255,000, or a balance December 31, 1938, of \$148,004,942.09. The Reserve for Contingent Projects Account, amounting to \$3,200,000 at December 31, 1937, was decreased by the sum of \$1,500,000, to \$1,700,000 at December 31, 1938.

The detailed transactions affecting both of these accounts are shown in Exhibit B, page 388.

At the close of the year the accounts of the Comptroller, the accounts of the Treasurer, and the securities owned by the Corporation have been examined by Messrs. Haskins & Sells, Certified Public Accountants, who have rendered a report to the Committee on Audit.

The financial condition and operations are set forth in the appended exhibits as follows:

Balance Sheet	Exhibit A
Statement of Principal Fund	Exhibit B
Statement of Reserve for Contingent Projects	Exhibit B
Statement of Funds Available for Appropriation and Disbursement	Exhibit C
Summary of Appropriations, Authorizations, and Pledges	Exhibit D
Statement of Building and Equipment Fund	Exhibit E
Statement of Foreign Currencies Held December 31, 1938	Exhibit F
Statement of Appropriations Made During the Year 1938	Exhibit G
Statement of Appropriations During 1938 or Unpaid Balances as at December 31, 1937 on Prior Year Appropriations and Payments Thereon During 1938	Exhibit H
Statement of International Health Division. Designations During 1938 or Unpaid Balances as at December 31, 1937 on Prior Year Designations and Payments Thereon During 1938	Exhibit I
Finance Committee's Statement of Transactions Relating to Invested Funds	Exhibit J
Schedule of Securities on December 31, 1938	Exhibit K

EXHIBIT A

BALANCE SHEET—DECEMBER 31, 1938

ASSETS

INVESTMENTS

Securities (Ledger valuation).....		\$157,339,992.30
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CURRENT ASSETS

Cash on deposit.....	\$19,419,829.92	
Foreign currencies purchased to meet specific appropriations payable in foreign exchange of at least the same dollar amount.....	818,074.10	
Advances and deferred charges under appropriations and sundry accounts receivable.....	1,209,497.23	21,447,401.25
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BUILDING AND EQUIPMENT

In New York.....	\$ 55,332.32	
In Paris.....	63,793.40	119,125.72
	<hr/>	
		<hr/>
		\$178,906,519.27
		<hr/> <hr/>

TREASURER'S REPORT

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EXHIBIT A

BALANCE SHEET—DECEMBER 31, 1938

FUNDS AND OBLIGATIONS

UNAPPROPRIATED PRINCIPAL FUND.....		\$148,004,942.09
RESERVE FOR CONTINGENT PROJECTS.....		1,700,000.00
APPROPRIATIONS FUNDS		
Unpaid appropriations.....	\$25,384,000.02	
Unappropriated authorizations and pledges...	1,791,188.00	27,175,188.02
	<hr/>	
FUNDS AVAILABLE FOR APPROPRIATION.....		1,899,994.46
CURRENT LIABILITIES		
Accounts Payable.....		7,268.98
BUILDING AND EQUIPMENT FUND.....		119,125.72
		<hr/>
		<u>\$178,906,519.27</u>

EXHIBIT B

STATEMENT OF PRINCIPAL FUND

Balance, December 31, 1937		\$150,259,942.09
Contingent project canceled in accordance with trustees' action at meeting of April 6, 1938.....		<u>1,500,000.00</u>
		\$151,759,942.09
Amount transferred to Appropriations Account in accordance with trustees' action		
At meeting of April 6, 1938	\$2,500,000.00	
At meeting of December 7, 1938.....	<u>1,255,000.00</u>	<u>3,755,000.00</u>
Balance, December 31, 1938		<u><u>\$148,004,942.09</u></u>

STATEMENT OF RESERVE FOR CONTINGENT PROJECTS

Balance, December 31, 1937		\$3,200,000.00
Contingent project canceled in accordance with trustees' action at meeting of April 6, 1938		<u>1,500,000.00</u>
Balance, December 31, 1938		<u><u>\$1,700,000.00</u></u>

EXHIBIT C

STATEMENT OF FUNDS AVAILABLE FOR APPROPRIATION AND DISBURSEMENT

AMOUNTS AVAILABLE

Balance, December 31, 1937		
For unpaid appropriations.....	\$22,258,156.96	
For unappropriated authorizations and pledges.....	3,319,697.00	
Funds available for appropriation.....	5,393,943.76	\$30,971,797.72
<hr/>		
Income received during the year 1938.....	\$ 7,087,106.56	
Refunds received during the year 1938.....	21,008.94	
Amount transferred from Principal Fund in accordance with trustees' action.		
At meeting of April 6, 1938.....	2,500,000.00	
At meeting of December 7, 1938.....	1,255,000.00	10,863,115.50
		<hr/>
		\$41,834,913.22
<hr/>		
DISBURSEMENTS		
Public Health.....	\$ 2,367,159.76	
Medical Sciences.....	4,435,713.48	
Natural Sciences.....	1,210,469.84	
Social Sciences.....	2,479,109.11	
Humanities.....	1,013,437.34	
China Program.....	296,853.57	
Miscellaneous.....	170,098.11	
Administration		
Scientific Divisions.....	524,444.19	
General.....	262,445.34	12,759,730.74
		<hr/>
		\$29,075,182.48
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Balance, December 31, 1938.....		\$29,075,182.48

TREASURER'S REPORT

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EXHIBIT C—Continued

This balance is available as follows		
For unpaid appropriations.....	\$25,384,000.02	
For unappropriated authorizations and pledges.....	1,791,188.00	\$27,175,188.02
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Probable payments in the following years		
1939.....	\$14,891,863.02	
1940.....	5,168,003.00	
1941.....	3,459,897.00	
1942.....	2,107,726.00	
1943.....	1,144,884.00	
1944.....	177,240.00	
1945.....	84,575.00	
1946.....	58,500.00	
1947.....	55,000.00	
1948.....	27,500.00	
	<hr/>	
	\$27,175,188.02	
<hr/>		
Balance available for appropriation.....		1,899,994.46
Balance, December 31, 1938, as above.....		<hr/>
		\$29,075,182.48
		<hr/>

EXHIBIT D

SUMMARY OF APPROPRIATIONS, AUTHORIZATIONS, AND PLEDGES

Unpaid appropriations and unappropriated authorizations and pledges, December 31, 1937		
Unpaid appropriations	\$22,258,156.96	
Unappropriated authorizations and pledges	3,319,697.00	\$25,577,853.96
<hr/>		
Appropriations, authorizations, and pledges during the year ended December 31, 1938		
Appropriations and pledges	\$16,867,087.00	
Less appropriations for which funds were previously authorized	1,920,000.00	
<hr/>		
	\$14,947,087.00	
Plus authorizations for later appropriation by the Executive Committee	251,491.00	15,198,578.00
<hr/>		
		\$40,776,431.96
LESS		
Payments during the year 1938	\$12,759,730.74	
Sum of unused balances of appropriations and authorizations allowed to lapse	841,513.20	13,601,243.94
<hr/>		
Balance, December 31, 1938		\$27,175,188.02
This balance consists of		
Unpaid appropriations	\$25,384,000.02	
Unappropriated authorizations and pledges	1,791,188.00	
<hr/>		
Balance, December 31, 1938, as above	\$27,175,188.02	\$27,175,188.02
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TREASURER'S REPORT

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EXHIBIT E

STATEMENT OF BUILDING AND EQUIPMENT FUND

	EXPENDITURES		TOTAL	
		1938	DEC. 31, 1938	
New York Office				
Library, December 31, 1937.....	\$17,424.74			
Less depreciation—1938.....	1,675.61	\$15,749.13	\$550.87	\$16,300.00
	<u>38,412.62</u>			
Equipment, December 31, 1937.....	\$38,412.62			
Less depreciation—1938.....	3,008.17	35,404.45	3,627.87	39,032.32
	<u>3,008.17</u>			
Paris Office				
Part interest in building occupied by Paris Office, December 31, 1937....	63,889.29		95.89Cr	63,793.40
	<u>63,889.29</u>			
	<u>\$115,042.87</u>	<u>\$4,082.85</u>		<u>\$119,125.72</u>

SECURITIES HELD IN PARIS REPRESENTING INTEREST IN BUILDING OCCUPIED BY PARIS OFFICE

Securities held December 31, 1937			
985 Bonds Société Immobilière La Baume Haussmann			
4% Bearer Debentures, due December 31, 2003, of Francs 500 each.....		Francs 492,500	\$39,603.58
		<u>Francs 492,500</u>	
640 Certificates Société Immobilière La Baume Haussmann, of Francs 500 each.....		Francs 320,000	24,285.71
		<u>Francs 320,000</u>	
			<u>\$63,889.29</u>

Securities redeemed during the year		
7 Bonds Société Immobilière La Baume Haussmann, of Francs 500 each.....	Francs 3,500	\$95.89
	<u> </u>	<u> </u>
Securities held December 31, 1938		
978 Bonds Société Immobilière La Baume Haussmann 4% Bearer Debentures, due December 31, 2003, of Francs 500 each.....	Francs 489,000	\$39,507.69
	<u> </u>	<u> </u>
640 Certificates Société Immobilière La Baume Haussmann, of Francs 500 each.....	Francs 320,000	24,285.71
	<u> </u>	<u> </u>
		<u>\$63,793.40</u>

TREASURER'S REPORT

EXHIBIT F

STATEMENT OF FOREIGN CURRENCIES HELD DECEMBER 31, 1938

	AMOUNT IN LOCAL CURRENCY	RATE	COST IN U. S. DOLLARS
England..... Pounds Sterling.....	211,242/4/10	3.5614979	\$752,338.80
Japan..... Yen.....	212,490.07	.3093571	65,735.30
			<u>\$818,074.10</u>

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EXHIBIT G

APPROPRIATIONS MADE DURING THE YEAR 1938

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THE ROCKEFELLER FOUNDATION

PUBLIC HEALTH

International Health Division of The Rockefeller Foundation.....	\$2,200,000.00
State Institute of Public Health, Stockholm, Sweden.....	270,000.00*
University of Toronto School of Nursing, Canada.....	255,000.00
	\$2,725,000.00

MEDICAL SCIENCES

Psychiatry, Neurology, and Allied Subjects

American Psychiatric Association.....	\$9,000.00
Centre Neurologique de Bruxelles, Belgium.....	12,750.00
Columbia University, New York City.....	100,000.00
Cornell University, Ithaca, New York.....	33,500.00
Emma Pendleton Bradley Home, Providence, Rhode Island.....	15,000.00
Institute for Psychoanalysis, Chicago, Illinois.....	120,000.00
London County Council, England.....	127,500.00
Massachusetts Department of Mental Diseases, Boston.....	20,550.00
McGill University, Montreal, Canada.....	51,000.00
National Committee on Maternal Health, New York City.....	18,000.00
University of Chicago, Illinois.....	150,000.00
Washington University, St. Louis, Missouri.....	234,000.00
Yale University, New Haven, Connecticut.....	700,000.00

* Appropriation for which funds were previously authorized.

Endocrinology	
Massachusetts General Hospital, Boston.....	\$20,000.00
Teaching of Public Health in Medical Schools	
Dalhousie University, Halifax, Nova Scotia.....	21,400.00
Fellowships.....	120,000.00
General	
Commission on Graduate Medical Education, New York City.....	36,000.00
Dartmouth College, Hanover, New Hampshire.....	60,000.00
Grants in Aid.....	90,000.00
Johns Hopkins University, Baltimore, Maryland.....	150,000.00
Research Council of the Department of Hospitals, New York City.....	66,000.00
University of Oregon, Portland.....	100,000.00
West China Union University, Chengtu, Szechwan.....	35,000.00
Former Program	
American University of Beirut, Lebanon.....	1,000,000.00
China Medical Board, Inc., New York City.....	1,580,000.00*
Leland Stanford, Jr., University, Palo Alto, California.....	75,000.00
Washington University, St. Louis, Missouri.....	400,000.00
	\$5,344,700.00

NATURAL SCIENCES

Experimental Biology	
California Institute of Technology, Pasadena.....	\$70,000.00*
Columbia University, New York City.....	83,700.00
Cornell University, Ithaca, New York.....	31,400.00

* Appropriations for which funds were previously authorized.

EXHIBIT G—Continued

NATURAL SCIENCES—Continued

Experimental Biology—Continued

Harvard University, Cambridge, Massachusetts	\$122,500.00
Laboratory of Organic Chemistry, Eidgenössische Technische Hochschule, Zurich, Switzerland	58,800.00
Marine Biological Association of the United Kingdom, Plymouth, England	11,220.00
National Research Council, Washington, D.C.	25,000.00
New York University, New York City	25,000.00
Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine	40,000.00
University of Stockholm, Sweden	37,400.00
University of California, Berkeley	30,000.00
University of Chicago, Illinois	1,680,000.00
University of Illinois, Urbana	75,000.00
University of Leeds, England	51,000.00
University of London, England	61,200.00
University of Rochester, New York	35,000.00
University of Wisconsin, Madison	25,650.00
Washington University, St. Louis, Missouri	67,000.00
Fellowships	140,000.00
General	
Grants in Aid	160,000.00
	<hr/>
	\$2,829,870.00
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SOCIAL SCIENCES

Social Security

Geneva Research Center, Switzerland.....	\$50,000.00
Social Science Research Council, New York City.....	35,000.00
University of Louvain, Belgium.....	14,000.00

Public Administration

American Association of Schools of Social Work, Cleveland, Ohio.....	36,000.00
American University, Washington, D.C.....	18,000.00
Harvard University, Cambridge, Massachusetts.....	20,000.00
National Institute of Public Affairs, Washington, D.C.....	105,000.00
Pacific Northwest Council of Education, Planning, and Public Administration, Portland, Oregon..	74,500.00
Social Science Research Council, New York City.....	15,000.00
Spelman Fund of New York, New York City.....	2,000,000.00
University of Chicago, Illinois.....	75,000.00
University of Southern California, Los Angeles.....	36,000.00

International Relations

Centre d'Études de Politique Étrangère, Paris, France.....	102,000.00
Council on Foreign Relations, New York City.....	99,000.00
Foreign Policy Association, New York City.....	75,000.00
Geneva Graduate Institute of International Studies, Switzerland.....	315,000.00
Institute of Economics and History, Copenhagen, Denmark.....	18,000.00
Institute of Pacific Relations, New York City.....	200,000.00
International Information Committee, Stockholm, Sweden.....	25,000.00

General

Grants in Aid.....	125,000.00
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EXHIBIT G—Continued

SOCIAL SCIENCES—Continued	
General—Continued	
Social Science Research Council, New York City.....	\$225,000.00
Fellowships.....	100,000.00
	\$3,762,500.00
 HUMANITIES	
Drama	
Carolina Art Association, Charleston, South Carolina.....	\$15,000.00
National Theatre Conference, Cleveland, Ohio.....	15,000.00
University of North Carolina, Chapel Hill (Pledge \$150,000).....	183,000.00
Western Reserve University, Cleveland, Ohio.....	35,000.00
Libraries and Museums	
Harvard University, Cambridge, Massachusetts.....	6,000.00
Library of Congress, Washington, D.C.....	35,000.00
Princeton University, Princeton, New Jersey.....	50,000.00
Tulane University, New Orleans, Louisiana.....	10,000.00
University of New Mexico, Albuquerque.....	16,000.00
Radio and Film	
Museum of Modern Art, New York City.....	70,000.00
World Wide Broadcasting Foundation, Boston, Massachusetts.....	100,000.00
Studies of American Culture	
American Museum of Natural History, New York City.....	6,500.00

Latin-American and Far Eastern Interests	
American Council of Learned Societies, Washington, D.C.....	\$22,500.00
Bureau International d'Éducation, Geneva, Switzerland.....	12,000.00
Columbia University, New York City.....	25,000.00
Cornell University, Ithaca, New York.....	15,000.00
Princeton University, Princeton, New Jersey.....	15,000.00
University of Chicago, Illinois.....	25,000.00
University of Pennsylvania, Philadelphia.....	15,000.00
Fellowships	
Administered by the Foundation.....	75,000.00
Authors' League of America, Inc., New York City.....	25,000.00
General	
American Council of Learned Societies, Washington, D.C.....	90,000.00
American National Committee on International Intellectual Cooperation, New York City.....	23,500.00
Grants in Aid.....	90,000.00
Former Program	
American School of Classical Studies, Athens, Greece.....	25,000.00
	<hr/>
	\$999,500.00
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PROGRAM IN CHINA	
Associated Boards for Christian Colleges in China, New York City.....	\$85,000.00
Chinese Mass Education Movement.....	15,000.00
Fellowships.....	60,000.00
Ministry of Education, Nanking.....	9,600.00

EXHIBIT G—Continued

400 THE ROCKEFELLER FOUNDATION

PROGRAM IN CHINA—Continued

Nankai University, Tientsin, China	\$6,000.00
China. National Agricultural Research Bureau, Ministry of Industry and Agriculture, Nanking.....	9,000.00
National Central University, Nanking, China	3,000.00
National Health Administration of China, Nanking, China.....	42,000.00
National Rural Administration Training Institute.....	60,000.00
Research and developmental aid grants.....	10,000.00
University of Nanking, China.....	13,500.00
Yenching University, Peiping, China.....	12,000.00
	<hr/>
	\$325,100.00
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MISCELLANEOUS	
Special Research Aid Fund for European Scholars.....	\$50,000.00
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ADMINISTRATION	
New York, Paris, and Shanghai Offices	
Scientific Divisions.....	\$544,325.00
General.....	286,092.00
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	\$830,417.00
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	\$16,867,087.00
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EXHIBIT H

APPROPRIATIONS DURING 1938, OR UNPAID BALANCES AS AT DECEMBER 31, 1937 ON PRIOR YEAR APPROPRIATIONS, AND PAYMENTS THEREON DURING 1938

	APPROPRIATIONS	1938 PAYMENTS
PUBLIC HEALTH		
<i>International Health Division of The Rockefeller Foundation</i>		
Prior years (RF 35204, 36130)	\$1,377,517.91*	} \$1,956,058.61
1938 (RF 37113)	2,200,000.00	
1939 (RF 38103)	2,200,000.00	
Revolving Fund. To provide working capital (RF 29093)	200,000.00	.....
Fellowships in Nursing (RF 33018)	1,000.00	.....
<i>League of Nations. Health Organisation, Geneva, Switzerland</i>		
Epidemiological intelligence, public health documentation, international interchange of public health personnel (RF 34178)	43,670.35	3,938.78
<i>Schools and Institutes of Hygiene and Public Health</i>		
Bulgaria. Sofia. Land, buildings, and equipment (RF 30059)	12,092.24	12,092.24
Japan. Tokyo. Construction and equipment (RF 32116)	404,001.38	338,266.08
<i>Rumania. Bucharest.</i>		
Construction and equipment (RF 33078)	40,610.17	23,639.46
Health Center (RF 33079)	15,000.00	.....
Sweden. Stockholm. Construction and equipment (RF 38099)	270,000.00	.....

* A complete financial statement of the work of the International Health Division for 1938 will be found in Exhibit I, pages 442-463.

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
PUBLIC HEALTH—Continued		
Schools of Nursing		
Emergency aid to schools of nursing in Europe to the development of which the Foundation has previously contributed (RF 31099)	\$23,409.26	\$114.34
School of Nursing, Bucharest, Rumania. Building (RF 35099)	31,211.94	25,050.25
State Institute of Public Health, Prague, Czechoslovakia. School of Nurses in Public Health and Social Welfare		
Improvement of teaching services (RF 30082)	14,700.00	8,000.00
University of Toronto, Ontario. School of Nursing. Endowment (RF 38104)	255,000.00	.....
Vanderbilt University, Nashville, Tennessee		
Interest on RF 36131 (RF 37144)	89.04	.....
MEDICAL SCIENCES		
Psychiatry, Neurology, and Allied Subjects		
American Psychiatric Association		
Symposium on mental hygiene (RF 38009)	9,000.00	9,000.00
Boston University, Massachusetts		
Researches on cerebral cortex (RF 36104)	3,750.00	2,500.00
Centre Neurologique de Bruxelles, Belgium		
Research (RF 38007)	12,750.00	4,102.57
Chicago Area Project, Chicago, Illinois		
General budget (RF 35128, 36024, 37035)	39,625.00	20,956.89

Columbia University, New York City		
Research in poliomyelitis (RF 36026)	\$1,005.04	\$996.44
Study of constitutional aspects of disease (RF 36103)	21,000.00	13,884.12
Teaching and research in neurology (RF 38080)	100,000.00	10,000.00
Cornell University, Ithaca, New York		
Study of reflex behavior in relation to neuroses (RF 36102, 38018)	38,700.00	9,700.00
Cornell University Medical College, New York City		
Research in psychosomatic disorders (RF 37062)	2,500.00	2,500.00
Emma Pendleton Bradley Home, Providence, Rhode Island		
Research in electroencephalography (RF 35096, 38069)	23,674.02	8,711.65
Harvard Medical School, and Massachusetts General Hospital, Boston, Massachusetts		
Teaching and research in psychiatry (RF 37017)	117,000.00	78,000.00
Harvard University, Cambridge, Massachusetts		
Research in epilepsy at Harvard Medical School and Boston City Hospital (RF 37060)	43,750.00	17,500.00
Research in industrial hazards (RF 37055)	351,904.24	97,645.85
Research in neurophysiology (RF 36125)	67,500.00	15,000.00
Institute for Psychoanalysis, Chicago, Illinois		
General activities (RF 38021)	120,000.00	7,500.00
Research and teaching (RF 35041)	25,000.00	23,559.78
Institute of the Pennsylvania Hospital, Philadelphia		
Development of research and teaching in psychiatry (RF 37009)	27,000.00	17,770.70
Johns Hopkins University, Baltimore, Maryland		
Development of neurology (RF 36022)	20,228.77	7,799.36

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
MEDICAL SCIENCES—Continued		
Psychiatry, Neurology, and Allied Subjects—Continued		
Johns Hopkins University, Baltimore, Maryland—Continued		
Neurological research (RF 37080).....	\$8,000.00	\$1,987.50
Research in psychiatry (RF 37018).....	33,750.00	22,327.94
Study of accessory factors of health (RF 37081).....	4,000.00	4,000.00
Study and teaching in child psychiatry (RF 35010).....	20,894.03	13,782.10
London County Council, England		
Research in psychiatry at Maudsley Hospital (RF 35108, 38061).....	135,331.86	17,931.38
Massachusetts Department of Mental Diseases, Boston		
Publication of statistical data on mental disease in Massachusetts (RF 35003)...	16,729.64	3,230.30
Research in psychiatry at Boston State Hospital (RF 38006).....	20,550.00	13,700.00
McGill University, Montreal, Canada		
Research in epilepsy and dementia (RF 38068).....	51,000.00	9,272.07
Medical Research Council, London, England		
Research in field of hereditary mental diseases (RF 37056).....	14,980.75	4,338.11
Studies in human genetics in relation to mental disease, Galton Laboratory, University of London (RF 35057, 36132).....	29,634.75	9,359.50
National Committee on Maternal Health, New York City		
Toward budget (RF 37100, 38084).....	21,000.00	5,456.40
National Committee for Mental Hygiene, New York City		
Support of activities (RF 36025).....	30,000.00	15,000.00
Support of Division of Mental Hospital Service (RF 36055).....	24,023.69	15,996.03

National Hospital for Diseases of the Nervous System, Queen Square, London, England		
Endowment of research (RF 35040).....	\$300,000.00	\$298,650.00
Building (RF 35040).....	142,548.88	141,143.92
Northwestern University Medical School, Chicago, Illinois		
Research in neuroanatomy (RF 37010).....	22,500.00	5,000.00
Royal Medico-Psychological Association, London, England		
Teaching and training in psychiatry (RF 37098).....	7,549.25	1,428.75
Tulane University, New Orleans, Louisiana		
Development of subdepartment of psychiatry (RF 36086).....	12,000.00	8,000.00
University of Alabama, University, Alabama		
Research in neurophysiology (RF 36105).....	3,750.13	2,466.11
University of Amsterdam, Netherlands		
Research in dementia praecox (RF 35109).....	1,028.45	.....
University of California, Berkeley		
Support of child guidance program (RF 36012, 36133).....	21,000.00	13,990.71
University of Cambridge, England		
Department of Psychology. Research and alterations (RF 37079).....	56,800.00	.....
Department of Experimental Medicine. Research (RF 37137).....	40,800.00	1,913.00
University of Chicago, Illinois		
Development of subdepartment of psychiatry (RF 35055).....	50,022.62	19,024.22
Investigation of physiology of sleep (RF 36023).....	2,250.00	2,250.00
Psychiatric teaching and research (RF 38016).....	150,000.00	25,000.00
University of Cincinnati, Ohio		
Research in neurology in relation to nutrition (RF 37107).....	37,500.00	7,500.00

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>MEDICAL SCIENCES—Continued</i>		
<i>Psychiatry, Neurology, and Allied Subjects—Continued</i>		
University of Colorado, School of Medicine, Denver		
Teaching in psychiatry (RF 37019)	\$15,000.00	\$9,880.00
University of Edinburgh, Scotland		
Research in neurology (RF 36054)	25,196.25	11,777.91
University of Freiburg, Germany		
Neuropsychiatric research (RF 37138)	19,600.00	6,630.83
University of Helsinki, Finland		
Research in neurophysiology (RF 37099)	15,000.00	7,719.69
University of Illinois, Urbana		
Development of teaching and research in psychiatry (RF 36085)	22,500.00	15,000.00
University of Leiden, Netherlands		
Research in child psychiatry (RF 34145)	11,369.02	2,511.61
University of Michigan, Ann Arbor		
Development of teaching and research in psychiatry (RF 35009)	5,149.45	3,586.74
University of Oslo, Norway		
Research in neuroanatomy and neuropathology (RF 37057)	6,602.81	2,374.40
University of Paris, France		
Endowment of neurosurgery (RF 37115)	60,000.00	.....
University of Rochester, New York		
Virus research (RF 36027)	4,180.92	2,180.92

Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne, Australia		
Research on virus diseases, with special reference to neurotropic viruses (RF 37011)	\$4,027.50	\$1,983.75
Washington University, St. Louis, Missouri:		
Research in neurophysiology (RF 33061, 38017)	90,469.68	11,847.54
Support of Department of Neuropsychiatry (RF 38067)	150,000.00	25,000.00
Worcester State Hospital, Massachusetts		
Research on dementia praecox (RF 37034)	41,250.00	16,018.32
Yale University, New Haven, Connecticut		
Institute of Human Relations		
Development of psychiatry (RF 29002, 37114)	485,130.04	100,000.00
Support (RF 38058)	700,000.00	700,000.00
Experimental studies in neurophysiology (RF 36013)	2,500.00	2,498.47
Endocrinology		
Brush Foundation, Cleveland, Ohio		
Researches on human ovulation (RF 37032)	15,000.00	6,000.00
Columbia University, New York City		
Researches in endocrinology (RF 37074)	42,000.00	10,500.00
Harvard University, Cambridge, Massachusetts		
Researches in endocrinology (RF 37078)	15,000.00	5,500.00
Massachusetts General Hospital, Boston		
Research on the parathyroid hormone and calcium and phosphorus metabolism (RF 35024, 38082)	21,803.82	2,000.00
National Research Council, Washington, D.C.		
Committee for Research in Problems of Sex (RF 37123)	200,000.00	15,877.77

TREASURER'S REPORT

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EXHIBIT H—*Continued*

	APPROPRIATIONS	1938 PAYMENTS
MEDICAL SCIENCES—<i>Continued</i>		
Endocrinology—<i>Continued</i>		
Ohio State University, Columbus		
Research in endocrinology (RF 37082).....	\$11,250.00	\$7,500.00
Philadelphia Institute for Medical Research, Pennsylvania		
Research in endocrinology (RF 36100).....	10,500.00	6,000.00
University of Paris, France		
Research in endocrinology and vitamins (RF 35147).....	4,496.73	945.41
University of Rochester, New York		
Research on physiology of reproduction (RF 35052).....	3,455.67	1,204.85
University of Virginia, Charlottesville		
Research in endocrinology (RF 35161).....	5,000.00	5,000.00
Teaching of Public Health in Medical Schools		
Cornell University Medical College, New York City		
Maintenance of Department of Public Health and Preventive Medicine (RF 36057).....	109,360.83	39,360.83
Dalhousie University, Halifax, Nova Scotia		
Development of teaching in public health and preventive medicine (RF 33044, 38081).....	28,555.45	7,670.59
Study of the teaching of preventive medicine, public health, and hygiene in North American and Western European medical schools (RF 35171).....	2,156.50	350.00

Fellowships

Administered by The Rockefeller Foundation (RF 34162, 35172, 36144, 37129, 38113).....	\$407,164.62	\$88,847.19
Medical Research Council, London, England (RF 37033).....	45,000.00	16,448.39
National Research Council, Washington, D.C. (RF 35169, 37061).....	95,123.78	25,173.77

General

Commission on Graduate Medical Education, New York City		
Study of graduate medical education (RF 38010).....	36,000.00	12,000.00
Cornell University Medical College, New York City		
Studies of the role of the glands of internal secretion in relation to growth and inheritance (RF 30006).....	63,840.30	24,829.61
Dartmouth College, Hanover, New Hampshire		
Research in physiological optics (RF 35125, 38083).....	72,000.00	22,000.00
Grants in Aid (RF 34166, 35173, 36148, 37125, 38109).....	281,020.03	86,456.51
Johns Hopkins University, Baltimore, Maryland		
Institute of History of Medicine (RF 35056, 38022).....	156,250.00	13,750.00
Medical Research Council, London, England		
Research on puerperal fever (RF 31044).....	24,968.01	15,000.00
Research aid fund. Europe (RF 34038).....	10,377.52	.....
Research Council of the Department of Hospitals, New York City		
Research on chronic diseases (RF 38008).....	66,000.00	22,000.00
Royal Caroline Institute, Stockholm, Sweden		
Research in biochemistry (RF 34144).....	7,059.50	5,101.98

TREASURER'S REPORT

EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
MEDICAL SCIENCES—Continued		
<i>General—Continued</i>		
University of Copenhagen, Denmark		
Institute of Human Genetics		
Building and equipment (RF 36053)	\$62,500.00	\$37,213.93
Endowment (RF 36053)	27,500.00	23,255.81
University of Oregon, Portland		
Construction of library for School of Medicine (RF 38011)	100,000.00	5,350.26
University of Paris, France. Radium Institute		
Division of Biophysics (RF 32076)	57,574.52	7,155.98
West China Union University, Chengtu, Szechwan		
Building and equipment of the Outpatient Center of the Central Hospital of the University of Chengtu, Szechwan, China (RF 38079)	35,000.00	35,000.00
Former Program		
American University of Beirut, Lebanon		
Improvement of teaching facilities in the medical sciences, nursing, and the pre-medical subjects (RF 31124)	154,166.74	50,000.00
Endowment of medical sciences, nursing, and premedical subjects (RF 38057)...	1,000,000.00	.....
China Medical Board, Inc., New York City		
Peiping Union Medical College. Maintenance		
1937-38 (RF 37063)	210,000.00	210,000.00
1938-43 (RF 38077, 38117)	1,580,000.00	1,580,000.00

Institute of the Educational Sciences, Geneva, Switzerland		
General budget (RF 32002, 34121, 35152, 36106)	\$13,791.71	\$10,000.00
Johns Hopkins University, Baltimore, Maryland		
Study of deafness (RF 32024)	43,575.34	15,000.00
Leland Stanford, Jr., University, Palo Alto, California		
Fluid research fund in medicine (RF 38060)	75,000.00	5,000.00
Medical literature for Russia (RF 35166, 36121)	2,657.25	.....
National Research Council, Washington, D.C.		
Work of the Committee on Drug Addiction (RF 36011)	113,638.55	48,413.32
Peiping Union Medical College, China		
Allowance for a widow of staff member (RF 29034)	6,875.70	1,529.68
University of Copenhagen, Denmark		
Research on inheritance in relation to blood groupings (RF 34112)	3,387.13	1,462.80
University of Leipzig, Germany. Institute of Physiological Chemistry		
Research assistants, fellows, and aid (RF 31016, 33082)	4,670.31	4,670.31
University of Paris, France. Department of Parasitology		
Support (RF 36056)	9,526.54	1,761.87
University of Szeged, Hungary. Department of Medicine		
Scientific equipment (RF 31025)	1,497.04	1,497.04
Vanderbilt University, Nashville, Tennessee. School of Medicine		
Fluid research fund (RF 31136)	15,000.00	10,000.00
Washington University, St. Louis, Missouri		
Maintenance of Departments in the School of Medicine (RF 38059)	400,000.00	20,000.00

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
NATURAL SCIENCES		
Experimental Biology		
Amherst College, Massachusetts		
Research in genetics and experimental embryology (RF 34130)	\$3,800.00	\$2,200.00
California Institute of Technology, Pasadena		
Research in chemistry (RF 34151)	5,000.00	5,000.00
Developments of chemistry in its relationship to biological problems (RF 38086) .	70,000.00	30,000.00
Carlsberg Foundation, Copenhagen, Denmark		
Special researches under direction of Professor Linderstrøm-Lang (RF 37024) . .	16,215.49	3,721.98
Carnegie Institution of Washington, D.C.		
Researches in Department of Embryology (RF 37083)	2,500.00	2,356.35
Clark University, Worcester, Massachusetts		
Research in neurophysiology (RF 35005)	450.00	450.00
Collège de France, Laboratory of Atomic Synthesis, Paris		
Research on biological problems (RF 37093)	15,000.00	3,000.00
Columbia University, New York City		
Researches in nutrition (RF 37084)	13,750.00	5,500.00
Researches in physiology (RF 35160)	1,500.00	1,500.00
Researches in Departments of Biochemistry and Urology and in the Presbyterian Hospital (RF 38020)	12,200.00	7,000.00
Researches on problems of metabolism, with the aid of chemical isotopes (RF 38026)	71,500.00	6,100.00

Cornell University, Ithaca, New York		
Research in nutrition (RF 36029).....	\$30,009.97	\$7,487.49
Researches on biochemistry of proteins, peptides, amino acids, hormones, and related compounds (RF 38094).....	31,400.00	5,950.00
Fondation Rothschild, Paris, France. Institute of Physicochemical Biology		
Researches in cellular physiology, chemical embryology, and genetics (RF 36067)	42,634.34	4,480.22
George Washington University, Washington, D.C.		
Research in biochemistry (RF 35022).....	4,200.00	2,826.02
Harvard University, Cambridge, Massachusetts		
Chemical research to determine the heats of organic reactions (RF 32098, 38019)	25,500.00	6,216.52
Researches in Department of Physical Chemistry (RF 37077, 38038).....	106,250.00	16,249.51
Research on physical and chemical properties of synovial fluid (RF 36082).....	6,300.12	4,200.00
Johns Hopkins University, Baltimore, Maryland		
Research in Department of Biochemistry (RF 36099).....	22,750.00	6,497.25
Eidgenössische Technische Hochschule, Zurich. Laboratory of Organic Chemistry		
Researches on constitution and synthesis of physiologically active compounds (RF 38042).....	58,800.00	4,864.01
Leland Stanford, Jr., University, Palo Alto, California		
Research in chemophysical biology (RF 35174).....	16,250.00	11,250.00
Researches under direction of Professor Addis (RF 37030).....	22,000.00	10,000.00
Long Island Biological Association, Cold Spring Harbor, New York		
Support of symposia in summers of 1938 and 1939 (RF 37076).....	20,000.00	10,000.00
Marine Biological Association of the United Kingdom, Plymouth, England		
Building and equipment (RF 38071).....	11,220.00	954.00

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
NATURAL SCIENCES—Continued		
Experimental Biology—Continued		
McGill University, Montreal, Canada		
Research in the applications of spectroscopic methods to biological and medical problems (RF 35097)	\$2,000.00	\$2,000.00
Research in the Department of Genetics (RF 36097)	6,602.59	4,942.22
National Research Council, Washington, D.C.		
Committee for Research in Problems of Sex (RF 36135)	61,078.89	54,960.78
Committee on Effects of Radiation on Living Organisms (RF 35095, 38072) . . .	48,206.71	24,120.37
Researches in biophysics (RF 37020)	73,374.64	9,581.15
New York University, New York City. College of Medicine		
Researches in cellular physiology (RF 35176, 38085)	28,500.00	3,500.00
Oregon State College, Corvallis		
Research in Department of Chemistry (RF 36069)	9,750.00	6,500.00
Princeton University, New Jersey		
Researches in organic chemistry (RF 37052)	14,500.00	6,500.00
Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine		
Research in mammalian genetics (RF 35159)	12,500.00	7,500.00
Construction of animal building (RF 38004)	40,000.00	40,000.00
State University of Iowa, Iowa City		
Investigations on the physiology of the normal cell (RF 35050)	15,250.00	7,500.00

University of Stockholm, Sweden		
Wenner-Grens Institute of Experimental Biology. Construction and equipment (RF 37021, 38023)	\$86,000.00	\$34,726.61
Researches under direction of Professor Runnström (RF 37022, 38024)	40,865.00	4,428.57
Scientific equipment and materials for researches under direction of Professor von Euler (RF 37023)	11,700.00	.....
Strangeways Research Laboratory, Cambridge, England		
Building and equipment of additional wing (RF 37109)	32,830.00	26,109.38
Technical Institute, Graz, Austria		
Research in biophysical chemistry (RF 35141)	408.53	.....
University of Berne, Switzerland		
Researches in physiology (RF 37054)	23,402.93	5,795.20
University of California, Berkeley		
Researches in plant genetics (RF 35025)	2,000.00	2,000.00
Study of chemical aspects of vitamins and hormones (RF 36008)	23,750.00	16,250.00
Completing essential equipment of Radiation Laboratory (RF 38005)	30,000.00	22,500.00
University of Cambridge, England		
Research in cellular physiology (RF 35146)	21,690.57	5,971.81
University of Chicago, Illinois		
Research in application of spectroscopic methods to biological problems (RF 36081)	26,750.00	10,672.55
Biological research (RF 35053, 38037)	205,041.45	54,987.76
Endowment of biological research (RF 38036)	1,500,000.00
Research in surface chemistry (RF 36080)	5,625.00	5,546.32

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EXHIBIT H--*Continued*

	APPROPRIATIONS	1938 PAYMENTS
<i>NATURAL SCIENCES--Continued</i>		
<i>Experimental Biology--Continued</i>		
University of Copenhagen, Denmark		
Completion of design, development, construction, and testing of a cyclotron (RF 37029)	\$12,500.00	\$12,500.00
Special research in application of methods of physics, chemistry, and mathematics to biological problems (RF 35043).....	28,797.31	13,839.93
University of Illinois, Urbana		
Research in spectroscopic analysis of water (RF 36016).....	3,500.00	3,455.91
Research in biochemistry of amino acids (RF 36030, 38039).....	77,500.00	10,000.00
University of Leeds, England		
Research in the x-ray analysis of biological tissues (RF 35145, 38041)	57,238.57	5,109.93
University of London, England		
Researches on vitamins, sterols, and related compounds (RF 38070)	61,200.00	6,811.50
University of Manchester, England		
Researches on vitamins, sterols, and related compounds (RF 37031).....	18,802.62	4,083.69
University of Michigan, Ann Arbor		
Research in the physiology of respiration (RF 35049)	12,570.71	4,994.75
University of Minnesota, Minneapolis		
Cost of high-pressure generator and for researches in biology and medicine (RF 37053)	28,000.00	13,000.00

University of Missouri, Columbia		
Research in cytology and genetics (RF 36098).....	\$7,250.00	\$4,500.00
University of Oxford, England		
Research in application of mathematical analyses to biological problems (RF 35144)	5,311.25	2,405.00
Research on the synthesis of proteins (RF 36083).....	28,684.18	7,844.21
University of Pennsylvania, Philadelphia		
Research on influence of minerals and other elements in diet upon resistance to infection (RF 37075)	9,000.00	5,000.00
University of Rochester, New York		
Researches on biological and medical problems (RF 38025)	35,000.00	5,500.00
University of Stockholm, Sweden		
Research in biophysics, chemical biology, and cell physiology (RF 35142).....	2,817.81	2,088.33
University of Uppsala, Sweden. Institute of Physical Chemistry		
Research on the physiochemical properties of proteins and other heavy molecules (RF 35044).....	39,325.26	10,707.47
University of Utrecht, Netherlands		
Research in spectroscopic biology and addition to laboratory (RF 35143, 37094).....	61,875.91	24,977.50
University of Virginia, Charlottesville		
Development of ultracentrifuges (RF 37008).....	4,000.00	3,594.47
University of Wisconsin, Madison		
Research in immunogenetics (RF 36032, 38073)	27,909.32	4,854.64
Washington University, St. Louis, Missouri		
Research in the Department of Anatomy (RF 36118).....	1,750.00	1,658.98
Research in nerve physiology (RF 35048)	2,500.00	2,480.82

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
NATURAL SCIENCES—Continued		
Experimental Biology—Continued		
Washington University, St. Louis, Missouri—Continued		
Research in general physiology and experimental embryology (RF 38040)	\$50,000.00	\$5,000.00
Research in biochemistry (RF 38074)	17,000.00	2,000.00
Yale University, New Haven, Connecticut		
Experimental embryology (RF 36015)	10,000.00	7,500.00
Fellowships		
Administered by The Rockefeller Foundation (RF 32111, 34168, 35019, 35178, 36145, 37130, 38114)	435,019.33	117,926.39
National Research Council, Washington, D.C.		
Physical and biological sciences (RF 35037, 36070)	160,634.75	64,472.55
General		
American Mathematical Society, New York City		
Expenses of 1940 International Congress of Mathematicians (RF 37108)	7,500.00	2,500.00
China Medical Board, Inc., New York City		
Peiping Union Medical College, China		
Human paleontological research in Asia (RF 32100, 36137)	76,171.17	15,872.63
Grants in Aid (RF 34170, 35179, 36079, 36149, 37126, 38110)	395,420.35	108,361.00
Massachusetts Institute of Technology, Cambridge		
Construction of differential analyzer (RF 36071)	47,038.24	24,498.16

National Research Council, Washington, D.C.		
Conferences (RF 32010)	\$2,808.74	Cr. \$766.70
Support of central purposes (RF 36136)	38,043.46	13,043.46
University of Alaska, College, Alaska (Formerly Alaska Agricultural College and School of Mines)		
Study of the aurora (RF 29118)	1,573.16	1,573.16
Yale University, New Haven, Connecticut		
Research in oceanography (RF 36084)	2,500.00	2,500.00
Former Program		
American Institute of Physics, New York City		
Scientific publications (RF 35122)	3,471.86	849.99
California Institute of Technology, Pasadena		
Development of natural sciences, including buildings and equipment (RF 30080)	500,000.00	.....
Harvard University, Cambridge, Massachusetts		
Geophysical research (RF 35194)	27,500.00	10,000.00
International Commission for the Polar Year 1932-33, Copenhagen, Denmark		
Equipment and expenses (RF 34132)	12,000.00	.....
Johns Hopkins University, Baltimore, Maryland		
Biological research (RF 30005)	73,750.00	31,250.00
National Research Council, Washington, D.C.		
<i>Biological Abstracts</i> . Editing and indexing (RF 34152, 35123)	8,884.48	8,884.48
University of Leiden, Netherlands		
Purchase and endowment of a photographic telescope for the Union Observatory, Johannesburg, Union of South Africa (RF 30021, 34100)	112,673.02	99,934.57
University of Szeged, Hungary. Department of Science		
Scientific equipment (RF 31025)	1,497.04	259.39

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
NATURAL SCIENCES—Continued		
Former Program—Continued		
University of Virginia, Charlottesville		
Graduate research in the natural sciences (RF 34153)	\$7,500.00	\$.
Yale University, New Haven, Connecticut		
Maintenance of an anthropoid experiment station, Orange Park, Florida (RF 29090)	77,952.72	31,507.56
SOCIAL SCIENCES		
Social Security		
Austrian Institute for Trade Cycle Research, Vienna		
Research program (RF 35164, 37104)	20,844.81	4,438.24
Dutch Economic Institute, Rotterdam, Netherlands		
Research program (RF 36076)	12,416.44	4,456.83
Geneva Research Center, Switzerland		
Collaborative study of commercial policy (RF 38095)	50,000.00	5,000.00
Harvard University, Cambridge, Massachusetts		
Research on problems of the business cycle (RF 35083)	2,500.00	2,439.45
Industrial Relations Counselors, New York City		
Study of railroad retirement systems (RF 36094)	4,000.00	Cr. 181.27
League of Nations, Geneva, Switzerland		
Analytical research work of the Financial Section and Economic Intelligence Service (RF 33023, 37116)	146,260.02	40,002.01

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London and Cambridge Economic Service, England		
Research on business cycle (RF 37067)	\$13,758.75	\$4,930.32
National Bureau of Economic Research, New York City		
Planning and research in field of finance (RF 37139)	70,000.00	16,284.06
National Institute of Economic and Social Research of Great Britain, London		
Toward general budget (RF 37049)	150,000.00	23,033.75
Ontario Medical Association, Welland, Ontario		
Development of medical relief records (RF 37016)	15,826.49	11,681.01
Social Science Research Council, New York City		
Committee on Social Security		
General budget (RF 35115)	35,000.00	35,000.00
Organizing exploratory studies, conferences, or small projects in the field of social security (RF 38064)	15,000.00	4,000.00
Study of state unemployment compensation administration (RF 37086, 38101)	40,000.00	20,000.00
Study of mobility of labor and unemployment (RF 37105)	8,000.00	3,000.00
Study of unemployment relief policies in New Jersey (RF 36114)	3,239.93	2,865.11
Work in the field of social security (RF 37070)	60,000.00	15,000.00
State Charities Aid Association, New York City		
Establishing local citizens public welfare committees in New York State (RF 37111)	80,000.00	22,155.04
University of Louvain, Belgium. Institute of Economics		
Business cycle research (RF 33010, 36115)	3,618.56	2,475.72
General budget (RF 38102)	14,000.00	.....
University of Oxford, England		
Business cycle research (RF 37015)	10,804.62	6,426.07
University of Sofia, Bulgaria. Statistical Institute of Economic Research		
General budget (RF 35077, 37110)	26,413.23	5,580.04

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EXHIBIT H—Continued

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	APPROPRIATIONS	1938 PAYMENTS
SOCIAL SCIENCES—Continued		
Public Administration		
American Association of Schools of Social Work		
Development of standards for training public welfare officials (RF 38014).....	\$36,000.00	\$11,250.00
American University, Washington, D.C.		
Training program in public administration (RF 35082).....	2,000.00	2,000.00
Training program for government employees of Latin-American countries (RF 38063).....	18,000.00	3,600.00
Brookings Institution, Washington, D.C.		
Concurrent study of National Industrial Recovery Administration (RF 33067, 34078).....	2,623.42	900.00
Dalhousie University, Halifax, Nova Scotia		
Program of training and research in public administration (RF 36093).....	38,679.48	7,456.06
Harvard University, Cambridge, Massachusetts		
Graduate School of Public Administration		
Development of organization and program (RF 37002).....	57,066.55	19,024.48
Program of consultants (RF 38062).....	20,000.00	.....
Training in public service (RF 35078).....	41,086.51	11,392.99
National Institute of Public Affairs, Washington, D.C.		
Training of personnel attached to federal services (RF 35138, 37085, 38047)....	125,000.00	26,747.34
Training of administrative personnel for the Indian Service (RF 37106).....	49,500.00	13,500.00
Pacific Northwest Council of Education, Planning, and Public Administration		
Administration, research, and publication (RF 38048).....	74,500.00	11,000.00

Social Science Research Council, New York City

Public Administration Committee

General expenses, exploratory studies, conferences, and small projects (RF 35114, 36140, 38035)	\$127,101.54	\$64,586.34
Study of the administrative organization of the Tennessee Valley Authority (RF 36040)	13,000.00	8,347.96
Study of work of agencies engaged in municipal or government research (RF 37064)	7,200.00	7,200.00
Survey of programs of training in public administration (RF 37065)	8,750.00	.....
Survey and appraisal of council-manager form of local government (RF 37066)	14,000.02	9,333.32
Study of administrative methods of Department of Agriculture (RF 37140) . . .	35,000.00	13,924.65
Spelman Fund of New York, New York City		
Support of work in public administration (RF 35199, 38049)	2,400,000.00	300,000.00
Syracuse University, New York. School of Citizenship and Public Affairs		
Research and training (RF 32037, 35139)	23,500.00	16,000.00
University of Chicago, Illinois		
Training and research in public administration (RF 32035, 38091)	87,500.00	25,000.00
University of Cincinnati, Ohio		
Training in public administration (RF 32036)	2,500.00	2,500.00
University of Minnesota, Minneapolis		
Program of training for the public service (RF 36065)	55,000.00	20,000.00
University of Southern California, Los Angeles. School of Government		
Development of program (RF 38033)	36,000.00	6,000.00
University of Virginia, Charlottesville. Bureau of Public Administration		
Program of service and research (RF 36066)	25,000.00	9,445.47

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>SOCIAL SCIENCES—Continued</i>		
International Relations		
Agricultural economics. World-wide study (RF 35081)	\$3,005.87	\$3,000.00
American Geographical Society, New York City		
Preparation and publication of Millionth Map of Hispanic America (RF35028).	5,000.00	.....
Canadian Institute of International Affairs, Toronto, Ontario		
Research and educational activities (RF 36075)	6,551.17	4,953.12
Canton of Geneva, Switzerland. Department of Public Instruction		
Graduate Institute of International Studies. Maintenance (RF 29136, 38045) ..	666,873.78	73,456.90
Centre d'Études de Politique Étrangère, Paris, France		
Research in international relations (RF 35136)	20,000.00	20,000.00
General budget (RF 38046)	102,000.00	.....
Council on Foreign Relations, New York City		
Work of American Coordinating Committee of the International Studies Confer- ence (RF 38034)	24,000.00	12,000.00
Research program (RF 35189, 38015)	90,000.00	25,000.00
Foreign Policy Association, New York City		
Support of experimental educational program (RF 36138)	4,280.06	4,280.06
Support of Research Department (RF 35188, 38106)	100,000.00	25,000.00
Support of Department of Popular Education (RF 37119)	75,000.00	25,000.00
Geneva Research Center, Switzerland		
General research budget (RF 36113, 37068)	44,850.00	17,835.42

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Harvard University and Radcliffe College, Cambridge, Massachusetts		
Research in the field of international relations (LS 993).....	\$144,802.01	\$18,059.58
Institute of Economics and History, Copenhagen, Denmark		
Budget of International Relations Section (RF 36111, 38065).....	22,755.51	3,781.08
Institute of Pacific Relations		
American Council, New York City. General expenses (RF 35187, 38108).....	45,000.00	15,000.00
International Secretariat. Studies of issues involved in present situation in the Far East (RF 38013).....	90,000.00	12,791.27
Pacific Council, Honolulu, Hawaii. General expenses and research program (RF 35186, 38107).....	120,000.00	40,000.00
International Information Committee, Stockholm, Sweden		
Research and popular education in international problems (RF 38001).....	25,000.00	7,782.10
International Institute of Intellectual Cooperation, Paris, France		
Maintenance and conferences (RF 37117).....	100,000.00	50,000.00
Danubian Economic Study (RF 37118).....	25,000.00	12,000.00
International Studies Conference		
Special grants in aid (RF 36017).....	2,982.07	56.55
John Casimir University, Lwow, Poland. Institute of Constitutional and Interna- tional Law		
Research on problems of international relations (RF 35190).....	7,000.00	7,000.00
League of Nations, Fiscal Committee		
Study of international double taxation problems (RF 33004).....	27,829.65	3,771.75
Library of International Relations, Chicago, Illinois		
General budget (RF 36095).....	28,750.00	8,750.00

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>SOCIAL SCIENCES—Continued</i>		
<i>International Relations—Continued</i>		
Norwegian Committee for International Studies, Oslo		
Development of program of research and popular education in international problems in Norway (RF 37102).....	\$23,113.21	\$5,639.73
Royal Institute of International Affairs, London, England		
Research program (RF 37004).....	180,145.00	39,445.00
Survey of refugee problem (RF 37087).....	22,518.75	22,518.75
Study of workings of Geneva Convention in Upper Silesia (RF 37103).....	10,200.00	9,861.25
Yale University, New Haven, Connecticut		
Research in international relations (RF 35079).....	45,000.00	25,000.00
<i>General</i>		
Brookings Institution, Washington, D.C.		
General research program (RF 36062).....	112,500.00	75,000.00
Grants in aid in the fields of social security, international relations, and public administration (RF 35089, 35192, 36150, 37127, 38096, 38111).....	286,440.87	73,252.08
Institute of Economic and Social Research, Paris, France		
Establishment and support (RF 33072).....	177,957.25	40,767.15
National Bureau of Economic Research, New York City		
General research program and expense of office of Executive Director (RF 36064)	155,970.78	89,720.78

Purdue University, Lafayette, Indiana		
Research in field of housing (RF 37001).....	\$63,895.64	\$19,613.68
Social Science Research Council, New York City		
General budget (LS 875).....	66,250.00	34,999.98
Conferences and planning (RF 31127, 38043).....	223,025.97	44,709.66
General research projects (RF 31126).....	106,416.46	9,838.43
Grants in aid of research (RF 36038, 37050, 38044).....	101,600.00	24,118.23
Fellowships		
Administered by The Rockefeller Foundation		
Former program (RF 34044, 34173, 35195).....	72,733.33	11,671.12
In fields of social security, international relations, and public administration (RF 35088, 35191, 36146, 37131, 38115).....	390,365.70	77,692.42
Social Science Research Council, New York City (RF 35039, 36037, 37051).....	241,710.04	37,485.16
Former Program		
American Statistical Association, Washington, D.C.		
General budget (RF 35197).....	9,000.00	4,500.00
American University of Beirut, Lebanon		
Work in the social sciences (RF 35070).....	13,500.00	7,500.00
Canadian National Committee for Mental Hygiene, Toronto, Canada		
Development of training centers for advanced students (RF 30088).....	5,784.94	Cr. .40
Program of mental hygiene and social research in Canadian universities (RF 33049).....	3,013.12	.....
Columbia University, New York City		
Research in the social sciences (RF 30036-37).....	144,571.02	58,763.08
Grants in Aid		
Europe (RF 34174, 35196).....	2,252.84	702.08

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>SOCIAL SCIENCES—Continued</i>		
<i>Former Program—Continued</i>		
Harvard University, Cambridge, Massachusetts		
Research in anthropology (RF 36035).....	\$10,000.00	\$7,500.00
Research in the social sciences (RF 32032, 35086).....	217,500.89	50,069.72
Institute of Economics and History, Copenhagen, Denmark		
General budget (RF 36110).....	8,243.39	3,370.79
International Institute of African Languages and Cultures, London, England		
General budget (RF 35085).....	20,000.00	15,000.00
Leland Stanford, Jr., University, Palo Alto, California		
Research in the social sciences (RF 37069).....	32,500.00	20,000.00
London School of Economics and Political Science, University of London, England		
Research fund (RF 35067).....	18,000.00	15,000.00
Library development (RF 31030).....	30,442.62	7,516.42
Improving facilities for research and postgraduate teaching (RF 31031).....	30,000.00	30,000.00
Purchase of land for expansion of school plant (RF 31028).....	58,127.66	23,987.28
McGill University, Montreal, Canada		
Research in the social sciences (RF 36078).....	25,294.84	12,436.17
National Bureau of Economic Research, New York City		
International study of the history of prices (RF 29138, 33113).....	11,765.48	Cr. 20.70
New York School of Social Work, New York City		
General budget (RF 32043).....	22,500.00	12,500.00

Polish Academy of Sciences, Cracow. Economic Institute		
Research program (RF 35076).....	\$3,630.00	\$1,630.00
Rumanian Institute of Social Sciences, Bucharest		
General administration and research program (RF 35071).....	1,000.00	1,000.00
Social Science Research Council, New York City		
Instruction in agricultural economics (RF 30104).....	4,140.83	4,090.38
Study of population redistribution (RF 34001).....	4,390.02	3,761.91
Tulane University, New Orleans, Louisiana. School of Social Work		
General budget (RF 32044).....	9,000.00	5,000.00
University of California, Berkeley. Institute of Social Sciences		
Research (RF 35068).....	22,500.00	12,500.00
University of Chicago, Illinois		
Aid to social science facilities (RF 31133, 35087).....	150,000.00	.....
Local community research (RF 31131).....	31,522.50	.....
School of Social Service Administration		
General endowment (RF 34057).....	500,000.00	.....
Current expenses (RF 34058, 34059).....	46,294.75	21,294.75
University of Manchester, England		
Economic Research Department (RF 35075).....	5,000.00	3,500.00
University of North Carolina, Chapel Hill		
Program in the social sciences (RF 35069).....	22,500.00	12,500.00
University of Oslo, Norway. Institute of Economics		
Research program (RF 36112).....	18,000.00	.....
University of Oxford, England		
Development of program in the social sciences (RF 34154).....	74,142.17	24,715.63

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
SOCIAL SCIENCES—Continued		
Former Program—Continued		
University of Paris, France		
Research in the social sciences (RF 35072).....	\$72,181.18	\$18,750.00
University of Pennsylvania, Philadelphia. Wharton School of Finance and Commerce. Industrial Research Department		
Support (RF 35074).....	22,500.00	12,500.00
University of Stockholm, Sweden		
General research program in the social sciences (RF 36092).....	9,000.00	5,000.00
Special faculty appointment in the social sciences (RF 35073).....	2,750.00	.....
Translation and publication of recent studies in Social Science Institute (RF 37101).....	10,000.00	10,000.00
University of Texas, Austin		
Research in the social sciences (RF 32030, 37003).....	58,333.33	17,895.76
University of Virginia, Charlottesville		
Research in the social sciences (RF 34175).....	11,250.00	6,250.00
Welfare Council of New York City. Research Bureau		
Support (RF 36139).....	99,000.00	45,000.00
Western Reserve University, Cleveland, Ohio. School of Applied Social Sciences		
Support (RF 32042).....	11,250.00	6,250.00
Yale University, New Haven, Connecticut. Institute of Human Relations		
Research in psychology, child development, and social sciences (RF 29008)....	225,000.00	150,000.00

HUMANITIES

Drama

Carolina Art Association		
General expenses of Dock Street Theatre, Charleston, South Carolina (RF 38051)	\$15,000.00	\$2,500.00
Cornell University, Ithaca, New York		
Work in drama (RF 36002)	7,500.00	5,000.00
Leland Stanford, Jr., University, Palo Alto, California		
Development of program of School of Drama (RF 37006)	17,500.00	7,500.00
National Theatre Conference, Cleveland, Ohio		
General expenses and royalty fee for noncommercial productions (RF 38054)	15,000.00	3,500.00
Northwestern University, Evanston, Illinois		
Development of School of Drama (RF 36073)	7,500.00	4,874.61
University of North Carolina, Chapel Hill		
Development of drama as a college and regional activity (RF 35061, 37028, 38050)	51,799.37	20,987.83
Washington State Theatre, Seattle		
Touring of dramatic productions (RF 36052)	8,000.00	8,000.00
Western Reserve University, Cleveland, Ohio, Department of Drama and Theatre		
Development (RF 35062)	2,500.00	2,500.00
Reconstruction of building (RF 38052)	35,000.00	35,000.00
Yale University, New Haven, Connecticut		
Development of library in Department of Drama (RF 35092)	3,754.69	1,559.29
Aid in acquiring and operation of a motion picture camera for the use of the Department of Drama (RF 36096)	5,000.00	1,500.00

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>HUMANITIES—Continued</i>		
Libraries and Museums		
American Library Association, Chicago, Illinois		
Aid in connection with the General Catalogue of the Bibliothèque Nationale (RF 36020).....	\$30,000.00	\$.....
Project in microphotography at Paris Exposition and in Great Britain (RF 37013).....	6,000.00	Cr. 140.16
British Library Association, London		
For establishing a service of information on library practice (RF 35060).....	2,234.04	Cr. 30.13
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).....	88,066.05	2,103.26
Additional service in connection with the new edition of the Catalogue of Printed Books (RF 29087).....	3,000.68	880.95
Brooklyn Museum, Brooklyn, New York		
Training of museum personnel (RF 35116).....	460.02	Cr. 616.85
Buffalo Museum of Science, New York		
Training museum personnel (RF 37071).....	43,750.00	25,000.00
Harvard University, Cambridge, Massachusetts		
Microfilm copies of foreign newspaper files (RF 38090).....	6,000.00	2,000.00
Library of Congress, Washington, D.C.		
Equipping and operating laboratory of microphotography (RF 38002).....	35,000.00	35,000.00

National Central Library, London, England		
Establishment of Bureau of American Bibliography (RF 37059).....	\$10,984.00	\$2,794.95
National Library of Peiping China		
Support of <i>Quarterly Bulletin of Chinese Bibliography</i> (RF 35150).....	1,875.00	750.00
Development of library services (RF 36072).....	15,500.00	Cr. 2,000.00
New York Museum of Science and Industry, New York City		
Development of new methods of museum exhibition (RF 35151).....	10,000.00	10,000.00
Princeton University, New Jersey		
Index of Christian Art (RF 38100)	50,000.00	.....
Society of the Friends of the Bibliothèque Nationale, Paris, France		
Expenses of printing the General Catalogue (RF 29089, 34094, 35134).....	4,824.90	1,000.00
Tulane University, New Orleans, Louisiana		
Cataloguing collections of museum of the Middle American Research Institute (RF 38098).....	10,000.00	5,000.00
University of New Mexico, Albuquerque		
Development of library resources (RF 38089).....	16,000.00	11,216.00
University of Oxford, England		
Bodleian and other libraries. Development (RF 31121).....	1,488,658.05	273,980.26
Radio and Film		
Museum of Modern Art, New York City		
Establishment of a motion picture department (RF 35090).....	10,975.00	10,975.00
General support of Film Library (RF 38055).....	70,000.00	35,000.00
Pan American Union, Washington, D.C.		
Latin-American radio broadcasts (RF 37088).....	4,000.00	3,941.99
Princeton University, New Jersey. School of Public and International Affairs		
Study of value of radio to listeners (RF 37072).....	50,250.00	37,500.00

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
HUMANITIES—Continued		
Radio and Film—Continued		
University Broadcasting Council, Chicago, Illinois		
Developing radio programs of educational and cultural value (RF 37073).....	\$52,500.00	\$27,500.00
World Wide Broadcasting Foundation, Boston, Massachusetts		
Development of radio programs of educational and cultural value (RF 38056, 36051).....	105,000.00	28,000.00
Studies of American Culture		
American Museum of Natural History, New York City		
Collection of materials on arts of the American Indian (RF 38032).....	6,500.00	6,500.00
Authors' League of America, New York City		
Preparation of a series of American plays (RF 36124).....	5,022.69	3,696.97
University of Alaska, College, Alaska		
Aid in the production of a history of the Territory of Alaska (RF 36074).....	4,250.00	4,250.00
Latin-American and Far Eastern Interests		
American Council of Learned Societies, Washington, D.C.		
Chinese and Japanese studies (RF 37096).....	10,000.00	5,656.19
Cataloguing American collections of Chinese and Japanese books (RF 37120)..	60,000.00	4,570.60
<i>Handbook of Latin American Studies</i> (RF 38012).....	15,000.00	.....
Summer seminars in Far Eastern studies (RF 38088).....	7,500.00	.....
International Bureau of Education, Geneva, Switzerland. Children's Literature Section		
Studies in Latin-American countries (RF 38003).....	12,000.00	4,000.00

Claremont Colleges, California			
Materials for courses in Far Eastern subjects (RF 36001).....	\$1,000.00	\$1,000.00	
Columbia University, New York City			
Studies of English usage at the Institute of Educational Research, Teachers College (RF 35063).....	4,393.52	4,393.52	
Japanese studies (RF 37112).....	7,500.00	2,500.00	
Books and teaching materials in Far Eastern languages (RF 38030).....	25,000.00	5,000.00	
Cornell University, Ithaca, New York			
Development of Far Eastern studies (RF 38087).....	15,000.00	1,750.00	
Harvard University, Cambridge, Massachusetts			
Translating, abstracting, and indexing works on oriental art (RF 35120).....	2,808.61	1,200.00	
Institute of Pacific Relations, American Council, New York City			
Experiments in intensive teaching of Chinese language (RF 35182).....	6,695.00	6,500.00	
Library of Congress, Washington, D.C.			
Development of Far Eastern Center in the Division of Orientalia (RF 35091)....	4,500.00	4,500.00	
Orthological Institute, London, England			
Research in the Chinese and Japanese languages in relation to Basic English (RF 35181).....	16,891.25	16,106.88	
Orthological Institute, Peiping, China			
General expenses (RF 37012).....	19,500.00	10,866.40	
Pomona College, Claremont, California			
Development of Far Eastern studies (RF 36033).....	2,500.00	1,750.00	
Princeton University, New Jersey			
Development of Far Eastern studies (RF 36034, 38029).....	20,250.00	1,850.00	
Royal Ontario Museum of Archaeology, Toronto, Canada			
Teaching and research in Far Eastern subjects (RF 37121).....	25,000.00	5,000.00	

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>HUMANITIES—Continued</i>		
<i>Latin-American and Far Eastern Interests—Continued</i>		
Tulane University, New Orleans, Louisiana. Department of Middle American Research		
Survey of archives and libraries in Central America and the West Indies (RF 36142)	\$8,500.00	\$8,500.00
University of Chicago, Illinois		•
Development of new materials for teaching Chinese languages and literature (RF 36122)	19,000.00	6,000.00
Books and teaching materials in Far Eastern languages (RF 38031)	25,000.00	5,000.00
University of Colorado, Boulder		
Development of Far Eastern studies (RF 36117)	4,000.00	3,000.00
University of Pennsylvania, Philadelphia		
Development of Far Eastern studies (RF 38028)	15,000.00	2,500.00
Yale University, New Haven, Connecticut		
Development of Chinese studies (RF 37026)	25,800.00	9,200.00
<i>Fellowships</i>		
Administered by The Rockefeller Foundation (RF 35065, 35184, 36147, 37132, 38111)	229,512.61	74,204.36
American Council of Learned Societies, Washington, D.C.		
Fellowships and research aid grants in the field of humanistic studies (RF 36141)	22,500.00	15,000.00
Authors' League of America, Inc., New York City		
Fellowships (RF 38053)	25,000.00	1,500.00

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General

American Council of Learned Societies, Washington, D.C.		
Expenses of planning committees (RF 36141)	\$22,500.00	\$15,000.00
General activities (RF 34157, 35168, 38105)	147,542.06	32,768.39
American National Committee on International Intellectual Cooperation, New York City		
Committee on Copyright (RF 38066)	23,500.00	15,000.00
Grants in Aid (RF 35064, 35185, 36109, 36151, 37128, 38112)	190,828.00	47,310.06
International Committee of Historical Sciences, Paris, France		
Toward general budget, increasing distribution of publications, and expenses of next Congress (RF 37141)	16,800.00	7,000.00
Former Program		
American Council of Learned Societies, Washington, D.C.		
Completion of Linguistic Atlas of New England (RF 37097)	5,000.00	5,000.00
American School of Classical Studies, Athens, Greece		
Fellowships in archaeology in connection with the excavation of the Athenian Agora (RF 38097)	25,000.00	.....
Museum to house objects excavated at the Agora (RF 37089)	150,000.00	.....
American Schools of Oriental Research, Baghdad, Iraq, and Jerusalem, Palestine		
Current expenses (RF 36061)	12,500.00	7,500.00
Endowment (RF 36061)	120,576.50	36,068.04
Johns Hopkins University, Baltimore, Maryland		
Completion of Spenser project (RF 37007)	2,000.00	1,995.59
University of Chicago, Illinois		
Research in the humanities (RF 35029)	22,500.00	15,000.00

TREASURER'S REPORT

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EXHIBIT H—Continued

	APPROPRIATIONS	1938 PAYMENTS
<i>HUMANITIES—Continued</i>		
<i>Former Program—Continued</i>		
University of London, England, School of Oriental Studies Research in African linguistics (RF 36003).....	\$11,904.58	\$8,273.34
University of Michigan, Ann Arbor Research in humanities (RF 35033).....	3,750.00	3,750.00
CHINA PROGRAM		
Associated Boards for Christian Colleges in China, New York City Emergency grants to private universities and colleges in China (RF 38078).....	85,000.00	85,000.00
Chinese Mass Education Movement General budget (RF 37041, 38075).....	31,778.93	17,561.61
Chinese Ministry of Education, Nanking Expenses of a Commission on Medical Education (RF 37046, 38075).....	15,757.71	7,178.52
Emergency Fund (RF 37124).....	25,000.00	7,500.00
Fellowships, Foreign and local (RF 36050, 37047, 38076).....	155,192.41	49,793.62
Nankai University, Tientsin, China. Institute of Economics General budget (RF 37039, 38075).....	12,153.93	6,169.66
Ministry of Industry and Agriculture, Nanking, China. National Agricultural Research Bureau Insect control work (RF 37044, 38075).....	13,624.53	5,774.96
National Central University, Nanking, China. College of Agriculture Development of work in animal husbandry and veterinary preventive medicine (RF 37043, 38075).....	6,116.36	3,409.65

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THE ROCKEFELLER FOUNDATION

National Health Administration of China, Nanking		
Training of health personnel (RF 37045, 38075).....	\$72,408.92	\$28,486.60
National Rural Administration Training Institute		
Expenses (RF 38075).....	60,000.00	9,232.98
North China Council for Rural Reconstruction		
Toward expenses (RF 37038).....	66,525.20	34,981.27
Research and Developmental Aid (RF 37048, 37142, 38076).....	35,178.36	15,322.20
University of Nanking, China. Departments of Agricultural Economics and Science		
General budget (RF 37042, 38075).....	31,600.00	17,943.71
Yenching University, Peiping, China. College of Public Affairs		
General budget (RF 37040, 38075).....	18,153.93	8,498.79
MISCELLANEOUS		
Commission on Interracial Cooperation, Atlanta, Georgia		
General budget (LS 999).....	50,469.77	35,036.36
Exchange Fund (RF 33082, 35100).....	51,131.29	.....
<i>History of The Rockefeller Foundation</i> (RF 37037).....	15,000.00	2,367.98
Playground and Recreation Association of America, New York City		
General budget (LS 1000).....	60,000.00	30,000.00
Special Research Aid Fund for European Scholars (RF 35135, 35153, 36090, 37090, 38092).....	179,450.18	51,762.76
State University of Iowa, Iowa City		
Work in child study and parent education (LS 932).....	34,902.01	34,902.01
Travel funds in aid of selection of personnel for teaching and research (RF 36088)....	9,381.20	326.50
University of Minnesota, Minneapolis		
Child study and parent education (LS 933-34).....	43,635.57	9,667.09

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EXHIBIT H—Continued

		1938
	APPROPRIATIONS	PAYMENTS
<i>MISCELLANEOUS—Continued</i>		
University of Toronto, Canada		
Development of child research and parent education (RF 30054).....	\$19,962.22	\$5,000.00
Visits by individuals and commissions (RF 30101).....	13,270.74	1,035.41
<i>ADMINISTRATION</i>		
Scientific Divisions		
1937.....	63,191.32	21,483.42
1938.....	558,570.57	502,960.77
1939.....	544,325.00	.....
General		
1937.....	33,889.59	16,729.51
1938.....	291,650.37	245,715.38
1939.....	282,592.00	.....
	\$38,975,243.96	
Unused Balances of Appropriations Allowed to Lapse		
The Rockefeller Foundation.....	\$734,923.74	
International Health Division.....	96,589.46	831,513.20
	\$38,143,730.76	\$12,759,730.74
TOTAL NET APPROPRIATIONS AND EXPENDITURES.....	\$38,143,730.76	\$12,759,730.74

REFUNDS ON PRIOR YEAR APPROPRIATIONS

Council on Foreign Relations (RF 36036)	\$1,189.73	
Egypt. Hookworm Studies (IH 29086).	258.49	
Encyclopaedia of the Social Sciences (RF 32114).	3,220.25	
Harvard University (RF 33030).	5,000.00	
Jamaica. Yaws and Syphilis (IH 31164).	496.75	
Johns Hopkins University (RF 36068).	3,074.74	
National Central University, Nanking (RF 36047)	2.50	
National Institute of Health of the United States Public Health Service (IH 34063).	872.35	
National Research Council (RF 34172).	1,715.30	
National Research Council (RF 32109).	104.07	
National Research Council (RF 33121)	340.79	
Northwestern University Medical School (RF 35011).	105.35	
Paris Office. Building (RF 21151).	95.89	
Prussian State Library (RF 32102).	180.08	
Puerto Rico. Anemia (IH 31165).	75.00	
State University of Iowa (RF 35149).	44.58	
University of Michigan (RF 35046).	2,004.52	
University of Stockholm (RF 35073).	321.73	
University of Wisconsin (RF 36101).	272.26	
Vassar College (RF 37027).	68.51	
Western Reserve University (IH 36013).	132.55	
Yale University (LS 900).	1,433.50	\$21,008.94
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EXHIBIT I

INTERNATIONAL HEALTH DIVISION

DESIGNATIONS DURING 1938, OR UNPAID BALANCES AS AT DECEMBER 31, 1937
ON PRIOR YEAR DESIGNATIONS, AND PAYMENTS THEREON DURING 1938

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THE ROCKEFELLER FOUNDATION

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
CONTROL AND INVESTIGATION OF SPECIFIC DISEASES			
Anemia			
Puerto Rico			
1937 (IH 36102).....	\$1,476.43	\$.....	\$1,090.46
1938 (IH 37038).....	.....	3,500.00	2,270.96
Hookworm			
Control			
Africa			
Egypt			
1936 (IH 35119).....	1,284.59	.....	.....
1937 (IH 36077).....	964.80	.....	315.51
1938 (IH 37039).....	.....	2,990.00	1,128.81
Europe			
Cyprus			
1937 (IH 36108).....	641.70	.....	616.12
Investigations			
Africa			
Egypt			
1936 (IH 35120).....	331.77	.....	.....
1937-38 (IH 36080, 37036).....	5,627.56	.....	2,552.49

United States			
Florida			
1937-38 (IH 36078).....	\$2,618.44	\$.....	\$2,090.33
Johns Hopkins University. School of Hygiene and Public Health, Baltimore, Maryland			
1937-38 (IH 36079).....	1,243.76	.....	1,183.31
1938-39 (IH 37040).....	.....	1,500.00	326.88
Malaria			
Control			
Caribbean Area			
Central America			
Costa Rica			
1937 (IH 36046).....	266.88	.....	266.88
1937-38 (IH 37027, 38007).....	1,000.00	300.00	1,119.37
1938-39 (IH 38008).....	.....	2,000.00	1,374.78
Guatemala			
1936-37 (IH 34006, 36038).....	1,400.00	.....	.....
Panama			
1937 (IH 36081).....	1,030.62	.....	79.20
1938 (IH 37041).....	.....	2,000.00	14.85
Salvador			
1937-38 (IH 37010-11).....	1,200.00	.....	913.75
1938-39 (IH 38038).....	.....	600.00	.....
Europe. Albania			
1937 (IH 36083).....	3,099.14	3,088.16
1938-40 (IH 37089).....	20,955.00	9,633.36

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
CONTROL AND INVESTIGATION OF SPECIFIC DISEASES—Continued			
<i>Malaria—Continued</i>			
<i>Control—Continued</i>			
South America			
Brazil			
1929-30 (IH 28183, 29217).....	\$13,877.19	\$.....	\$.....
Colombia			
1937 (IH 36082).....	1,285.68	.....	974.84
The East			
India			
Madras			
1937-38 (IH 37014).....	6,300.00	.....	5,227.18
United States			
Florida			
1937-38 (IH 37016).....	4,544.51	.....	3,748.75
1938-39 (IH 38015).....	.....	5,000.00	284.32
<i>Investigations</i>			
Caribbean Area			
West Indies			
Cuba			
1937 (IH 36086).....	3,376.70	.....	3,370.50
1938-40 (IH 37087).....	.....	18,350.00	4,825.29
Puerto Rico			
1936-38 (IH 35127).....	798.46	.....	778.13

Mexico			
1937-38 (IH 37003)...	\$7,314.46	\$.....	\$6,265.80
1938-39 (IH 38021)...	.....	17,400.00	1,382.32
Europe, Africa, and Near East			
Albania, Italy, and Northern Europe			
1937 (IH 36087).....	2,473.87	.....	2,473.87
Balkans, Italy, and Northern Europe			
1938 (IH 37044).....	.....	13,000.00	11,202.00
Bulgaria			
1936 (IH 35129)....	1,209.46	.....	.....
1937 (IH 36088)....	4,764.88	.....	971.54
Cyprus			
1936 (IH 35155)....	167.38	.....	.....
1937 (IH 36089)....	1,965.10	.....	1,726.18
1938 (IH 37045)....	.....	8,760.00	6,384.45
Egypt			
1938 (IH 37094, 38039)	.....	3,000.00	2,427.62
England			
University of Cambridge. Molteno Institute of Parasitology			
1936-39 (IH 36051).....	1,660.87	.....	800.80
Greece			
1936 (IH 35130).....	1,040.60	.....	.....
1937 (IH 36090).....	6,377.15	.....	3,896.87
1938 (IH 37046).....	.....	15,000.00	7,898.98
Italy			
Institute of Public Health, Rome. Laboratory			
1937 (IH 36091).....	17,880.00	15,754.27
1938-39 (IH 37092).....	24,000.00	192.62

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
CONTROL AND INVESTIGATION OF SPECIFIC DISEASES—Continued			
<i>Malaria—Continued</i>			
<i>Investigations—Continued</i>			
<i>Europe—Continued</i>			
Portugal			
1936 (IH 35132).....	\$1,471.04	\$.....	\$.....
1937 (IH 36092).....	5,407.63	.....	4,580.35
1938 (IH 37047).....	.....	10,000.00	7,605.32
Spain			
1936 (IH 35133).....	2,454.06	.....	.....
The East			
India			
Madras			
1937 (IH 36093).....	3,333.16	.....	3,219.44
1938 (IH 37048).....	.....	13,800.00	10,192.74
Mysore			
1936-37 (IH 36031).....	191.05	.....	143.78
South America			
Brazil			
1938 (IH 38028).....	.....	1,500.00	.....
United States			
Florida			
1937 (IH 36084).....	3,259.74	.....	3,112.77
1938 (IH 37042).....	.....	14,800.00	10,925.14

Johns Hopkins University. School of Hygiene and Public Health, Baltimore, Maryland			
1938-39 (IH 38016).....	\$.....	\$3,000.00	\$250.00
University of Chicago, Illinois			
1937 (IH 36085).....	1,260.01	.....	1,159.99
1938 (IH 37043).....	.....	2,000.00	851.56
Miscellaneous			
Special investigations			
1937 (IH 36017, 37001).....	1,878.68	.....	1,379.44
1938 (IH 37031).....	10,000.00	.....	9,740.97
Surveys of the anophelines of the Eastern Mediterranean			
1936-37 (IH 36009).....	206.65	.....	.....
Mental Hygiene			
Europe			
Poland. National Department of Health			
Development of a division of mental hygiene in the Warsaw School of Hygiene			
1935-36 (IH 35012).....	794.55	.....	.....
United States			
Johns Hopkins University. School of Hygiene and Public Health, Baltimore, Maryland			
1936-37 (IH 36019).....	319.36	.....	.....
1937-38 (IH 37025).....	10,700.00	.....	10,078.24
1938-39 (IH 37049).....	.....	10,700.00	.....
Tennessee. State Department of Health			
1936-38 (IH 36005, 36047).....	11,599.93	11,389.37
1938-39 (IH 37050).....	16,000.00	3,935.66

TREASURER'S REPORT

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EXHIBIT I—Continued

CONTROL AND INVESTIGATION OF SPECIFIC DISEASES—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
Rabies			
Alabama			
1936-37 (IH 36010, 36034, 36048, 37024).....	\$6,526.87	\$.....	\$5,846.23
1938-39 (IH 37081, 38013, 38081).....	.....	25,230.00	9,495.87
Respiratory Diseases			
Influenza Studies			
Europe			
Hungary			
1936-37 (IH 35063).....	2,992.33	.....	2,992.33
1938 (IH 37052).....	.....	6,000.00	2,950.96
United States			
California			
1938-40 (IH 38014).....	.....	43,430.00	20,000.00
Minnesota			
Remodeling laboratory			
1937 (IH 36049).....	5,586.97	.....	5,586.97
Studies			
1937-39 (IH 37021).....	21,680.64	.....	10,963.03
New York			
1937-39 (IH 36049, 37084).....	9,769.00	.....	4,688.94
New York University			
1938-41 (IH 38023).....	24,000.00	6,500.00
University of Pennsylvania			
1937-38 (IH 36050).....	7,482.89	6,941.45

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Studies on the Common Cold			
Columbia University, New York City			
1937-38 (IH 36103).....	\$11,000.00	\$.....	\$9,782.52
1938-39 (IH 37051).....	.....	11,000.00	3,459.18
Scarlet Fever			
Rumania			
1934-36 (IH 34057, 36042).....	2,271.45	.....	.....
1937-38 (IH 36043, 38030).....	10,579.60	4,000.00	12,017.87
Smallpox			
Spain			
Study of vaccine virus			
1936 (IH 35144).....	1,950.08	.....	.....
Syphilis			
United States			
Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Maryland			
1937-39 (IH 37017, 37083, 38005).....	1,000.00	14,675.00	8,160.39
Tuberculosis			
Caribbean Area			
Jamaica			
Tuberculosis work and rural isolation studies			
1937 (IH 36098).....	5,698.20	.....	1,256.81
1938 (IH 37054).....	10,200.00	5,039.12
Puerto Rico			
1938-39 (IH 38026).....	2,360.00

TREASURER'S REPORT

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
CONTROL AND INVESTIGATION OF SPECIFIC DISEASES—Continued			
Tuberculosis—Continued			
Europe			
Austria			
1937 (IH 36099).....	\$7,075.00	\$.....	\$6,634.69
1938-39 (IH 37090).....	.....	15,760.00	.....
United States			
Alabama			
1937 (IH 36096).....	8,104.02	.....	7,951.14
Committee on Neighborhood Health Development of New York City			
1938-41 (IH 38031).....	.....	12,800.00	.....
Consultant			
1938-40 (IH 38003).....	.....	4,000.00	747.66
Cornell University Medical College, New York City			
1937-38 (IH 37019-20, 36047).....	14,820.83	.....	13,647.93
1938-39 (IH 38004).....	.....	13,500.00	2,767.09
Tennessee			
1937-38 (IH 36097, 37002).....	9,222.50	.....	8,847.07
1938-39 (IH 37053).....	.....	12,100.00	2,984.83
Yellow Fever			
Africa			
1937 (IH 36109).....	8,294.25	3,244.19
1938 (IH 37057).....	12,500.00	6,852.26

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THE ROCKEFELLER FOUNDATION

Europe			
France. Pasteur Institute, Paris			
1936 (IH 35135).....	\$775.94	\$.....	\$493.99
1937 (IH 36095).....	1,370.47	.....	760.60
1938 (IH 37056).....	.....	2,000.00	807.57
South America			
Brazil			
Laboratories			
1934-37 (IH 34116, 36014)	892.38	.....	892.38
Control and investigation			
1937 (IH 36094).....	37,549.39	.....	37,549.39
1938 (IH 37055, 38022).....	.. ..	230,000.00	173,972.15
Colombia			
1937 (IH 36094).....	10,417.29	.....	8,674.34
1938 (IH 37055).....	.....	37,200.00	26,468.80
Laboratory building			
1938-39 (IH 37030, 38029).....	15,000.00	3,000.00	12,986.09
Other countries of South America, including international administration			
1937 (IH 36094, 37012).....	22,439.24	.....	11,593.38
1938 (IH 37055).....	.....	16,800.00	10,645.45
Collection and Testing of Wild Animals for Use in the Study of Diseases of Public Health Interest			
1938-40 (IH 38042, 38080).....	.....	26,000.00	1,218.75
Statistical Analyses of the Records of Certain Specific Diseases			
1936-38 (IH 36033)	263.02	119.33

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
LABORATORIES OF THE INTERNATIONAL HEALTH DIVISION AT THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, NEW YORK CITY			
1937 (IH 35063, 36104).....	\$4,923.84	\$.....	\$4,878.41
1938 (IH 37058, 38018).....	.....	112,000.00	98,789.79
STATE AND LOCAL HEALTH SERVICES			
Public Health Administration			
Canada			
Nova Scotia			
1937-41 (IH 36022).....	33,400.00	.....	5,895.05
Caribbean Area			
Central America			
Costa Rica. Office in San José			
1937 (IH 36057).....	571.48	.....	570.48
1938 (IH 37062).....	.....	2,700.00	2,049.04
Panama			
1937 (IH 36058).....	687.24	.....	402.59
1938 (IH 37063).....	.....	2,500.00	1,368.63
West Indies			
Puerto Rico			
1937-38 (IH 36056).....	422.53	.....	276.53
West Indies and Central America			
1937 (IH 36055).....	932.10	.....	443.44
1938 (IH 37061).....	.....	3,500.00	1,518.00

Mexico			
Central Administration and Training Station			
1937 (IH 36053-54).....	\$1,466.71	\$.....	\$1,118.55
1938 (IH 37059-60).....	....	4,750.00	3,336.87
The East			
Fiji Islands			
1937 (IH 36062)..	395.23	.....	232.09
1938 (IH 37067)...	.....	1,800.00	1,249.40
India			
1937 (IH 36059-60)	1,919.54	.....	756.11
1938 (IH 37064-65) . . . . .	.....	3,280.00	1,647.68
Netherlands India			
1937 (IH 36061)..	1,340.87	.....	1,158.23
1938 (IH 37066).. . . . .	.. ..	4,405.00	3,112.06
United States			
Alabama			
1938-40 (IH 37080). . . . .	.. ..	18,000.00	5,143.73
State Health Surveys			
1935-39 (IH 35065)....	4,132.87	.. . .	212.39
Divisions of Vital Statistics			
Canada			
Manitoba			
1938-40 (IH 37085)	16,320.00	2,653.50
Nova Scotia			
1938-42 (IH 37026).....	8,160.00

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
STATE AND LOCAL HEALTH SERVICES—Continued			
Divisions of Epidemiology			
Canada			
Alberta			
1938-39 (IH 38006).....	\$.....	\$10,200.00	\$2,370.19
British Columbia			
1938-39 (IH 38006).....	.....	10,200.00	2,045.07
Public Health Laboratories			
Canada			
Prince Edward Island			
1939-43 (IH 38035).....	.....	15,300.00	.....
Caribbean Area			
Central America			
Costa Rica			
1937-38 (IH 37009).....	548.31	.....	490.21
1938-39 (IH 38027, 38037).....	.....	900.00	80.07
Nicaragua			
Training Center			
1937 (IH 36111).....	250.53	.....	247.50
Panama			
1937 (IH 36063).....	1,053.56	.....	1,053.56

Divisions of Public Health Nursing			
United States			
Committee on Neighborhood Health			
Development of New York City			
1938-40 (IH 37079).....	\$.....	\$35,000.00	\$8,463.77
Divisions of Sanitary Engineering			
Canada			
Nova Scotia			
1934-39 (IH 34064).....	5,117.65	.....	2,447.57
Caribbean Area			
1937 (IH 36064).....	465.40	.....	14.36
Africa			
Egypt			
1936-37 (IH 35104).....	630.69	.....	287.19
Europe			
Greece			
1936 (IH 35103).....	85.01	.....	.....
Other State Health Services			
Canada			
Division of Industrial Hygiene			
1936-38 (IH 35042).....	2,998.58	.....	2,995.62
Division of Hygiene and Nutrition			
1936-38 (IH 35043).....	3,598.69	.....	2,995.63
Europe			
Hungary. Survey of Public Health			
Machinery			
1937 (IH 36041).....	2,200.00	1,631.30
1938 (IH 37068).....	1,575.00

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
STATE AND LOCAL HEALTH SERVICES—Continued			
Local (County) Health Departments			
Canada			
British Columbia			
1935-39 (IH 35083).....	\$3,256.89	\$.....	\$1,996.47
1936-41 (IH 36021, 38020, 38024).....	58,115.91	12,365.00	17,439.48
Ontario			
1935-39 (IH 34065).....	10,411.50	.....	4,147.64
Quebec			
1938-43 (IH 38025).....	.....	15,300.00	.....
Caribbean Area			
Central America			
Costa Rica			
1936-39 (IH 36024, 38009, 38090).....	1,000.00	2,640.00	2,240.46
Guatemala			
1936-37 (IH 36037).....	500.00	.....	.....
Nicaragua			
1936-37 (IH 36039).....	62.96	.....	.....
1937-38 (IH 37032).....	1,200.00	.....	835.63
Panama			
1937-38 (IH 36066, 36107).....	3,410.44	.....	829.57
Salvador			
1937-38 (IH 37033).....	800.00	.....	110.80
West Indies			
Cuba			
1937 (IH 36106).....	2,329.25	2,290.61
1938-41 (IH 37088).....	28,150.00	8,611.68

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Europe				TREASURER'S REPORT
Albania				
1936-40 (IH 36028).....	\$16,046.29	\$.....	\$7,933.29	
Tirana Health Center. Construction and equipment				
(IH 36052, 37028).....	8,000.00	.....	400.76
Austria				
1936-39 (IH 35154)....	5,156.75	.....	1,801.12
Greece				
1936-40 (IH 36029).....	7,950.88	.....	2,468.50
1938-42 (IH 37034)	10,000.00	.....	.....
Hungary				
1937 (IH 36067-71).....	9,415.00	.....	6,979.42
1938 (IH 37069-73).....	.....	4,490.00	.....
Italy				
1938-42 (IH 37035).....	18,000.00	.....	.....
Rumania				
Institute of Hygiene, Bucharest. Development of health center				
1935-40 (IH 35058).....	8,586.55	.....	3,948.21
Spain				
1936 (IH 36008).....	3,000.00	.....	.....
Turkey				
Health Center, Istanbul				
1936-39 (IH 36016).....	3,142.96	.....	.....
Health Center, Ankara				
1938-42 (IH 37093).....	56,700.00	.....	.....

EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
STATE AND LOCAL HEALTH SERVICES—Continued			
Local (County) Health Departments—Continued			
Mexico			
1936-40 (IH 35084, 36065, 37086, 38036).....	\$24,696.19	\$10,215.00	\$11,209.42
The East			
India			
Bengal			
1938-43 (IH 38011).....	.....	24,000.00	.....
Delhi			
1937-42 (IH 36110).....	27,147.74	.....	6,457.77
Madras			
1935-37 (IH 35060).....	1,958.44	.....	53.40
1937-40 (IH 36044).....	13,794.19	.....	2,216.61
Mysore			
1936-40 (IH 35156).....	15,950.32	.....	4,222.30
Sanitation Research			
1938-39 (IH 38012, 38041).....	.....	4,225.00	2,817.97
Travancore			
1936-37 (IH 35086, 36032).....	223.06	.....	.....
United Provinces			
1932-38 (IH 31163).....	5,629.48	.....	1,406.75
Java			
1933-40 (IH 32189, 33077, 34143).....	13,762.65	.....	3,894.47
1938-40 (IH 36045).....	11,260.00	.....	5,024.93

United States			
New York			
1935-39 (IH 34047, 34132).....	\$16,823.86	\$.....	\$4,263.73
PUBLIC HEALTH EDUCATION			
Schools of Hygiene and Public Health			
Europe			
Bulgaria. Institute and School of Hygiene, Sofia			
1938-41 (IH 38010).....		17,800.00	.....
Greece. National Institute of Hygiene, Athens			
1936-37 (IH 36015).....	4,950.47	.....	3,469.06
1938 (IH 37074).....		4,000.00	.40
Hungary. State Hygienic Institute, Budapest			
1936-37 (IH 35116, 36040).....	910.42	.....	802.02
1938-40 (IH 37091).....		3,135.00	471.47
Turkey. School of Hygiene, Ankara			
1936-37 (IH 36030).....	5,000.00	.....	1,826.91
1938-39 (IH 37075, 38040).....		6,740.00	.....
United States			
Johns Hopkins University. School of Hygiene and Public Health,			
Baltimore, Maryland			
1938 (IH 38032-33).....		35,000.00	.....
The East			
Japan. Institute of Public Health, Tokyo			
Field Training Area			
1935-40 (IH 32188, 37037).....	30,199.58	19,368.30

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
PUBLIC HEALTH EDUCATION—Continued			
Schools of Nursing			
Canada			
University of British Columbia, Victoria			
1936-39 (IH 36035).....	\$7,650.00	\$.....	\$2,495.05
University of Toronto			
1937-39 (IH 37006).....	10,409.37	.....	4,950.00
Caribbean Area			
Panama. Santo Tomás Hospital. School of Nursing			
1937-42 (IH 37015).....	33,379.98	.....	6,059.20
Europe			
Denmark			
1937-41 (IH 37029).....	20,430.00	.....	.....
Rumania. School of Nursing, Bucharest			
Developmental aid			
1936-39 (IH 35085).....	11,888.34	.....	6,773.75
South America			
Brazil. School of Nursing, Rio de Janeiro			
Salary and travel of acting directress			
1934-40 (IH 36036).....	5,835.12	.....	2,669.50

United States			
Skidmore College, Saratoga Springs, New York			
1937-39 (IH 37004).....	\$15,000.00	\$.....	\$9,999.73
1939-43 (IH 38019).....	.....	30,000.00	.....
University of California, Berkeley			
1937-40 (IH 37005).....	6,000.00	.....	2,400.00
University of Washington, Seattle			
1935-39 (IH 35005).....	7,795.00	.....	5,000.00
Vanderbilt University, Nashville, Tennessee			
1936-40 (IH 36012).....	7,500.00	.....	3,000.00
Western Reserve University, Cleveland, Ohio			
1937-39 (IH 37007).....	10,000.00	.....	7,500.00
Other Schools			
Fiji. Central Medical School for Native Medical Students, Suva			
1937 Laboratory equipment			
(IH 36075).....	271.93	.....	.....
First National Midwifery School, Peiping, China			
1938 (IH 37095).....	.....	7,500.00	6,393.85
Training Stations			
Caribbean Area			
Panama			
1937-38 (IH 36074).....	981.15	4.25
Puerto Rico			
1937-38 (IH 36073).....	1,776.35	1,405.00

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EXHIBIT I—Continued

	PRIOR DESIGNATIONS	1938 DESIGNATIONS	1938 PAYMENTS
PUBLIC HEALTH EDUCATION—Continued			
Training Stations—Continued			
United States			
Harvard University. School of Public Health, Boston, Massachusetts			
Field training and study area			
1935-39 (IH 34068).....	\$16,347.26	\$.....	\$6,196.64
Johns Hopkins University. School of Hygiene and Public Health, Baltimore, Maryland			
Field training and study area			
1937 (IH 32196, 34050).....	700.27	.....	.....
1937-42 (IH 37018).....	86,458.09	.....	18,859.87
Committee on Neighborhood Health Development, New York City Consultant			
1938 (IH 38001).....	.....	5,000.00	5,000.00
North Carolina. Public Health Education and School Health Service			
1939-43 (IH 38034).....	.....	25,000.00	.....
Fellowships. Travel of Government Health Officials and Teachers of Public Health, and Training of Health Workers			
1935 (IH 34095).....	2,000.00	.....	467.68
1936 (IH 35113).....	28,736.29	.....	4,403.31
1937 (IH 36072, 36076, 37022-23).....	126,121.83	.....	109,981.58
1938 (IH 37076-77).....	.....	210,510.00	74,326.82

FIELD SERVICE

Salaries and Expenses of Staff

1937-38 (IH 36105, 37078)

Salaries.....	\$15,683.30	\$485,000.00	\$473,029.58
Commutation.....	11,043.77	47,000.00	49,297.89
Travel.....	37,502.05	144,000.00	147,759.01
Medical examinations.....	562.43	1,000.00	738.97
Field equipment and supplies.....	1,750.18	5,000.00	1,636.21
Pamphlets and charts.....	1,626.55	6,000.00	6,615.16
Express, freight, and exchange.....	802.69	1,000.00	376.55
Insurance and retirement allowances.....	26,401.58	54,000.00	47,454.19
Bonding.....	1,476.25	3,000.00	1,357.73
Automobiles.....	1,000.00	1,000.00	.....
Field office expenses.....	3,726.49	5,000.00	3,713.74
Director's Fund for Budget Revision (IH 34006, 36047).....	5,569.00	.....	.....
Exchange Fund (IH 33052, 33077)....	21,538.81	.....	.....
Exhibits on Virus and Other Diseases			
1937 (IH 37013).....	2,000.00	1,962.52
1938-40 (IH 38017).....	20,000.00	10,000.00
	<u>\$1,377,517.91</u>	<u>\$2,197,210.00*</u>	<u>\$1,956,058.61</u>

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* The Foundation appropriated \$2,200,000 for the work of the International Health Division during 1938, the undesignated balance of \$2,790.00 being allowed to lapse as of December 31, 1938.

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EXHIBIT J
STATEMENT OF TRANSACTIONS RELATING TO INVESTED FUNDS
STOCK DIVIDEND RECEIVED

	SHARES	LEDGER VALUE
Standard Oil Co. (New Jersey).....	16,155-15/200	\$.....
SECURITIES PURCHASED		
	PAR	AMOUNT
Bethlehem Steel Corporation Consolidated 3 $\frac{1}{2}$ s/66.....	\$ 105,000	\$ 97,163.75
ADDITION TO LEDGER VALUE		
Payment to Protective Committee added to cost of security Interborough Rapid Transit Co., 1st & Refunding 5s/66 (Payment of 1% of Principal).....	1,750,000	\$ 17,500.00
		\$114,663.75
SECURITIES SOLD, REDEEMED, OR EXCHANGED		
	PAR	LEDGER VALUE
BONDS		AMOUNT RECEIVED
Calgary Protestant Public School Dist. #19, Province of Alberta 5s/38, redeemed.....	\$ 13,750	\$ 11,687.50 \$ 13,750.00
Carolina, Clinchfield & Ohio Ry. 5s/38, redeemed.....	1,488,000	1,116,000.00 1,488,000.00

Chicago, Milwaukee & St. Paul R.R. Receivers' Equipment 5s/35-38 (Payment of 20%).....	\$532,000	\$106,400.00	\$106,400.00
Consolidation Coal Co. Notes 5s/50, sold.....	6,000	6,000.00	6,000.00
Edmonton Public School 5s/53 exchanged for Edmonton School Dist. due 2/1/67 bearing interest at 5% to 4/15/53 and then 4½ to ma- turity.....	350,000	.....	.....
Illinois Central R.R. Equipment 4½s/38, redeemed.....	80,000	78,800.00	80,000.00
Pennsylvania R.R. Equipment Trust 4½s/38, redeemed.....	30,000	29,550.00	30,000.00
Phelps Dodge Corp. 3½s/52, redeemed.....	3,000	3,257.81	3,150.00
St. Louis, San Francisco Ry. Equipment 4s/38, redeemed.....	50,000	46,179.84	50,000.00
Southern Pacific Equipment 4½s/38, redeemed.....	100,000	98,500.00	100,000.00
U.S. Rubber 1st & Refunding 5s/47, redeemed.....	3,820,000	3,247,000.00	4,011,000.00
U.S.A. Treasury Notes 2-7/8s/38, sold.....	7,000,000	7,069,039.06	7,096,250.00
U.S.A. Treasury Notes 2½s/38, sold.....	1,305,000	1,305,000.00	1,326,002.35
		<u>\$13,117,414.21</u>	<u>\$14,310,552.35</u>

TREASURER'S REPORT

Stocks

Continental Oil Co. Rights, sold.....	60,627	\$ 19,024.07	\$ 19,024.07
Ohio Oil Co. 6% Preferred, redeemed.....	4,500	465,750.00	495,000.00
Standard Oil Co. (New Jersey), sold.....	15/200	3.87	3.87
Western Pacific R.R. 6% Preferred, sold.....	28,609	858,270.00	26,224.93
		<u>\$ 1,343,047.94</u>	<u>\$ 540,252.87</u>

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EXHIBIT J—Continued

DEDUCTIONS FROM LEDGER VALUE

	PAR	LEDGER VALUE	AMOUNT RECEIVED
Refund from Reorganization Committee used to adjust ledger value of Chicago, Rock Island & Pacific R.R. 3½s/47.....	\$609,300	\$ 420.00	\$ 420.00
		<u>\$14,460,882.15</u>	<u>\$14,851,225.22</u>
Balance.....		390,343.07*	
		<u>\$14,851,225.22</u>	<u>\$14,851,225.22</u>

RECONCILIATION

Ledger value of securities, December 31, 1937.....			\$172,073,541.24
Securities purchased, etc.....			114,663.75
			<u>\$172,188,204.99</u>
Ledger valuation of securities, sold, redeemed, etc.....	\$14,460,882.15		
Balance used to write down ledger valuation.....	387,330.54		14,848,212.69
			<u>\$157,339,992.30</u>

* This balance of \$390,343.07, less charges for legal services of \$3,012.53, resulted in a net balance of \$387,330.54 which was used to write down the ledger value of \$1,785,200 par value Chicago, Milwaukee, St. Paul & Pacific R.R. 5s/2000.

EXHIBIT K

SCHEDULE OF SECURITIES ON DECEMBER 31, 1938

BONDS

NAME	INTEREST RATE PER CENT	DATE OF MATURITY	AMOUNT	FOUNDATION'S LEDGER VALUE PER CENT	FOUNDATION'S TOTAL LEDGER VALUE
Atchison, Topeka & Santa Fe Ry. One Hundred-year Adjustment Mortgage Gold (Stamped).....	4	July 1995	\$420,000.00	75.	\$315,000.00
Baltimore & Ohio R.R. Refunding & General Mortgage Gold Series "A".....	5	Dec. 1995	1,750,000.00	80.	1,400,000.00
Baltimore & Ohio R.R. Refunding & General Mortgage Series "F".....	5	Mar. 1996	495,500.00	101.8848	504,839.38
Bethlehem Steel Corporation Consolidated Sinking Fund Series "E".....	3½	Oct. 1966	831,000.00	92.4020758	767,861.25
Burlington, Cedar Rapids & Northern Ry. Consolidated First Mortgage Gold.....	5	Apr. 1934 Serially	64,000.00	101.5625	65,000.00
Calgary Protestant Public School District No. 19, Province of Alberta.....	5	June 2, 1939-48	84,750.00	85.	72,037.50
Chicago & Alton R.R. Refunding Mortgage Gold.....	3	Oct. 1949	551,000.00	65.	358,150.00

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EXHIBIT K—Continued

NAME	INTEREST RATE PER CENT	DATE OF MATURITY	AMOUNT	FOUNDATION'S LEDGER VALUE PER CENT	FOUNDATION'S TOTAL LEDGER VALUE
Chicago City & Connecting Rys. Collateral Trust (Certificates of Deposit).....	5	Jan. 1927	\$1,305,000.00	52.	\$678,600.00
Chicago & Erie R.R. First Mortgage Gold..	5	May 1982	156,000.00	93.	145,080.00
Chicago, Junction Rys. & Union Stockyards Co. Forty-year Mortgage and Collateral Refunding.....	5	Apr. 1940	500,000.00	93.	465,000.00
Chicago, Milwaukee & St. Paul Ry. Receivers' Equipment Gold Series "D" (80% paid).....	5	Aug. 1935	133 bonds @ \$200 each or 26,600.00	91.25	24,272.50
Chicago, Milwaukee & St. Paul Ry. Receivers' Equipment Gold Series "D" (60% paid).....	5	Aug. 1936	133 bonds @ \$400 each or 53,200.00	95.625	50,872.50
Chicago, Milwaukee & St. Paul Ry. Receivers' Equipment Gold Series "D" (40% paid).....	5	Aug. 1937	133 bonds @ \$600 each or 79,800.00	97.0833	77,472.50
Chicago, Milwaukee & St. Paul Ry. Receivers' Equipment Gold Series "D" (20% paid).....	5	Aug. 1938	133 bonds @ \$800 each or 106,400.00	97.8125	104,072.50

Chicago, Milwaukee & St. Paul Ry. Receivers' Equipment Gold Series "D".....	5	\$133,000 due Aug. 1 each year 1939-40	\$266,000.00	98.25	\$261,345.00
Chicago, Milwaukee & St. Paul Ry. General Mortgage Gold Series "C".....	4½	May 1989	500,000.00	103.	515,000.00
Chicago, Milwaukee, St. Paul & Pacific R.R. Fifty-year Mortgage Series "A".....	5	Feb. 1975	446,300.00	95.	423,985.00
Chicago, Milwaukee, St. Paul & Pacific R.R. Convertible Adjustment Mortgage Series "A".....	5	Jan. 2000	1,785,200.00	40.80324109	728,419.46
Chicago & North Western Ry. General Mortgage.....	5	Nov. 1987	201,000.00	98.097	197,175.00
Chicago Rys. Co. First Mortgage Gold (25% paid) (Certificates of Deposit).....	5	Feb. 1927	500 bonds @ \$750 each or 375,000.00	96.	360,000.00
The Chicago, Rock Island & Pacific Ry. Co. First and Refunding Mortgage Gold.....	4	Apr. 1934	3,345,000.00	81.458204	2,724,776.93
The Chicago, Rock Island & Pacific Ry. Co. Ten-year Certificates of Indebtedness of the Trustees.....	3½	July 1947	609,300.00	100.9051386	614,815.01
Chicago, St. Louis & New Orleans R.R. Consolidated Mortgage Gold.....	3½	June 15, 1951	200,000.00	66.	132,000.00
Cleveland, Cincinnati, Chicago & St. Louis Ry. General Mortgage.....	4	June 1993	700,000.00	83.89285	587,250.00

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EXHIBIT K—Continued

NAME	INTEREST RATE PER CENT	DATE OF MATURITY	AMOUNT	FOUNDATION'S LEDGER VALUE PER CENT	FOUNDATION'S TOTAL LEDGER VALUE
Cleveland Short Line Ry. First Mortgage Gold.....	4½	Apr. 1961	\$500,000.00	95.	\$475,000.00
Consolidation Coal Co. Secured Notes.....	5	July 1950	494,000.00	100.	494,000.00
Denver & Rio Grande R.R. First Consolidated Mortgage Gold.....	4	Jan. 1936	810,000.00	96.4238456	781,033.15
Denver & Rio Grande Western R.R. General Mortgage (Assented subject to plan).....	5	Aug. 1955	574,000.00	59.	338,660.00
Edmonton School District No. 7 Debenture dated Feb. 1, 1937.....	5 4½	Apr. 15, 1953 Feb. 1, 1967	350,000.00	81.	283,500.00
Erie R.R. General Mortgage Convertible Gold Series "B".....	4	Apr. 1953 \$80,000 due May 1 each year 1939-41	1,065,000.00	74.717586	795,742.30
Illinois Central R.R. Equipment Series "M".	4½		240,000.00	98.5	236,400.00
Illinois Central R.R. Refunding Mortgage Gold.....	4	Nov. 1955	1,233,000.00	82.45985	1,016,730.00
Illinois Central R.R. & Chicago, St. Louis, New Orleans R.R. Joint First Refunding Gold Series "A".....	5	Dec. 1963	1,000,000.00	90.	900,000.00

Imperial Chinese Government Hu Kuang Rys. Sinking Fund Loan of 1911.....	5	June 15, 1951	£189,000	34.	\$321,300.00
Interborough Rapid Transit Co. First & Re- funding Mortgage Gold (Stamped).....	5	Jan. 1966	\$1,750,000.00	97.8571428	1,712,500.00
Kansas City, Fort Scott & Memphis Ry. Re- funding Mortgage Gold.....	4	Oct. 1936	274,000.00	95.755708	262,370.64
Kansas City Southern Ry. Refunding & Im- provement Mortgage Gold.....	5	Apr. 1950	550,000.00	84.	462,000.00
Kansas City Terminal Ry. First Mortgage Gold.....	4	Jan. 1960	500,000.00	75.	375,000.00
The Laclade Gas Light Co. Refunding & Ex- tension Mortgage Gold.....	5	Apr. 1939	200,000.00	102.3797	204,759.41
Lake Erie & Western R.R. Second Mortgage Gold.....	5	July 1941	100,000.00	100.	100,000.00
Lake Shore & Michigan Southern Ry. First Mortgage Gold.....	3½	June 1997	926,000.00	87.	805,620.00
Louisville & Nashville-Southern Ry. Monon Collateral Joint Fifty-year Gold.....	4	July 1952	775,000.00	72.	558,000.00
Mexico, Republic of, Consolidated External Loan, Series "C" (Assenting bonds).....	5	June 1945	343,380.00	35.0515463	120,360.00
Class "A" Certificates for interest in arrears			150,228.75	6.	9,013.73
Missouri-Kansas-Texas R.R. Prior Lien Gold Series "A".....	5	Jan. 1962	331,250.00	78.5	260,031.25

TREASURER'S REPORT

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EXHIBIT K—Continued

NAME	INTEREST RATE PER CENT	DATE OF MATURITY	AMOUNT	FOUNDATION'S LEDGER VALUE PER CENT	FOUNDATION'S TOTAL LEDGER VALUE
Missouri-Kansas-Texas R.R. Prior Lien Gold Series "B".....	4	Jan. 1962	\$331,250.00	64.5	\$213,656.25
Morris & Essex R.R. First Refunding Mortgage Gold.....	3½	Dec. 2000	175,000.00	82.75	144,812.50
Mutual Fuel Gas Co. First Mortgage Gold..	5	Nov. 1947	250,000.00	100.	250,000.00
National Rys. of Mexico Prior Lien Fifty-year Sinking Fund (Assenting Bonds)....	4½	July 1957	350,000.00	13.	45,500.00
Secured 6% Notes for coupon due January 1, 1914.....		Jan. 1933	1,125.00	59.	663.75
National Rys. of Mexico Certificates Series "A" Interest in arrears.....			47,857.50	5.50	2,632.16
National Rys. of Mexico Certificates Series "B" Interest in arrears.....			94,500.00	.50	472.50
New Orleans, Texas & Mexico Ry. Non-Cumulative Income Gold Series "A" (Certificates of Deposit).....	5	Oct. 1935	75,000.00	99.05	74,287.52
New York Central R.R. 10 year Secured Sinking Fund.....	3½	Apr. 1946	979,000.00	97.948125	958,912.15

New York Connecting R.R. First Mortgage Gold Series "A"	4½	Aug. 1953	\$500,000.00	95.69073	\$478,453.65
New York, Lake Erie & Western Docks & Improvement Co. First Extended Gold	5	July 1943	400,000.00	90.	360,000.00
Northern Pacific Ry. Refunding & Improvement Mortgage Gold Series "A"	4½	July 2047	1,390,000.00	85.04676	1,182,150.00
Northwestern Elevated R.R. First Mortgage Gold	5	Sept. 1941 \$30,000 due May 15 each year 1939-41	500,000.00	70.	350,000.00
Pennsylvania R.R. General Equipment Trust Certificates Series "D"	4½		90,000.00	98.5	88,650.00
Pennsylvania R.R. General Mortgage Gold Series "A"	4½	June 1965	1,500,000.00	98.25	1,473,750.00
Phelps Dodge Corporation Convertible Debenture	3½	June 15, 1952	147,400.00	108.59375	160,067.19
Philadelphia & Reading Coal & Iron Co. Refunding Mortgage Sinking Fund Gold	5	Jan. 1973	167,000.00	94.252347	157,401.42
Pittsburgh, Cincinnati, Chicago & St. Louis Ry. Consolidated Mortgage Gold Series "I"	4½	Aug. 1963	500,000.00	103.	515,000.00
Public Service Corporation of New Jersey Perpetual Interest Bearing Certificates	6		550,000.00	84.	462,000.00
Raleigh & Gaston R.R. First Mortgage Gold Forty-year (Certificates of Deposit)	5	Jan. 1947	250,000.00	95.	237,500.00

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EXHIBIT K—Continued

NAME	INTEREST RATE PER CENT	DATE OF MATURITY	AMOUNT	FOUNDATION'S LEDGER VALUE PER CENT	FOUNDATION'S TOTAL LEDGER VALUE
Reading Co. General & Refunding Mortgage Gold Series "A".....	4½	Jan. 1997 \$50,000 due May 15 each year 1939-43	\$333,000.00	94.25	\$313,852.50
St. Louis-San Francisco Ry. Equipment Gold Series "CC".....	4	July 1950	250,000.00	90.683736	226,709.34
St. Louis-San Francisco Ry. Prior Lien Gold Series "A".....	4	Mar. 1978	1,500,000.00	72.75	1,091,250.00
St. Louis-San Francisco Ry. Consolidated Mortgage Gold Series "A".....	4½	July 1990 \$100,000 due June 1 each year 1939-41	2,500,000.00	14.	350,000.00
St. Louis Southwestern Ry. General & Refunding Mortgage Gold Series "A".....	5	Aug. 1949	1,918,500.00	66.792744	1,281,418.80
Southern Pacific Co. Equipment Gold Series "I".....	4½	Jan. 1955	300,000.00	98.5	295,500.00
Southern Pacific Co.—Central Pacific Stock Collateral Gold.....	4		100,000.00	76.	76,000.00
Southern Pacific R.R. First Refunding Mortgage Gold.....	4		100,000.00	86.	86,000.00

Standard Oil Co. (New Jersey) Twenty-five year Debentures.....	3	June 1961	\$15,000,000.00	98.	\$14,700,000.00
Tennessee Coal, Iron & R.R. Co. General Mortgage.....	5	July 1951	400,000.00	92.	368,000.00
United Electric Co. of New Jersey First Mortgage Gold.....	4	June 1949	500,000.00	72.	360,000.00
United States of America Treasury Notes, Series "A" dated June 15, 1937.....	1½	Mar. 15, 1942	5,000,000.00	100.2065626	5,010,328.13
Wabash R.R. Second Mortgage Gold.....	5	Feb. 1939	120,000.00	97.8	117,360.00
Washington Ry. & Electric Co. Consolidated Mortgage Gold.....	4	Dec. 1951	450,000.00	83.5	375,750.00
Western Pacific R.R. First Mortgage Gold Series "A" (Assenting).....	5	Mar. 1946	200,800.00	83.	166,664.00
TOTAL BONDS.....					\$54,059,786.87

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EXHIBIT K—Continued

MISCELLANEOUS STOCKS

NAME	NUMBER OF SHARES	FOUNDATION'S LEDGER VALUE PER SHARE	FOUNDATION'S TOTAL LEDGER VALUE
American Telephone & Telegraph Co. Capital.....	5,400	\$182.917129	\$987,752.50
Atchison, Topeka & Santa Fe Ry. 5% Non-Cumulative Pfd.....	5,000	98.25	491,250.00
Atlanta Birmingham & Coast R.R. 5% Guaranteed Cumulative Pfd..	4,062	94.	381,828.00
Bethlehem Steel Corp. (Delaware) 7% Cumulative Pfd.....	400	129.07367	51,629.47
The Buckeye Pipe Line Co. Capital (Par \$50).....	49,693	62.7675873	3,119,109.72
Central National Bank of Cleveland Common (Par \$20).....	8,482	32.114764	272,397.43
Chehalis & Pacific Land Co. Capital.....	220		1.00
Chicago City & Connecting Rys. Participation Certificates Pfd. (Certificates of Deposit) (No par).....	17,530		1.00
Chicago City & Connecting Rys. Participation Certificates, Common (No par).....	10,518		1.00
Chicago & Eastern Illinois Ry. 6% Cumulative Pfd.....	3,000	5.	15,000.00
Cleveland Arcade Co. Capital.....	2,500	98.62222	246,555.56
Cleveland Trust Co. Capital.....	638	192.22824	122,641.62
Colorado & Southern Ry. 4% First Non-Cumulative Pfd.....	4,800	54.	259,200.00
Consolidated Edison Co. of New York Inc. \$5 Cumulative Pfd. (No par).....	13,333	91.75	1,223,302.76

Consolidated Edison Co. of New York, Inc. Common.....	22,200	\$45.260923	\$1,004,792.50
Consolidation Coal Co. Rights to purchase Common Stock.....	5,875		
Continental Oil Co. (Delaware) Capital (Par \$5).....	60,627	11.15222	676,125.70
Denver & Rio Grande Western R.R. 6% Cumulative Pfd.....	3,280	5.	16,400.00
Eureka Pipe Line Co. Capital (Par \$50).....	12,357	45.	556,065.00
Illinois Central R.R. 6% Non-Cumulative Pfd. "A".....	2,857	15.50	44,283.50
Illinois Central R.R. Common.....	4,070	9.625	39,173.75
Indiana Pipe Line Co. Capital (Par \$10).....	74,535	11.7	872,059.50
International Harvester Co. 7% Cumulative Pfd.....	45,721	115.	5,257,915.00
International Nickel Co. of Canada, Ltd. Common.....	30,600	65.139	1,993,253.40
Interstate Natural Gas Co. Inc. Capital (No par).....	33,763	14.958453	505,042.25
Kanawha & Hocking Coal & Coke Co. 7% Cumulative Pfd.....	202	20.	4,040.00
Kanawha & Hocking Coal & Coke Co. Common.....	668	4.	2,672.00
Kennecott Copper Corporation Capital (No par).....	33,100	59.780393	1,978,731.03
Manhattan Ry. Capital (Modified Guarantee).....	10,000	60.	600,000.00
Middle West Corporation Capital (Par \$5).....	68,351.92	9.75	666,431.22
Missouri-Kansas-Texas R.R. 7% Cumulative Pfd. "A".....	10,499	41.982284	440,772.00
National Fuel Gas Co. Capital (No par).....	847,060	7.75	6,564,715.00
National Transit Co. Capital (Par \$12.50).....	126,481	12.7	1,606,308.70
New York Transit Co. Capital (Par \$5).....	24,784	6.5	161,096.00
Northern Pipe Line Co. Capital (Par \$10).....	27,000	8.3333	225,000.00
The Ohio Oil Co. Non-Voting Cumulative 6% Pfd.....	10,500	103.5	1,086,750.00
The Ohio Oil Co. Common (No par value).....	94,684	35.375	3,349,446.50
Pere Marquette Ry. Cumulative 5% Pfd.....	5,740	49.6600627	285,048.76
Phelps Dodge Corporation Capital (Par \$25).....	37,600	52.7167925	1,982,151.40

TREASURER'S REPORT

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EXHIBIT K—Continued

NAME	NUMBER OF SHARES	FOUNDATION'S LEDGER VALUE PER SHARE	FOUNDATION'S TOTAL LEDGER VALUE
Provident Loan Society of New York 6% Certificates..	266,000	100. %	\$266,000.00
Southern Pipe Line Co. Capital (Par \$10).....	24,845	\$6.25	155,281.25
South West Pennsylvania Pipe Lines, Capital (Par \$10)..	8,000	37.5	300,000.00
Standard Oil Co. (California) Capital (No par)	60,967	17.25	1,051,680.75
Standard Oil Co. of Indiana, Capital (Par \$25).	691,140	28.90	19,973,946.00
Standard Oil Co. (N.J.) Capital (Par \$25)...	1,093,160	33.8125456	36,962,522.40
The Standard Oil Co. (Ohio) Cumulative 5% Pfd..	15,000	101.	1,515,000.00
The Standard Oil Co. (Ohio) Common (Par \$25)..	135,648	25.50	3,459,024.00
Tilden Iron Mining Co. Capital.....	667½	27.350258	18,256.29
Union Tank Car Co. Capital (No par value)...	240,000	6.692033	1,606,087.97
United States Steel Corporation 7% Cumulative Pfd	6,600	133.85795	883,462.50
Wilson Realty Co. Capital	591		1.00
TOTAL MISCELLANEOUS STOCKS. .			\$103,280,205.43

SUMMARY		
Bonds..		\$54,059,786.87
Miscellaneous Stocks..		103,280,205.43
TOTAL.....		\$157,339,992.30

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