

# The Rockefeller Foundation

*Annual Report*

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THE ROCKEFELLER  
FOUNDATION

1916

The Rockefeller Foundation  
61 Broadway, New York

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# THE ROCKEFELLER FOUNDATION

## Report for the Year 1916

*To the Members of the Rockefeller Foundation:*

I have the honor to transmit to you herewith a report on the activities of the Rockefeller Foundation and on its financial operations for the year 1916.

The following members were re-elected at the annual meeting of January, 1916, for a term of three years:

John Davison Rockefeller, of New York, N. Y.,  
John Davison Rockefeller, Jr., of New York,  
N. Y.,  
Frederick Taylor Gates, of Montclair, New  
Jersey.

At the same meeting the following additional members were elected: Martin Antoine Ryerson, to serve until the annual meeting of 1919, and Harry Emerson Fosdick and Frederick Strauss, to serve until the annual meeting of 1918.

Appended hereto are the detailed reports of the Secretary and the Treasurer of the Rockefeller Foundation, the Director General of the International Health Board, the Director of the China Medical Board, and the Chairman of the War Relief Commission.

JOHN D. ROCKEFELLER, JR.,  
*President.*

THE ROCKEFELLER FOUNDATION  
OFFICERS, MEMBERS AND COMMITTEES  
1916

*President*

JOHN DAVISON ROCKEFELLER, JR.

*Secretary*

JEROME DAVIS GREENE

*Treasurer*

LOUIS GUERINEAU MYERS

*Comptroller*

ROBERT HORNER KIRK

*Assistant Treasurer*

LEFFERTS MASON DASHIELL

*Executive Committee*

John Davison Rockefeller, Jr., *Chairman*

Simon Flexner

Starr Jocelyn Murphy

Jerome Davis Greene

Wickliffe Rose

*Finance Committee*

John Davison Rockefeller, Jr., *Chairman*

Alonzo Barton Hepburn

Starr Jocelyn Murphy

*Nominating Committee*

Frederick Taylor Gates

Alonzo Barton Hepburn

Harry Pratt Judson

*Members*

*To serve until the annual meeting of 1919*

Frederick Taylor Gates

John Davison Rockefeller, Jr.

John Davison Rockefeller

Martin Antoine Ryerson

*To serve until the annual meeting of 1918*

Simon Flexner

Harry Pratt Judson

Harry Emerson Fosdick

Starr Jocelyn Murphy

Frederick Strauss

*To serve until the annual meeting of 1917*

Charles William Eliot

Wickliffe Rose

Jerome Davis Greene

Alonzo Barton Hepburn

Charles Otto Heydt





# THE ROCKEFELLER FOUNDATION

## Report of the Secretary

*To the President of the Rockefeller Foundation:*

Sir:

I beg to submit herewith my third annual report on the activities of the Rockefeller Foundation for the year ending December 31, 1916.

*Respectfully yours,*

JEROME D. GREENE,

*Secretary.*

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## THE ROCKEFELLER FOUNDATION FUND<sup>S</sup>

The executors of the estate of Laura Spelman Rockefeller (Mrs. John D. Rockefeller), acting within the discretion given them by her will and in conformity with her wishes, made additional gifts to the Rockefeller Foundation during the year amounting in value to \$86,860. The total amount received from Mrs. Rockefeller's executors is \$427,733. From this fund \$250,000 was given by vote of the Trustees to the General Education Board for its corporate purposes, and by that board fittingly applied upon certain terms and conditions to the benefit of Spelman Seminary.

### CONSTITUTION, BY-LAWS AND RULES

Amendments of the Constitution and By-Laws were adopted during the year pertaining to the office and functions of the Comptroller, the powers of the Finance Committee, the bonding of financial officers, and access to the securities of the corporation. A body of Rules was also adopted for the administration of the International Health Commission and the name of this subsidiary organization was changed to International Health Board.<sup>1</sup>

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<sup>1</sup>The Constitution and By-Laws of the Rockefeller Foundation, including the amendments, and the Rules of the International Health Board, will be found in the Appendix, see pp. 897 to 410.

### EXPENDITURES

The expenditures of the Foundation and of its subsidiary organizations during the year under review may be summarized as follows:

Administration.....	\$94,160.74
Equipment, Library, etc ...	7,557.73
International Health Board .	505,900.99
China Medical Board.....	549,558.57
War Relief.....	966,667.55*
Investigation of Industrial Relations.....	15,048.27
Scientific Studies of Governmental Problems.....	50,000.00
Gifts and Pledges to Unaffiliated Agencies for Objects Designated by the Foundation.....	1,591,108.01
Gifts for Objects Designated by the Founder in Accordance with his Letter of Gift of March 6, 1914.....	2,535,846.13
Payments on Account of Special Fund of Laura S. Rockefeller.....	3,000.00
Payments on Account of Special Fund of John D. Rockefeller.....	1,850.00 \$6,320,697.99

### PUBLICITY AND OFFICIAL RECORDS

It has been the policy of the Foundation since its establishment to give publicity to its acts through the publication of all its expenditures, a very wide distribution of its annual reports and the occasional issue of bulletins. This policy was formulated for the permanent guidance of

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\* The Foundation appropriated \$2,590,000 for war relief during 1916, of which sum only the amount indicated had been actually expended before the end of the year.

the executive officers by the adoption of the following resolution on March 7, 1916:

"WHEREAS the Rockefeller Foundation is a charitable corporation, whose funds are dedicated to public uses, and can best accomplish the purposes for which it was established by securing the interest, sympathy and moral support of the public, and it is therefore its duty to keep the public accurately informed in regard to its activities; and

"WHEREAS the Foundation has been established to further 'the well-being of mankind throughout the world,' and as a result of studies along various lines is currently securing information and data which would be highly useful to the public if broadly disseminated; be it

*Resolved* that the officers of the Foundation be, and they hereby are, authorized to take such steps, including the employment of individuals and organizations, as in their judgment may be necessary to accomplish these purposes."

As the functions and activities of the various boards established by Mr. John D. Rockefeller are not always distinguished by the public a pamphlet was issued during the year setting forth briefly the history, purposes, work, personnel, and financial resources of the Rockefeller Institute for Medical Research, the General Education Board and the Rockefeller Foundation, including the organizations subsidiary to the Foundation, namely, the International Health Board, the China Medical Board, and the War Relief Commission. Revised editions of this pamphlet are issued from time to time.

Full records of all transactions of the Trustees and of the Executive Committee are kept and vouchers are preserved for every expenditure

whether made on the direct authorization of the Trustees or the Executive Committee or by the officers acting under their instructions. After each meeting of the Trustees or of the Executive Committee a copy of the minutes is sent to every Trustee for his approval.

#### INTERNATIONAL HEALTH BOARD

The work of the International Health Board has expanded rapidly. To the list of countries in which work for the relief and control of hook-worm disease has been carried on the following were added during the past year: Ceylon, Siam, Salvador, and Brazil; making sixteen countries in all, in which the Board is co-operating with governments. Meanwhile certain collateral activities referred to in the previous report have assumed more definite and significant proportions.

In fulfillment of the plans announced in the last report the Yellow Fever Commission entered upon its survey of actual or suspected foci of the disease. The Commission was composed of the following members: Major General William C. Gorgas, Medical Department, United States Army, Chairman; Dr. Henry R. Carter, of the United States Public Health Service; Dr. Juan Guiteras, of Havana; Major T. C. Lyster and Major E. R. Whitmore, of the Medical Department, United States Army; and Mr. W. D. Wrightson. The Commission sailed from New York on June 14, 1916, and visited Ecuador,

Peru, Colombia and Venezuela. In order to reach Brazil, owing to the impossibility of direct communication, the Commission returned to New York on September 25, and sailed on October 11 for the east coast of Brazil, returning to the United States on December 12, 1916.

The Commission's report expresses the unanimous opinion of its members that the eradication of yellow fever is feasible and that the present is an opportune time for beginning the work. Owing to war conditions there has been a great reduction in immigration into those countries in which yellow fever prevails. For lack of fresh human material upon which to "feed," the disease is now probably at its lowest ebb, and therefore a determined attack on the remaining cases offers excellent prospects of success in stamping out the infection. The resolutions adopted by the last Pan-American Scientific Congress on the subject of yellow fever and the cordial hospitality accorded to the Commission in all the countries visited indicate that the necessary practical steps toward the control of the disease in its seed-beds will enlist the hearty co-operation of the peoples concerned.

In accordance with authority granted by the Board, small experimental units for attempting the control of malaria by different methods were conducted at Crossett and Lake Village, Arkansas, and in Bolivar County, Mississippi. At

Crossett, a town with a population of 2,029, control was attempted entirely through simple measures for the elimination of mosquitoes. In comparison with previous years, a remarkable reduction of malarial cases occurred. The number of calls for malaria answered by the physicians of the town declined from 2,100 for the latter half of the year 1915 to 310 for the same period in 1916. This work was done within reasonable limits of per capita cost, and will be continued at the charge of the local authorities. Under the general direction of Dr. C. C. Bass, of Tulane University, microscopical examinations were made of all individuals in a selected area in Mississippi and the efficacy of quinine treatment as a measure of eradication has been subjected to a thorough study. It is as yet too early to report the results of this work.

A commission consisting of Dr. Richard M. Pearce, Professor of Research Medicine in the University of Pennsylvania, Major Bailey K. Ashford, Medical Department, United States Army, and Dr. John A. Ferrell, Assistant Director General of the International Health Board, visited Brazil in the early part of last year, leaving New York January 22, and returning May 7. The primary object of this visit was to make a study of medical education and public health agencies. The eradication of yellow fever from Rio Janeiro was one of the most brilliant achievements of modern sanitary ad-

ministration. The exchange of information and the establishment of friendly contact with a country which has made such a signal contribution to the welfare of this hemisphere is clearly of great importance to the medical as well as to the other cultural relations of North and South America. As a result of the Commission's visit arrangements have been made for the beginning of hookworm work on the usual basis of co-operation with government, and the State of Rio has enacted legislation creating a department of ankylostomiasis. The United States has been favored by the presence in this country during the same time of Dr. Carlos Chagas, the eminent bacteriologist of Brazil, and it is to be hoped that similar exchanges of visits between the two countries may be frequent.

The library of the Foundation is primarily a special reference and working library for hookworm disease. In addition to a collection of nearly all existing treatises and special articles on this disease the library contains a large amount of excerpted material bearing on the subject in health reports and scientific journals. This material is not only indispensable to the work of the International Health Board but is held at the service of individuals, governments, mining companies and other industrial organizations for which hookworm disease is a factor of large economic as well as humanitarian significance.

As a collateral activity, more or less incidental to the work for the relief and control of hook-worm disease, the officers of the Board have been able to acquire much valuable information and to render service in respect to other important problems of public health. The long and fruitful experience of Dr. Victor G. Heiser, Director for the East, as Director of Public Health in the government of the Philippine Islands, has made him an appropriate adviser of the Board in all its contacts with such problems. His previous identification with proposals for the concerted action of East Asiatic countries in measures to control beriberi has made it fitting for him to continue his interest in the subject and it is hoped that when the war is over the simple expedients that are necessary to abate this scourge will receive the concurrent approval of the several governments, whereby alone they can be made effective.

Dr. Heiser's observations in the East in connection with soil pollution have an importance over and above that which this subject possesses in connection with hookworm disease. In western countries this is a question primarily of hygiene and cleanliness. In the East, on the other hand, it is also a question of direct economic importance, owing to the use of excrement for fertilizing purposes. The sudden stopping of soil pollution there would mean the impoverishment of the soil unless some substi-

tute were placed within the reach of the people. No such substitute is now available. If the problem could be economically solved in such a way as to utilize excrement without danger to the health of the people the result would not only be of vast economic significance to the East but might also prove to be of equal significance to countries where the same material is entirely wasted.

The prevention of hookworm disease, in places such as newly developed plantations in countries where it has not hitherto made its appearance, is a subject demanding early attention. Timely preventive methods have been proved to be justifiable as an economic investment and as such they should commend themselves to the managers of the industries involved. The fullest possible co-operation of the International Health Board is at their service in this important branch of hookworm work.

The report of the Director General of the International Health Board is supported by numerous statistical tables showing the volume of the Board's operations in each country and the results so far as they can be recorded. While it is agreeable to contemplate large contributions to the general welfare and happiness of the people among whom the Board's work is carried on and while it is not unreasonable to attribute such results to all well-directed efforts in the promotion of public health, it is the purpose of the Director General's report to lay emphasis

upon facts that are susceptible of accurate measurement and record, leaving the vaguer and more indirect benefits to be inferred only with the utmost conservatism until the future shall have demonstrated them more clearly.

### CHINA MEDICAL BOARD

The report of the Director of the China Medical Board reveals significant progress in the main lines of work to which the Board is devoting its energies. These are (1) the promotion of medical education by the building up of schools with adequate personnel and equipment in Peking and Shanghai, and by substantial aid to the Hunan-Yale Medical School in Changsha; (2) grants in aid to hospitals of various missionary organizations; (3) the granting of fellowships to missionary physicians and to Chinese physicians in order to give them the advantages of special study; (4) aid in the translation of medical books including nursing text-books.

The organization of the Peking Union Medical College, as indicated by the Annual Report of 1915, was completed in May, 1916, when the Trustees organized under a provisional charter granted by the Regents of the University of the State of New York. The officers of the China Medical Board have been authorized to proceed with the purchase of land, construction of buildings and organization of the College on the basis of a preliminary estimate of the cost. The

Rockefeller Foundation appropriated funds for the purchase of land on which it is proposed to construct the laboratories, out-patient department, hospital wards, nurses' home and religious buildings. Dr. Franklin C. McLean, of the Rockefeller Institute for Medical Research, has been elected Professor of Medicine and Physician-in-Chief, and the preparatory department will be opened in September, 1917.

The organization of the Shanghai Medical College on the basis described in the preceding report was entrusted to a committee, but its report was not submitted until after the close of the year under review. Meanwhile the Red Cross Hospital, formerly used by the Harvard Medical School of China, has been leased by the China Medical Board in order to preserve the continuity of the clinical work and to give facilities to men chosen for the staff of the new college. Dr. Henry S. Houghton, formerly Dean of the Harvard Medical School of China, has been employed by the Board and placed in charge of the Red Cross Hospital.

In addition to its contribution of \$16,200 a year to the Hunan-Yale Medical School for a period of five years, the Board has appropriated \$30,000 for the construction and equipment of a laboratory. This school has been fortunate in securing co-operation and to a gratifying extent a sense of local responsibility on the part of the influential citizens of the Province.

By vote of the Board appropriations made to missionary societies for the support of medical missionaries and nurses are for a term of five years subject to certain conditions designed to ensure the successful fulfillment of the purposes of the appropriations. Appropriations for hospitals are hereafter to be made only upon the understanding that the societies making application shall contribute at least one fourth of the total sum required for increase of staff, equipment or plant.

Grants in aid have been made to the following missionary organizations:

American Baptist Mission Society (North).

Foreign Mission Board of the Southern Baptist Convention.

American Board of Commissioners for Foreign Missions.

Board of Foreign Missions of the Methodist Episcopal Church (North).

Board of Missions of the Methodist Episcopal Church (South).

Board of Foreign Missions of the Presbyterian Church in the U. S. A. (North).

Executive Committee of Foreign Missions of the Presbyterian Church in the U. S. (South).

Foreign Christian Missionary Society.

London Missionary Society.

Church of Scotland Foreign Mission Committee.

Canton Christian College for the Canton Hospital.

Nanking Hospital (Union).

Huchow Hospital (Union).

The several denominations having missions in Nanking have united to maintain one general hospital. To this general hospital the Board has appropriated \$9,250 for annual expense con-

ditioned on the raising of \$11,750 for the same purpose by the several missionary societies, and \$25,000 for buildings and equipment conditioned on the raising of an equal amount by the missionary societies.

At Huchow, the Northern Baptists and Southern Methodists have joined to maintain a union hospital costing \$48,500. Toward this amount the China Medical Board has subscribed \$20,000, payable when the balance shall be secured in cash. The Board has also pledged a total sum averaging about \$2,000 a year to cover three fourths of the cost during a period of five years of a foreign doctor, a foreign nurse, and a Chinese doctor.

The Board has contributed \$4,500 a year for five years to the Canton Christian College to be used for the current expenses of the Canton Hospital, the largest hospital in China.

The total amount appropriated for mission hospitals to be expended during 1916 is as follows:

For capital account .....	\$78,704.20
For current expenses .....	79,798.00
Total.....	\$158,502.20

The further sum of \$291,087 has been pledged to be paid during the next five years, of which \$20,000 is for capital expenditure and the remainder for maintenance.

The Board has contributed fellowships for graduate study in the United States to twenty-

seven medical missionaries on furlough from China. The cost of these appropriations for 1916 will be \$26,750. Seven Chinese doctors, of whom five have already held China Medical Board fellowships for a year, have also received grants during the year.

The China Medical Board has assumed a grave responsibility to the missionary societies and to the people of China as well as to the Trustees of the Rockefeller Foundation in its far-reaching plans for the improvement of medical education. Hope for the successful discharge of this responsibility lies in the enormous opportunity which China holds out for carefully directed effort in this field; in the earnest co-operation of the missionary body in presenting Western medicine at its best to the people of China, as an adjunct of Christian civilization; and in the expressed intention of the Foundation to give adequate support to the co-operative program now adopted.

#### PROMOTION OF MEDICAL EDUCATION

By its gifts in recent years to Johns Hopkins University, Washington University (St. Louis) and Yale University, the General Education Board, a corporation distinct from the Rockefeller Foundation and chartered by act of Congress in 1903, has given its support to an important movement aimed to place the clinical departments of medical teaching upon a thor-

ough going university basis. The method by which this result has been sought has been that of establishing so-called "full-time" professorships of the clinical subjects, so that these might be taught by men sufficiently free from the routine of professional practice and consultation to give their time and strength wholly to teaching and research.

Single-minded attention to teaching and research does not, as has been sometimes supposed, involve the substitution of the laboratory for the bedside. On the contrary, its advocacy is based on a more and more adequate appreciation of the subtlety and complexity of the human organism and of the consequent obscurity of the processes of health and disease. For this very reason the control of a university hospital or its equivalent, combining a varied and abundant clinical material with all the collateral resources of the laboratory, is regarded as the indispensable accompaniment of the "full-time" plan, and those who work under it will have a contact with the human patient as intensive or extensive as their work requires. The student trained under such a plan for private practice will have much to learn of the practical requirements of his profession. The same is true of the graduate of a course in industrial chemistry or law. He will learn from practice what only practice can teach. But he will bring to his work a disciplined mind thor-

oughly impregnated with the scientific spirit—a spirit that can be acquired best, if not solely, from teachers who are thoroughly imbued with it. The successful practitioner, thus trained, with his numerous patients and his comfortable income, may acquire a proficiency no less worthy than that of the university clinician, but a different proficiency. Of two men equally able one may be at his best in one calling, and one in the other, while neither could fill the other's shoes. The advocacy of university professorships of medicine or surgery, strictly so-called, is intended not only to differentiate these two callings but to raise the standard of both—to improve the private practitioner by giving him higher scientific ideals and a better discipline at the one time of life when he is most amenable to both; to improve the teacher and researcher by making it possible for him to subordinate all other considerations, whether pecuniary or social, to the training of his pupils and the advancement of medical science.

During the past year the General Education Board by vote of January 27, 1916, invited the co-operation of the Rockefeller Foundation in such measures as should be recommended "for the development of medical education in important centres of the country." The Trustees of the Foundation having immediately expressed their readiness to consider specific recommendations to this end, a communication was received

from the officers of the General Education Board on October 25, 1916, setting forth a "Plan for the Development of Medical Education in Chicago." The plan described the means which appeared to be feasible whereby a medical school of high rank might be established as an integral part of the University of Chicago, with a hospital and full-time staff of its own, reinforced by the co-operation and resources of certain other local institutions and funds, making the aggregate value of the plant and endowments thus brought together about \$14,300,000, of which \$5,300,000 would need to be raised. In response to these representations the Trustees of the Foundation then adopted the following resolution:

*"Resolved* that the Trustees of the Rockefeller Foundation have learned with profound interest of the plan by which it is hoped to create within the University of Chicago a medical school of high rank and adequate resources, and that the Executive Committee be, and they hereby are, authorized to make such contribution not exceeding one million dollars (\$1,000,000) through the General Education Board as shall seem wise to the Committee for the accomplishment of the above purpose, as set forth in the communication of October 23, 1916, from the officers of the General Education Board, payment to be made in such instalments as the Committee shall approve."

Since the close of the year under review private subscriptions have been assured to the amount necessary for the inauguration of this great project for a university school of medicine in Chicago.

It should be stated in this connection that while the Rockefeller Foundation has shown its disposition to co-operate with the General Education Board in the promotion of medical education, it does not itself entertain applications for gifts in this field, but refers to the General Education Board those who are concerned with such applications.

#### MEDICINE AND PUBLIC HEALTH

It will be apparent to anyone comparing the activities of the various boards established by Mr. John D. Rockefeller, that they have all touched the great field of medicine and public health in one or another of its aspects. The province of the Rockefeller Institute for Medical Research is to extend the bounds of human knowledge in everything pertaining to the causes and nature of disease, its treatment and prevention. In the performance of this function the Institute, while concentrating its resources at any particular time upon selected fields of work, ascribes worth and importance to all relevant studies, whether dealing with the fundamental facts and laws of organic life, or with the more direct application of those facts and laws to the problems of particular diseases. The General Education Board, by its co-operation with American universities, is helping them to raise the standards of medical education and research. The China Medical Board is be-

ginning a similar service to China, by strengthening the foundations of institutions in that country upon which the Chinese themselves will be enabled to build up their own structure of medical education, research and public health. The International Health Board, by its world-wide campaign for the relief and control of hookworm disease, by its plan of eradicating yellow fever, its studies of measures for the control of malaria, and its large program of public health as set forth in the resolutions establishing the Board in 1913,<sup>1</sup> is aiding the movement whereby the steadily increasing knowledge applicable to the prevention of disease is brought to the actual service of governments and peoples.

It is hardly necessary to point out the correlation of these main activities or the essential unity of the program of human betterment, which together they represent. But although the three elements of research, education and hygiene are all here represented, it has become more and more evident that the importance of the third element, hygiene, including public health and preventive medicine, has thus far failed of adequate recognition. Three serious evils are attributable to this failure; first, the lack of a sufficiently broad and sound basis of scientific knowledge for the systematic promotion of public and personal hygiene; second, the

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<sup>1</sup> Annual Report, 1913-14, p. 11.

lack of a well-defined career as an attraction to able men whose interest is in this field rather than in the practice of medicine; third, the lack of due emphasis, in the training of practitioners of medicine, upon the importance of hygiene and of the practitioner's rôle as an apostle of hygiene no less than of therapy.

In the rapidly extending work of the International Health Board, calling for men adequately trained in public health, the fact has been only too well demonstrated that until very recently no body of men with such training has existed except as the health services of nation, state, and municipality have laboriously created it out of the ranks of medical practitioners, or as men trained in bacteriology or sanitary engineering have been able to step into positions requiring a command of those specialties. Consequently, the Board has had to borrow experienced men from other services, or to train its own men in the field—a training which though always essential can be made much more economical and productive if applied to men properly grounded in the principles and methods of preventive medicine as well as in the fundamental medical and engineering subjects. In this respect the experience of the Board has been identical with that of every public health organization which has striven to keep abreast of the time. Young men with a good professional training have been few and far to seek.

These considerations led the Trustees of the Rockefeller Foundation, by a resolution adopted December 20, 1913, to invite the attention of the General Education Board to the subject of professional training for public health work. The Board immediately undertook an inquiry into the subject and called a conference of prominent representatives of public health teaching and administration from different parts of the country. The results of this conference were crystallized and developed in a report prepared by Dr. William H. Welch and Mr. Wickliffe Rose, in which the ideals and organization of an institute of public health were set forth. A special committee consisting of executive officers of the General Education Board, the Rockefeller Foundation and the International Health Board was then appointed to consider the more concrete aspects of the subject, including the location and mode of organization of the proposed institute. A report from this committee was transmitted to the Trustees of the Foundation and considered by them at their meeting of January 26, 1916.<sup>1</sup> After full discussion a resolution was adopted "that an Institute of Public Health should be established" and the special committee was directed to recommend the steps to be taken to bring the institute into existence. At a meeting of the Executive Committee, April

<sup>1</sup> See Appendix V, pp. 415-427.

11, 1916, it was decided, upon recommendation of the special committee, to proceed with the elaboration of the plan in conference with the authorities of Johns Hopkins University. On May 24, 1916, the proposals of Johns Hopkins University for the organization of a School of Hygiene and Public Health were approved by the Trustees of the Foundation and referred to the Executive Committee with power; and on June 12, 1916, it was

*"Resolved, that the executive officers be authorized to inform the President of Johns Hopkins University that the Rockefeller Foundation is prepared to co-operate with the University in the establishment of a School of Hygiene and Public Health for the advancement of knowledge and the training of investigators, teachers, officials and other workers in these fields."*

At the same meeting an appropriation of \$267,000 was made to Johns Hopkins University, to cover the cost of a building and site and certain preliminary expenses. On the following day, when the establishment of the School was made known at the Commencement Exercises of the University, its Trustees announced the appointment of Dr. William H. Welch as Director of the School and of Dr. William H. Howell as Assistant Director and head of the Department of Physiology.

The School of Hygiene and Public Health is to be an integral part of Johns Hopkins University. It will be co-ordinate with the Medical School while drawing largely upon the resources

of the latter, and of the Engineering and other departments of the University, to supplement the more specialized instruction in public health branches. But the central and vitalizing feature of the School will be an institute of research in the sciences underlying hygiene and preventive medicine.

Much credit must be given to other institutions, notably the Massachusetts Institute of Technology, Harvard University, the University of Pennsylvania and the University of Michigan, for having led the way in research and technical training for public health work and to the distinguished sanitarians in national, state and municipal service for having in the face of almost overwhelming odds, created the nucleus of a new profession. American achievements in preventive medicine are among the best fruits of the new scientific era in our country. What is now needed is a more general recognition of public health work as offering to the ablest talent an attractive career, comparable in dignity and importance with medicine and the other established professions. Signs are not wanting that this recognition is beginning, and that the demand for trained health officers will more than keep pace with the output from the schools. It is to help meet this demand, including that for the supplementary training of men already possessed of practical experience, as well as to foster research, that the school at Baltimore

has been established. While the growth of the work of the International Health Board and of the China Medical Board and the demands of other large undertakings above mentioned in the domain of medicine and public health point to the concentration of the Foundation's resources in a few great fields, the Trustees have during the past three years aided a number of organizations that promise to have a marked influence on the diffusion of public health knowledge in this country. Among these may be mentioned the National Committee for the Prevention of Blindness, the National Committee for Mental Hygiene, the Training School for Dental Hygienists connected with the Vanderbilt Clinic, and the American Social Hygiene Association, all of which will be found on the list of the past year's expenditures.<sup>1</sup> It is not conceived to be the function of the Foundation to assume the burden of current support for such organizations. The Trustees have believed, however, that by aiding them at what has been the pioneer stage of their activities, results would be obtained which would not only be very far-reaching, but would help to secure that degree of public support to which such organizations may appropriately aspire.

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<sup>1</sup> Pages 349 to 353.

## ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

The complete list of gifts and appropriations printed in the Treasurer's Report contains several appropriations both by the Trustees and by the Founder to the Rockefeller Institute for Medical Research. These appropriations, in part for current expenses and in part for building, following an appropriation of \$1,000,000 for endowment made in the previous year, attest the confidence of the Trustees of the Foundation in the usefulness of money invested in productive research. It is of the very essence of modern scientific work that it should be subjected to universal discussion and criticism. By the same token its results when established come nearer to being of universal human benefit than any other form of philanthropic service; none other more truly, in the words of the Foundation's Charter, promotes "the well-being of mankind throughout the world."

### EPIDEMIC OF INFANTILE PARALYSIS

The City and State of New York were sorely stricken by the epidemic of infantile paralysis which occurred during the past year. The total number of recorded cases for the State was 13,476 of which 9,290 were within the City of New York. At a meeting called by the Mayor of New York on July 12, a committee was appointed by the Mayor to consider measures for

the discovery and continuous observation of persons having had contact with known cases of infantile paralysis, so that possible consequences of such contact might be observed and fresh cases promptly reported and isolated. The committee having tentatively formulated measures to this end, in co-operation with the Department of Health, the Foundation appropriated the sum of \$50,000, or so much thereof as might be needed, for the assistance of the Department of Health through the agency of the Mayor's Committee. Dr. Alvah H. Doty, formerly Medical Officer of the Port of New York, was appointed Director of the work, and it was systematically carried on by him until the end of the epidemic. An appropriation was also made to defray the cost of similar work in the City of New Rochelle.

As the summer advanced and the number of cases greatly increased, it became apparent that the proper after care of survivors left crippled by the disease would severely tax the surgical and charitable resources of the city, and that there was grave danger that large numbers of children, especially those apparently only slightly paralyzed, might become seriously and perhaps needlessly crippled unless they could have prompt orthopedic advice and treatment. A conference of leading orthopedic surgeons of New York and other cities was called at the office of the Foundation in order that advice might be

obtained as to the best way in which the Foundation might be of service. In conformity with the advice received the Foundation gave its support to a committee organized by the Commissioner of Health, for the purpose of co-ordinating the efforts of the various hospitals, dispensaries and charitable agencies, so as to minimize the possibility that cases should be neglected from lack of knowledge of available facilities for treatment, or from lack of means. An initial appropriation of \$25,000 was made by the Foundation for the promotion of after care, nearly all of which was assigned to meet the administrative expenses of the New York Committee on After Care of Infantile Paralysis Cases, and classes for the special training of orthopedic nurses were organized through the generous co-operation of Dr. Robert W. Lovett of Boston. Appropriations were also made to the Brooklyn Bureau of Charities, in whose district a large proportion of the paralysis cases occurred, toward the actual cost of treatment and nursing; and to the State Charities Aid Association to meet expenses incurred by the Association in co-operating with the State Department of Health, which had efficiently organized and promoted the after care of paralyzed cases outside of New York City. An appropriation was also made to the Rockefeller Institute for Medical Research for the extension of its researches in infantile paralysis.

### MENTAL HYGIENE

Reference was made in the annual report for 1915 to the assistance given by the Foundation to the National Committee for Mental Hygiene in carrying out a series of surveys in several states in regard to institutional provision for the insane. These surveys have been carried on during the past year and some of them are still in progress. Their fruitfulness and the confidence of the Foundation in the timely value of the general activities of the National Committee for Mental Hygiene has been such as to lead them to extend the loan of Dr. Thomas W. Salmon's services for the scientific direction of the Committee's work.

During the year a plan was developed for the establishment of an adequate medical service at Sing Sing Prison in which an important place was assigned to the psychiatric department. For this department the Foundation appropriated \$10,000 through the National Committee for Mental Hygiene. The discovery of mental abnormalities or disease is important for the humane adaptation of the penal, custodial, or therapeutic treatment to the needs of the individual prisoner; but it is not less important for the reason that it makes it possible to eliminate from the consideration of strictly penological problems the complications due to abnormal or pathological conditions.

### WAR RELIEF

The amount of expenditures for war relief during the past year has been such as to necessitate the continuation of the War Relief Commission, both for the supervision of work aided by the Foundation and for the investigation of needs that were being brought to its attention. Early in the year Mr. Warwick Greene, Director of Public Works in the Philippine Islands, resigned that position to accept appointment as Director of the War Relief Commission, and sailed for Europe in March. He was accompanied by Mr. William J. Donovan, of Buffalo, as a member of the Commission. Before Mr. Greene's arrival Mr. Frederic C. Walcott, a member of the firm of William P. Bonbright & Company, had been appointed a member of the Commission, for the purpose, first, of inquiring into conditions in Belgium, and later of making a similar inquiry in Poland. In co-operation with a representative of the Commission for Relief in Belgium, and at the request of the German authorities, Mr. Walcott visited Poland and lent his best efforts to the revival of the plan for importing relief supplies into that country and distributing them there as had been permitted by the several belligerent governments in the case of Belgium. The diplomatic negotiations on this subject, with which Mr. Walcott and later Messrs. Warwick Greene and Donovan were associated, proved

unsuccessful, but the need in Poland, while subsequently mitigated with respect to certain articles of diet available locally, was still so serious with respect to other essential components of a living ration, and to clothing, that the devising of measures for bringing relief, in some form acceptable to all the governments concerned, continued for the whole year to engage a large share of the Commission's attention. In the hope that these efforts might prove successful, and in order that prompt advantage might be taken of any favorable opening, the Trustees at their meeting of May 24, 1916, appropriated the sum of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania. The Balkan countries were included with Poland in this appropriation in order that they might profit by any arrangement permitting the importation of supplies into territory occupied by the Central Powers.

In September arrangements were consummated for importing a limited amount of condensed milk into Poland from Switzerland, and for the remainder of the year a quantity of milk was thus imported sufficient to eke out the ration of about sixteen thousand children in Warsaw and Lodz. The children thus fed were chiefly those between the ages of one and a half and five years, the infants under one and a half years having already been given the preference in the distribution of existing supplies of milk.

All of this relief work, initiated by Mr. Warwick Greene, was under the personal direction of Mr. Reginald C. Foster, of the War Relief Commission, upon whose guarantees as to the faithful delivery of supplies to their destination the continuation of the relief has depended. Local committees were organized in both Warsaw and Lodz to supervise the delivery of food, the committees consisting in each case of the representative of the Rockefeller Foundation, the American Consul, and a number of Polish citizens of high standing in the community. In the transactions above described, as in all the activities of the War Relief Commission, its members have regarded themselves as strictly accountable to the supervisory authorities of the governments concerned and have scrupulously observed all the limits set upon their activities by the exigencies of the war. Upon no other condition could an agency whose operations are necessarily carried on in part under the supervision of one group of belligerents, and in part under that of their opponents, enjoy the respect and confidence of the military and civil authorities.<sup>1</sup>

For the proper conduct of the work of the War Relief Commission it was found advisable to establish headquarters in Berne, Switzer-

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<sup>1</sup> For the instructions issued to all war relief agents of the Foundation, see Appendix, page 411.

land, with a small office staff. With this base of operations the Director of the Commission has been able to keep in fairly close contact with matters requiring his attention in all the adjacent countries, and particularly with the work done by the Foundation in co-operation with the generous people of Switzerland, in offering a refuge for Belgian children from the fighting zone. In this undertaking the Foundation has had the sympathetic assistance of the Belgian Relief Committee of New York, which contributed \$25,000; the Belgian Relief Committee of New England, which contributed \$10,000, and the Refugees' Relief Fund, which made an initial gift of \$1,000 followed by monthly contributions amounting in all to \$3,000. The total cost of this work, approximating \$75,000 for a maximum of five hundred children in the first year and \$51,000 in the second year, if necessary, was guaranteed by the Foundation.

As will be seen in the table accompanying the appended report of the Chairman of the War Relief Commission, the Foundation continued to make appropriations for Armenian and Syrian Relief (\$590,000), for the aid of Belgian professors in England (\$15,000), for relief in Serbia, through the American Red Cross (\$30,000), for the welfare of prisoners of war through the International Committee of Young Men's Christian Associations (\$200,000), and for re-

lief work in Turkey, through the American Red Cross (\$25,000).

The admirable work for prisoners of war done by the International Committee of Young Men's Christian Associations and by the International Red Cross at Geneva, and the activities of some scores of prisoners' relief agencies conducted in Switzerland and elsewhere were made the subject of special study by the War Relief Commission with a view to ascertaining whether these various activities might not, through some co-operative arrangement, become even more serviceable to the five or six millions of able-bodied men in prison camps whose welfare is a matter of such deep concern to their respective countries. This subject was brought before the Trustees in the latter part of the year under review, and the Director of the War Relief Commission was authorized to make such further inquiries as might be necessary to determine the feasibility of larger and more effective measures for the relief of prisoners. A conditional appropriation of \$500,000 was made for this purpose.

For medical research at the seat of war the Foundation has continued its appropriation through the Rockefeller Institute, to which reference was made in the last annual report. A part of this appropriation was applied during the year to research on the subject of shock at the Belgian Red Cross hospital in La Panne, and the Institute had the good fortune to enlist

the services of Professor William T. Porter of Harvard University in this study.

#### TUBERCULOSIS IN FRANCE

From time to time during the past year appeals were made to the Foundation in behalf of agencies formed to combat the increase of tuberculosis in France. After a preliminary report on the situation had been made by Professor Wallace C. Sabine of Harvard University, a member of the War Relief Commission, the Trustees of the Foundation requested Dr. Hermann M. Biggs, Commissioner of Health of the State of New York, to visit France in order to study the situation more fully and to recommend what aid if any a foreign agency might render in co-operation with the public authorities. The French Government expressed its cordial sympathy with Dr. Biggs's mission and he sailed for Europe on January 9, 1917, as a member of the War Relief Commission. He was accompanied by Dr. Alphonse R. Dochez of the Rockefeller Institute as his assistant and Mr. Geoffroy Atkinson of Columbia University as secretary and interpreter.

#### SOLDIERS' WELFARE WORK ON THE MEXICAN BORDER

On the application of the International Committee of Young Men's Christian Associations, the Foundation made two appropriations of \$50,000 each for the welfare work so promptly

and efficiently organized by that Committee for the benefit of the soldiers of the United States Army serving on the Mexican border. The Foundation also contributed \$15,000 for the purchase and distribution of small circulating libraries to be maintained at the recreation centres of the various brigades.

The importance of providing educational, recreational, and religious opportunities for men in camp has been so conclusively demonstrated in this country and in Europe that it is hard to see how a factor bearing so directly on the morale of troops and hence upon their fighting efficiency can hereafter be omitted from any intelligent system of military "preparedness." But the greatest significance of this work is suggested by the potentiality for good or ill that lies in any such large aggregation of men, drawn largely from civil life and eventually to return to their home communities, either broadened and disciplined by their experience, or demoralized both morally and physically.

#### INTERSTATE PALISADES PARK

In response to an appeal made on behalf of the Interstate Palisades Park Commission, a body created with identical personnel by separate action of the states of New York and New Jersey, the Foundation made a contribution of \$1,000,000 to the Commission toward a fund of \$5,000,000 raised in part by legislative

appropriation and in part by private subscriptions. This large gift for an isolated project lying outside the fields to which the attention of the Trustees has been chiefly directed was occasioned by the emergency which threatened the destruction for commercial purposes of the one portion of the Hudson Palisades not previously secured to the public enjoyment and by the urgency which attached to the early preservation of an extended region back of the Palisades in addition to the areas already acquired by the Interstate Commission. The Palisades are a national monument of great beauty, worthy to be held forever as one of the most precious possessions of the American people. The great park of which they form a part has been saved for the recreation and enjoyment of all classes of the population in the metropolitan district; and its preservation in anticipation of the time when that district must inevitably become a desert of brick and stone, relieved by only a few urban parks, is sure to become recognized as a thoughtful provision for future generations comparable with that which, half a century ago, by the creation of Central Park, conferred a priceless boon upon the New York of to-day. It is happily true that the Palisades Park is already availed of by hundreds of thousands of the masses of the people in this day and generation; and it is a source of profound satisfaction to the Trustees of a Foundation which owes its cor-

porate existence to the State of New York to have been enabled to give this immediate token of obligation to its people.

The Foundation has shown by two substantial gifts its recognition of the vital and urgent importance of two closely related interests of the people of the United States. The first is the pre-empting, before it is too late, of such available areas as are necessary, whether for urban or suburban parks, or for the more extensive state and national forest reservations. The second is the protection of birds and other forms of wild-life, many of which are in danger of extinction, such protection consisting in part of federal and state game laws and in part of wild-life refuges whether within the bounds of parks and forests reserved also for other uses or in lowland and marsh districts marked off for this special purpose. By its purchase and dedication in 1913 of the Grand Chenier Tract of 85,000 acres on the southern shore of Louisiana as a refuge for birds and other forms of wild-life, and by its contribution to the Interstate Palisades Park in 1916, the Foundation has sought to confer a public benefit measurable not only by the immediate usefulness of these two tracts, but also by such aid and encouragement as have been given to a movement of national extent and importance—a movement which ought to engage the timely and liberal support of both public and private funds.

## THE ROCKEFELLER FOUNDATION FOUNDER'S REQUISITIONS

The Treasurer's Report contains the customary list of Founder's Requisitions—by which is meant appropriations for objects designated by Mr. John D. Rockefeller and approved by the Trustees as coming within the corporate purposes of the Foundation. These requisitions are made in accordance with Mr. Rockefeller's letter of gift of March 6, 1914, reserving \$2,000,000 from each year's income for this purpose. While many of Mr. Rockefeller's beneficiaries under the terms of this letter, are, and were expected to be, local or denominational charities in which his interest is largely personal, it will be noted that not a few are closely identified with the broader interests of philanthropy, among which are to be noted the Rockefeller Institute for Medical Research, the National Board of the Young Women's Christian Association, the International Committee of Young Men's Christian Associations, Cornell University and the Training School for Public Service of the Bureau of Municipal Research.

### EXTRA COMPENSATION TO EMPLOYEES

In recognition of the increased cost of living due to the abnormal conditions caused by the European war, an additional and special compensation equal to fifteen per cent of the current annual salary was appropriated by the Executive Committee to each regular employee attached

to the New York office, the amount being payable January 5, 1917. It was understood that this was not an increase of the regular salary and did not create a precedent for the future. Similar action was taken by a large number of private business houses and commercial institutions in New York City and elsewhere in recognition of conditions that, by common acknowledgment, bore with special severity upon salaried workers.

#### APPENDED REPORTS

Appended hereto will be found the more detailed reports of the Director General of the International Health Board, the Director of the China Medical Board, the Chairman of the War Relief Commission and the Treasurer of the Foundation.

In submitting this my third and last report as Secretary of the Rockefeller Foundation, and in retiring from the Board of Trustees, I beg to acknowledge my obligations to the President and Members of the Corporation for the unique opportunity of working with them in the inauguration of this Foundation. To my colleagues and fellow-employees on its staff I wish to express my gratitude for their able and unfailing co-operation.



**INTERNATIONAL HEALTH BOARD**  
**Report of the Director General**



*To the President of the Rockefeller Foundation:*

Sir:—

I have the honor to submit herewith my report as Director General of the International Health Board for the period January 1, 1916, to December 31, 1916.

*Respectfully yours,*

WICKLIFFE ROSE,  
*Director General.*

# INTERNATIONAL HEALTH BOARD

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## MEMBERS

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John Atkinson Ferrell, M.D.  
*Assistant Director General*

Ernst Christopher Meyer, Ph.D.  
*Director of Surveys and Exhibits*

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Victor George Heiser, M.D.  
*Director for the East*

William Perrin Norris, M.D.  
*Associate Director for the East*

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\* Member of the Executive Committee.

## I. GENERAL SUMMARY

### I

#### THE YEAR IN BRIEF

During the year 1916 the work of the International Health Board continued to be directed chiefly toward the relief and control of hook-worm disease. In coöperation with Government, systematic efforts toward control have now been inaugurated in eight of the Southern States and in fifteen foreign countries located between degrees of latitude 36 north and 30 south in the tropical and sub-tropical belt which is the native habitat of the hookworm. New fields of operation in 1916 were Salvador, Brazil, Ceylon, and Siam. Arrangements were also completed to start work early in 1917 in the Fiji Islands, in Papua, and in Queensland, Australia.

In British Honduras and the island of Barbados, preliminary infection surveys were made; and in the Yangtse-kiang Valley of Central China a preliminary survey was carried out with special reference to the problem of soil pollution in shallow mining operations.

The Board conducted during the year a series of four experiments in malaria control. Three were finished. The fourth will be completed in

1917. The object of all four experiments was to determine the degree to which malaria could be controlled within the limits of reasonable expenditure and under conditions prevailing in typical farm communities of the South. Gratifying results have been obtained.

Two commissions were sent to South America. One, composed of six sanitarians, with Major General William C. Gorgas as chairman, visited the Republics of Ecuador, Peru, Colombia, Venezuela, and Brazil to study yellow fever conditions. Two definite objects were sought: (1) to determine the status of doubtful endemic centers of infection; (2) to ascertain what measures were necessary and feasible to eradicate the disease from the localities responsible for its dissemination. The second commission investigated medical education and public health agencies in Brazil. Each of the above activities, as well as minor undertakings, will be reviewed in subsequent sections of this report.

#### Evolution of Working Methods

Experience derived from working in many countries, with their great diversity of races, languages, and racial prejudices, is gradually evolving working methods adapted to diverse conditions. In this, the staff has been fortunate in meeting with a universally cordial reception and generous coöperation on the part of Government officials and the medical profession in the

countries visited or in which work has been begun. It has also been fortunate in encountering a Governmental attitude of great patience in dealing with native populations—an attitude that accomplishes results by persuasion rather than by force. The field staff has endeavored to show the same patient spirit and as a result has found happy issues out of emergencies which could not otherwise have been overcome—emergencies arising from illiteracy, superstition, religious intolerance, and apathy on the part of native populations. The working methods that are wrought out in one field are immediately available for use in every other similar field. Thus, a director who enters a new territory now has a vast amount of experience upon which to draw in making plans.

#### Development of Field Staff

Inasmuch as the success of the work in any area is largely dependent upon the personality, character, and general fitness of the director in charge, in making selection for field directors great care is taken to choose men who, after a period of probationary training, may become qualified to act in administrative positions. During 1916 the field staff was increased from twenty to thirty-six members. In making the new appointments the Board gave preference to physicians under thirty-five years of age who had received an academic degree, who had a

medical degree from an institution of recognized standing, and who had served a hospital internship of at least twelve months. In the few exceptions to these requirements, the candidates presented a record of excellent training for the service or possessed unusual personal qualifications.

#### Training of Recruits

It is the policy of the Board to place no medical officer in a position of administrative responsibility until he has stood the test of practical work in the field. In 1916 the islands of Trinidad and Ceylon were used as training centers. These remote locations, however, offered serious disadvantages. The work could not be supervised adequately from the home office, and unnecessary expense was involved in transporting to places so distant, untried men who might not prove satisfactory. For these reasons it was decided to transfer the training centers to a convenient section of the Southern United States. The Board selected North Carolina. Dr. B. E. Washburn, formerly in charge of the training of recruits in Trinidad, is director of the new station.

When the recruit has received preliminary training in North Carolina, he completes his probationary period under an experienced director in a foreign country located as near as possible and presenting similar problems to the

region in which he is to do independent work. If he is to serve in Latin America, his training is completed in a Latin-American country in which work is being done; if he is to serve in the British West Indies, he is trained on one of those islands. By this plan, a trustworthy idea of the capabilities of each new director is gained and the director himself secures as thorough equipment as possible for his future effort.

#### Publications and Exhibit Material

The need of satisfactory printed matter and exhibit material for use of field officers has become increasingly urgent. Accordingly, with the assistance of a number of medical men and special artists, original material was prepared during the year to illustrate the story of hook-worm disease. This equipment includes small, light, easily transportable, and durable lecture charts adaptable for use in any language; the same material, with suitable text, in the form of a chart for schools; a set of about fifty selected lantern slides and an accompanying popular lecture designed to furnish sufficient information to enable a man to give an intelligent talk; an illustrated leaflet telling in language which young children will understand the story of the hook-worm and its importance to every child of the South; and other similar printed matter. The Board coöperates with boards of health, boards of education, and other exhibitors in supplying

this material, as well as slides, photographs, and specimens of hookworms, for exhibits and teaching purposes.

In 1912 and 1913 Dr. E. K. Strong, Jr., of George Peabody College for Teachers, and Dr. C. W. Stiles, of the United States Public Health Service, made a study of the relation of hookworm disease to the physical and mental development of children. Their report was published in 1916. A Spanish edition of the Board's second annual report was also prepared and sent to medical journals, medical schools, public health officers, government officials, and many private individuals in Latin America.

#### Collection of Information

A vast amount of literature written in many languages was collected during the year. A special bibliography was made on the incidence of hookworm disease in mines. Much information also was gathered on medical education and public health agencies. All of this material was classified, indexed, translated, and made available for the guidance of the officers of the Board and other interested persons.

#### Coöperation with Tropical Diseases Bulletin

The *Tropical Diseases Bulletin*, a publication issued under the auspices of the British Government, has created a special department for recording work for the relief and control of hook-

worm disease. The object is "to devote periodically a section to an account of the various hookworm campaigns in progress from time to time in tropical regions, and to supplement the summaries of the official reports issued by the International Health Board with abstracts of the more interesting local details and observations made by the medical officers in charge to the local officers in their periodical reports." The *Bulletin* is widely circulated in tropical countries; it will therefore give to the work desired publicity.

## II

### RELIEF AND CONTROL OF HOOKWORM DISEASE

Active measures to control and prevent hookworm disease are now in operation in Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia; in Antigua, Grenada, St. Lucia, St. Vincent, and Trinidad of the West Indies; in British Guiana and Dutch Guiana; in Costa Rica, Guatemala, Nicaragua, Panama, and Salvador of Central America; in Brazil; and in Ceylon and Siam of the Far East.

#### Complete Infection Survey

A new and valuable development of the service is the complete infection survey which gives to Government and to the Board definite infor-

mation upon which to base a future working program.

Two such surveys were made in 1916, in Barbados and in British Honduras, respectively. They brought to light many striking facts. They showed particularly the important relation between geological structure and hookworm infection. The greater part of the island of Barbados is composed of porous coral limestone, which allows rapid seepage and percolation. The ground dries quickly, a condition unfavorable to the growth of young hookworms, and even though the thin superlying stratum of soil is polluted by fecal matter, this matter may easily seep away during subsequent rain. The smaller portion of Barbados, known as the "Scotland district," has an underlying structure of impervious sandstone and clay. This picturesque, highland district shows heaviest infection; it is estimated that in it 25,000 persons suffer from hookworm disease within an area of less than twenty-five square miles. The amount of infection in the island is further modified by the exceedingly low rainfall. In 1913 the rainfall was 46.16 inches; in 1914, 36.9 inches; in 1915, 56.7 inches. The average rainfall for a tropical country is about 100 inches; in British Guiana it is more than 200 inches.

In British Honduras, when other contributing factors have been eliminated, the rate of infection is seen steadily to increase as one travels

south, following a change in geological formation from porous limestone to impervious clay. The average rainfall of British Honduras is about 81 inches.

Interesting data as to race distribution of hookworm disease were also brought out by the two surveys. In British Honduras the greatest incidence is found among Indians and Mestizos, the latter being a mixture of Spanish and Indian blood. The Negro-creoles who have lived in the colony for several generations are, clinically speaking, almost immune. In Barbados the "poor whites" bear the brunt of the disease, as is indicated from personal appearance and hemoglobin tests. The blacks, though heavily infected, do not deteriorate to such a degree as the white population.

A great lack of knowledge on the part of native populations as to the dangers attendant on soil pollution, has been found in all tropical countries in which the Board has worked. A recent sanitary inspection of Barbados showed that of 4,240 houses visited, 2,132 had no sanitary conveniences; 1,387 had water closets or latrines; the remaining 721 had holes or receptacles of a primitive sort, or none. In British Honduras, in all parts of the colony outside the city of Belize, both in district capitals and in rural settlements, fecal contamination of the soil is universal. As a result, hookworm disease is making increasingly serious ravages among

agricultural workers, as is recognized by planters, particularly in the southern districts.

#### Hookworm Infection in Mines

Germany has spent over \$2,500,000 in direct outlay to control hookworm infection in a few of its mines. The disease has been brought under reasonable control in the mines of Wales and Belgium. It is known to be prevalent in many of the mines of France, Hungary, Spain, Sicily, California, South America, and China.

Until 1916 the Board had not undertaken directly the relief and control of hookworm disease in mines, though by supplying literature it had stimulated active measures in some of the mines of Ecuador and California and had awakened interest in the subject in certain tin mines of Spain. The field, however, offers large opportunity for service with but small expenditure of funds.

#### Infection Survey of Yangtse-kiang Valley

In 1916 the Yale Medical School, through a subvention by the Board, carried out a partial infection survey in the Yangtse-kiang river valley of Central China, a vast agricultural region in which extremely active shallow coal mining and antimony mining operations have sprung up since the beginning of the world war. The entire valley, so far as examined, was found to be infected, the infection being greatest among

farm coolies and miners, particularly in the provinces of Hunan and Kiangsi.

#### Economic Importance of Human Excrement to China

The hookworm problem in China presents unique features because of the economic importance of human excrement as a fertilizer and a source of revenue to the state. It is the only fertilizer available in sufficient quantities to supply agricultural needs. China has no sewerage system. Each night in urban centers the excrement is collected by male and female coolies who carry it in wooden buckets to temporary storage depots outside the city walls. To these depots farmers and gardeners go in tank boats to purchase supplies, which they convey up the rivers to their plantations of rice and mulberry. There they dig the excrement into the fields or moisten it with water and sprinkle it over growing vegetation. A relatively light infection in Chinese cities may thus become a serious factor in spreading the disease to agricultural districts.

More than one hundred thousand miners, largely recruited from farmers who have worked barefoot in the moist, larva-infected soil, are employed in the mines of Hunan province alone. The Government authorities and mine owners have waked to the seriousness of this situation and have made inquiry of the Board regarding the nature of hookworm disease and possible measures for its control. As a result, a plan of

coöperation in a program of sanitary reform has been entered into between the Board and the mining interests of Hunan and Kiangsi provinces. Dr. F. C. Yen, dean of the Yale College of Medicine at Changsha, has been placed in charge of the initial stages of the work. Dr. Yen is at present in the United States, studying systems of public health work, in preparation for the undertaking in the mines of China.

#### Sewage Disposal in Rural Districts

It becomes increasingly apparent as the work of the Board progresses that the solution of the problem of soil pollution in rural districts, both of this country and foreign countries, would have a far-reaching effect in lowering death rates and furthering public health. Typhoid, dysentery, diarrheal diseases, especially those of infants in summer time, and similar enteric infections, are in large measure due to this widespread custom of polluting the soil.

There is still diversity of opinion among public health officials as to the best method of disposal of human excrement in rural communities with limited means. In its work for the control of hookworm disease, the Board has made it a rule to coöperate in the installation of such devices as are recommended by the departments of health in the several states and countries.

In January, 1916, provision was made for carrying out, under the direction of the Rocke-

feller Institute for Medical Research, a study of the relative efficiency of various types of latrines suitable for farm use. The investigation will cover several years. It is hoped that as it progresses many sanitary experts will become interested and coöperate in the undertaking.

#### Uncinariasis Commission to Orient

In 1914 the Director General, while visiting the Federated Malay States, was impressed with the amount of hookworm disease and malaria which prevailed in that section. The local medical profession seemed divided as to which of these two diseases was the real menace to working efficiency, and as to the interrelation between the two. In 1915 an Uncinariasis Commission, with Dr. S. T. Darling as chairman, was sent out to investigate this problem. The Commission has now completed its work in Malaya and in Java, and has proceeded to the Fiji Islands in order to continue the study in a country where hookworm disease is not complicated with malaria.

### III

#### MALARIA CONTROL

Four experiments in malaria control were carried out during 1916 at different points in the lower Mississippi river valley. In each a different line of investigation was pursued, the object

being to discover a practical method of control which the average rural community could afford.

#### Experiments in Bolivar County, Mississippi

An experiment was conducted under the administration of the Mississippi Department of Health, with Dr. W. S. Leathers as Administrative Director and Dr. C. C. Bass of Tulane University as Scientific Director. The practicability of control through detecting the carriers and freeing them of the malaria parasites, was tested. The experiment covered two hundred twenty-five square miles of territory, the size of the communities varying from nine to sixteen square miles, with an average population of one thousand. Adjoining communities were taken up one after another as facilities permitted, the work in each lasting about four weeks, with subsequent visits to insure thoroughness. Blood tests were taken. Quinine treatment was given to those found infected. The experiment will be continued in 1917.

#### Experiments at Lake Village and Crossett, Arkansas

Three experiments were carried out, two at Lake Village and one at Crossett, in coöperation with the United States Public Health Service and under the general supervision of the late Dr. R. H. von Ezdorf. Assistant Surgeon R. C. Derivaux and Dr. H. A. Taylor were in charge of the work.

At Lake Village, 103 homes were selected from plantations in the immediate vicinity of the town. These 103 homes were divided into groups: in Group A, control was based on screening; in Group B, on the issuance of prophylactic doses of quinine; in Group C, on a combination of the two measures. A fourth group of houses was kept under observation as an experiment in negative control. The experiments at Lake Village have been completed, but it is too early to announce their results.

The experiment at Crossett was based on mosquito control without major drainage operations. The work consisted of the draining and re-grading of natural streams so as to secure rapid off-flow, the filling of bottoms, the digging of ditches, the removal of accumulated vegetation, and the systematic use of oil and other larvacidal substances by sprays and automatic drips. A remarkable decrease in the number of malaria calls resulted. During the last six months of 1915 there were 2,100 malaria calls in Crossett; during the last six months of 1916, 310 calls. In October 1915, there were 600 calls; in October 1916, 46 calls. In December 1915, there were 100 calls; in December 1916, 4 calls. Thus, at the end of 1916, the malaria index had been brought far below the normal winter level and was approaching the zero point. (See chart, page 69.) As a result of the steady

decrease in malaria cases, community interest in Crossett was aroused to take over the work for 1917, with a view to making it permanent. A similar experiment was also undertaken and is now in progress at Hamburg, Arkansas.

## IV

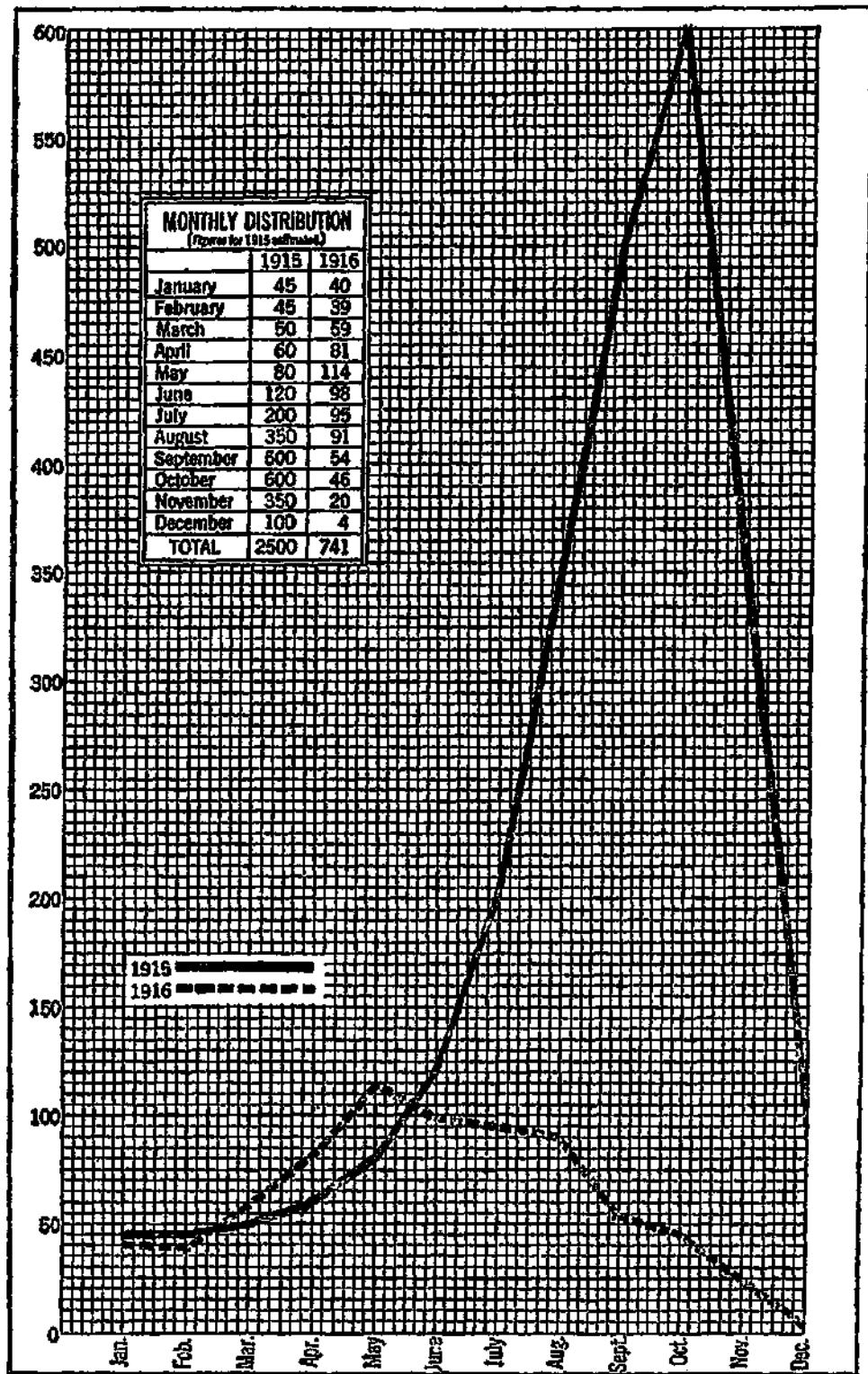
### WORK OF THE YELLOW FEVER COMMISSION

The work of the Yellow Fever Commission resulted in defining the problem, so far as South America is concerned, and in preparing the way for extending into new areas definite measures for the eradication of yellow fever infection.

The Commission consisted of Major General William C. Gorgas, Dr. Juan Guiteras, Dr. Henry R. Carter, Major T. C. Lyster, Major Eugene R. Whitmore, and Mr. William D. Wrightson. It was appointed early in the year and sailed from New York on June 14. It finished its work in December, after a period of investigation of approximately six months' duration.

#### Cordial Reception by Government

In each country visited the Commission met with a cordial reception from Government officials, who showed appreciative recognition of its distinguished personnel and of the spirit of service to humanity which had prompted its



CALLS FOR MALARIA, 1915 AND 1916, CROSSETT, ARKANSAS (POPULATION 2,029)

Office, Hospital, and Residence Calls Included; Monthly Distribution for 1915 Estimated.

visit. All that could be done was done to facilitate the investigation. Public records were displayed, hospitals and health organizations were shown, medical boards were convened in consultation, and many social courtesies were extended. These tokens of good will and interest facilitated greatly the progress of the investigation.

#### Findings of the Commission

The Commission reported that so far as it could determine, the only endemic center for yellow fever in South America at present is Guayaquil, Ecuador. Peru seems free from infection, but certain sections of Colombia, Venezuela, adjacent West Indian islands, and the entire east coast of Brazil call for close observation.

The problem of yellow fever eradication resolves itself into the following specific undertakings: (1) the elimination of the infection from Guayaquil, the chief seed-bed of infection now existing in South America; (2) the keeping under observation of the east coast of Brazil and the southern littoral of the Caribbean sea, and the undertaking of intensive work for the control of yellow fever infection at any point where it may be discovered; (3) the extension of the investigation to Mexico and West Africa, which regions are under suspicion, but have not yet been examined.

#### Adoption of Working Plan

The Board has appointed General Gorgas to direct the practical work of eradication along the three lines mentioned. It was expected that the work would begin in March, 1917. On account of war developments, however, it has been necessary to postpone the greater part of the undertaking.

## V

#### MEDICAL COMMISSION TO BRAZIL

The Medical Commission to Brazil, composed of Dr. Richard M. Pearce, chairman, Dr. John A. Ferrell, and Dr. Bailey K. Ashford, sailed from New York on January 22, and returned on May 7. Its inquiries covered the ground of medical education, hospitals and dispensaries, public health agencies, and sanitary progress.

#### Coöperation for Hookworm Control

As a result of the visit, the Government of Brazil has asked the Board's coöperation in carrying out demonstrations in hookworm control in selected areas in the States of Rio de Janeiro, Sao Paulo, and Minas Geraes, and on an island in the harbor of Rio de Janeiro in the Federal District. The Government has created a Department of Uncinariasis and appointed as its Director the Board's representative, Dr. L. W. Hackett, who will have charge of the four demonstrations mentioned above.

### Education in Medicine and Hygiene

The Commission submitted an illuminating report on Medical Education in Brazil. As an outgrowth of this report and of the personal relations established by the Commission in Brazil, negotiations are under way looking toward a co-operative arrangement between the Board and the Sao Paulo Medical School for the establishment of a department of hygiene in that institution. The plan covers a period of five years. During this time the head of the new department will be an American sent from the United States. Two scholarships will be awarded to promising young Brazilians who will come to the United States for special training in hygiene and public health and then return to Sao Paulo to serve on the staff of the school. If the department succeeds, at the end of the five-year period the Government of Brazil will take over the undertaking and bear the entire expense, which will temporarily be met by the Board.

A scholarship arrangement has also been made with the Bello Horizonte Medical School in the State of Minas Geraes. The incumbent will come to the United States in 1917 for special study, with a view to his return to Bello Horizonte to be head of the department of pathology.

## VI

**ESTABLISHMENT OF SCHOOL OF HYGIENE AND PUBLIC HEALTH AT BALTIMORE**

The Board, as well as other public health agencies in the United States, has been greatly handicapped in its work by the fact that hitherto there has been no school in this country prepared to give adequate training in public health. It is fundamental that the men whom the Board employs shall have had such training; that is, that before being placed in charge of work in the field, they shall not only receive a medical degree but shall be familiar with the problems in sanitary chemistry, industrial hygiene, bacteriology, protozoölogy, and kindred subjects with which the public health officer is constantly confronted.

The Executive Committee of the Board on May 27, 1915, asked that the matter be called to the attention of the General Education Board. As a consequence, the Rockefeller Foundation has established in Baltimore, in connection with the Johns Hopkins University, a School of Hygiene and Public Health. The new institution will open in October, 1917, with Dr. William H. Welch as Director and Dr. William H. Howell as head of the department of physiology. It will be closely associated with the Hopkins medical school, hospital, and school of engineering. It will offer instruction and re-

search facilities in hygiene, sanitation, and preventive medicine to medical students, engineers, chemists, biologists, and especially to men who desire to fit themselves for careers in public health.

The school will supply three urgent needs of the Board:

(1) It will furnish a body of trained men upon which the Board may draw in recruiting its field staff; and to the men who are now in the service it will offer special opportunities for additional training.

(2) It will serve as a center to which students from other countries may be sent for training in hygiene and public health, with a view to their returning to their own countries to become teachers and investigators, or to fill important positions in public health administration. The Board is prepared to coöperate with other countries, as opportunity offers, in developing public health agencies and in establishing schools and departments of hygiene in which teachers and public health workers may be trained. When the new institution at Baltimore opens in October, 1917, among its students will be enrolled a limited number of foreign students who will have been selected on the basis of availability for public health service in their native countries. It is expected that in some of the foreign countries from which such students come, facilities will be offered, in turn, to students

from the United States who may be interested in the study of tropical and other diseases.

(3) The new school will serve as a laboratory to which the Board may go for aid in solving some of the scientific problems which it meets in its work, and for specialists whom it can send out to investigate special diseases in regions where they are endemic. To the school, the Board on its side will supply a body of interesting and fresh material from tropical countries and will give opportunity for research and practical field experience. This relation of close coöperation, it is hoped, will be shared also by municipal and state departments of health and by the United States Public Health Service.

## VII

### INCIDENTAL ACTIVITIES

Without loss of time or expenditure of funds, and without allowing themselves to be diverted from primary undertakings, members of the staff have been able to render many incidental services which in the aggregate constitute an important contribution to the work of the year.

For example, when the Yellow Fever Commission was in Lima, Peru, the mayor of the city called the engineer of the commission into consultation concerning a new water supply system which was about to be installed. The modifications suggested provided for a more

effective installation at a lower cost than that contemplated in the original plans. As a result, the engineer was asked to supervise the installation of the plant. In response to a similar request, the commission inspected the hospitals and laboratories of Lima and gave aid in formulating a new plan of administration.

The Director for the East, in his travels during the year, was called into frequent consultation with reference to plans for tropical hospitals, the organization of health services, the making of laws and regulations for the control of leprosy, and for the treatment of persons afflicted with beriberi and yaws.

These concrete examples illustrate fields of activity in which it is hoped that greater service will be rendered in future. They all contribute toward the ultimate purpose for which the Board was established: the control of special diseases; the encouragement of the development of public health agencies; and the spread of the knowledge of scientific medicine.

## II. SUMMARY OF ACTIVITIES AND RESULTS BY STATES AND COUNTRIES<sup>1</sup>

### SOUTHERN STATES

During the year 1916, work for the control of hookworm disease in the Southern States showed definite progress. The chief feature of the advance was directed against soil pollution. In this undertaking the working force was enlarged; the area of operation was extended to include the entire county; the time devoted to each county was lengthened from three or four months to approximately one year; and a program was developed which provided, within the one-year period, for definite reduction in the prevalence of hookworm disease and a marked improvement in home sanitation.

Public sentiment has backed the work. State and county appropriations show a decided increase. A movement is under way to develop the county force into a permanent department of health, ultimately to be maintained with state and county funds, and to assume responsibility not only for the completion of the work of hookworm control but for the advancement of other measures pertaining to public health.

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<sup>1</sup> For a brief statistical interpretation of the figures included in this section of the report, see Addenda, pages 277 to 280.

Coöperative work with the Southern State Boards of Health began in 1910. For the first two years the undertaking was educational, seeking by demonstration, by illustrated lectures, by the distribution of literature, and by other means, to convince the people that hook-worm disease was a reality, and that it was a serious menace to health which could and should be eradicated. In 1912, as a nucleus for this endeavor, county dispensaries were established for the free treatment of all persons who applied. The dispensaries were widely distributed at five or more points in the county, and on one day of each week for five successive weeks or longer, free clinics were held at each dispensary point. The people took advantage of this opportunity. They were urged to do so by the press, by the practicing physicians, and by teachers and influential citizens who set an example by having themselves examined.

The dispensary plan was successfully operated in over seven hundred of the more heavily infected counties. It paved the way for the intensive type of work, which, in addition to maintaining a central dispensary, carries the work into every corner of the community by a house-to-house inspection. Since the intensive plan is now in universal use throughout the South, a brief review of its development and method of operation will be given.

### Development of the Intensive Plan

The first experiment in the intensive method of hookworm control was conducted in the latter part of 1913 on Knott's Island, a fishing hamlet of 567 inhabitants, located in Currituck Sound, off the extreme northeastern coast of North Carolina. Five hundred sixty persons were examined. Ninety-three were found infected and were treated. Microscopic re-examination showed that practically all of these were cured. In its effort to eradicate the infection permanently, the undertaking fell short on the sanitary side, as at the time the staff was unable to recommend a suitable type of latrine. However, the results were sufficiently encouraging to warrant similar undertakings during 1914 at various points in Virginia, North Carolina, South Carolina, and Louisiana, the four states that were first to complete the dispensary work.

The working staff in the beginning consisted of a medical officer, termed a "field director," and a trained lay assistant, termed a "microscopist" or "health inspector." These two men, by persistent effort and by confining their attention to one small rural community of five or six hundred people, could, within a period of three or four months, treat practically every infected person and secure great reduction in the degree of soil pollution. Experience showed, however, that it was not practicable to achieve one hundred per cent control in any demonstration

if ultimately the work of sanitation were to be placed on an economic basis within the reach of the average rural community. Accordingly, in 1915, further developments were introduced with a view to increased efficiency.

First, the number of health inspectors under each field director was increased to three, the object being, without enlarging overhead expense, to increase the number of people reached and the extent of territory covered by a given working staff. This provision proved so satisfactory that in 1916 the working force was again enlarged to include a field director and a sufficient number of health inspectors to cover an entire county, in approximately one year, taking the communities series by series.

By the end of 1916 the unit of working force had come to consist of a field director and five to ten health inspectors; the county had become the unit of operation; and eight months to one year had been adopted as the most satisfactory time unit for county work. In some states the field director served directly under the State Health Officer, and in others under a State Director who in turn served under the general supervision of the State Health Officer.

#### Present Method of Work

In conducting a campaign by the intensive plan the director who is in charge establishes an office at the county seat or at some other

point convenient to all of the communities in the series to be worked. This central office keeps financial records, distributes publicity material, makes microscopic examinations, tabulates on specially prepared blanks detailed statistics of the house-to-house sanitary survey, and prepares local maps on which are shown the homes, roads, streams, school houses, churches, and other features pertinent to the work.

The field work is done by the health inspectors, who report to the central office. They visit the people, inspect their premises, and urge changes necessary to provide each family with a latrine of a type approved by the State Board of Health. The health inspector advises as to the location of the latrine, and frequently supervises the manual labor of construction. He leaves at each home containers in which are placed the specimens of feces, which are later collected and sent to the central office for examination to determine the presence of parasites. In short, through personal contact with the people, the inspector does all in his power to further sanitation and a general knowledge of disease prevention.

#### Devices to Gain Coöperation

The working force has discovered many ingenious devices to gain the coöperation of the people. Two agencies brought particularly good results in the state of Mississippi in 1916. One was the publishing each week in the county

newspaper of a list of heads of families who had brought their latrines up to the standard approved by the State Board of Health. In Forrest county this list aroused local interest wherever the work was in progress. Each family wished to be recorded on the honor roll as early as possible. (See clipping, page 83.)

A second device to obtain coöperation was employed in the communities in Pearl River county, Mississippi, in which intensive work was conducted. A large, carefully prepared map giving the location of every home was posted in a conspicuous place in the community. As each householder completed the sanitary program a ring was drawn around the dot on the map which indicated his home. The map became a topic of community conversation. As the scales tipped in favor of those who had completed the work of sanitation, further delay for the remaining families became increasingly embarrassing. (See map, page 85.)

#### Evidence of Growing Interest in Home Sanitation

Growing interest throughout the South in hygiene and in sanitation of the home may fairly be ascribed in part to the intensive work. One notices that screening against flies and mosquitoes is gaining in popularity. It is also significant that the directors of the State Division of Morbidity Statistics in two states have mentioned an apparent reduction in the preva-

THE TRIBUNE, HATTIESBURG, MISS., JULY 23

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**Forrest County Leads the State in Rural Sanitation**

More than Three Hundred Sanitary Closets Built at Rural  
Homes in the County This Year—Below will be found  
Lists of those who have Built Sanitary  
Closets.

**EATON GROVE COMMUNITY.**

The territory in Forrest County between Leaf and Bonne Rivers, Contain-  
ing 176 homes.  
(Whites who have built sanitary closets).

Bayless, J. M.	Jacobs, E.	Pool, J. D.
Bayless, R. W.	Jacobs, J. J.	Powell, Mrs.
Bayless, G. B.	Johnson, O. R.	Quick, J. A.
Baum, J. R.	Jones, Rev. W. F.	Richardson, B. F.
Beavers, G. B.	Knight, R. W.	Richardson, W. N.
Bishop, A.	Lee, T. F.	Richardson, L. M.
Bodman, J. F.	Lee, A. M.	Rich, C. S.
Boyce, L. R.	Lewis, B. B.	Roberts, Mrs. V. M.
Brown, W. D.	Lott, J. C.	Spencer, A. J.
Bryant, S. H.	Lovelace, O.	Steele, M. A.
Burkett, G. A.	Lovelace, L. H.	Stewart, G. W.
Chappell, J. O.	McCullough, J. W.	Strahan, A. L.
Clinton, David	McDonald, J. C.	Strahan, W. A.
Dossett, H. D.	McDonald, J. D.	Sumrell, W. A.
Edmonson, Chas.	McLemore, J. H.	Travis, J. A.
Fairchild, Mrs.	Meeks, J. C.	Travis, J. H.
Gill, M. N.	Menesco, C. R.	Travis, O. A.
Glover, J. M.	Miley, J. M.	Walls, J.
Graham, S. H.	Miller, W. D.	Watts, J. H.
Granberry, W. L.	Mixon, G. R.	Wellington, R. W.
Gray, W. R.	Montgomery, W. H.	Wilson, C. G.
Harrel, Mrs.	Nobles, F. S.	Windham, W. J.
Hobby, T. G.	Norrell, C. B.	Wright, H. B.
Holliday, M. H.	Patrick, W. J.	Young, J. M.
	Parry, L. R.	

(Colored, who have built sanitary closets).

Bishop, Isom	Forrall, Lem	Lindsey, —
Blanks, Ell	Forrall, Sol.	McComb, John
Boles, Edw.	Fairley, Albert	McGurdy, R.
Brown, Frank	Fairley, Joel	McGullion, S.
Byrd, Eph.	Fairley, O.	Merrill, Jim
Cameron, Joe	Gillespie, O.	Merritt, M.
Campbell, R.	Grant, West	Miner, Albert
Carter, Quil.	Heidelberg F.	Mott, Bill
Carter, Joe	Henderson, M.	Mott, Warren
Charleston, W.	Holliman, L.	Mott, Henry
Chapman, Zeck	Jones, Lillian	Overhart, G.
Chapman, Z., Jr.	Jones, Mose	Page, Steve
Chayman, Will	Kelly, Taft	Powell, Gip
Craft, Nathan	Kelly, Horatio	Travis, Leroy
Dahmer, G. W.	Kelly, Elbert	Travis, Levi

Extract from Hattiesburg, Miss., Tribune, giving list of homes in Forrest  
county at which improved latrines have been built.

lence of typhoid fever and also of dysentery and diarrhea in the areas in which intensive sanitary work has been conducted. The incidence of these diseases in the areas worked, as compared with their incidence elsewhere, would have to be observed for a large number of communities and for a long time to warrant drawing definite conclusions, but these statements are worthy of mention.

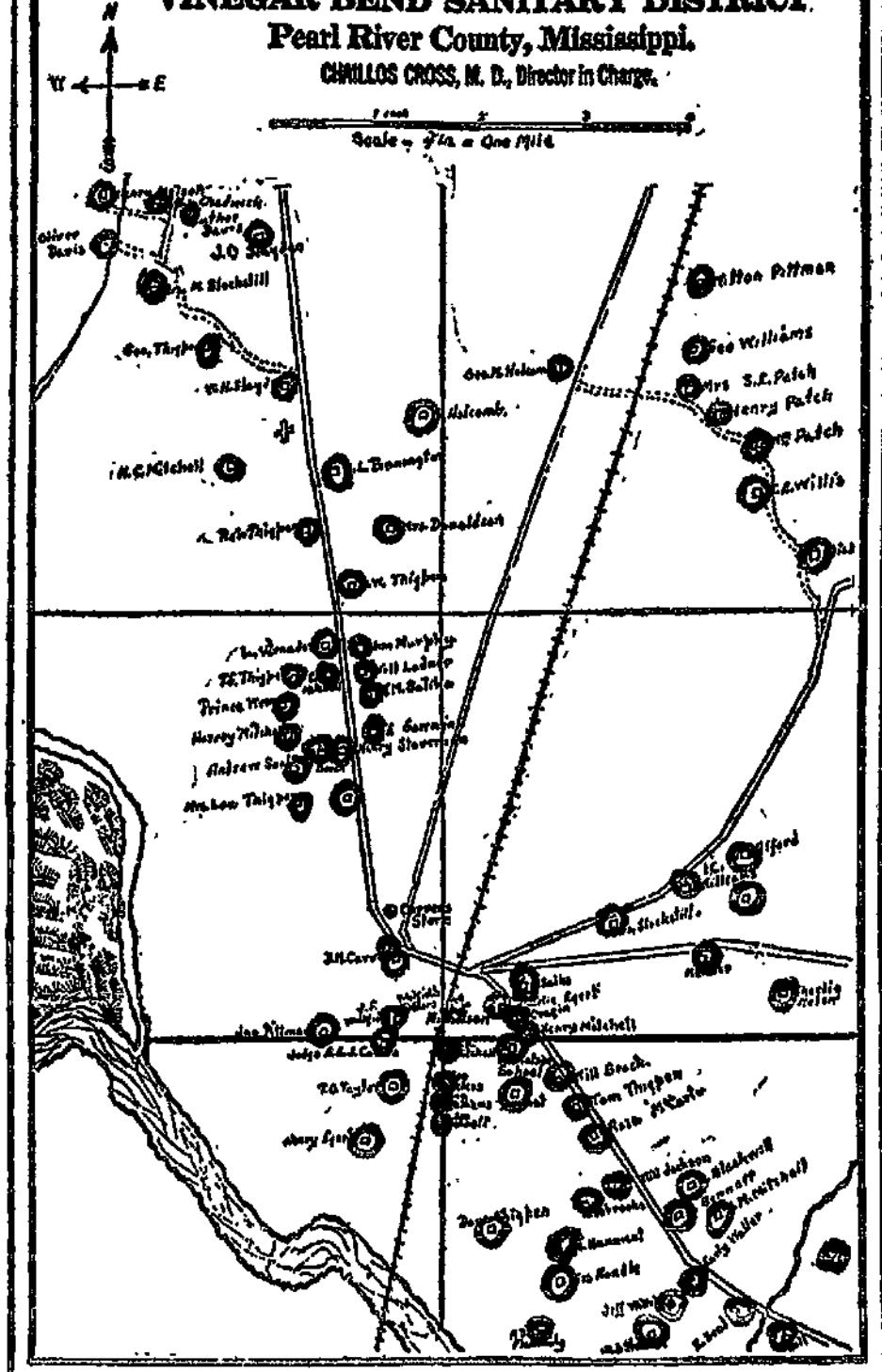
The progress of State Health Officers in securing increased appropriations from states and counties for the enlargement of their health programs, of which the intensive work for hook-worm control is one phase, also affords gratifying evidence of greater public appreciation of health measures in general.

#### **Resulting Permanent Agencies**

Still another and even more significant out-growth is the fact that the demonstrations are creating among the people a demand for permanent agencies to continue and enlarge the work. The first definite development in this direction occurred in North Carolina. It provides that each of ten counties undertake a definite health program for a three-year period. The work outlined for the control of soil pollution diseases will consume the major portion of the first year. Gradually, the staff will be converted into a county health department and the program expanded.

**MISSISSIPPI STATE BOARD OF HEALTH  
VINEGAR BEND SANITARY DISTRICT.**

**Pearl River County, Mississippi.**  
**CHILLOS CROSS, M. D., Director in Charge.**



Section of map of Vinegar Bend community, Pearl River county, Mississippi, showing method of gaining coöperation in intensive community work. The dark circles indicate homes at which improved latrines have been built.

For the support of the undertaking each county will pay 50 per cent of the cost for the first year and a larger amount in succeeding years. The remainder of the expense during the three-year period will be shared equally by the North Carolina State Board of Health and the International Health Board.

#### Measurable Reduction in Infection Secured by Dispensary Method

Under the dispensary plan of work, because of the brevity of the campaign, it was exceedingly difficult to obtain concrete information as to the degree to which hookworm disease was controlled. The four to eight weeks during which work was carried on in a given county was too short a period to admit of adequate re-examination of persons who had been treated. The intensive method has been used in fifty-five counties, in thirty-five of which the dispensary method was formerly employed. The following figures are significant:

In these thirty-five counties, 63,882 persons were examined by the dispensary plan. Of these, 37.5 per cent were found to be infected with hookworm disease. At the beginning of the intensive work in the same areas, usually from three to five years after the completion of the dispensary work, 34,727 persons were examined. The infection was found to be 26.5 per cent. Thus, in spite of the opportunities

offered over a period of years for cases of new infection or re-infection to arise, it will be seen that the infection recorded in intensive work was 11.0 per cent lower than that recorded in dispensary work, indicating that as a result of the dispensary work the number of persons infected with the disease was reduced approximately one third. The method of comparison may be open to error; the number of persons examined and the per cent of decrease are, however, sufficiently large to be significant. A more limited comparison, including only persons who were examined by both methods, indicates that the estimate of reduction is conservative. Practicing physicians and field directors state, moreover, that they now encounter but few of the severe cases of infection which were so frequently seen in 1910 and 1911.

Sufficient time has not yet elapsed since the adoption of the intensive method to warrant a tabulation of the percentage of reduction in infection which it has secured. It can reasonably be estimated, however, that this percentage is greater than that secured by the dispensary method. The intensive type of work, like the dispensary, reduces infection through curative measures. In addition, by the installation of latrines, it seeks to prevent the further spread of disease through soil pollution. It is also leading up to the establishment of permanent local agencies which guarantee the necessary system

of inspection. By its means it is reasonable to hope that new infections and re-infections will be reduced to a minimum, and that as a result hookworm disease in course of time will disappear.

#### Comparison of the Two Methods

The intensive type of work, which involves the installation, use, and maintenance of adequate latrines, while it produces more permanent results than the dispensary type, is nevertheless more difficult of operation than measures directed mainly to the treatment and cure of infected persons and the education of the people. It demands of the population itself a positive contribution. In most cases it requires the purchase of building material and the expenditure of time and energy to build latrines. More than this, it necessitates the arousing of a sanitary sense and a change of personal habits that will lead the people to use and maintain the latrines once built, and calls for more intimate contact with the people, more persistent and protracted effort, and a more marked faculty of leadership by the director in charge.

#### Increase in State Health Funds

In 1910, the legislatures of the eleven states, Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia, appro-

priated \$216,195 for health work. In 1915, the same eleven states appropriated \$512,300, an increase of 136 per cent. The present state appropriations are much larger. The funds available in North Carolina for health work, for example, have grown from approximately \$12,500 to more than \$150,000. The state health funds for South Carolina have increased from \$24,000 in 1910 to more than \$75,000 at present.<sup>1</sup> A similar increase is seen in other states.

#### Increased Budgets for Intensive Work

While the intensive work was in the experimental stage, it was financed by the International Health Board. When its feasibility had been demonstrated, and as a result the working area had been enlarged, the state and county began to assume a portion of the expense. As soon as it had been demonstrated in a few countries that the enlarged program, when carried out on a coöperative basis, was within the reach of the people, local contributions toward its maintenance increased. Subsequent growth in the size of the working staff for each base unit has been almost entirely due to increased appropriations by state and county.

In the work conducted in 1916,<sup>2</sup> for instance, the Board's proportion of the total expense throughout the South was about 50 per cent.

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<sup>1</sup> March, 1917.

<sup>2</sup> For statistical results see pages 94 to 99.

The remaining 50 per cent was shared by state and county. In the budgets which are being developed for 1917,<sup>1</sup> local agencies furnish from 50 to 75 per cent. The tendency is toward a working arrangement by which the county provides 50 per cent, the State Board of Health 25 per cent, and the International Health Board 25 per cent.

The state budgets which are being developed for 1917 show large increases in appropriations for intensive work on the county plan. North Carolina, as one phase of its health program, has developed a budget for the current year in excess of \$75,000 for this purpose. Of the total amount the state pays 25 per cent, the counties 50 per cent, and the International Health Board 25 per cent. The South Carolina budget for 1917 has developed an appropriation amounting to more than \$25,000 on a similar coöperative plan. Of the amount, the state pays \$9,650, the counties \$6,000, and the International Health Board \$9,650. A somewhat larger budget is provided by Tennessee. The state pays \$10,000, the International Health Board \$10,000, and the counties the remaining amount. Texas has appropriated \$70,000 for intensive work during the biennial period beginning June 20, 1917, with the provision that the money is to be used, in coöperation with counties and other agencies, in an effort to eradicate soil pollution

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<sup>1</sup> March, 1917.

diseases and malaria. The portion of the appropriation to be used for work in which the International Health Board coöperates is approximately \$17,000 yearly, and the total budget for intensive work is in excess of \$45,000. Toward this sum the counties contribute \$12,000. The remainder is shared equally by the state of Texas and the International Health Board.<sup>1</sup>

#### Progress in State Work

Since 1910 the State Health Officers of eleven Southern States have obtained for varying periods more or less coöperation from the International Health Board and its predecessor, the Rockefeller Sanitary Commission. Generally, such assistance has taken the form of financial aid in the working programs against hookworm disease and other soil pollution diseases. In other cases it has been the temporary loan of a man to carry out a health demonstration, a state director, a field director, or an investigator to make a special study and recommend a working plan for the solution of a definite problem. The temporary association of such men with the state officials has been uniformly congenial and the results mutually satisfactory.

As has been said, the State Health Officers have obtained from state and county increased

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<sup>1</sup> The enlarged programs were projected in 1910, but the state appropriations were not increased to the points mentioned until the early months of 1917, shortly before this report reached the press.

appropriations. In enlarging their staff they are endeavoring to establish a high standard of eligibility, and to have tenure of office and promotion rest solely on efficiency. The tendency is to have new members take a course of practical field training the better to fit them for the work they are to do. Special training bases for men who are to engage in the intensive county work, for example, have been established in Wilson county, North Carolina, and in Jones county, Mississippi.

The International Health Board is utilizing these training bases to give new members of its field staff a few months of practical experience as a preliminary to their training period in a foreign country. This practical training has proved invaluable to men who formerly were engaged in the practice of medicine, or who, on completing their medical education, have assumed the responsibilities of health officers.

#### The Outlook

The above developments point to a growing public interest in health work and to increased efficiency in its administration. As a field, preventive medicine is coming to be regarded as affording a useful career to efficient men. The tendency is toward more liberal compensation, greater security in tenure of office, and increased authority. The degree to which these features are emphasized will determine the at-

tractiveness of the field for young physicians of the highest type, and this, in turn, will greatly influence the progress that will be made in the control of preventable diseases.

Fortunately, the outlook is very promising for more money and men, greater efficiency and larger results, less sickness, fewer deaths, and increased economic and social development.

**TABLE I: Southern States—Intensive Work: Homes Provided with Latrines of Approved Type, During Progress of Work, in Communities Completed from May 1, 1914, to December 31, 1916**

With Comparison of Figures for Communities Completed During 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	20,515	....	12,078	....	8,487	....
2. Homes Provided With Latrines of Approved Type: <sup>1</sup>						
1) First Inspection <sup>2</sup> .....	555	2.7	806	2.5	249	3.0
2) Last Inspection.....	12,937	60.1	7,052	58.4	5,985	62.6
3. Homes Provided With New Latrines..	4,989	24.1	2,376	19.7	2,563	30.4

<sup>1</sup> These are latrines which, when inspected, have at least approximated the minimum requirements of the respective State Boards of Health as a safeguard against soil pollution.

<sup>2</sup> The first inspection is made at the time the intensive work in the community begins; the last inspection is made when the work ends.

TABLE 2: *Southern States—Intensive Work: Homes Provided with Latrines of Approved Type, During Progress of Work, in Communities Completed During 1916, by States*

	TOTAL		MISSISSIPPI		SOUTH CAROLINA		TENNESSEE		TEXAS		VIRGINIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	12,078	....	1,287	....	2,299	....	2,707	....	806	....	4,820	....
2. Homes Provided With Latrines of Approved Type:												
1) First Inspection .....	906	2.5	49	3.8	10	.4	8	.3	...	...	293	4.9
2) Last Inspection.....	7,052	58.4	1,120	87.0	1,367	59.5	762	27.2	591	68.2	3,212	66.5
3. Homes Provided With New Latrines.....	2,376	19.7	675	44.7	678	25.1	516	18.4	273	31.5	435	9.0

**TABLE 3: Southern States—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Communities Completed from May 1, 1914, to December 31, 1916**

With Comparison of Figures for Communities Completed During 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	97,973	....	55,285	....	42,738	....
2. Examined.....	49,509	50.5	22,169	40.1	27,340	64.0
3. Found Infected .....	11,808	22.8	4,669	20.6	6,739	24.6
4. Given First Treatment ..	10,587	98.6	4,644	99.5	6,048	89.7
5. Cured.....	2,815	26.6	1,231	27.1	1,584	26.2

TABLE 4: *Southern States—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Communities Completed During 1916, by States*

	TOTAL		MISSISSIPPI		SOUTH CAROLINA		TENNESSEE		TEXAS		VIRGINIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	55,235	....	5,730	...	11,433	....	12,740	....	4,165	....	21,157	....
2. Examined.....	22,169	40.1	3,730	66.0	6,065	58.3	1,217	9.5	2,801	67.2	7,706	36.4
3. Found Infected.....	4,509	20.6	1,466	38.8	1,001	20.9	49	4.0	570	20.3	493	6.4
4. Given First Treatment..	4,544	99.6	1,455	99.2	1,080	99.4	48	98.0	568	99.6	493	100.0
5. Cured.....	1,931	27.1	403	27.7	292	14.7	1	10.7	357	62.9	171	84.7

**TABLE 5: Southern States—Inensive Work: Number of Pieces of Literature Distributed During 1916, by States<sup>1</sup>**

CLASS OF LITERATURE	Total	Mississippi	Tennessee	Virginia
<b>Total.....</b>	<b>54,334</b>	<b>8,322</b>	<b>14,091</b>	<b>31,921</b>
Letters.....	10,938	872	2,485	8,081
Pamphlets.....	16,293	1,980	6,556	7,757
Leaflets.....	11,974	4,950	4,945	2,079
Notices and Bulletins.....	15,129	1,020	105	14,004

<sup>1</sup>The distribution of literature during 1916 was not reported by South Carolina and Texas.

TABLE 6: *Southern States—Intensive Work: Number of Lectures Delivered During 1916, with Attendance, by States*

	Total	Mississippi	South Carolina	Tennessee	Texas	Virginia
<b>1. Total Lectures.....</b>	<b>705</b>	<b>6</b>	<b>16</b>	<b>202</b>	<b>30</b>	<b>451</b>
1) Public.....	632	2	16	152	20	838
2) School.....	150	3	..	46	1	100
3) Special.....	23	1	..	4	..	18
<b>2. Attendance at Lectures.....</b>	<b>43,623</b>	<b>448</b>	<b>..<sup>1</sup></b>	<b>15,747</b>	<b>695</b>	<b>26,733</b>
1) Public.....	30,511	300	..	11,050	660	18,501
2) School.....	12,076	118	..	4,545	95	7,878
3) Special.....	1,096	30	..	152	..	854

<sup>1</sup> The attendance at lectures in South Carolina was not reported.

**ANTIGUA**

In Antigua the measures for the relief and control of hookworm disease are conducted under the supervision of Dr. M. P. Duke, the Chief Government Medical Officer. The intensive plan is followed. The staff engaged in the curative work consists of two microscopists, four nurses, two assistant nurses, one clerk, and one caretaker, acting under the direction of Dr. Don Morse Griswold.<sup>1</sup> Since May 15, 1916, the Government of Antigua has employed a special sanitary inspector to advance the measures of sanitary reform. Headquarters are at St. Johns, the capital.

The unit of operations is a group of villages. Excluding St. Johns, with its population of 8,000, the people of the Island, about 85 per cent of whom are full-blooded negroes, live mainly in rural villages and engage in agriculture. Sugar is the principal crop. For the purposes of the work, the Island has been divided into six areas. On account of the sparsity of the population, these areas have been made as large as can be conveniently handled from a central point. From the inauguration of the work on September 15, 1915, up to December 31, 1916, work had been completed in three of these areas, and was in progress on December

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<sup>1</sup>On March 8, 1916, Dr. Griswold succeeded Dr. P. W. Covington as Director. During the period from December 7, 1915, to March 8, 1916, Dr. Harold Leslie Kearney served as Acting Director.

31, 1916, in a fourth. All four of these districts lie in the southern half of the island, where the population is most dense.

The first area in which operations were undertaken (York Valley) occupied the southwestern portion of the colony. This, with the second area (Belvidere), just to the east, was bounded on three sides by high hills and mountains. Both districts included all the villages within a radius of three miles. The Belvidere area had a population of only 884, but the high hills surrounding it prevented the inclusion of any additional villages. The third area, known as the All Saints, adjoined the Belvidere district on the east, and had the largest population of any of the areas completed by the end of the year.

#### Examination and Treatment

The population of the three areas in which work had been completed up to December 31, 1916, was 7,565. Of this total population, the staff examined 7,477, or 98.8 per cent, for hook-worm disease; and found 2,229, or 29.8 per cent, of those examined to be infected. First treatment was administered to 2,054, or 92.1 per cent, of those infected; and 1,973, or 96.1 per cent of those given first treatment, were cured.

In Table 1 these figures are presented, along with a comparison of the results accomplished in the three areas completed during 1916.<sup>1</sup>

<sup>1</sup>No areas were completed during 1915.

**TABLE 1: Antigua—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from September 15, 1915, to December 31, 1916**

	TOTAL		YORK VALLEY		BELVIDERE		ALL SAINTS	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	7,565	....	1,957	....	884	....	4,724	....
2. Examined.....	7,477	98.8	1,948	99.3	860	97.8	4,674	98.9
3. Found Infected.....	2,229	29.8	581	27.3	254	29.5	1,444	30.9
4. Given First Treatment.....	2,054	92.1	471	88.7	241	94.9	1,342	92.9
5. Cured.....	1,973	96.1	450	95.5	219	90.9	1,304	97.2

It will be seen from Table 2 that of the 2,229 persons originally found infected, only 8.5 per cent remained as possible foci of infection when operations within the three districts had been completed. Almost all of those who were not cured during the progress of the work were persons from whom treatment had to be withheld for medical reasons: they represented 6.4 per cent of those infected. Persons who refused to be cured numbered only 1 per cent of the total infected. In the All Saints district, as the table shows, the percentage of persons remaining uncured was smaller than in either of the other two districts. (See Table 2, page 104.)

Table 3 presents in detail the results of the work of examination and treatment in the York Valley, Belvidere, and All Saints districts. In this table are included the supporting figures upon which Tables 2 and 3 are based. (See Table 3, page 105.)

#### Educational Work

In each area in which operations are conducted, public lectures, accompanied by projection-lantern slides, are given in the evening; and talks in the school-rooms, illustrated by a chart on hookworm disease, are given in the afternoon. The plan adopted is to give these lectures at various places in the districts until the total attendance at all of the lectures is approximately the same as the population of the dis-

TABLE 2: *Antigua—Intensive Work: Number of Persons Remaining Uncured in Areas Completed from September 15, 1915, to December 31, 1916, by Areas*

	TOTAL		YORK VALLEY		BELVIDERE		ALL SAINTS	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected .....	2,229	....	531	....	254	....	1,444	....
2. Cured.....	1,973	88.5	450	84.7	219	86.2	1,304	90.3
3. Removed.....	67	3.0	27	5.1	7	2.8	83	2.3
4 Remaining in Area Uncured.....	189	8.5	54	10.2	29	11.0	107	7.4
1) Not located.....	14	.6	....	....	3	1.2	11	.8
2) Refused.....	24	1.1	10	1.9	4	1.6	10	.7
3) Medical Reasons.....	143	6.4	36	6.8	21	8.3	86	6.0
4) Under Treatment.....	8	.4	8	1.5	....	....	....	....

**TABLE 3: Antigua—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed from September 15, 1915, to December 31, 1916, by Areas**

	Total	York Valley	Belvidere	All Saints
<b>1. Census.....</b>	<b>7,565</b>	<b>1,957</b>	<b>884</b>	<b>4,724</b>
<b>2. Examined.....</b>	<b>7,477</b>	<b>1,943</b>	<b>860</b>	<b>4,674</b>
<b>3. Not Examined.....</b>	<b>88</b>	<b>14</b>	<b>24</b>	<b>50</b>
1) Not Located.....	6	..	3	3
2) Refused.....	28	14	9	5
3) Removed.....	44	..	11	33
4) Insane.....	2	..	1	1
5) Died.....	8	..	..	8
<b>4. Found Infected.....</b>	<b>2,229</b>	<b>531</b>	<b>254</b>	<b>1,444</b>
<b>5. Given First Treatment</b>	<b>2,054</b>	<b>471</b>	<b>241</b>	<b>1,342</b>
<b>6. Not Given First Treatment.</b>	<b>175</b>	<b>60</b>	<b>13</b>	<b>102</b>
1) Not Located.....	10	..	1	9
2) Refused.....	12	5	1	6
3) Medical Reasons....	112	36	10	66
4) Removed.....	37	17	1	19
5) Died.....	4	2	..	2
<b>7. Cured.....</b>	<b>1,973</b>	<b>450</b>	<b>219</b>	<b>1,304</b>
<b>8. Given First Treatment but Not Cured.....</b>	<b>81</b>	<b>21</b>	<b>22</b>	<b>38</b>
1) Not Located.....	4	..	2	2
2) Refused.....	12	5	3	4
3) Medical Reasons....	31	..	11	20
4) Removed.....	24	7	6	11
5) Died.....	2	1	..	1
6) Under Treatment ...	8	8	..	..

trict. At two of the most important meetings, His Excellency the Acting Governor and His Lordship the Bishop presided. The attendance at all has been exceptionally good.

The number of lectures delivered in the various areas up to December 31, 1916, with the estimated attendance, is shown in Table 4.

**TABLE 4: Antigua—Intensive Work: Number of Lectures Delivered in Areas Completed from September 15, 1915, to December 31, 1916**

	Total	York Valley	Belvidere	All Saints
<b>1. Total Lectures.....</b>	<b>29</b>	<b>16</b>	<b>4</b>	<b>9</b>
1) Public.....	18	4	2	7
2) School.....	5	1	2	2
3) Special.....	11	11	..	..
<b>2. Attendance at Lectures</b>	<b>8,570</b>	<b>1,720</b>	<b>850</b>	<b>6,000</b>
1) Public.....	6,900	1,250	650	5,000
2) School.....	1,270	70	200	1,000
3) Special.....	400	400	..	..

At every home, circulars describing hook-worm disease and handbills announcing the dates of lectures are delivered; and a copy of the progress report which appears in the Official Gazette of the Antiguan Government is mailed monthly to each of the district medical officers, clergymen, planters, and other influential persons throughout the colony, as a means of keeping them informed concerning the work.

#### Sanitary Improvement

The native rural population of Antigua is almost entirely without latrine accommodations. In the three areas in which the work of examination and treatment had been completed up to

December 31, 1916, for instance, the sanitary inspection showed that only 38 among a total of 1,830 homes were provided with latrines. The task of securing the installation of latrines at rural homes is therefore one of the most pressing problems of the local Government.

The special sanitary inspector appointed by His Excellency the Acting Governor, has been actively engaged in this work since May 15, 1916. Up to the end of the year, 32 additional homes had been provided with latrines,—15 in the York Valley and 17 in the Belvidere district. In the All Saints district, efforts at sanitary reform were also in progress, but no definite figures have been reported. In all of these areas the sanitary work will be continued until a far larger proportion of the homes has been provided with latrines.

### BRITISH GUIANA

The work conducted by the Government of British Guiana for the relief and control of hook-worm disease continued during 1916 under the direction of the Surgeon General, Dr. K. S. Wise. On July 1, 1916, Dr. F. W. Dershimer succeeded Dr. F. E. Field as Supervising Medical Officer. The intensive plan was followed. Measures of sanitary reform remained in the hands of a staff of native inspectors maintained by the Government.

The bulk of the population of the colony lives in a narrow strip of land along the northern coast. With the exception of a few habitations extending inland for a short distance along the larger rivers, this represents practically the only inhabited area. The land is low-lying, flat, and swampy, and is used almost entirely for cane cultivation and rice-growing.

Of the total population of the colony, numbering approximately 296,000 persons, about one-fourth live on the sugar estates. The remainder are grouped in towns and villages, there being few isolated houses. Approximately 42 per cent of the inhabitants are East Indians and 39 per cent negroes. A large variety of races and religions are included in the other 19 per cent.

From the beginning of the work on March 12, 1914, up to December 31, 1916, operations had been completed in three areas: Peter's Hall,

Belle Vue, and Plaisance. The first extends for a distance of eight miles along the east bank, and the second for a distance of fourteen miles along the west bank, of the Demerara river. The results accomplished in these areas were included in the annual report for 1915.

In the Plaisance area, the only area completed during 1916, the work had been begun on October 1, 1915. It was completed on September 30, 1916. Operations were then begun in another area, but since the work in this fourth area had not been completed by December 31, 1916, the results accomplished in it are omitted from this report.

Headquarters for the Plaisance area were established in the village of that name, located near the center of the area, with field offices in each of the four districts into which the area was divided. Each field office had its staff of nurses and distributors, and a caretaker. Early in the work the total force employed in the field, exclusive of the home office, numbered sixty-two men. This was found too large for effective supervision, and was gradually reduced until, towards the close of the campaign, only ten nurses, twelve distributors, and four caretakers, or twenty-six persons in all, remained.

The area, with a population of 18,951, extends eastward along the northern coast for a distance of twelve miles from Georgetown, the capital. Its width varies from one to three

miles. The land is flat, and at high tide lies several feet below sea-level. Dikes have been built to keep out the sea. Drainage is carried out by an elaborate system of canals, from which the water escapes at low tide through gates in the sea wall. Certain of the canals are used for drainage and sewerage; others furnish water for drinking and culinary purposes. During the rainy season, the drainage is sometimes inadequate and large areas are flooded. Storms often batter down the sea walls, and until the break is repaired large areas are flooded with salt water at each succeeding high tide.

The rice-growing industry, spreading rapidly in this area, has resulted in the formation of numerous ponds of shallow water. In these, as well as in the trenches which have become choked with vegetation, mosquitoes breed in large numbers. Throughout the area malaria is prevalent to a marked degree.

Huts of from one to three rooms, built either of mud, thatched with palm leaves or straw, or of wood, house the majority of the people. Many of these huts have dirt floors. During the rainy season the yards are often covered with water and the houses built on the ground are flooded.

#### Examination and Treatment

The total population of the three areas in which work had been completed up to December 31, 1916, was 41,274,—approximately one-

seventh of the total population of the colony. Of these 41,274 persons, 39,568, or 95.9 per cent, were examined for hookworm disease; and 22,943, or 58.0 per cent of those examined, were found infected. First treatment was administered to 20,166 persons, representing 87.9 per cent of those infected; and 16,264, or 80.7 per cent of those receiving first treatment, were cured.

In Table 1 figures are presented separately for the results accomplished in the areas completed during 1915 and 1916. The statistics for 1915 include the combined results in the Peter's Hall and Belle Vue districts, both of which were completed in that year; those for 1916 are for the Plaisance area only.

TABLE 1: *British Guiana—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from March 12, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916<sup>1</sup>

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	41,274	....	18,951	....	22,323	....
2. Examined.....	39,568	95.9	18,498	97.6	21,070	94.4
3. Found Infected.....	22,943	58.0	9,808	53.0	13,135	62.3
4. Given First Treatment.....	20,166	87.0	8,263	84.2	11,903	90.6
5. Cured.....	16,264	80.7	6,225	75.3	10,030	84.3

<sup>1</sup>No area was completed during 1914.

It will be seen that for the Plaisance area the percentage of persons infected and the percentage of persons cured was lower than the average for the two areas previously completed. The decrease in the percentage of persons cured may be explained by the fact that the East Indians engaged in the rice-growing industry spend, during the planting and harvesting seasons, seven long days each week in the fields, and as a rule will not give even one day for treatment. Two crops are raised each year, so that there are four or five months during which a large part of the population can hardly be reached. The rice fields, furthermore, are kept submerged until just before the harvest, and many of the people believe that if they go into the water within a day or two after taking salts they will catch cold, and so lose not one but two or three days from their labor.

Table 2 exhibits the thoroughness of the work in reducing the number of persons remaining as foci of infection. As will be noted, 2,122 of the 9,808 persons originally found infected, or 21.6 per cent, remained in the area uncured at the close of the work. The largest single group (902) of these uncured persons included those who had taken one or more treatments but had not been found cured on re-examination. These persons, representing 9.2 per cent of those infected, are classed as under treatment. The persons who could not be treated for medical reasons or who refused treatment, formed, re-

spectively, groups including 6.0 and 6.5 per cent of the total found infected.

**TABLE 2: British Guiana—Intensive Work: Number of Persons Remaining Uncured in Area Completed During 1916**

	TOTAL FOR 1916	
	Number	Per Cent
1. Infected.....	9,808	.....
2. Cured.....	6,225	63.5
3. Removed.....	1,461	14.9
4. Remaining in Area Uncured.....	2,122	21.6
1) Refused.....	633	6.5
2) Medical Reasons.....	587	6.0
3) Under Treatment.....	902	9.2

Table 3 presents in detail the figures covering the results of examination and treatment in the Plaisance area. (See Table 3, page 114.)

#### Educational Work

The same educational features were employed in the Plaisance as in the Peter's Hall and Belle Vue areas. There was an inaugural meeting attended by prominent officials and citizens, and other public meetings were held from time to time throughout the area. During the progress of the work twenty-six lectures were delivered to a total attendance estimated at 5,947. Ten of these lectures were to the public and sixteen to school children.

**TABLE 3: British Guiana—Intensive Work: Detailed Results of Examination and Treatment in Area Completed During 1916**

	Total for 1916
<b>1. Census . . . . .</b>	<b>18,951</b>
<b>2. Examined . . . . .</b>	<b>18,498</b>
<b>3. Not Examined (not located) . . . . .</b>	<b>453</b>
<b>4. Found Infected . . . . .</b>	<b>9,808</b>
<b>5. Given First Treatment . . . . .</b>	<b>8,263</b>
<b>6. Not Given First Treatment . . . . .</b>	<b>1,545</b>
1) Removed . . . . .	767
2) Refused . . . . .	191
3) Medical Reasons . . . . .	587
<b>7. Cured . . . . .</b>	<b>6,225</b>
<b>8. Given First Treatment but Not Cured . . . . .</b>	<b>2,038</b>
1) Removed . . . . .	670
2) Refused . . . . .	442
3) Died . . . . .	24
4) Under Treatment . . . . .	902

A summary of the educational work by lectures, as conducted in the areas completed up to December 31, 1916, is presented in Table 4. (See Table 4, page 115.)

Table 5 indicates that in the Plaisance area 6,164 pieces of literature were distributed, of which 6,029 were pamphlets and 135 were posters. (See Table 5, page 115.)

#### Sanitary Improvement

The three areas in which the work of examination and treatment had been completed up to

**TABLE 4: British Guiana—Intensive Work: Number of Lectures Delivered from March 12, 1914, to December 31, 1916, with Attendance**

With Comparison of Figures for 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
<b>1. Total Lectures.....</b>	<b>68</b>	<b>26</b>	<b>42</b>
1) Public.....	35	10	25
2) School.....	27	16	11
3) Special.....	6	..	6
<b>2. Attendance at Lectures ..</b>	<b>15,858</b>	<b>5,947</b>	<b>9,911</b>
1) Public.....	8,986	4,124	4,862
2) School.....	3,257	1,823	1,434
3) Special.....	3,615	.....	3,615

**TABLE 5: British Guiana—Intensive Work: Number of Pieces of Literature Distributed from March 12, 1914, to December 31, 1916, by Classes**

With Comparison of Figures for 1915 and 1916

CLASS OF LITERATURE	Up to December 31, 1916	During 1916	During 1915
<b>Total.....</b>	<b>18,171</b>	<b>6,164</b>	<b>12,007</b>
Pamphlets.....	16,367	6,029	10,338
Posters.....	1,784	135	1,649
Not Classified.....	20	....	20

December 31, 1916, included a total of 11,047 homes. When the work of examination and treatment was begun, 4,933 of these homes, or 44.7 per cent, were found to be provided with latrines, as compared with 6,382, or 57.8 per cent, when the work of examination and treat-

ment ended. During the progress of the work, therefore, 1,449 additional homes were provided with latrine accommodation. These figures are shown in Table 6.

**TABLE 6: British Guiana—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed from March 12, 1914, to December 31, 1916**

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected....	11,047	.....	4,900	.....	6,147	.....
2. Homes with Latrines:						
1) First Inspection	4,933	44.7	2,409	49.2	2,524	41.1
2) Last Inspection	6,882	57.8	2,464	50.3	3,918	63.7
3. Homes Provided with New Latrines....	1,449	13.1	55	1.1	1,394	22.7

The figures in this table do not include all of the sanitary work undertaken nor all of the results accomplished. In addition to securing the installation of latrines at homes where none have previously existed, the inspectors endeavor to have old latrines improved and made sanitary, main and interlot drains cleaned out, unnecessary vegetation removed, and other measures of sanitation introduced; and this work often continues in an area for months after the population has been examined and treated. In the Peter's Hall and Belle Vue districts, for in-

stance, which are represented in the table by the figures for 1915, it is shown that only 63.7 of the homes were provided with latrines when the curative work ended. A recent report states that as a result of the active campaign waged by the Government sanitary inspectors, practically every home in these districts has been provided with an approved latrine, and a tour of inspection made by the Surgeon General and the Supervising Medical Officer showed that every latrine was being used. In addition, houses have been razed in overcrowded districts, and measures against mosquitoes, such as the removal of underbrush from the vicinity of houses and the improvement of drainage, have been employed.

In the Plaisance area, the table shows that there were only 55 additional homes provided with latrines during the progress of the work of examination and treatment. In this area it had been planned to have the sanitary work completed before the curative work was begun, but a lack of funds prevented this, and a start was not made until the curative work was well under way. Unfortunately, however, the villagers objected to the enforcement of sanitary laws and refused to take further treatment unless the inspectors were withdrawn. This was done, with the result that conditions in the area remained practically unimproved while the people were being examined and treated.

Although the failure to effect the needed sanitary improvement in this area during the progress of the work was a disappointment, the delay was merely temporary, steps are now being taken to enforce the sanitary regulations, and the Surgeon General promises that most of the necessary latrines will be erected within a few months. The Government authorities are now carrying out advance measures for the sanitary improvement of areas into which the curative work is shortly to be introduced.

The interest which the Government, the District Medical Officers, and the estate owners are manifesting in efforts to banish the disease from the colony is reflected in the fact that in the three public hospitals, and in most if not all of the estate hospitals, every patient admitted is examined for hookworm disease without regard to the complaint for which he enters. If found infected, effort is made to cure him before he is discharged. On many of these estates, furthermore, the indentured laborers are being systematically examined and treated under the supervision of the District Medical Officers.

As a means of reducing the amount of sickness in certain localities, the value of well-directed efforts at sanitary improvement, taken in conjunction with the treatment and cure of sufferers from hookworm disease, is suggested by the figures in Table 7. This table shows the number of persons admitted to the public hospital at

Georgetown during the years 1914, 1915, and 1916. From the Peter's Hall and Belle Vue districts, in which operations against hookworm disease were in progress, respectively, from March 12, 1914, to March 31, 1915, and from January 9, 1915, to September 30, 1915, it will be seen that the number of patients admitted during 1916 was 31.5 per cent lower than the number admitted during 1914. In contrast with this, the table shows that from the districts in which measures against hookworm disease were not conducted, exclusive of the city of Georgetown, the percentage of reduction in admissions

TABLE 7: *British Guiana: Number of Patients Admitted to Public Hospital at Georgetown from Districts in which Work Against Hookworm Disease Was Conducted, Compared with Number Admitted from Districts in which Work Was Not Conducted—Years 1914, 1915, and 1916*

	NUMBER OF ADMISSIONS			Per Cent of Reduction— 1916 Compared with 1914 <sup>1</sup>
	During 1914	During 1915	During 1916	
<b>Areas in which Work Was Conducted:</b>				
Total.....	1,457	1,018	998	31.5
Peter's Hall.....	929	625	606	34.7
Belle Vue.....	528	393	392	25.8
<b>Areas in which Work Was Not Conducted:</b>				
Total.....	6,964	6,950	7,518	+ 8.0
Total Excluding City of Georgetown.....	2,215	2,147	2,072	6.5
City of Georgetown.....	4,749	4,803	5,446	+14.7

<sup>1</sup>A plus sign denotes per cent of increase.

was only 6.5; while from the city of Georgetown the number of patients admitted was 14.7 per cent higher in 1916 than in 1914. (See Table 7, page 119.)

**DUTCH GULANA**

The work for the relief and control of hook-worm disease in Dutch Guiana follows the intensive plan and provides for two separate staffs, one concerned with remedial and the other with preventive measures. The first staff is maintained by the Board, the second by the Government. Both are under the supervision of the Surgeon General, Honorable A. L. Schenck.

During 1916, the remedial measures have remained under the direction of Dr. W. H. Kibler, who serves as State Director. From October 15, 1915, the date on which the work in Dutch Guiana was inaugurated, until March 15, 1916, his staff consisted of eight persons, including two microscopists, four nurses, one clerk, and one caretaker. From March 15 to December 31, 1916, from nineteen to twenty-one persons were employed, consisting of three microscopists and twelve nurses, and, at different times, three or four clerks and one or two caretakers.

The entire population of Dutch Guiana lives in a strip of coastal plain, or mud flat, lying along the northern coast and extending inland a distance of about fifty miles. Paramaribo, the capital, with a population of 40,000, and about 155 estates and settlements having a population of more than 50 persons each, are included within this plain. The total population of the 155 estates and settlements, excluding Paramaribo,

is 38,055. For the purpose of the work, each estate or settlement forms a separate unit. On twelve of these estates and in one of these settlements, all lying along the Commewyne river in what is known as the Lower Commewyne area, operations were brought to a close during the year 1916. The total population of these estates and this settlement was 4,470 persons, composed mainly of East Indians and Javanese in about equal numbers, with approximately 500 creoles. Full-blooded whites and negroes were not numerous.

#### Examination and Treatment

Of the total of 4,470 persons inhabiting the area in which operations were completed during 1916, the staff succeeded in examining 4,411, or 98.7 per cent, for hookworm disease. The number found infected was 3,900, or 88.4 per cent of those examined. First treatment was administered to 3,667 persons, representing 94.0 per cent of those found infected; and 3,233, or 88.2 per cent of those receiving first treatment, were cured. Table 1 presents these figures in tabular form. (See Table 1, page 123.)

Treatment is administered under hospital conditions. For this purpose, accommodations in the hospital located on each estate are provided by the estate owners.

Table 2 illustrates the effectiveness of the work in reducing the number of infected persons in the area. It will be seen that of the 3,900 persons

**TABLE 1: Dutch Guiana—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916**

	TOTAL FOR 1916	
	Number	Per Cent
1. Census.....	4,470	....
2. Examined.....	4,411	98.7
3. Found Infected.....	3,900	88.4
4. Given First Treatment.....	3,667	94.0
5. Cured.....	3,233	88.2

originally found infected, only 337, or 8.6 per cent, remained in the area uncured at the close of the work. More than half of these were persons who could not be cured for medical reasons. Those who refused to be treated numbered less than 1 per cent of the total infected.

**TABLE 2: Dutch Guiana—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916**

	TOTAL FOR 1916	
	Number	Per Cent
1. Infected .....	3,900	....
2. Cured.....	3,233	82.9
3. Removed.....	330	8.5
4. Remaining in Area Uncured .....	337	8.6
1) Refused.....	83	.8
2) Medical Reasons.....	202	5.2
3) Under Treatment.....	102	2.6

In Table 3 are given the detailed figures upon which Tables 1 and 2 are based. This table gives full particulars of the work of examination and treatment.

**TABLE 3: Dutch Guiana—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916**

	Total for 1916
1. Census.....	4,470
2. Examined.....	4,411
3. Not Examined.....	50
1) Not Located.....	10
2) Refused.....	16
3) Removed.....	33
4. Found Infected.....	3,900
5. Given First Treatment.....	3,667
6. Not Given First Treatment.....	223
1) Refused.....	5
2) Medical Reasons.....	150
3) Removed.....	77
4) Died.....	1
7. Cured.....	3,233
8. Given First Treatment but Not Cured.....	434
1) Refused.....	28
2) Medical Reasons.....	52
3) Removed.....	246
4) Died.....	6
5) Under Treatment.....	102

#### Educational Work

In an attempt to acquaint the people of Dutch Guiana with the symptoms, harmful effects, prevalence, method of distribution, and means

of prevention of hookworm disease, several measures are pursued. A public lecture illustrated by lantern slides is given before work is begun on an estate; pamphlets printed in Dutch, Negro-English, Hindustani, and Javanese are distributed; and the nurses, in their daily contact with the people, use every opportunity to explain in simple terms the facts about the disease. On beginning the work on each estate there is a public demonstration of worms that have been recovered from persons treated on other estates. At this demonstration, charts and pictures are exhibited, and the microscope is used to show young hookworms recently hatched from the eggs. The practice, too, of counting in the presence of each patient the number of worms recovered from his stool, enlists much interest and lends strong support to the work of examination and treatment.

In the educational work in Dutch Guiana up to December 31, 1916, eleven public lectures had been delivered to a total attendance estimated at 5,000 persons, and approximately 2,000 printed pamphlets had been distributed.

#### Sanitary Improvement

On the first of January, 1916, a code of general sanitary regulations went into effect. In these regulations the entire extent of all plantations is considered public land, and soil pollution thereon is penalized. The district medical offi-

cers and the police, among others, are charged with their enforcement. Additional regulations, designed especially to aid the measures against hookworm disease, were presented to the Colonial Assembly on March 20, 1916, by His Excellency the Governor. These regulations require the construction, maintenance, and use of latrines in numbers sufficient to accommodate the entire population of all areas wherein operations are conducted.

The barracks, or ranges, built for the estate laborers in Dutch Guiana contain from five to twenty rooms, each room being occupied by a family of two or more persons. In the reports these separate rooms are classed as homes. One latrine may provide accommodations for the occupants of one or more ranges, and thus serve a large number of homes. The territory in which the curative work had been completed up to December 31, 1916, included 1,824 homes. Table 4 shows that when the work began, only 325, or 17.8 per cent, had latrine accommodation. During the progress of the work, accommodation was provided for 1,290 additional homes, increasing the number with latrine accommodation to 1,615, or 88.5 per cent of the total. The actual number of new latrines installed, by which accommodation was provided for the 1,290 additional homes, was 226. (See Table 4, page 127.)

**TABLE 4: Dutch Guiana—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed During 1916**

	TOTAL FOR 1916	
	Number	Per Cent
1. Homes Inspected.....	1,824	....
2. Homes Provided with Latrine Accommodation:		
1) First Inspection.....	325	17.8
2) Last Inspection.....	1,615	88.5
3. Homes Accommodated by New Latrines.....	1,290	70.7

The figures in this table, however, do not signify the real extent of sanitary reform accomplished. In addition to the new latrines installed, a number of old latrines were improved and made sanitary; the maintenance and use of all latrines was required; drainage for the laborers' quarters was secured; filth, rubbish, and unnecessary vegetation were removed. On every hand the laborers gave evidence of genuine coöperation. One manager, representing a group of estates, writes: "At first I had some doubt that the laborers would use the latrines which I was advised to build, but I find they like them and use them regularly. I think this will continue so long as the latrines are inspected and kept clean."

From all of the estates the reports received indicate that the laborers show marked improvement in general health and in working capacity following their treatment and cure for hook-

worm disease. On one estate, among five men taken at random, their average wage per working day was 34 per cent higher for the three months following treatment than it had been for the three months preceding; and on another, among six men chosen at random, their average daily wage for a period of two months after treatment exceeded by 38 per cent that for a period of three months before treatment.

## GRENADA

In Grenada the work for the relief and control of hookworm disease is conducted under the direction of the Colonial Surgeon, with the assistance of a local Advisory Committee of which the Colonial Secretary is Chairman. On August 26, 1916, Dr. H. S. Colwell succeeded Dr. Angus MacDonald as Medical Officer in Charge of the curative work. The staff engaged in this work consists of one clerk, three microscopists, six nurses and assistant nurses, and two caretakers. In addition, a staff of inspectors is employed by the Government to secure the needed sanitary reform.

From the beginning of the work in Grenada on December 1, 1914, up to December 31, 1916, operations had been completed in a part of the parish of St. George known as the Mt. Moritz area, in the whole of the parish of St. David, in approximately one half of the parish of St. Andrew, and in a small area (Dougaldston) embracing two square miles in the parish of St. John. In addition, a central office was maintained in the town of St. George's, where persons who applied from any section of the Island were examined and treated. In all of the areas except Dougaldston, the work was conducted by the dispensary plan. On December 31, 1916, activities by the intensive plan were also in progress in four restricted areas in St. John's

parish: Concord, Marigot, Grand Roy, and Mt. Nesbit, which, taken in connection with the Dougaldston area completed before the end of the year, include the whole of St. John's parish south of the Dougaldston river.

In the Concord and Dougaldston areas, the work was inaugurated on February 1 and February 15, 1916, respectively; in Marigot and Grand Roy on September 9; and in Mt. Nesbit on November 28. From the first of September until the close of the year, the entire attention of the staff was devoted to the intensive work in these five areas. For this purpose, headquarters were established in the town of Grand Roy. The other eight months of the year were spent in bringing to a close the operations by the dispensary plan which had been begun during 1915 in the Mt. Moritz, St. David's, and St. Andrew's areas.

The Dougaldston area, the only area completed by the intensive plan during 1916, consists of one large cocoa estate, situated about one half mile from the town of Gouyave and about twelve miles from St. George's, the capital. The land rises rapidly from the sea-level to the high hills near the central ridge of the Island. The people, numbering about 426, are mostly negroes, with a few East Indians. About 150 are housed in barracks and another 150 live along the main road near the seacoast. The remainder have small houses scattered about the estate.

### Examination and Treatment

In all of the areas in which work had been completed by either the dispensary or intensive method up to December 31, 1916, a total of 23,896 persons was examined. Of these, 15,420, or 64.5 per cent, were found infected. Due to the plan followed up to September 1, 1916, of administering treatment in certain cases on clinical diagnosis, first treatment was given to 15,669 persons,—249 in excess of the number found infected. Of those who received first treatment, 4,384, or 28.0 per cent, were cured.

Table 1 presents these figures, and offers a comparison of the results accomplished during 1916 and prior to 1916.

**TABLE 1: Grenada—Dispensary and Intensive Work:  
Number of Persons Examined, Found Infected, Given  
First Treatment, and Cured in Areas Completed from  
December 1, 1914, to December 31, 1916**

With Comparison of Figures for 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	23,896	....	5,312	....	18,584	....
2. Found Infected.....	15,420	64.5	4,926	79.6	11,194	60.2
3. Given First Treatment.....	15,669	....	4,147	....	11,522	....
4. Cured.....	4,384	28.0	1,038	25.0	3,346	29.0

In Table 2 the results accomplished by the dispensary method during 1916 are compared

with those accomplished by the intensive method in the one area wherein operations by the latter plan had been completed by the close of the year. The most striking contrast is shown in the percentage of persons cured: in the dispensary work this was only 20.4 per cent of the persons given first treatment, as compared with 77.1 per cent in the intensive work.

**TABLE 2: Grenada—Dispensary and Intensive Work:  
Number of Persons Examined, Found Infected, Given  
First Treatment, and Cured in Areas Completed During  
1916**

With Comparison of Figures for Results Accomplished in Dispensary and in Intensive Work

	TOTAL		DISPENSARY WORK		INTENSIVE WORK	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	....	....	....	....	426	....
2. Examined.....	5,312	....	4,886	....	426	100.0
3. Found Infected .....	4,226	....	3,885	....	341	80.0
4. Given First Treatment.....	4,147	98.1	3,807	98.0	340	99.7
5. Cured.....	1,038	25.0	776	20.4	262	77.1

#### Educational Work

In the areas in which intensive work was conducted from August 26 until the end of the year, two out-door lectures were held, in addition to the customary meetings in schools and churches. Occasionally, the microscopists have gone into outlying districts and given microscopic demon-

strations to the people in their homes; and in some cases the nurses have strained the stools of the patients after treatment to exhibit the worms that have been expelled. In addition, the medical officer and the nurses in their daily contact with the people have done much to spread a knowledge of the disease.

Table 3 presents a summary of the educational work conducted by means of lectures in the areas in which operations by the intensive plan were in progress during the last four months of 1916.

**TABLE 3: Grenada—Intensive Work: Number of Lectures Delivered from August 28, 1916, to December 31, 1916, with Attendance**

	Total for 1916
<b>1. Total Lectures.....</b>	<b>9</b>
1) Public.....	7
2) School.....	2
<b>2. Attendance at Lectures.....</b>	<b>1,415</b>
1) Public.....	1,275
2) School.....	140

The distribution of literature in these areas is indicated in Table 4. (See Table 4, page 134.)

#### Sanitary Improvement

A detailed sanitary survey was made throughout the five areas in which work was conducted during the last four months of the year. In these areas, with a population of 2,620 persons,

**TABLE 4: Grenada—Intensive Work: Number of Pieces of Literature Distributed from August 26, 1916, to December 31, 1916**

CLASS OF LITERATURE	Total for 1916
Total .....	1,960
Personal Letters.....	10
Leaflets.....	1,025
Pamphlets.....	325
Notices.....	600

there are 671 homes. Only 75 were found to be provided with latrines on the first inspection, and 59 of these were in the Mt. Nesbit area, which embraces two large cocoa estates and the village of Mt. Granby. In this area there are 319 inhabitants and 87 homes. The owners of the estates have provided latrines for the use of their laborers, who keep the latrines in fairly good condition. Some of the people in the village of Mt. Granby also have creditable latrines.

Throughout the other areas the homes provided with adequate sanitary accommodations number less than ten. A spot about 75 feet from the house, often on the slope of a hill directly above it, is most frequently chosen for the disposal of excrement. No attempt is made to bury the feces. Persons living near the seashore carry their utensils daily to the beach, where they exercise a varying degree of caution against emptying the contents upon the dry sand above high-water mark.

Very few of the people have shown any dis-

position to provide themselves voluntarily with latrines. There is, however, a law for compelling the installation of latrines at all homes, except where such installation might contaminate the water supply. The Advisory Committee has urged that this law be more rigidly enforced by the local authorities. The Government has also been requested to appropriate 300 pounds for sanitary improvement. A part of this sum would be used to provide dumping stations for the convenience of persons living in thickly populated districts in proximity to streams or other sources of drinking water.

At Belmont, Concord, and Grand Roy, capacious and well-constructed latrines, with concrete sides to the pit, have been constructed at the Government schools by order of His Excellency the Governor, and similar structures are in course of erection at the Government schools in other centers. The installation of these latrines at the schools will doubtless have much influence in educating the people to build and use latrines at their homes.

### ST. LUCIA

Measures for the relief and control of hook-worm disease in St. Lucia continued during 1916 under the supervision of Dr. Stanley Branch. On June 19, 1916, the functions of the Advisory Committee, which had been appointed by the Island Government to direct the work, were vested in the Board of Health of the Colony. At that time, two influential landed proprietors were added to the Board. The Administrator is Chairman.

Beginning January 1, 1916, a strictly intensive plan of work was followed. In preparing specimens for microscopic examination the centrifuge was used, and in administering treatment the nurses were required to see that the patients swallowed each dose. Throughout the year, two microscopists, four nurses, and a clerk were engaged in the work of examination and treatment, with a special field inspector, employed by the Government, devoting his energies to measures for the improvement of sanitation.

Activities during the year were confined to the Castries Valley area, immediately surrounding Castries, the seaport and seat of Government of the Island. Work had been completed in one third of this area during the last six months of 1915; it was completed in the remaining two thirds during 1916. The area as a

whole embraced a population of 10,482 persons, of whom 5,936, or 56.6 per cent, were residents of the town of Castries. The remainder of the inhabitants lived in districts suburban rather than rural. More than 98 per cent were colored.

#### Examination and Treatment

Excluding the preliminary infection survey conducted during the closing months of 1914, the staff had enumerated in the work extending from January 1, 1915, to December 31, 1916, a census of 14,363 persons. Of this total population, 13,927, or 97.0 per cent, were examined for hookworm disease, and 6,772, or 48.6 per cent, were found to be infected. First treatment was administered to 6,307 persons,—93.1 per cent of those found infected; and 4,081—64.7 per cent of those who received first treatment—were cured. Table 1 presents a summary of the results of examination and treatment up to December 31, 1916, showing separately the results accomplished in the areas completed during 1915 and during 1916. In the areas completed during 1916, there was a decrease in the volume of results, but in every detail the work during this period was more careful and more thorough, and its results may be expected to be more permanent. (See Table 1, page 138.)

The portion of the Castries Valley in which work was conducted during 1916 was divided for convenience into two sections, separated by

**TABLE 1: St. Lucia—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from January 1, 1915, to December 31, 1916**

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	14,363	....	6,214	....	8,149	....
2. Examined.....	13,927	97.0	6,003	96.6	7,924	97.2
3. Found Infected .....	6,772	48.6	2,336	38.9	4,436	56.0
4. Given First Treatment.....	6,907	93.1	2,201	94.2	4,106	92.6
5. Cured.....	4,081	64.7	1,904	86.5	2,177	53.0

natural boundaries. The staff devoted a period of six months to the work in each section. In Table 2 the results accomplished during each half-yearly period are compared. (See Table 2, page 139.)

The section in which work was conducted during the first half year included a larger proportion of town residents than the second; consequently, the percentage of persons found infected was lower, being 32.4 in the first half as compared with 47.0 in the second. The suburban districts have been found to show a steady increase in infection as the work has proceeded farther from the town.

Table 3 presents figures showing the number of persons remaining uncured in the work con-

**TABLE 2: St. Lucia—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916**

With Comparison of Figures for Areas Completed During the First and Second Half Years, Respectively

	TOTAL FOR 1916		FIRST HALF 1916		SECOND HALF 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	6,214	....	3,455	....	2,759	....
2. Examined.....	6,003	96.6	3,831	96.4	2,672	96.8
3. Found Infected .....	2,336	38.9	1,079	32.4	1,257	47.0
4. Given First Treatment.....	2,201	94.2	1,012	93.8	1,189	94.6
5. Cured.....	1,904	86.5	901	89.0	1,003	84.4

ducted during 1916. Of the 2,336 persons found infected during this year, only 311, or 13.3 per cent, remained in the area uncured at the close of work. More than half of these were persons under treatment. The failure to treat all of the infected persons until they had been cured was due almost wholly to the migratory habits, procrastination, and shiftlessness of certain members of the negro laboring population. (See Table 3, page 140.)

Table 4 gives the details of the work of examination and treatment during 1916, and includes the supporting figures upon which Tables 2 and 3 are based. (See Table 4, page 141.)

The figures in these four tables do not include the results accomplished by the out-

**TABLE 3: St. Lucia—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916**

With Comparison of Figures for Areas Completed During the First and Second Half Years, Respectively

	TOTAL FOR 1916		FIRST HALF 1916		SECOND HALF 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	2,336	..	1,079	..	1,257	..
2. Cured.....	1,904	81.5	901	83.5	1,003	79.8
3. Removed.....	121	5.2	82	4.8	69	5.5
4. Remaining in Area Uncured.....	311	13.3	126	11.7	185	14.7
1) Refused.....	80	3.4	57	5.3	23	1.8
2) Medical Reasons	15	.6	9	.8	6	.5
3) Under Treatment	216	9.2	60	5.6	156	12.4

patient department at the central office, where persons are examined and treated who live outside the areas in which operations are being conducted. The following summary shows the number of persons examined, found infected, and cured by this department up to December 31, 1916:

	TOTAL	DURING 1916	DURING 1915
1. Examined.....	305	251	54
2. Found Infected.....	188	120	18
3. Cured.....	61	54	7

There were also 139 persons cured during 1916 in addition to those reported in this summary. These were persons who had been classified as "Under Treatment" in earlier reports. The total number cured up to December 31, 1916,

**TABLE 4: St. Lucia—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916**

With Comparison of Figures for Areas Completed During the First and Second Half Years, Respectively

	Total for 1916	First Half 1916	Second Half 1916
<b>1. Census . . . . .</b>	<b>6,214</b>	<b>3,455</b>	<b>2,759</b>
<b>2. Examined . . . . .</b>	<b>6,003</b>	<b>3,331</b>	<b>2,672</b>
<b>3. Not Examined . . . . .</b>	<b>211</b>	<b>124</b>	<b>87</b>
1) Removed . . . . .	65	21	44
2) Refused . . . . .	141	100	41
3) Died . . . . .	5	3	2
<b>4. Found Infected . . . . .</b>	<b>2,336</b>	<b>1,079</b>	<b>1,257</b>
<b>5. Given First Treatment . . . . .</b>	<b>2,201</b>	<b>1,012</b>	<b>1,189</b>
<b>6. Not Given First Treatment . . . . .</b>	<b>135</b>	<b>67</b>	<b>68</b>
1) Removed . . . . .	61	21	40
2) Refused . . . . .	58	37	21
3) Medical Reasons . . . . .	13	8	5
4) Died . . . . .	3	1	2
<b>7. Cured . . . . .</b>	<b>1,904</b>	<b>901</b>	<b>1,003</b>
<b>8. Given First Treatment but Not Cured . . . . .</b>	<b>297</b>	<b>111</b>	<b>186</b>
1) Removed . . . . .	54	29	25
2) Refused . . . . .	22	20	2
3) Medical Reasons . . . . .	2	1	1
4) Died . . . . .	3	1	2
5) Under Treatment . . . . .	216	60	156

was therefore 4,281, instead of 4,081, as indicated in Table 1.

#### Educational Work

The nurses in visiting the patients, and the Medical Officer in conversing with persons at the central office, have used every opportunity

to acquaint the people with the measures necessary for curing and preventing hookworm disease. Lectures to the public, particularly to school-children, have been held at frequent intervals during the year, and an address has been delivered to the students of Saint Mary's College, the only school of higher education in the colony.

The managers of primary schools have evinced a determined effort to assist the work, and among the teachers the coöperation, on the whole, has been all that could be desired. In a few cases, however, it has seemed that the teachers have failed to appreciate the benefits which would result if both themselves and their pupils were freed of the infection. The Administrator has therefore instructed the Inspector of Schools to impress upon them the fact that they and their scholars should be treated and freed of the disease, and that latrines should be used to prevent re-infection.

#### Sanitary Improvement

Sanitary regulations framed by the Board of Health require that all premises (including schools and business places) shall be provided with satisfactory accommodations for disposing of human feces. Medical officers, the Inspector of Nuisances, and the special sanitary inspector appointed by the Government are clothed with power to see that the regulations are enforced.

At a meeting on March 16, 1916, a joint committee of representatives of the General Board of Health and of the Castries Town Board unanimously agreed as to the most satisfactory and economical method of disposing of sewage in Castries and its vicinity. This body recommended that the inhabitants of the town of Castries be permitted to continue dumping their refuse into the sewage barge which anchors nightly in the river; that an additional barge be provided for the section of the town most remote from the anchorage of the present barge; and that, for the low-lying localities just outside the town boundaries, central dumping depots of the pit type, with proper precautions against the contamination of underground waters by seepage, be established. The territory served by each of these depots will not extend beyond a radius of one half mile. The first of the depots was opened in October, and arrangements are being made to open others in the localities suggested by the committee. Provision for the additional barge was also included in the financial estimates for 1917-1918.

In the portions of the area which will not be served either by the sewage barges or by the dumping depots, effort will be made to have latrines installed. In these outlying districts there are 411 houses. On December 31, 1916, the conditions of disposal at 226, or 55.0 per cent, were satisfactory. The erection of an out-

building for permanent or temporary disposal of sewage will be required at every house located outside the town, while in the town effort will be made to discourage the practice of keeping in living rooms, or in other places accessible to flies and poultry, the utensils in which the feces are carried to the depot or barge for disposal. Properly constructed fly-proof boxes, for use in storing the feces in the outbuilding, are furnished free of charge on orders issued by the field inspector.

Sanitary supervision will be exercised over the areas in which the work of examination and treatment has ended, but unless the Government sanitary staff is considerably enlarged there may be some degree of reversion to insanitary practices, especially in the rural districts. To prevent this, and to see that effective supervision is maintained, the number of sanitary inspectors will be increased as soon as possible.

## ST. VINCENT

Active measures for the relief and control of hookworm disease have been conducted in St. Vincent during the past year by two separate staffs, coördinated under the general supervision of Dr. C. H. Durrant, the Colonial Surgeon. One staff devotes its energies to the work of examination and treatment; the other endeavors to secure sanitary improvement. The staff employed in curative measures includes, besides the Medical Officer in Charge, two microscopists and six nurses. On November 13, 1915, Dr. P. B. Gardner succeeded Dr. W. P. Jacocks as Medical Officer in Charge of the curative work.

The only inhabited part of St. Vincent is the narrow strip of land lying between the central mountain range, which extends the entire length of the island, and the seacoast on both sides. It is planned to complete work on the windward, or eastern, side before beginning on the leeward. Despite the rugged character of the country, the scarcity of good roads, the widely scattered population, and the long rainy season, it has been found feasible to conduct operations by the intensive plan. Small areas are selected, and the work is confined to them until as many as possible of the infected inhabitants have been treated and cured.

The area in which the work of examination and treatment had been completed up to De-

ember 31, 1916, embraced the territory on the windward side, extending for a distance of eleven miles from Kingstown, the seat of government. Within this small territory is included the most populous part of the island. It was subdivided, for convenience in conducting operations, into five smaller areas: Calliaqua, Belair, Sion Hill, Stubbs, and Mesopotamia. Activities in the two first-named areas were completed during 1915 and were described in the second annual report. During 1916 work was completed in the Sion Hill, Stubbs, and Mesopotamia areas.

The Sion Hill area, the first to be completed during 1916, included all the territory between the town of Kingstown and the Calliaqua and Belair areas. Headquarters were established on Sion Hill, near Kingstown. One estate and two villages just outside of Kingstown were included in the area, but no portion of the town itself. In the census taken by the field staff, 1,880 persons, living in 366 homes, were enumerated. About one half were white; the others, black or colored.

The Stubbs area had as its center the large village of that name, located on the seacoast about eight miles from Kingstown. The area, triangular in shape, had a base five miles long on the seacoast and extended inland for a distance of two and one-half miles. There were four villages and four estates within its limits.

Headquarters were at Stubbs. The population numbered 2,362; the homes, 457. Of the population, about 95 per cent were black or colored, 3 per cent white, and 2 per cent Indians.

The Mesopotamia area was entirely inland. It was composed of a large, crater-like valley, circular in shape, surrounded on all sides by mountains. The field office was located in its center, a distance of nine miles from Kingstown. The majority of the inhabitants lived in six small villages, but there were many scattered homes on the sides of the surrounding mountains. In one instance, two families lived three miles from the nearest neighbor and five miles from the field office. The entire population of this area was agricultural. There were three small estates, but, as in the Sion Hill and Stubbs areas, the majority of the inhabitants owned and tilled their own small plots of land. The census enumerated 696 homes and 3,325 persons. Approximately 97 per cent of the inhabitants were black or colored, 1 per cent East Indian, and 2 per cent white.

#### Examination and Treatment

In the five areas in which the work had been completed up to December 31, 1916, there was a total population of 11,392. Only 76 of these persons, representing slightly more than one half of 1 per cent of the total population, were not examined for hookworm disease,—the majority

because of refusal. Of the 11,316 persons examined, 5,738, or 50.7 per cent, were found to be infected; and 5,338, or 93.0 per cent of those infected, received first treatment. Microscopic re-examination showed that 4,664, or 87.4 per cent of those receiving first treatment, had been cured. Table 1, in which these figures are exhibited, presents separately the results accomplished in the areas completed during 1915 and 1916.

*TABLE 1: St. Vincent—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from May 1, 1915, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	Up To DECEMBER 31, 1916		DURING 1916		DURING 1915	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
1. Census.....	11,392	....	7,567	....	3,825	....
2. Examined.....	11,316	99.3	7,494	99.0	3,822	99.9
3. Found Infected.....	5,738	50.7	4,062	54.2	1,676	43.9
4. Given First Treatment.....	5,338	93.0	3,748	92.3	1,590	94.9
5. Cured.....	4,664	87.4	3,314	88.4	1,350	84.9

The average percentage of persons found infected and the average percentage of persons cured was higher in the three areas completed during 1916 than in the two areas completed during 1915. Separate figures for each of the 1916 areas are given in Table 2.

TABLE 2: *St. Vincent—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916, by Areas*

	TOTAL		SION HILL		STUBBS		MESOPOTAMIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	7,567	....	1,880	....	2,362	....	3,325	....
2. Examined.....	7,494	99.0	1,853	98.6	2,346	99.3	3,295	99.1
3. Found Infected.....	4,062	54.2	1,120	60.4	1,063	45.3	1,879	57.0
4. Given First Treatment.....	3,748	92.3	1,090	92.0	973	92.0	1,740	92.6
5. Cured.....	3,314	88.4	907	88.1	887	80.7	1,520	87.4

The Sion Hill area presented the highest percentage of infection during the year, but the infection throughout this area was not uniform. In Sion Hill village, located near Kingstown, where many of the inhabitants use the public latrine over the sea, only about 30 of every 100 persons were infected, as compared with 85 in portions of the district further inland, where there are practically no sanitary conveniences.

In Table 3, which shows the number of persons remaining uncured in the three areas completed during 1916, the effectiveness of the work on the curative side is best exhibited. It will be seen that in the three areas combined, there remained uncured at the close of work only 17.0 per cent of the persons originally found infected. Approximately one fourth of these refused to accept treatment, another one fourth could not be treated for medical reasons, and one half received one or more treatments but had not been cured when the work was brought to a close. (See Table 3, page 151.)

Table 4 presents figures showing in detail and by areas the results accomplished in the work of examination and treatment during 1916. In the Sion Hill area, the majority of the persons who refused to coöperate were residents of Sion Hill village; in the Mesopotamia area those who refused to coöperate lived in two small villages. Elsewhere in these areas the residents coöperated willingly. (See Table 4, page 152.)

TABLE 3: *St. Vincent—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916, by Areas*

	TOTAL		SION HILL		STUBBS		MESOPOTAMIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	4,062	....	1,120	....	1,063	....	1,879	....
2. Cured.....	3,814	81.6	907	81.0	887	88.4	1,520	80.9
3. Removed.....	69	1.5	21	1.9	11	1.0	27	1.4
4. Remaining in Area Uncured....	689	17.0	192	17.1	165	15.5	382	17.7
1) Refused.....	150	8.7	33	2.9	48	4.5	69	8.7
2) Medical Reasons.....	161	4.0	49	4.4	47	4.4	65	3.5
3) Under Treatment.....	378	9.3	110	9.8	70	6.6	198	10.5

**TABLE 4: St. Vincent—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916, by Areas**

	Total	Sion Hill	Stubbs	Mesopotamia
<b>1. Census.....</b>	<b>7,567</b>	<b>1,880</b>	<b>2,362</b>	<b>3,325</b>
<b>2. Examined.....</b>	<b>7,494</b>	<b>1,853</b>	<b>2,346</b>	<b>3,295</b>
<b>3. Not Examined.....</b>	<b>73</b>	<b>27</b>	<b>16</b>	<b>30</b>
1) Removed.....	12	3	4	5
2) Refused.....	53	22	10	21
3) Insane.....	2	2	..	..
4) Died.....	6	..	2	4
<b>4. Found Infected.....</b>	<b>4,062</b>	<b>1,120</b>	<b>1,063</b>	<b>1,879</b>
<b>5. Given First Treatment</b>	<b>3,748</b>	<b>1,030</b>	<b>978</b>	<b>1,740</b>
<b>6. Not Given First Treatment</b>	<b>814</b>	<b>90</b>	<b>85</b>	<b>139</b>
1) Removed.....	46	14	9	23
2) Refused.....	107	27	29	51
3) Medical Reasons ....	161	49	47	65
<b>7. Cured.....</b>	<b>3,314</b>	<b>907</b>	<b>887</b>	<b>1,520</b>
<b>8. Given First Treatment but Not Cured.....</b>	<b>434</b>	<b>123</b>	<b>91</b>	<b>220</b>
1) Removed.....	13	7	2	4
2) Refused.....	43	6	19	18
3) Under Treatment....	378	110	70	198

#### Educational Work

The purpose and scope of the work are explained to the people in handbills and posters distributed throughout each area before the work of examination and treatment begins. Preliminary public lectures also are given in areas having buildings suitable for public assembly. These lectures are illustrated by lantern slides describing the disease. In all of the schools

located in the areas wherein work has been conducted, lectures accompanied by microscopic demonstrations of the ova and embryos have been a feature. Persons who visit the staff headquarters in each area are shown charts and given general information concerning the disease, and opportunity is afforded them to look at the eggs and larvae with the microscope.

Table 5 indicates that in the work up to December 31, 1916, a total of 19 lectures had been delivered to an attendance estimated at 4,162 persons. Eight of the lectures were to the public and eleven to school children.

**TABLE 5: St. Vincent—Intensive Work: Number of Lectures Delivered in Areas Completed from May 1, 1915, to December 31, 1916, with Attendance With Comparison of Figures for Areas Completed During 1915 and 1916**

	Up to December 31, 1916	During 1916	During 1915
<b>1. Total Lectures.....</b>	<b>19</b>	<b>8</b>	<b>11</b>
1) Public.....	8	4	4
2) School.....	11	4	7
<b>2. Attendance at Lectures</b>	<b>4,162</b>	<b>2,160</b>	<b>2,062</b>
1) Public.....	2,750	1,550	1,200
2) School.....	1,412	610	862

The number of lectures delivered in each of the three areas completed during 1916 is shown in detail in Table 6.

**TABLE 6: St. Vincent—Intensive Work: Number of Lectures Delivered in Areas Completed During 1916, with Attendance, by Areas**

	Total	Sion Hill	Stubbs	Mesopotamia
<b>1. Total Lectures.....</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>4</b>
1) Public.....	4	..	2	2
2) School.....	4	1	1	2
<b>2. Attendance at Lectures</b>	<b>2,100</b>	<b>75</b>	<b>1,050</b>	<b>975</b>
1) Public.....	1,550	..	850	700
2) School.....	550	75	200	275

During the year the nurses found that demonstrations with the microscope in the homes of persons who had been unwilling to coöperate in the work were effective in overcoming indifference or opposition. Visits of this kind to the homes of these obdurate persons have therefore become an important factor in the educational work.

#### Sanitary Improvement

The work of the staff employed by the Government in the construction of latrines is still far behind that of the staff engaged in examination and treatment. The aim is to have the sanitary and curative work proceed simultaneously in each area, but the greater part of the sanitary work is not done until after the work of examination and treatment has ended and until the majority of the persons who have been cured have had opportunity to be re-infected. No

compulsion is used in securing sanitary improvement. The Government makes and sells for eighteen cents a fly-proof box to be placed over a pit, and the sanitary staff installs the box for every person who will purchase one and dig a pit.

Table 7 presents a comparison of the number and percentage of homes with latrines when the work of examination and treatment was begun, with the number and percentage when the work ended. In the five areas in which the curative work had been completed up to December 31, 1916, there were 2,255 homes. On the first inspection, made when the work began, latrines were found at 395 homes, or 17.5 per cent of the total, as compared with 905, or 40.1 per cent,

**TABLE 7: St. Vincent—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed from May 1, 1915, to December 31, 1916**

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected....	2,255	....	1,519	....	736	....
2. Homes with Latrines:						
1) First Inspection	395	17.5	809	20.3	86	11.7
2) Last Inspection	905	40.1	456	30.0	449	61.0
3. Homes Provided with New Latrines ...	610	22.6	147	9.7	363	49.3

**TABLE 8: St. Vincent—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed During 1916, by Areas**

	TOTAL		SION HILL		STRUAB <sup>1</sup>		MESOPOTAMIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	1,619	....	306	....	457	....	696	....
2. Homes With Latrines:								
1) First Inspection.....	309	20.3	78	21.3	90	19.7	141	20.3
2) Last Inspection.....	456	30.0	108	29.5	191	41.8	157	22.6
3. Homes Provided With New Latrines.....	147	9.7	30	8.2	101	22.1	16	2.3

<sup>1</sup>Conditions October 31, two months after work of examination and treatment ended.

**TABLE 9: St. Vincent—Intensive Work: Additional Sanitary Improvement Subsequent to the Close of Curative Work, During 1916, by Areas**

AREA	New Latrines Erected	Old Latrines Improved	Homes Remaining Without Latrines	
			No.	Per cent of Homes in Area
Total .....	246	35	992	57.1
Belair.....	159	..	16	7.3
Sion Hill.....	40	18	218	59.6
Stubba.....	47	14	219	47.9
Mesopotamia....	..	3	539	77.4

on the last inspection, made at the close of the work. The number of homes at which latrines were erected during the progress of the work was therefore 510, representing 22.6 per cent of the total. (See Table 7, page 155.)

The figures presented in Table 8 compare the conditions on first and last inspections in the three areas completed during 1916. (See Table 8, page 156.)

This table indicates that during 1916, only 147 new latrines were erected at homes located within the areas of operation while the work of examination and treatment was in progress. However, this does not measure the full extent of sanitary reform accomplished. After the curative work had ended, efforts at sanitary improvement continued in each of the areas, and 246 additional new latrines were erected

and 35 old latrines improved. These figures are exhibited in Table 9. (See Table 9, page 157.)

As this table indicates, on December 31, 1916, there remained, among the total homes in the Belair, Sion Hill, Stubbs, and Mesopotamia areas, 992 homes, or 57.1 per cent, to be provided with latrines. The sanitary work will undoubtedly proceed until latrines have been erected at practically all of these homes.

## TRINIDAD

Measures against hookworm disease in Trinidad are conducted as a department of the Government Medical Service, under the supervision of the Surgeon General. During 1916, the work has been conducted entirely by the intensive plan. From January 1, 1916, to May 19, 1916, Dr. B. E. Washburn continued active direction of the curative work, under the designation of Medical Officer in Charge. From May 19 to the close of the year, Dr. Washburn was on leave of absence, and the work was in the hands of Dr. George C. Payne, who served as Acting Medical Officer in Charge. The staff consists of six clerks, four microscopists, ten nurses, and one caretaker.

Operations were conducted during the year in four adjoining areas: Tunapuna, Tacarigua, Arouca, and Lopinot, all included within the ward union, or borough, of Tacarigua. With the exception of Lopinot, these areas extend eastward for a distance of about six miles along the Government railway, running from Port-of-Spain, the capital, to Sangre Grande. The Lopinot area is located in a range of hills in the northern part of the ward union; on its southern boundary it is contiguous with the Arouca area.

All four areas include, besides one large village from which the area takes its name, a number of smaller villages. Neither the separate villages

nor the areas as a whole, however, form any sort of entity; they are merely a series of villages formerly occupied by free laborers on adjoining sugar estates, which have gradually grown together to form a compact, thickly settled strip along the railway. During the progress of the work in each area, headquarters for the staff were established in the village from which the area took its name. Almost all the inhabitants of the four areas engage in raising cocoa or sugar,—some as laborers on the large estates, the majority on small holdings which they own or lease. About 40 per cent are East Indians, the remainder consisting largely of persons of mixed negro or European blood.

Work was in progress during 1916 in two other areas located further east along the Government railway, but the operations in these areas had not been completed by December 31, 1916. It was also found possible, during the progress of the work in the other areas, to conduct a second campaign in the Tacarigua Orphanage,—a small institution included within the boundaries of the original Tacarigua area, in which about 225 boys and girls under 17 years of age are housed. Special effort has been made to eradicate the disease from this institution.

#### Examination and Treatment

From August 11, 1914, the date on which measures against hookworm disease in Trinidad

were inaugurated, until May 15, 1915, the work was conducted according to the dispensary method. Since the latter date, however, a strictly intensive plan of work has been followed.

Table 1 indicates that the total number of persons examined in all of the work conducted up to December 31, 1916, was 23,651,—13,447 in the areas completed by the intensive method during 1916, and 10,204 in those completed by the dispensary method prior to 1916. Of the total number examined in all of the work to date, 16,148, or 68.3 per cent, were found infected; 13,524, or 83.8 per cent of those infected, were given first treatment; and 7,636—56.5 per cent of those receiving first treatment—were cured. In the table a comparison is given of the results accomplished by the dispensary and intensive methods. (See Table 1, page 162.)

Although intensive work was in progress during seven and one half months in 1915, all results accomplished by this method are assigned to the year 1916, owing to the fact that no area had been completed by this plan of work up to the end of 1915. For the Tunapuna area, in which operations were not brought to a close until April 30, 1916, the figures published in the second annual report have been withdrawn from the year 1915 and re-assigned to 1916.

In the four areas in which operations by the intensive plan had been completed up to December 31, 1916, there was a population of 14,156

**TABLE I: Trinidad—Dispensary and Intensive Work:  
Number of Persons Examined, Found Infected, Given  
First Treatment, and Cured in Areas Completed from  
August 11, 1914, to December 31, 1916**

With Comparison of Figures for Areas Completed During 1916 and  
Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	.....	.....	14,158	.....	.....	.....
2. Examined.....	28,651	.....	18,447	95.0	10,204	.....
3. Found Infected.....	16,148	68.9	10,021	74.5	6,127	60.0
4. Given First Treatment.....	18,524	83.8	8,997	89.8	4,527	73.9
5. Cured.....	7,686	56.5	7,110	79.0	526	11.6

persons, 18,447 of whom, or 95.0 per cent, were examined for hookworm disease. Of those examined, 10,021, or 74.5 per cent, were found infected; and first treatment was administered to 8,997, or 89.8 per cent, of those infected. Re-examination showed that 7,110 persons, representing 79.0 per cent of those receiving first treatment, had been cured. Figures in detail, by areas, are shown in Table 2. (See Table 2, page 163.)

On an average, approximately three of every four persons examined in all four of the areas were found infected. The fact that many of the villages are built on the sites of former sugar

TABLE 2: *Trinidad—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916, by Areas*

	TOTAL		TUNAPUNA		TACARIGUA		AROUCA		LOPINOT		TACARIGUA ORPHANAGE <sup>1</sup>	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	14,156	....	7,428	....	2,623	....	3,260	....	621	....	224	....
2. Examined.....	13,447	95.0	6,885	92.0	2,581	98.4	3,201	98.2	606	97.6	224	100.0
3. Found Infected .....	10,021	74.5	4,898	70.8	2,155	88.5	2,458	76.8	512	84.5	58	25.9
4. Given First Treatment	8,997	69.8	4,819	89.3	1,898	88.1	2,253	91.7	471	92.0	56	96.6
5. Cured.....	7,110	79.0	3,185	73.9	1,597	84.1	1,910	84.8	362	76.9	56	100.0

<sup>1</sup> Second campaign.

estates, which have been heavily infected for many years, is undoubtedly largely responsible for the high rate of infection found. Furthermore, many of the East Indians included in the population of these areas are employed on the nearby sugar estates, where they come in contact with the heavily infected indentured laborers and receive many opportunities to become infected.

The effectiveness of the work in reducing the amount of existing infection is exhibited in Table 3. In the four areas a total of 10,021 persons were originally found infected. Of these, 2,062, or 20.6 per cent, remained in the areas uncured at the close of work. Approximately three fifths of the persons not cured refused to accept or to continue treatment, while about one third could not be treated for medical reasons. (See Table 3, page 165.)

Figures in detail showing the results of examination and treatment in the areas completed during 1916 are exhibited in Table 4. In this table are presented the supporting figures upon which Tables 2 and 3 are based. (See Table 4, page 166.)

#### Educational Work

The first step in conducting educational work in an area is to hold a public meeting for acquainting the people with the nature and scope of the measures to be undertaken against hook-worm disease. This meeting is usually attended

TABLE 3: *Trinidad—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916, by Areas*

	TOTAL		TUNAPUNA		TACARIGUA		AROUCA		LOPINOT		TACARIGUA ORPHANAGE	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	10,021	....	4,838	....	2,155	....	2,458	....	512	....	58	....
2. Cured.....	7,110	71.0	3,185	68.0	1,597	74.1	1,910	77.7	362	70.7	50	96.6
3. Removed.....	849	8.5	626	12.9	69	3.2	136	5.5	16	3.1	2	3.4
4. Remaining in Area Uncured.....	2,062	20.6	1,027	21.1	489	22.7	412	16.8	134	26.2	..	....
1) Not Located...	31	.3	...	...	26	1.2	3	.1	2	.4	..	....
2) Refused.....	1,227	12.2	728	15.0	271	12.6	203	8.5	20	3.9	..	....
3) Medical Reasons	699	7.0	299	6.2	192	8.9	172	7.0	36	7.0	..	....
4) Under Treatment.....	105	1.0	....	....	....	....	29	1.2	76	14.8	..	....

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TABLE 4: *Trinidad—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916, by Areas*

	Total	Tunapuna	Tacarigua	Arouca	Lopinot	Tacarigua Orphanage
<b>1. Census.....</b>	<b>14,156</b>	<b>7,428</b>	<b>2,623</b>	<b>3,260</b>	<b>621</b>	<b>224</b>
<b>2. Examined.....</b>	<b>13,447</b>	<b>6,835</b>	<b>2,581</b>	<b>3,201</b>	<b>606</b>	<b>224</b>
<b>3. Not Examined.....</b>	<b>709</b>	<b>593</b>	<b>42</b>	<b>59</b>	<b>15</b>	<b>..</b>
1) Not Located.....	19	7	9	3	..	..
2) Refused.....	283	158	24	40	11	..
3) Removed.....	446	417	9	16	4	..
4) Died.....	11	11	..	..	..	..
<b>4. Found Infected.....</b>	<b>10,021</b>	<b>4,838</b>	<b>2,155</b>	<b>2,458</b>	<b>512</b>	<b>58</b>
<b>5. Given First Treatment.....</b>	<b>8,997</b>	<b>4,319</b>	<b>1,898</b>	<b>2,253</b>	<b>471</b>	<b>56</b>
<b>6. Not Given First Treatment.....</b>	<b>1,024</b>	<b>519</b>	<b>257</b>	<b>205</b>	<b>41</b>	<b>2</b>
1) Not Located.....	31	..	26	8	2	..
2) Refused.....	192	109	96	37	10	..
3) Medical Reasons.....	569	235	167	141	26	..
4) Removed.....	222	171	26	22	2	1
5) Died.....	10	4	2	2	1	1
<b>7. Cured.....</b>	<b>7,110</b>	<b>3,185</b>	<b>1,597</b>	<b>1,910</b>	<b>362</b>	<b>56</b>
<b>8. Given First Treatment but Not Cured.....</b>	<b>1,887</b>	<b>1,134</b>	<b>301</b>	<b>843</b>	<b>109</b>	<b>..</b>
1) Refused.....	1,095	619	235	171	10	..
2) Medical Reasons.....	180	64	26	31	10	..
3) Removed.....	607	446	38	111	12	..
4) Died.....	10	5	3	1	1	..
5) Under Treatment.....	105	..	..	29	76	..

by dignitaries of church and state, by medical officers and school teachers, by prominent planters, and by other influential persons. Following this meeting, lectures illustrated by charts and magic lantern pictures, and accompanied by microscopic demonstrations, are held in the different schools. An effort is made to have present at some one of these lectures at least one representative of every family in the area. In addition, there are many informal talks in the homes of the people and in the office,—those in the office being illustrated with charts and photographs and accompanied by demonstrations of ova and embryos.

In Table 5 figures are given showing the number of lectures delivered up to December 31, 1916, with the estimated total attendance. (See Table 5, page 168.)

In Table 6 figures representing the extent of educational work during 1916 are shown by areas. (See Table 6, page 169.)

In the Arouca area the practice of giving open-air lectures was inaugurated. Rough drawings on frosted glass, accompanied by local photographs, are used in a revolving lantern purchased especially for these meetings. The screen is hung on the side of a building or suspended from the limb of a tree. By this means it has been found possible to reach and influence large numbers of persons whose coöperation in the work would otherwise have been difficult to obtain.

**TABLE 5: Trinidad—Dispensary and Intensive Work:  
Number of Lectures Delivered from August 11, 1914, to  
December 31, 1916, with Attendance**

With Comparison of Figures for 1916 and Prior to 1916

	Up to December 31, 1916	During 1916	Prior to 1916
<b>1. Total Lectures.....</b>	<b>45</b>	<b>25</b>	<b>20</b>
1) Public.....	31	16	15
2) School.....	14	9	5
<b>2. Attendance at Lec- tures.....</b>	<b>9,745</b>	<b>5,395</b>	<b>4,350</b>
1) Public.....	7,846	4,146	3,700
2) School.....	1,899	1,249	650
<b>3. Special Conferences .....</b>	<b>84</b>	<b>25</b>	<b>9</b>
<b>4. Attendance at Special Conferences .....</b>	<b>620</b>	<b>434</b>	<b>186</b>

In addition to the educational work by lectures, many leaflets and pamphlets are circulated and letters written. Table 7 presents a summary showing, by areas, the pieces of literature distributed in the areas completed during 1916.

**TABLE 7: Trinidad—Intensive Work: Number of Pieces  
of Literature Distributed in Areas Completed During  
1916, by Areas**

	Total	Tunapuna	Tacarigua	Arouca	Lopinot
<b>Total...</b>	<b>5,971</b>	<b>2,629</b>	<b>1,349</b>	<b>1,793</b>	<b>200</b>
Letters.....	1,041	189	279	573	..
Pamphlets.....	80	40	20	20	..
Leaflets.....	4,850	2,400	1,050	1,200	200

**TABLE 6: Trinidad—Intensive Work: Number of Lectures Delivered in Areas Completed During 1916, with Attendance, by Areas**

	Total	Tunapuna	Tacarigua	Arouca	Lopinot	Tacarigua Orphanage
<b>1. Total Lectures.....</b>	<b>25</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>6</b>	<b>1</b>
1) Public.....	16	5	1	5	5	..
2) School.....	9	..	4	3	1	1
<b>2. Attendance at Lectures.....</b>	<b>5,395</b>	<b>2,400</b>	<b>708</b>	<b>1,678</b>	<b>388</b>	<b>221</b>
1) Public.....	4,146	2,400	900	1,098	848	..
2) School.....	1,249	..	408	580	40	221
<b>3. Special Conferences.....</b>	<b>25</b>	<b>7</b>	<b>14</b>	<b>4</b>	<b>..</b>	<b>..</b>
<b>4. Attendance at Special Conferences...</b>	<b>434</b>	<b>132</b>	<b>238</b>	<b>64</b>	<b>..</b>	<b>..</b>

### Sanitary Improvement

In the principal village of each of the areas completed during 1916, sanitary conditions were better than in the average tropical town. In Tunapuna, an ample supply of water from mountain streams is piped along the streets and into some of the houses. The streets are well graded and the village is well drained. When measures against hookworm disease in this village were begun, all but 31 of the homes were found to be provided with satisfactory latrines, and at these 31 homes new latrines have since been built by order of the Government authorities.

In the village of Tacarigua, the water supply comes from the same source as that of Tunapuna; there are excellent roads; and the land is well drained by roadside gutters. In Arouca also the drainage is good, but the people depend for their drinking water upon wells, streams, and rainfall collected from roofs.

Table 8 affords a comparison, for the areas in which operations were completed during 1916, of the number of homes provided with latrines when the work of examination and treatment began, with the number so provided when it ended. It will be seen that of 3,395 homes located within the boundaries of these areas, 2,409, or 71.0 per cent, were found to be provided with latrines on the first inspection. Practically all of these homes with latrines were

included within the boundaries of the principal towns. (See Table 8, page 172.)

Very little progress was made in having new latrines installed at homes where none existed. The table shows that only 2,638 homes, or 77.7 per cent of the total, were provided with latrines when the work of examination and treatment ended. This indicates that during the progress of the work, only 229 additional homes were provided with latrines. In the Arouca area, the latrines at 104 homes fell down or were abandoned between the first and last inspections, so that although 50 homes in this area were provided with new latrines during the progress of the work, the records indicate that the number of homes with latrines was 54 less when the work ended than when it began. If the figures for this area are excluded, the number of additional homes provided with latrine accommodation during the progress of the work was 283, instead of 229.

Until December 31, 1916, the enforcement of laws governing the installation and use of latrines was in the hands of the Surgeon General, who depended upon the wardens for assistance in carrying out his orders. Beginning with the new year, however, the Government has placed entire responsibility for sanitary improvement in the hands of the local authorities, and has given assurance that this work will be pushed with great vigor.

TABLE 8: *Trinidad—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed During 1916, by Areas*

	TOTAL		TUNAPUNA		TACARIGUA		AROUCA		LOPINOT	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	8,895	....	1,827	....	630	....	809	....	129	....
2. Homes with Latrines:										
1) First Inspection.....	2,409	71.0	1,495	81.8	290	46.0	565	69.8	59	45.7
2) Last Inspection.....	2,638	77.7	1,675	91.7	392	62.2	511	68.2	60	46.5
3. Homes Provided with New Latrines	229	6.7	180	9.9	102	16.2	-54	-6.7	1	.8

## COSTA RICA

Operations for the relief and control of hook-worm disease in Costa Rica are conducted by a division of the national Department of Police known as the Department of Ankylostomiasis. Headquarters are in the city of San Jose. Dr. Louis Schapiro, the Director in charge, is assisted in the medical work by a staff consisting of an assistant director, three field directors, four microscopists, and a secretary. Throughout the year 1916, three permanent inspectors have been employed to give attention to sanitary improvement. In August, 1916, four additional temporary inspectors, to be employed locally in the various areas of operation, and three additional local clerks, were authorized. Under the regulations establishing the Department, the provincial governors, the police, and the official physicians are required to aid the work, particularly with regard to sanitation.

The work since its establishment on September 23, 1914, has followed the dispensary plan, though in the later operations there has been an approach to the intensive system in every area where the topography and proximity of the homes would permit. In the latter plan of work, a definite area is selected and an accurate house and resident census taken. At this time containers and identification cards are left, and each person is informed as to the date on which he

should appear at the dispensary for examination and treatment. Frequent visits are made to all the homes, to urge those who have not presented specimens to come to the dispensary, and those who have taken treatment to return for re-examination. After the lapse of a reasonable time, the inspectors or local sanitary police call for specimens and deliver treatments to persons who have not absolutely refused to coöperate.

The Republic is divided into seven provinces and 46 cantons, the canton corresponding to a county in the United States. The canton is usually the unit of operations, though in some cases certain districts within the cantons are selected and worked as units in themselves. Exclusive of the laboratory and dispensary maintained in the city of San Jose, where work has been in progress since March 1, 1915, operations were conducted during 1916 in 12 areas located in four provinces of the Republic. In three of these areas, the work remained in progress on December 31, 1916; for this reason the figures for these areas are excluded from this report. The areas in which the work was completed are listed in Table 3, page 178. To certain of these areas—among them Canas, Santa Cruz, and Liberia—it is proposed later to return, the unusually heavy rains during the summer having interfered with the work to such an extent that the operations in them could not be brought to a successful conclusion.

## Examination and Treatment

The total population of the areas completed from the inauguration of the work in Costa Rica on September 23, 1914, up to December 31, 1916, was 90,707. The number of persons examined was 70,876, or 78.1 per cent of the population; and 42,009, or 59.3 per cent of those examined, were found infected. First treatment was administered to 40,853 persons,—97.2 per cent of those infected; and 7,628—18.7 per cent of those receiving first treatment—were cured. These figures are shown in Table 1, which also presents separately the results accomplished in the areas completed during 1915 and 1916.<sup>1</sup>

TABLE 1: *Costa Rica—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from September 23, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	Up to DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	90,707	....	46,114	....	44,593	....
2. Examined.....	70,876	78.1	40,579	88.0	30,297	67.9
3. Found Infected .....	42,009	59.3	22,808	55.7	19,401	64.0
4. Given First Treatment.....	40,853	97.2	22,037	97.5	18,816	97.0
5. Cured.....	7,628	18.7	5,606	25.7	1,962	10.4

<sup>1</sup> No areas were completed during 1914.

Included in the above statistics are the results accomplished at the Central Office during the period from March 1, 1915, to December 31, 1916. Here the dispensary is in constant operation, the work is conducted on a basis different from that in the field, and the figures are not strictly comparable with those for the field dispensaries. Table 2, therefore, presents separately the results in the field and at the Central Office during the entire period of work. In all tables in this chapter the figures for the central office at San Jose have been assigned entirely to the year 1916, owing to the difficulty, under the present system of reporting, of separating these figures by years.

TABLE 2: *Costa Rica—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from September 23, 1914, to December 31, 1916*

With Comparison of Figures for Field Dispensaries and Central Office

	TOTAL		FIELD DIS-PENSARIES		CENTRAL OFFICE	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	90,707	....	74,412	....	16,295	....
2. Examined.....	70,876	78.1	54,581	73.3	16,295	....
3. Found Infected .....	42,009	59.3	37,119	68.0	4,890	30.0
4. Given First Treatment.....	40,853	97.2	36,210	97.6	4,643	94.9
5. Cured.....	7,628	18.7	6,213	17.2	1,415	30.5

Table 3 presents information showing in detail, by provinces and cantons, the number of

persons enumerated in the census, examined, found infected, given first treatment, and cured in the areas completed during 1916. In this table are included the figures for the Central Office as well as the field dispensaries. (See Table 3, page 178.)

It should be pointed out that the figures now reported for 1915 are not consistent with those published in the annual report for that year. During 1916, the records in Costa Rica were thoroughly revised, the results accomplished in each area were re-assigned to the year during which the work in the area was completed, and figures for all work remaining uncompleted at the end of 1916 were excluded. New figures have also been furnished to show the number of persons examined and found infected; in earlier reports, the figures for examinations had related to the number of specimens.

#### Educational Work

In each district within the areas of operation at least two lectures are given, one to the public and the other to school children. These lectures are followed by house talks and conferences at the dispensary. The house talks have been found to afford the best medium for keeping in touch with the people and maintaining their interest in the work. On every visit to a district the director and assistant direc-

TABLE 3: Costa Rica—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916, by Provinces and Cantons

PROVINCE AND CANTON	Census	Examined	Found Infected	Given First Treatment	Cured
Total.....	46,114	40,579	22,608	22,637	5,666
Provinces:					
Alajuela.....	4,370	3,477	1,967	1,960	70
Cartago.....	7,158	7,408	4,810	4,573	1,772
Guanacaste.....	11,967	8,786	6,900	6,882	1,503
San Jose.....	22,619	20,958	8,931	8,682	2,321
Alajuela:					
Alfaro Ruiz.....	1,552	1,433	225	219	19
San Carlos.....	2,818	2,044	1,742	1,731	51
Cartago:					
Paraiso.....	5,876	6,181	3,888	2,596	1,063
Turrialba (Dist. of Tuis).....	1,282	1,227	977	977	709
Guanacaste:					
Bagaces.....	1,685	1,291	1,001	996	247
Canas.....	3,856	3,295	2,780	2,752	749
Liberia.....	2,756	2,586	1,729	1,699	417
Santa Cruz.....	3,770	1,564	1,390	1,386	90
San Jose:					
Acosta.....	6,924	4,063	4,041	4,039	906
Central Office.....	16,295	16,295	4,890	4,643	1,415

tor call on the members of the school board, municipal and police officials, and other officials, and endeavor to enlist their support in the work.

Up to December 31, 1916, Table 4 shows that 614 public and school lectures had been delivered to a total attendance estimated at 37,416. There were also 11,489 special conferences at which an estimated total of 110,040 persons were present.

**TABLE 4: Costa Rica—Dispensary Work: Number of Lectures and Conferences Held in Areas Completed from September 23, 1914, to December 31, 1916, with Attendance**

With Comparison of Figures for Areas Completed During 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
<b>1. Total Lectures.....</b>	<b>614</b>	<b>196</b>	<b>418</b>
1) Public.....	157	79	78
2) School.....	457	117	340
<b>2. Attendance at Lec- tures.....</b>	<b>37,416</b>	<b>17,955</b>	<b>19,461</b>
1) Public.....	19,981	11,873	8,108
2) School.....	17,435	6,082	11,353
<b>3. Special Conferences.....</b>	<b>11,489</b>	<b>6,710</b>	<b>4,779</b>
<b>4. Attendance at Special Conferences.....</b>	<b>110,040</b>	<b>61,290</b>	<b>48,750</b>

The work receives further publicity through pamphlets and leaflets which explain in simple terms the facts about the disease, give informa-

tion as to the method to be followed in taking treatment, and tell how sanitary latrines may be constructed. Notices concerning the laboratory work are also widely distributed. When a laboratory is to be opened in a new district, circular letters are mailed to the local authorities, the church officials, and prominent citizens requesting their aid in the work.

Table 5 indicates that up to December 31, 1916, a total of 143,315 pieces of literature had been distributed, of which 18,053 were booklets and 75,196 were leaflets.

*TABLE 5: Costa Rica—Dispensary Work: Number of Pieces of Literature Distributed from September 23, 1914, to December 31, 1916, by Classes*

CLASS OF LITERATURE	Up to December 31, 1916
Total.....	113,315
Booklets.....	18,053
Leaflets.....	75,196
Notices.....	31,716
Newspaper Publicity.....	368
Letters.....	3,248
Unclassified.....	14,734

Recently the high schools and colleges and the normal school of the Republic incorporated into their curricula a course on sanitary science and hygiene. Two hours weekly during the second and third years, and four hours weekly during the fourth year, will be devoted to this course. For the past one and one half years, weekly

lessons on hookworm disease and personal hygiene have been given in the primary schools. Once a month the parents are invited to these lectures. From certain of the schools reports have been received that the lectures have been influential in diminishing the amount of sickness among the pupils.

#### Sanitary Improvement

Costa Rica has a law, enacted in 1915, which makes it obligatory for every home to be provided with a latrine of a type approved by the Department of Ankylostomiasis. In centers of population such as the canton capitals, it is possible, by invoking the aid of the authorities, to have latrines installed and used; but in the rural districts a large staff of inspectors would be required to secure this result. In these districts, therefore, the educational work and the influence and coöperation of the public authorities are relied upon to convince the householders of the need of sanitary betterment.

Table 6 indicates that in the areas completed up to December 31, 1916, there were 9,446 homes. On the first inspection, 1,273 of these, or 13.5 per cent, were found to be provided with latrines, as compared with 4,347, or 46.0 per cent, on the last inspection. During the progress of the work, latrines were constructed at 3,074 homes, representing 32.5 per cent of the total. (See Table 6, page 182.)

**TABLE 6: Costa Rica—Dispensary Work: Homes Provided with Latrine Accommodation in Areas Completed from September 23, 1914, to December 31, 1916**

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected....	9,446	....	4,352	....	5,094	....
2. Homes with Latrines:						
1) First Inspection.	1,273	19.5	640	14.7	633	12.4
2) Last Inspection..	4,847	46.0	1,874	43.1	2,478	48.5
3. Homes Provided with New Latrines.....	3,074	32.5	1,294	28.4	1,840	36.1

Figures showing in detail, by provinces and cantons, the results of latrine building during 1916 are presented in Table 7. (See Table 7, page 183.)

In Turrialba and Escasur<sup>1</sup> the authorities have employed a local sanitary inspector to supervise the construction of latrines and to help in the routine work of the laboratory. After the laboratories have left these districts, the inspectors will remain to continue the work of sanitary improvement. In the former district, there are one large sugar and four large coffee estates. The owners of three of the coffee estates have built latrines for their laborers, and two have ordered off their estates all who would not be examined or who would not be treated and cured if found infected.

<sup>1</sup>Work in this district remained in progress on December 31, 1916.

**TABLE 7: Costa Rica—Dispensary Work: Homes Provided with Latrine Accommodation in Areas Completed During 1916, by Provinces and Cantons**

PROVINCE AND CANTON	Homes Inspected	HOMES WITH LATRINES		Homes Provided with New Latrines
		First Inspection	Last Inspection	
Total.....	4,352	640	1,874	1,234
Provinces:				
Alajuela.....	398	51	154	103
Cartago.....	1,319	127	554	427
Guanacaste.....	2,020	448	757	309
San Jose.....	615	14	409	395
Alajuela:				
Alfaro Ruiz.....	248	28	77	51
San Carlos.....	150	25	77	52
Cartago:				
Paraiso.....	1,053	110	474	364
Turrialba (Dist. of Tuis).....	266	17	80	63
Guanacaste:				
Bagaces.....	289	16	131	115
Canas.....	659	102	197	95
Liberia.....	397	269	355	86
Santa Cruz.....	675	61	74	13
San Jose:				
Acosta.....	615	14	409	395

Provision for three additional sanitary inspectors to work under the direction of the Department of Ankylostomiasis was included in the budget of the Minister of Police for 1917, which has been approved by the National Congress. These men will become available later for appointment to municipalities which may desire to employ permanent sanitary inspectors. The municipality of the Canton of Moras, furthermore, has appropriated twenty colones to be

used in constructing latrines for six poor families living in the district of Piedras Negras. This is the first municipality in Costa Rica to incur such an expenditure.

## GUATEMALA

The work for the relief and control of hook-worm disease in Guatemala is conducted under the direction of the Department of Uncinariasis, which is a division of the National Board of Health. On June 28, 1916, Dr. Alvin M. Struse succeeded Dr. Walter H. Rowan as Director of this department. The working staff is composed of an assistant medical director, eight technical assistants, and two clerks. Headquarters are in Guatemala City.

The work of the year 1916 has been marked by closer association with the national Government, and by increased coöperation and support on the part of the Faculty of Medicine, the National Board of Health, and the physicians of the Republic. By presidential decree the installation of latrines on all plantations, and at all schools, residences, and other buildings, was made compulsory. An official order also provides that soldiers and all pupils in the public schools shall be examined for hookworm disease, and that instruction in hygiene and public health shall be given in the schools. Governors and mayors are obligated to assist the work in all its phases.

Activities follow the dispensary plan, though in the latter part of the year effort was made to put the work on a strictly intensive basis. Plantations, or fincas, are the unit of operations.

Almost all are coffee estates, though there are a few on which sugar is raised. On the finca, conditions are peculiarly favorable for effective work against the disease: the population is concentrated within small areas, there is usually a high percentage of infection, and considerable control may be exercised over the patients while they are being examined and treated.

The medical assistant visits the different fincas on invitation from the owners and arranges for the work. One or two technical assistants are then assigned to each finca, or to a finca which serves as a base from which to conduct work on other estates in the vicinity. In their work on the estates, the technical assistants take a census, distribute containers, examine specimens, and dispense treatment.

In the work to date, approximately 9,218 of the 48,290 square miles of the country have been covered. More than four fifths of the territory covered lies in the plateau region in the southern part of Guatemala, a short distance inland from the Pacific coast. The other region is located in the department of Alta Verapaz, a rich finca section in the central part of the Republic. As a whole, the country is mountainous, except along the coastal plains on the Atlantic and Pacific sides and in the extreme northern department of El Peten. The soil is rocky and sandy; there are both wet and dry seasons; and there are marked extremes of temperature.

The estate laborers, mostly Indians, are illiterate, unsanitary in their mode of life, and in the majority of cases present severe clinical symptoms of the disease. It has not been difficult to persuade them to take treatment. The town inhabitants are more intelligent and have shown a ready willingness to coöperate in the work.

#### Examination and Treatment

Up to December 31, 1916, operations had been conducted on 294 fincas and in two towns. The total population of these fincas and towns, as enumerated by the staff, was 70,176. Of this total population, Table 1 indicates that 65,183, or 92.9 per cent, were examined for hookworm disease; and 41,666, or 63.9 per cent of those examined, found infected. First treatment was administered to 39,744, or 95.4 per cent of those infected; and 10,475, or 26.4 per cent of those receiving first treatment, were found negative on microscopic re-examination. The results during 1915 and 1916 are exhibited separately in the table. (See Table 1, page 188.)

Although the table indicates that the infection for the country is between 60 and 70 per cent, there are regions of low elevation, with sandy soil and a hot and moist climate, in which the infection is between 80 and 90 per cent. The zone of heaviest infection lies in the departments of Retalhuleu, Suchitepequez, and Es-

**TABLE 1: *Guatemala—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from March 15, 1915, to December 31, 1916***

With Comparison of Figures for 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	70,176	....	42,086	....	28,090	....
2. Examined.....	65,189	92.9	39,596	94.1	25,587	91.1
3. Found Infected .....	41,666	63.9	26,865	67.8	15,001	58.6
4. Given First Treat- ment.....	39,744	95.4	25,961	97.4	18,783	91.9
5. Cured.....	10,475	26.4	10,475	40.3	.... <sup>1</sup>	....

cuintla, on both sides of the railroad running from Guatemala City to Ayutla.

Table 2 presents figures by departments covering the results of examination and treatment during 1916. (See Table 2, page 189.)

The figures in Tables 1 and 2 include 433 persons examined and 35 persons treated in Guatemala City. Here the infection is very light, and the work has been largely confined to the inmates of the General Hospital and to the poor. During the third quarter of 1916, a laboratory was established at the central office and placed at the disposal of the medical profession for the examination of specimens. Technical assistants in the field are also encouraged to send

<sup>1</sup> Not reported.

**TABLE 2: Guatemala—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured During 1916, by Departments**

DEPARTMENT	Census	Examined	Found Infected	Given First Treatment	Cured
Total.....	42,086	39,596	26,665	25,961	10,475
Alta Verapaz.....	9,168	7,495	5,149	6,061	.....
Amatitlan.....	369	366	128	128	.....
Escuintla.....	270	266	205	201	.....
Quetzaltenango.....	1,320	1,302	793	726	.....
Retalhuleu.....	2,443	2,439	2,012	1,957	.....
San Marcos.....	1,379	1,359	676	676	.....
Solola.....	17,498	16,824	10,824	10,476	.....
Suchitepequez.....	9,367	9,340	6,916	6,714	.....
Central Office.....	277	205	22	22	.....

to the central laboratory any interesting specimens, or specimens concerning which they are in doubt.

A large part of the difference between the number of persons included in the census and the number examined represents the wandering element of the population. This is a class difficult to control. Its members seem to originate from various centers which can be named, and it is hoped that eventually, when thorough work in these centers is undertaken, it will be possible to treat these persons until they have been cured.

#### Educational Work

On every finca at least one lecture is delivered to the Indian laborers. The lantern slides and charts accompanying the lecture always interest the natives, even though they may not understand the language used by the speaker. Visitors are welcomed at the laboratories, and informal conferences and talks are held daily at the dispensaries and in the homes of the people. Table 3 indicates that up to December 31, 1916, 985 public and 18 school lectures had been delivered to a total of 49,287 persons. (See Table 3, page 191.)

Since the beginning of the work, 11,754 pieces of literature have been distributed, of which 4,630 pieces were distributed during 1916. This includes bulletins, posters, charts, and letters.

A special bulletin addressed to finca owners discusses the disease from an economic standpoint.

**TABLE 3: *Guatemala—Dispensary Work: Number of Lectures and Conferences Held from March 15, 1915, to December 31, 1916, with Attendance***

With Comparison of Figures for 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
<b>1. Total Lectures.....</b>	<b>1,003</b>	<b>536</b>	<b>467</b>
1) Public.....	985	536	449
2) School.....	18	....	18
<b>2. Attendance at Lec- tures.....</b>	<b>49,287</b>	<b>26,987</b>	<b>22,300</b>
1) Public.....	48,987	26,987	22,000
2) School.....	300	....	300
<b>3. Special Conferences.....</b>	<b>13,776</b>	<b>6,253</b>	<b>5,523</b>
<b>4. Attendance at Special Conferences.....</b>	<b>47,949</b>	<b>23,949</b>	<b>24,000</b>

#### Sanitary Improvement

The decree signed by the President during 1916 makes the construction of latrines obligatory, but the Department in conducting its work has preferred to exercise no authority. Rather, it has sought to stimulate interest to a point where voluntary coöperation could be secured. The initial survey of the fincas and towns in which work had been conducted up to December 31, 1916, showed, for a population of 70,176 persons, only 576 latrines in use. By far

the greater number of these accommodated the families of finca owners and officials. For the laborers almost no accommodation was provided.

In conference with the finca owners the wisdom of preventing soil pollution on their estates is pointed out, and their duty to provide adequate latrine accommodation for their laborers is suggested. The records show that in the course of the work on their estates, 2,694 new latrines were erected. Each latrine is usually placed at the end of a row of laborers' houses and accommodates about twenty persons. The total number of persons accommodated by the new latrines erected is approximately 47,836, or about three fourths of the total population. During 1916 alone, 1,646 new latrines were installed for the accommodation of 35,260 persons. These figures are exhibited in Table 4, which presents separately the results accomplished during 1915 and 1916.

TABLE 4: *Guatemala—Dispensary Work: Number of New Latrines Erected from March 15, 1915, to December 31, 1916*

With Comparison of Figures for 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
1. Total Latrines Found..	576	391	185
2. New Latrines Erected.	2,694	1,646	1,048
3. Persons Accommodated by New Latrines....	47,836	35,260	12,576

The figures in this table do not represent the total results accomplished in sanitary reform. During the work on the fincas, a general disease census is made; the water supply is investigated and, if necessary, suggestions for improving it are given; and effort is made to develop a public sentiment favorable to sanitary measures. Moreover, large numbers of latrines are built on some of the estates after the work of examination and treatment has ended. Figures for this work are not reported to the Department of Uncinariasis and consequently cannot be included in the record.

The indifference or active opposition of a few owners has retarded or prevented the construction of latrines on some of the estates. This is mainly responsible for the fact that, for the area of operations as a whole, the number of persons provided with latrine accommodation is not sufficient when considered in relation to the census. This difficulty may be obviated in the future under the authority conferred by the President's decree.

### NICARAGUA

Measures against hookworm disease in Nicaragua are conducted by the Department of Uncinariasis, which was created in 1915 by presidential decree. During 1916, this Department remained under the direction of Dr. D. M. Molloy, aided by an assistant medical director and a staff consisting of three field directors, six technical assistants, and a secretary.

Operations follow the dispensary plan, although in some areas certain features of the intensive method have been introduced. Headquarters are in the city of Managua, where a central laboratory is maintained. Three dispensaries operate in the field. The unit of work is the town or municipality, within the jurisdiction of which certain surrounding territory is included. Effort is made to extend the work to the entire population embraced in each jurisdiction. During 1916, practically no work was done on coffee or sugar plantations.

On the Pacific side of Nicaragua, a chain of volcanic peaks runs parallel to the coast line a short distance inland, forming a great central basin and plateau region. The seven departments embraced in this territory, although comprising only one fourth the total area of the country, contain nearly 90 per cent of the inhabitants. The work, since its beginning on October 1, 1915, has been confined to the portion of this

region extending from the Gulf of Fonseca on the north to the northwestern part of Lake Nicaragua on the south.

The inhabitants of this area depend upon agriculture, trades, and commerce for their subsistence. They live almost entirely in towns, villages, or hamlets,—the majority in towns of considerable size. Relatively few people live permanently on the plantations. Almost all land is owned by large holders, the agricultural class cultivating the land as small tenants or wage-hands. Persons of mixed Indian and European descent, known racially as Mestizos, constitute about 80 per cent of the population. Full-blooded Indians, negroes, or whites are not numerous.

#### Examination and Treatment

In the areas in which work was conducted from October 1, 1915, to December 31, 1916, 31,570 persons were examined for hookworm disease, of whom 19,199, or 60.8 per cent, were found infected. First treatment was administered to 17,084, or 89.0 per cent of those infected. These figures are exhibited in Table 1, which presents separately the results during 1916 and during the period of three months in which operations were conducted during 1915. (See Table 1, page 196.)

In this table the percentage of infection for the work to date (60.8) does not indicate

**TABLE 1: Nicaragua—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from October 1, 1915, to December 31, 1916**  
**With Comparison of Figures for 1915 and 1916**

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	31,570	....	26,141	....	5,429	....
2. Found Infected.....	19,199	60.8	16,518	63.2	2,681	49.4
3. Given First Treatment.....	17,084	89.0	15,473	93.7	1,611	60.1

the proportion of persons infected with hook-worm disease in the rural districts. The figures given include the examinations made at the central office at Managua, among residents of that city, inmates of the penitentiary, and recruits in barracks. The infection for the entire country, exclusive of the larger cities, is approximately 73 per cent.

Beginning with the second quarter, 1916, the free use of the laboratory at the central office was tendered to the medical profession of Nicaragua for the examination of feces. Mailing-case containers are sent to every physician who desires to avail himself of the privilege, and the results of the examination are recorded on cards sent in sealed envelopes. This service has done much to gain the good will of the physicians, from many of whom specimens are now regularly received.

### Educational Work

Every one within the areas under operation is afforded an opportunity to hear the illustrated lectures; talks are given in all the schools; and informal lectures and demonstrations are held daily at the dispensaries. The parish priests usually aid the work by advising the people to coöperate, and local physicians sometimes lend their support by speaking at the public meetings.

Table 2 presents information showing the number of lectures and conferences delivered up to December 31, 1916, with figures showing the total attendance.

*TABLE 2: Nicaragua—Dispensary Work: Number of Lectures and Conferences Held from October 1, 1915, to December 31, 1916, with Attendance*

	Total for 1916 <sup>1</sup>
1. Total Lectures.....	54
1) Public .....	31
2) School.....	23
2. Attendance at Lectures.....	11,907
1) Public.....	8,775
2) School.....	3,132
3. Personal Conferences.....	5,056
4. Attendance at Personal Conferences.....	38,664

Leaflets and pamphlets have been freely distributed, and supplementary sheets added to

<sup>1</sup> No figures reported for 1915.

newspapers have been of great importance in spreading a knowledge of the work. These newspaper supplements, printed by the Government printing office on the regular newspaper page, are profusely illustrated and tell in detail the story of the disease. They have been distributed to the extent of 10,400 copies by seven of the leading newspapers in Nicaragua. In each case the newspaper has commented editorially on the importance of the supplement.

Figures in detail covering the distribution of literature up to December 31, 1916, are presented in Table 3.

TABLE 3: *Nicaragua—Dispensary Work: Number of Pieces of Literature Distributed from October 1, 1915, to December 31, 1916, by Classes*

CLASS OF LITERATURE	Total for 1916 <sup>1</sup>
<b>Total.....</b>	<b>47,754</b>
Pamphlets.....	32,750
Posters.....	8,504
Notices and Dodgers.....	6,500

#### Sanitary Improvement

In the towns of Nicaragua the poorer class of inhabitants, representing at least 90 per cent of the population, live in huts with dirt floors, often humid or muddy during the rainy season. These huts are usually surrounded by large yards, in which soil pollution reaches its maximum.

<sup>1</sup>No figures reported for 1915.

Among the middle class of inhabitants, approximately one half of the homes are provided with latrines. In many cases commodes are used, the contents of which are either dumped into the latrines, or, in the absence of latrines, into the street. The upper class of people, though relatively few in number, all have toilet accommodations, usually of the flush type.

On the sugar and coffee plantations during the few weeks of the harvesting season, large numbers of laborers are housed in barracks where almost no attention is paid to sanitation. With few exceptions, little or no effort is made to protect the health of the great mass of nomadic laborers during their temporary residence on the plantations.

Little progress was made during 1916 in improving these conditions. Only 246 new latrines were installed, which, added to the 20 reported in 1915, makes a total of 266 to date. The principal reason for the poor showing in this phase of the work is that there are no general sanitary laws compelling the people to install and use latrines. A bill now pending in the national Congress offers much encouragement, but until it is passed no definite improvement in sanitation can be expected.

**PANAMA**

During 1916, measures against hookworm disease in the Republic of Panama continued to be conducted by the Department of Uncinariasis, a division of the national Department of Public Works. The work received further official recognition on December 27, 1916, when the Director of the Department of Uncinariasis was made, *ex-officio*, an honorary member of the National Board of Health. On January 15, 1916, Dr. W. T. Burres succeeded Dr. L. W. Hackett as Director in charge.

The work follows the dispensary plan, with four dispensaries in constant operation: one at the central office in Panama City and three in the field. The working staff during 1916 consisted of the Assistant Director, a secretary, three technical assistants, eight microscopists, and a porter.

The Republic, with an area of 32,380 square miles, is divided into eight provinces, which are sub-divided into districts, corresponding to counties in the United States. These districts, often of considerable size, average 531 square miles in area, and constitute the unit of operations. A period of from three to six months is devoted to the work in each district. The bulk of the population consists of morenos, or natives of mixed Spanish and Indian blood, though there are large numbers of full-blooded Indians and ne-

groes, the latter being especially numerous in the Canal Zone.

In the period extending from July 15, 1914, the date on which the work against hookworm disease was undertaken in Panama, to December 31, 1916, operations had been conducted in six provinces and twenty-five districts of the Republic, including approximately two fifths of the total population of the country. Excluding the central office in Panama City, work had been completed up to December 31, 1916, in all but one of these districts. Since February, 1916, activities have been confined to the section of the country lying west of the Canal and south of the central mountain range, where the population is dense and a heavy infection exists.

#### **Examination and Treatment**

From the date of opening work on July 15, 1914, up to December 31, 1916, 60,425 persons had been microscopically examined for hookworm disease in Panama, and 43,990, or 72.8 per cent, had been found infected. First treatment was administered to 41,227, representing 93.7 per cent of the infected. Table 1 presents these figures in tabular form, and offers a comparison of the results during 1916 with those during the period of approximately eighteen months prior to 1916. (See Table 1, page 202.)

In the work conducted during the year 1916, as the table shows, 30,094 persons were examined,

**TABLE 1: Panama—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from July 15, 1914, to December 31, 1916**

With Comparison of Figures for 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	60,425	....	30,094	....	30,331	....
2. Found Infected .....	43,990	72.8	24,193	80.4	19,797	65.3
3. Given First Treat- ment.....	41,227	93.7	23,747	98.2	17,480	88.3

of whom 24,193, or 80.4 per cent, were found infected, and 23,747, or 98.2 per cent of those infected, were treated. The figures for 1916 are presented in Table 2 by provinces and districts. In the provinces and districts where the number of persons given first treatment exceeds the number found infected, the excess is due to first treatment having been given during 1916 to many persons who had been examined and found infected during 1915. (See Table 2, page 203.)

The 30,094 persons examined during 1916 represented approximately 86 per cent of the total population of the districts in which work was conducted, including the inhabitants of sparsely settled and remote mountain regions. The higher percentage of infection found during 1916 may be explained in part by a more careful technique of examination having been followed,

TABLE 2: *Panama—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment During 1916, by Provinces and Districts*

PROVINCE AND DISTRICT	Examined	Found Infected	Given First Treatment
Total.....	30,094	24,193	23,747
<b>Provinces:</b>			
Panama.....	1,281	429	484
Colon.....	529	494	598
Herrera.....	7,979	6,803	6,969
Chiriqui.....	10,488	9,124	7,880
Cocle.....	9,817	7,843	7,866
Panama:			
Panama.....	1,281	429	484
Colon:			
Donoso.....	529	494	598
Herrera:			
Chitre.....	698	588	806
Las Minas.....	1,505	1,285	1,264
Los Pozos.....	1,550	1,375	1,398
Ocu.....	2,910	2,502	2,465
Santa Maria.....	1,816	1,058	1,036
Chiriqui:			
David.....	4,625	3,457	2,909
Alanje.....	4,180	4,082	3,549
Bugaba.....	1,683	1,635	1,422
Cocle:			
La Pintada.....	120	116	800
Anton.....	4,981	3,684	3,561
Aguadulce.....	4,716	3,643	3,505

but more largely by the work having been conducted in towns such as Divala, Alanje, and La Pintada, where the proportion of the population infected with hookworm disease greatly exceeds the average for the country.

Although the table indicates that in Panama City, 1,281 persons were examined and 429, or 33.5 per cent, found infected, hookworm disease practically does not exist among the actual

residents of this city, owing to thorough sanitation and the universal use of shoes. The persons found infected in the work at the central office are nearly always visitors from the Interior, or local residents who have become infected during vacation or other periods spent out of town.

The most important development of the year's work was the increase in the number of re-examinations made and re-treatments administered. During 1916 the staff succeeded in administering at least two treatments to 88 per cent of the infected, as compared with 58 per cent in the period prior to 1916. This increased thoroughness is clearly reflected in Table 3, which compares the number of persons re-examined, re-treated, and cured during 1916 with the number during 1914-1915.

*TABLE 3: Panama—Dispensary Work: Number of Persons Found Infected, Given Two or More Treatments, Re-examined, and Cured from July 15, 1914, to December 31, 1916*

With Comparison of Figures for 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Persons Found Infected.....	43,990	....	24,193	....	19,797	....
2. Given Two or More Treatments	32,747	74.4	21,340	88.2	11,407	57.6
3. Re-examined.....	13,657	41.7	11,046	51.8	2,612	22.9
4. Cured.....	7,089	61.5	5,512	49.9	1,527	58.5

### Educational Work

In each area in which work has been conducted, measures for educating the people along the lines of public health and sanitation play an important part. By public and private lectures, by conferences at the dispensaries, and by demonstrations and talks to school children, the purpose and scope of the work are explained.

Table 4 indicates that from July 15, 1914, up to December 31, 1916, three hundred formal lectures had been delivered to a total attendance estimated at 15,847 persons. This is exclusive of 12,979 personal conferences, at which 39,990 persons were present.

**TABLE 4: Panama—Dispensary Work: Number of Lectures Delivered and Conferences Held from July 15, 1914, to December 31, 1916, with Attendance**

With Comparison of Figures for 1916 and Prior to 1916

	Up to December 31, 1916	During 1916	Prior to 1916
<b>1. Total Lectures.....</b>	<b>300</b>	<b>97</b>	<b>203</b>
1) School.....	120	40	80
2) Public.....	180	57	123
<b>2. Attendance at Lectures...</b>	<b>15,847</b>	<b>6,381</b>	<b>9,466</b>
1) School.....	6,536	1,226	5,310
2) Public.....	9,311	5,155	4,156
<b>3. Personal Conferences.....</b>	<b>12,979</b>	<b>7,652</b>	<b>5,327</b>
<b>4. Attendance at Personal Conferences.....</b>	<b>39,990</b>	<b>22,400</b>	<b>17,590</b>

Letters have also been written, and posters, booklets, and leaflets distributed in all areas in which the work has been conducted. In Table 5 figures are presented showing the number of pieces of literature distributed in the work up to December 31, 1916.

**TABLE 5: Panama—Dispensary Work: Number of Pieces of Literature Distributed from July 15, 1914, to December 31, 1916**

With Comparison of Figures for 1916 and Prior to 1916

CLASS OF LITERATURE	Up to December 31, 1916	During 1916	Prior to 1916
Total.....	20,168	8,458	11,710
Letters .....	460	126	334
Posters .....	1,807	398	1,409
Booklets.....	1,019	772	247
Leaflets.....	16,882	7,162	9,720

#### Sanitary Improvement

While excellent results have been accomplished in the clinical and educational work, efforts to achieve concrete results in sanitary reform have thus far been unsuccessful. A few latrines have been constructed for demonstration purposes, but there are no effective laws requiring the construction of latrines, the Government has been unable to give financial assistance to the work, and it is extremely difficult to enlist the voluntary coöperation of any considerable number of the inhabitants. The attitude of the people is frequently that of actual

opposition, and in some sections even the physicians are opposed to latrines for the reason that the few that have been used in the past have been insanitary and a menace to health.

In many parts of the country the problem would be unusually difficult even if the people were in sympathy with the idea. There are large areas of lowland, in which during the rainy season the latrines would become flooded. The basic problem in these sections is one of drainage rather than of latrine construction. In certain of the larger towns the Government proposes to install septic tank systems, but these are beyond the means of smaller communities. In the absence of effective Governmental supervision, pail latrines would unquestionably be neglected.

Where the topography of the country is favorable, pit latrines are easily constructed, and prove satisfactory in use. In such sections the staff will re-double its efforts during 1917 and endeavor to obtain permanent results in the improvement of sanitation. The President has been urged to strengthen the sanitary side of the work by issuing a decree requiring the construction and use of latrines, and it is also hoped that funds will shortly become available for erecting, at schools and houses favorably situated, latrines which may serve as models to the rest of the community.

### SALVADOR

On October 25, 1915, the Republic of Salvador, through its legation at Washington, extended the International Health Board an invitation to participate in measures for the relief and control of hookworm disease in that country. Acting on this invitation, Dr. John A. Ferrell, the Assistant Director General of the Board, accompanied by Dr. W. H. Rowan, at that time the Director of the work in Guatemala, visited Salvador in November, 1915. After a series of conferences with the President and members of his cabinet, and with members of the National Board of Health, a Department of Uncinariasis was organized as a bureau of the National Board of Health, and arrangements were made for undertaking operations. Headquarters were established in the city of San Salvador. Actual work was begun on March 6, 1916, under the temporary supervision of Dr. Rowan. On May 15, 1916, Dr. C. A. Bailey, who had been appointed to direct the work, arrived and assumed active charge of operations.

Both the dispensary and intensive plans of work have been followed. A town or an estate is the unit of operations. Here the intensive method is applied. Persons who come to the laboratory from districts surrounding the towns and estates are examined and treated by the dispensary method. In the reports, however, the

results accomplished by the respective methods have not been shown separately, so that for the present the entire work in Salvador is classed as being of the dispensary type. The working staff consists of an assistant director, nine microscopists (four of whom are medical students, designated assistant field directors), and one secretary.

To date the work has been confined to the department, or state, of San Salvador. At the suggestion of the central Government, activities were inaugurated in the capital city among the soldiers and government employes, and in the schools and public institutions. The first field laboratory was opened in August in the town of Apopa; by the end of the year there were five field laboratories in operation. The work in Apopa was concluded in December. This was the only field area in which operations had been concluded by the end of the year.

#### Examination and Treatment

The total population of the districts in which work had been conducted up to December 31, 1916, was 11,727. As will be seen from Table 1, 9,975, or 85.1 per cent, of these persons were examined for hookworm disease; and 3,444, or 34.5 per cent of those examined, were found infected. First treatment was administered to 2,946, representing 85.5 per cent of those found infected; and 1,311, or 44.5 per cent of those receiving first treatment, were cured.

**TABLE 1: *Salvador—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from March 6, 1916, to December 31, 1916***

	TOTAL FOR 1916	
	Number	Per Cent
1. Census.....	11,727	....
2. Examined.....	9,875	85.1
3. Found Infected.....	3,444	34.5
4. Given First Treatment.....	2,946	85.5
5. Cured.....	1,811	44.5

The percentage of infection is comparatively low, owing to the large number of persons examined and found negative in the city of San Salvador. The infection varies considerably in different localities and among different groups of persons. For instance, in a group of military recruits belonging to the cavalry, who were taken from many sections of the Republic, an infection of 89 per cent was found; at Apopa the infection was 51 per cent; and on two coffee plantations, situated on the slope of an extinct volcano, where climatic conditions are especially favorable for the spread of the disease, the infection was 76 and 67 per cent, respectively.

The removal of members of the military force, of the national guard, and of the municipal police from the field of operations after one or more treatments had been given but before re-

examination could be made, is responsible for the small percentage of persons recorded as cured. There were also many persons treated once or twice under the dispensary plan who did not return for re-examination.

Figures in detail showing the results of examination and treatment up to December 31, 1916, are presented in Table 2.

**TABLE 2: *Salvador—Dispensary Work: Detailed Results of Examination and Treatment from March 6, 1916, to December 31, 1916***

	Total for 1916
<b>1. Census.....</b>	<b>11,727</b>
<b>2. Examined.....</b>	<b>9,975</b>
<b>3. Not Examined.....</b>	<b>1,752</b>
1) Refused.....	545
2) Removed.....	42
3) To be examined.....	1,165
<b>4. Found Infected.....</b>	<b>3,444</b>
<b>5. Given First Treatment.....</b>	<b>2,946</b>
<b>6. Not Given First Treatment.....</b>	<b>498</b>
1) Refused.....	106
2) Removed.....	78
3) Medical reasons.....	85
4) To be given first treatment.....	279
<b>7. Cured.....</b>	<b>1,311</b>
<b>8. Given First Treatment but Not Cured.....</b>	<b>1,635</b>
1) Refused.....	263
2) Removed.....	499
3) Medical Reasons.....	21
4) Under Treatment.....	849
5) Died.....	3

### Educational Work

Educational work is conducted through the schools, by public and special lectures, and through the press. Public lectures illustrated by the stereopticon are held in every district in which laboratories are established, and private talks are given in the houses when the census is taken. Microscopic demonstrations of eggs and larvae are also frequently given in the laboratories and houses.

The results of lecture work are summarized in Table 3. The special lectures include talks to soldiers, municipal employes, and prisoners in the penitentiary. Talks with small groups in the laboratory and houses are classed as personal conferences.

**TABLE 3: Salvador—Dispensary Work: Number of Lectures and Conferences held from March 6, 1916, to December 31, 1916, with Attendance**

	Number
<b>1. Total Lectures.....</b>	<b>32</b>
1) Public.....	15
2) School.....	7
3) Special.....	* 10
<b>2. Attendance at Lectures.....</b>	<b>7,223</b>
1) Public.....	3,398
2) School.....	975
3) Special.....	2,850
<b>3. Personal Conferences.....</b>	<b>960</b>
<b>4. Attendance at Personal Conferences.....</b>	<b>3,281</b>

Literature, consisting of letters, illustrated pamphlets, handbills, and posters, has been distributed in every department of the Republic. Table 4 indicates that the total number of pieces of literature distributed up to December 31, 1916, was 5,010.

**TABLE 4: Salvador—Dispensary Work: Number of Pieces of Literature Distributed from March 6, 1916, to December 31, 1916, by Classes**

CLASS OF LITERATURE	Number of Pieces Distributed
<b>Total.....</b>	<b>5,010</b>
Letters.....	100
Leaflets.....	4,760
Bill Posters.....	105
Notices.....	45

#### Sanitary Improvement

During the early months of the work, operations were confined entirely to the city of San Salvador. Here there is a sewer system, which prevents to a large extent the spread of hook-worm disease. In the rural regions, however, soil pollution is almost universal and sanitation is one of the greatest needs. For instance, in the areas in which operations had been conducted up to December 31, 1916, among a total of 558 homes, only 39, or 6.9 per cent, were provided with latrines. In many rural districts, furthermore, conditions are peculiarly favorable for spreading the disease.

Throughout the Republic there are many coffee and sugar estates. On the former the conditions favoring the spread of hookworm disease are well recognized. On sugar plantations, latrine accommodations are absent, but the altitude is lower and the soil is not so well shaded nor so moist, especially during the dry season, when the sugar cane is harvested. The disease, therefore, is not so rife. The native laborers, however, often migrate back and forth between the two kinds of estates, being engaged today in picking coffee and tomorrow in harvesting cane.

Efforts at sanitary improvement during the year have had to rely on education and persuasion unbacked by legislation. Under these conditions very little progress has been made. It seems that there should be a special sanitary enactment compelling house owners to construct latrines under the supervision of the Department of Uncinariasis, with provision for municipal assistance in cases of poverty, and with a penalty for non-compliance. There is every prospect that during the coming year such a law will be passed by every department in the country.

## CEYLON

During 1916 the International Health Board began active participation in measures for the relief and control of hookworm disease in Ceylon. The work in this colony is conducted as a branch of the Government Medical Department, under the supervision of Dr. G. J. Rutherford, Principal Civil Medical Officer. Control is vested in a local Ankylostomiasis Committee, composed of the Colonial Secretary, the Principal Civil Medical Officer, members of the Estate Agents' and Planters' Associations, and prominent medical men of the colony. Of this committee the Colonial Secretary is chairman.

Efforts to eradicate the disease from Ceylon have been made for a number of years. At the time of the visit of the Director General of the International Health Board in 1914, definite plans for bringing the disease under control were formulated. These plans provided for the work to be conducted entirely by local agencies, the expense to be shared equally by the Government and the planters. Because of conditions growing out of the war, however, this project had to be abandoned soon after it was begun.

Later, on May 26, 1915, during the visit of the International Health Board's Director for the East, arrangements were made for resuming measures for the control of the disease with the coöperation of an officer of the Board. Active

work was begun on January 12, 1916. At first the staff consisted of a Director, an assistant medical director, six apothecaries, and one caretaker, with all expenses, exclusive of the salary and personal allowance of the Director, borne equally by the Government and the planters.

Later, in accordance with a new arrangement made by Dr. H. H. Howard, the Board's Director for the West Indies, who had been delegated to assist in organizing the work in Ceylon, the staff was enlarged to include a Director, an assistant medical director, three junior field directors (in training), four microscopists, twelve nurses, two clerical assistants, and one caretaker. Six of the nurses speak Tamil and English and four Sinhalese and English, while two are Moors engaged to handle the Moorish population in the villages. This division represents roughly the proportion of these elements of population. Under the new arrangement, the cost of the work is divided between the Government and the Board. From October 18 until the end of the year, the work in Ceylon was directed by Dr. W. Perrin Norris, Associate Director for the East, with Dr. John E. Snodgrass in direct charge of operations in the field.

The Matale district, located in the central part of the Island about seventy-five miles from Colombo, the capital, was chosen for initial operations. Roughly, this area is seven by ten miles in extent. Included within its boundaries

are twenty-four rubber and tea estates, and from forty to fifty towns, villages, and hamlets. The estate population numbers about 8,000 and averages one person to the acre; the village population is approximately 18,000. The district is mountainous, and large portions of it can be reached only on foot; on one estate, certain of the coolie lines are about five miles apart and difficult of access, as the estate extends over a mountain range.

Both the intensive and dispensary plans have been followed in the work to date. On the estates, where it is possible to exercise a considerable degree of control over the coolies while they are being examined and treated, and in the villages, the operations have been of the intensive type. In two of the villages, however, Alawatagoda and Wilane, in which operations were begun during the month of April, many obstacles, most of them of a religious nature, were encountered, and the work finally had to be abandoned before being completed. Examination and treatment by the dispensary method was carried out in the central office at Matale and in the village of Katugastota.

Up to December 31, 1916, operations had been brought to a close on ten estates and in the villages of Alawatagoda and Wilane, while work was in progress on five other estates and in four other villages, as well as in four schools and one college.

#### Examination and Treatment

In the areas in which work by either the intensive or dispensary method had been completed up to December 31, 1916, a total of 7,645 persons was examined, of whom 7,358, or 96.2 per cent, was found infected. First treatment was administered to 6,752 persons, or 91.8 per cent of those found infected, and 3,631, or 53.8 per cent of those given first treatment, were cured. These figures are shown in Table 1, which compares the results accomplished by the intensive and dispensary methods. (See Table 1, page 219.)

The figures in this table include the examination of 170 Europeans, only 25 of whom were found to be infected. Excluding these from the calculations, the percentage of infection rises to 98.1. This is the highest percentage encountered in any country with which the International Health Board has been coöperating. The degree of individual infestation is also very great, requiring on the average a large number of treatments to effect a cure.

The table shows that the intensive work was much more effective on the estates than in the villages. In addition to religious opposition, which leads the adherents of one faith instinctively to oppose measures in which the adherents of another faith are participating, the villagers have the fixed belief that it is dangerous to take a purgative during wet weather; and as

TABLE I: Ceylon—Intensive and Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured During 1916

With Comparison of Results by the Intensive and Dispensary Methods

	TOTAL FOR 1916		INTENSIVE WORK						DISPENSARY WORK	
			Total		Estates		Villages			
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	...	....	4,779	....	3,761	....	1,018	....	....	....
2. Examined.....	7,646	....	4,587	95.6	3,697	98.3	870	85.5	3,078	....
3. Found Infected.....	7,358	96.2	4,498	98.4	3,647	98.6	846	97.2	2,865	98.1
4. Given First Treatment:.....	6,752	91.8	4,101	91.8	3,563	97.8	593	69.0	2,661	92.5
5. Cured.....	3,631	68.8	3,190	77.8	2,958	82.8	252	47.3	441	16.6

a large proportion of the days are more or less rainy, this constitutes a serious hindrance to the work. Many lightly infected Sinhalese villagers have also declined to be treated, claiming they felt no ill effects from their infection.

The effectiveness of the intensive work in reducing the number of persons infected with hookworm disease on the estates and in the villages, is exhibited in Table 2. This shows that on the estates only 4.7 per cent of the persons originally found infected remained uncured when the work of examination and treatment ended. Practically all of these were persons who could not be treated or cured for medical reasons.

**TABLE 2: Ceylon—Intensive Work: Number of Persons Remaining Uncured on Estates and in Villages Completed During 1916**

	TOTAL		ESTATES		VILLAGES	
	No.	P. C.	No.	P. C.	No.	P. C.
<b>1. Infected.....</b>	<b>4,493</b>	....	<b>3,647</b>	....	<b>846</b>	....
<b>2. Cured.....</b>	<b>3,190</b>	<b>71.0</b>	<b>2,988</b>	<b>80.6</b>	<b>252</b>	<b>29.8</b>
<b>3. Removed.....</b>	<b>651</b>	<b>14.5</b>	<b>537</b>	<b>14.7</b>	<b>114</b>	<b>13.5</b>
<b>4. Remaining in Area Uncured.....</b>	<b>652</b>	<b>14.5</b>	<b>172</b>	<b>4.7</b>	<b>480</b>	<b>56.7</b>
1) Refused.....	422	9.4	61	1.7	361	42.7
2) Medical Reasons	107	2.4	107	2.9	....	....
3) Under Treatment	123	2.7	4	.1	119	14.1

The fact that the estate laborers move about more or less continuously is evidenced by the large number of infected laborers (537, or 14.7

per cent of the total) who removed from the estates while the work was going on. This militates strongly against the best results being obtained in the work of examination and treatment. On one estate employing a force of about 275 men, on which work had been conducted up to September 4, 1916, the superintendent stated that at the end of the year there remained not more than 30 to 40 per cent of those who had

**TABLE 3: Ceylon—Intensive Work: Detailed Results of Examination and Treatment on Estates and in Villages Completed During 1916**

	Total	Estates	Villages
<b>1. Census.....</b>	<b>4,779</b>	<b>3,761</b>	<b>1,018</b>
<b>2. Examined.....</b>	<b>4,567</b>	<b>3,697</b>	<b>870</b>
<b>3. Not Examined.....</b>	<b>212</b>	<b>64</b>	<b>148</b>
1) Refused.....	80	...	80
2) Removed.....	128	60	68
3) Died.....	4	4	....
<b>4. Found Infected.....</b>	<b>4,493</b>	<b>3,647</b>	<b>846</b>
<b>5. Given First Treatment.....</b>	<b>4,101</b>	<b>3,568</b>	<b>533</b>
<b>6. Not Given First Treatment.....</b>	<b>392</b>	<b>79</b>	<b>313</b>
1) Refused.....	210	...	210
2) Medical Reasons.....	68	68	...
3) Removed.....	110	7	103
4) Died.....	4	4	....
<b>7. Cured.....</b>	<b>3,190</b>	<b>2,938</b>	<b>252</b>
<b>8. Given First Treatment but Not Cured</b>	<b>911</b>	<b>630</b>	<b>281</b>
1) Refused.....	212	61	151
2) Medical Reasons.....	39	39	...
3) Removed.....	520	509	11
4) Died.....	17	17	...
5) Under Treatment.....	123	4	119

been treated. In their places, new, and presumably infected, laborers had been employed, thereby increasing the likelihood that those who had been cured would be re-infected.

The detailed results of examination and treatment by the intensive method are shown in Table 3. (See Table 3, page 221.)

#### Educational Work

Extensive publicity has been obtained through the press and by means of lectures and the distribution of literature. Table 4 shows that up to December 31, 1916, 43 lectures had been delivered to a total attendance estimated at 6,005 persons, and that 118 house-to-house talks, attended by an estimated total of 1,565 persons, had been delivered.

**TABLE 4: Ceylon—Intensive and Dispensary Work:  
Number of Lectures and House-to-House Talks Deliv-  
ered During 1916, with Attendance**

	Total for 1916
<b>1. Total Lectures.....</b>	<b>43</b>
1) Public.....	24
2) School.....	12
3) Special.....	7
<b>2. Attendance at Lectures.....</b>	<b>6,005</b>
1) Public.....	3,797
2) School.....	1,699
3) Special.....	509
<b>3. House-to-House Talks.....</b>	<b>118</b>
<b>4. Attendance at House-to-House Talks.....</b>	<b>1,565</b>

In addition, more than 3,500 leaflets in English, Sinhalese, and Tamil were distributed on the estates and in the schools, and more than 1,900 letters were mailed. The most far-reaching work of this kind was the publication by the newspapers and journals of special articles and editorials on the subject of hookworm disease. A popular article published in the *Kandyan Journal*, a native newspaper, was translated into English for distribution to estates, and into Sinhalese for distribution to schools. It is estimated that this article alone reached about 600,000 persons. Another popular article was issued in leaflet form by the Government Medical Department, and a copy sent to every estate in the colony with the suggestion that it be read to the laborers twice weekly at muster. A more comprehensive and technical article, published originally in the *Planters' Journal*, was re-published as a pamphlet and distributed among the medical profession.

Early in the year arrangements were made to receive at the office in Matale, for training in microscopic technique, a limited number of medical dispensers from various estates. So great was the interest in this work that only a small proportion of those who applied could be accommodated. However, fifty-one men, representing nearly every planting district in Ceylon, were given instruction for periods varying from seven to fifteen days each,

#### Sanitary Improvement

A sanitary survey made at the beginning of operations showed that none of the ten estates on which the work was completed during 1916, were provided with latrine accommodations for their laborers, while in the Alawatagoda and Wilane villages only 9 latrines were found at 274 homes. In April the Senior Sanitary Officer detailed a sanitary officer and two inspectors to supervise the installation of latrine accommodations in these villages. They encountered many difficulties, but were able during the progress of their work to have 184 additional homes provided with satisfactory latrines, leaving only 81 still to be provided. This work is being continued.

During November, the Government passed rules in connection with an existing ordinance, making it compulsory for all estates to provide adequate latrine accommodations for their laborers within the period of one year. Previously it had made provision for two medical inspectors to have charge of estate sanitation. Neither of these positions, however, was filled during the year. The Senior Sanitary Officer has no authority to supervise estate sanitation. No sanitary officer, therefore, was available to give attention to this branch of the work. It is expected that in the near future the Senior Sanitary Officer will be given authority to supervise both estate and village sanitation. Nearly all the estate

superintendents are anxious to install latrines, but lack information as to the most suitable type. During the year, 51 composite latrines, having a total of 302 compartments, were constructed for use on the ten estates. This work will undoubtedly proceed until sufficient accommodations have been provided for all the laborers.

### III. TECHNIQUE OF EXAMINATION AND TREATMENT

#### I

##### MICROSCOPIC EXAMINATION

In British Guiana, St. Lucia, and Nicaragua during 1916, experiments were conducted for determining the importance of the centrifuge in preparing specimens for examination, as well as for indicating the proper number of slides to be examined from each specimen before and after it is centrifuged. In Nicaragua the examination of 319 recruits for the army showed that 6.9 per cent persons were recorded as positive after their specimens had been centrifuged who would have been recorded as negative if the centrifuge had not been used. The figures are as follows:

	Per	
	<u>Number</u>	<u>Cent</u>
Recruits examined.....	319	....
Positive on first slide before cen- trifuging.....	217	68.0
Positive on second slide before cen- trifuging .....	44	13.8
Positive on first slide after centri- fuging.....	16	5.0
Positive on second slide after cen- trifuging.....	6	1.9

Approximately the same result was obtained on re-examination after treatment, when 7.9

per cent additional specimens were recorded as positive after being centrifuged.

In British Guiana it had been the custom to examine seven 2 x 3" slides before centrifuging, and seven additional slides after centrifuging, before pronouncing any specimen negative. During the year, tests were made to ascertain if so thoroughgoing a technique was required to detect practically all of the infected cases. Three smears were made from each specimen and examined. If no eggs were found an emulsion was made and centrifuged, and three additional slides examined. From the same specimen seven slides were then made, and if no eggs were found an emulsion was made and centrifuged, and seven additional slides examined. Two thousand specimens were examined in this way. It was found that by the short technique the results were the same as by the long, with the exception of two specimens. In these the result was negative by the short method and positive by the long. In other words, the extra eight slides which were examined (four before and four after centrifuging) resulted in the finding of only two additional positive specimens,—showing that in the examination by the short method there was an error of only one tenth of one per cent.

In St. Lucia a census of 2,662 persons was handled, with an infection of 47 per cent, and including all necessary subsequent examinations

only three instances were found in which infection was recorded on the third slide examined after centrifuging. It was therefore decided that the examination of two slides after centrifuging was sufficient for practical purposes.

These experiments in British Guiana and St. Lucia during 1916 confirm the tests carried out in Trinidad during 1915, in which, among a total of 1,434 specimens examined, 895 were found positive by the examination of two slides before and two after centrifuging. On the third slide examined after centrifuging, not one additional positive specimen was recorded.

## II

### TREATMENT

Further experiments as to the value of oil of chenopodium in the treatment of hookworm disease were conducted during the year. The efficacy of this drug was tested under varying conditions of administration, in doses of different sizes, and in certain instances studies were made of its value in comparison with thymol and beta-naphthol. Practically all reports agree that oil of chenopodium is the most effective remedy for expelling *Ascaris*, and that it is more active than thymol in the treatment of infection with *Oxyuris* and *Trichocephalus*. As to its value in the treatment of hookworm infection, however, the reports received have been con-

flicting in character,—the result, perhaps, of differences in the strength and potency of the drug, in the laboratory technique employed, or in the methods of administration.

Alarming symptoms, and sometimes death, have been reported in the Southern States, the West Indian colonies, Panama, Nicaragua, Ceylon, and Egypt following the administration of the drug in accordance with accepted methods of treatment, and in nearly every instance in less than the maximum dose. Extreme caution in the use of the drug is therefore indicated until its proper method of preparation has been learned, its chemical composition and stability standardized, and a safe dosage and method of administration established. The fact that the drug is a powerful poison, often uncertain in action under conditions at present attending its preparation and administration, should lead all medical officers to be extremely discriminating in its use.

In administering the drug in Nicaragua, Dr. Molloy reports that no arbitrary dosage has been followed. The dose recommended by Dr. Schüffner, 1.00 gram to 1.20 grams as the maximum (15 to 18 minims), was followed for a while, but this was found to be insufficient under ordinary conditions. The dose was finally increased to a maximum of 2.00 grams (30 minims). In none but very exceptional cases was a dose of 3.00 grams (recommended by some physicians

in the Far East) prescribed in a dispensary. The maximum dose which can be safely prescribed in dispensaries operating in Central America, where the average weight is about 120 pounds, is believed by Dr. Molloy to be 2.00 grams.

As a rule the dose is proportioned according to age, as follows: Two drops for each year of age to the age of 24, 48 drops being considered the maximum. This amount of the ordinary oil of chenopodium, dropped from a dropping bottle, weighs approximately 2.00 grams. This dose is always given in two or three equal parts, with an hourly, or two-hourly, interval between portions (two hours if given in two equal parts; or one hour if given in three equal parts).

The mode of administration followed is essentially as follows: All solid food is prohibited after the midday meal the day before administering the drug. At 4 p. m. of this day, the patient is given a cleansing purge of Epsom salts. By giving this preliminary purge at 4 o'clock, the necessity of having to get up during the night is avoided, since the purgative will have acted, as a rule, before bed-time.

At 6 o'clock the following morning, before any food is eaten, the first portion of sugar containing the chenopodium is taken, followed by the remainder at hourly or two-hourly intervals. Two hours after the last of the chenopodium, a good dose of Epsom salts (usually a little more

than an ounce for adults) is taken to expel the worms. This is repeated, if necessary, in two hours.

During the last quarter of the year, a series of experiments was begun in Nicaragua to determine the efficacy of chenopodium treatment under given conditions and in given doses. These experiments are still under way, and will be continued until a large number of cases have been treated.

Chenopodium oil, alone, is being used as the basis of treatment. Chenopodium oil mixed with a sufficient amount of oil of eucalyptus to disguise its unpleasant taste and odor (three parts chenopodium and one part eucalyptus) and chenopodium in capsules, are also being used. These treatments are being given to the recruits of the Nicaraguan army, are personally administered by a technical assistant, and all examinations are made with the use of the centrifuge. Data on the treatment of 140 cases to date reveal the results shown in Table 1, page 232.

While this series is too small for drawing deductions, it would seem to indicate that the addition of 25 per cent of oil of eucalyptus adds to the efficiency of the drug (51.4 per cent of cures resulting from one treatment, as against 48.6 per cent from one treatment with oil of chenopodium alone).

In Salvador, oil of chenopodium, given usually in capsules, and thymol with equal parts of

**TABLE 1: Nicaragua—Results of Re-examination of 140 Cases at End of Two Weeks Following Treatment with Oil of Chenopodium**

	All Methods	METHOD OF TREATMENT		
		Oil of Chenopo- dium Dispensed in Sugar (Maximum Dose 48 Drops)	Oil of Chenopo- dium Three Parts, Eucalyptus One Part (Maximum Dose 48 Drops)	Chenopodium in Capsules (90 Minims Maximum Dose)
1. Total Cases Treated.....	140	87	74	29
2. Cases Cured with One Treatment.....	Number	63	38	7
	Per Cent	45.0	51.4	24.1
3. Cases Remaining Positive after One Treatment.....		77	36	22
1) Positive First Slide Before Centrifuging.....		47	20	15
2) Positive Second Slide Before Centrifuging.....		19	9	5
3) Positive First Slide After Centrifuging.....		8	5	1
4) Positive Second Slide After Centrifuging.....		3	2	1

sugar of milk, also administered in capsules, are the drugs which have been used. In some instances both oil of chenopodium and thymol have been given to the same patients. When chenopodium is taken the preliminary purge is omitted, a dose of Epsom salts being given in the majority of cases following the last dose of chenopodium. No re-examinations are made in less than one week following the last treatment; in most cases, a longer period is allowed. The centrifuge is used, two slides being examined before and two after centrifuging.

In this country, experiments were conducted as to the relative efficiency of three methods of treatment—that is, oil of chenopodium alone, thymol alone, and one dose of oil of chenopodium followed by thymol for the second and for all subsequent treatments. These experiments, however, have not progressed sufficiently to draw positive conclusions. From the investigations so far conducted it would appear that with fifteen drops of oil of chenopodium administered every one or two hours for three doses, followed by castor oil, a larger number of persons are cured with two treatments than when thymol is administered. The following comparison of the results obtained in two districts, in one of which thymol was used and in the other oil of chenopodium, is offered by Dr. Bailey to substantiate this tentative conclusion:

Apopa <u>Treatment: Thymol Only</u>	El Angel <u>Treatment: Oil of Chenopodium Only</u>
Census.....	1,024
Microscopically examined.	903
Positive to uncinariasis...	457
Per cent infection.....	50.6
Received second examination.....	856
Cured.....	210
Per cent cured.....	59.0
Census.....	675
Microscopically examined..	619
Positive to uncinariasis....	376
Per cent infection.....	60.7
Received second examination.....	239
Cured.....	150
Per cent cured.....	62.8

In three laboratories operating in Panama, thymol is used; in one, chenopodium. Each drug is reported as having its advantages. At the close of the third quarter, 1916, a change to the exclusive use of chenopodium was being considered, but during the last quarter the results obtained by the laboratory using chenopodium were unsatisfactory. The cause may have been faulty technique on the part of the new microscopists employed in that laboratory, the drug may have been poor in quality, or there may have been some other cause not yet determined.

In administering the drug in Guatemala, a mathematical table of dosage is not adhered to. The minimum dose is 0.65 c.c.; the maximum, 3.00 c.c. To a child below ten years, either the minimum dose is given or the dose is increased according to the physical condition of the child; to an average adult, 2 c.c. is given; and to a strong, vigorous male, the maximum dose. At each treatment the dose is divided into three portions, with one hour intervals. Two hours following the last dose, a purge of sodium sul-

phate is administered. The chenopodium is given in sugar, in molasses, or in honey. It is administered in the early morning, and the patient is able to take his treatment and perform his day's work. During 1916, three days were allowed to elapse between treatments. Three days after the second treatment had been administered the patient was re-examined.<sup>1</sup> Three slides were carefully examined before the specimen was pronounced negative. The centrifuge, however, was not used.

In Costa Rica, Dr. Schapiro reports that chenopodium is used in preference to thymol. The following table indicates the maximum dose, according to apparent age and 80 per cent hemoglobin, as administered in that country. The maximum dose, however, is reduced according to the physical development of the patient and the percentage of hemoglobin in his blood.

<u>Age Years</u>	<u>Dose Drops<sup>2</sup></u>
2.....	1
3.....	3
4.....	4
5.....	6
6.....	8
7.....	10
8.....	12

<sup>1</sup> This interval between treatment and re-examination is believed by most authorities to be too brief. It has been established that because of the action of chenopodium in inhibiting the laying of eggs by female hookworms, an interval of at least ten days should elapse between treatments.

<sup>2</sup> Dropped from medicine-dropping bottle; 15 drops = 0.46 c.c.

<u>Age Years</u>	<u>Dose Drops</u>
9.....	14
10.....	16
11.....	18
12.....	20
13.....	22
14.....	24
15.....	26
16.....	28
17.....	30
18.....	32
19.....	34
20 to 50.....	36
Over 50.....	26

The drug is administered in a mixture of equal parts of syrup of brown sugar and strong extract of coffee. Dr. Schapiro reports that by this means it is more easily taken, the disagreeable taste is masked, and the dizziness frequently following its administration is practically eliminated, so that the patient can return to his home to take the second purge.

In the West Indies, less satisfactory results have been reported from the use of chenopodium. In Trinidad, the drug was used in lieu of thymol in one district, the conditions in which differed in no way from those in other districts. The work in this district was opened by one of the most successful nurses, and later, when he had to be taken to another field, it was always possible to have an unusually good nurse to administer treatment. Work in this district was begun on April 2, 1916, and the last treatments were given

September 29, 1916, the work being carried on for a period of practically six months.

The drug used was supplied in bulk by the medical storekeeper of this colony. The name of the manufacturer could not be learned. It was carefully measured in capsules of proper size and sealed in the office, under the direction of the Medical Officer in Charge. The drug was used the same week that it was encapsulated.

The dosage was 21 minims for an adult male or large female, and 17 minims for the average female. Children received one minim for each year of age. A purge, magnesium sulphate, was administered the night before the oil of chenopodium was taken. One third of the dose of oil of chenopodium was administered at 6 a. m., a like amount at 7 a. m., and the last portion at 8 a. m. At 10 a. m. a second purge of magnesium sulphate was given. The patient was required to fast until noon. It was necessary to use magnesium sulphate instead of castor oil, because in Trinidad there is an exceedingly strong local prejudice against the latter and it is practically impossible to induce persons of the lower class to take it.

The centrifuge was used in re-examining specimens, two slides being examined before and two after centrifuging. Specimens were collected for re-examination on the sixth day after each treatment. If positive, the patient received

another treatment the following day. If negative, another specimen was obtained on the eleventh day or later. No patient was pronounced cured unless his stool was free of eggs at least eleven days after treatment. Sixty-three specimens taken six or seven days after treatment were negative on microscopic examination; twenty-five specimens taken from five to ten days later from the same patients were positive. This apparently indicates that many worms which are not actually killed by the drug have their reproductive functions interfered with in such manner that it is many days before they resume laying eggs. Therefore, the ordinary method of examining a patient six days after treatment is not believed to be sufficiently accurate when this drug is employed.

Patients still positive after five successive treatments with oil of chenopodium were given thymol for the sixth and seventh treatments, after which the use of chenopodium was continued. There were 127 patients cured in this district, of whom 112 required less than six treatments. Four were cured by the sixth and four by the seventh treatments, in which thymol was administered. Of the other seven persons cured, four were cured after the eighth treatment, one after the tenth, and two after the twelfth, in all of which chenopodium was used. This is shown in the following summary:

<u>Number of Treatments</u>	<u>Number of Persons Cured</u>
All Treatments.....	<u>127</u>
First treatment.....	24
Second treatment.....	35
Third treatment.....	27
Fourth treatment.....	18
Fifth treatment.....	8
Sixth treatment.....	4
Seventh treatment.....	4
Eighth treatment.....	4
Ninth treatment.....	0
Tenth treatment.....	1
Eleventh treatment.....	0
Twelfth treatment.....	2

There were no very serious effects of the oil on any of the patients. The most serious mishap was collapse in a child of three, on whom the second dose of magnesium sulphate had had no effect. She recovered after a dose of castor oil. There were, however, an extraordinary number of complaints from this district, complaints which, while petty in themselves, had a great influence in preventing further treatment of the patients and their friends. These complaints were of dizziness and weakness, which lasted two or three days after treatment. There was also the well-known symptom of tingling in the palms of the hands. This was described by the patients as "a heat," and seemed to have an unfavorable psychic effect on them. The combined effect of these petty complaints was to compel the medical officer and chief nurse to spend a great deal of their time in this district.

reassuring the patients and urging them to continue treatment.

The statistics for this district, in comparison with the average for sixteen districts in which thymol exclusively was used, are given in Tables 2 and 3. (See Tables 2 and 3, page 241.)

In the district in which chenopodium was used, a much greater effort was required on the part of the nurse and director to induce the patients to take treatment than in the district in which thymol was employed. Because of this additional effort, the nurse could not handle so many patients at a time. The nurse's work was further increased by the additional number of specimens that it was necessary to collect, and was delayed by the long time which had to be allowed between the treatment and re-examination of each patient. These considerations are aside from the possible dangers of the drug, as shown by two cases of collapse in the Trinidad campaign (one was reported in 1915). With thymol, in an experience many times as great, no such accidents were recorded in the Trinidad work.

Chenopodium was used in almost all districts in Grenada from August 26 until the close of the year, because of inability to obtain a supply of thymol. The average adult dose was twenty minims: ten minims at 6 a. m. and ten at 8 a. m. Epsom salts was administrated the night before treatment, as well as two hours after the

**TABLE 2: Trinidad: Comparison of Results Obtained in One District Treated with Chenopodium with the Average Results Obtained in Sixteen Districts Treated with Thymol**

	OIL OF CHENOPODIUM (1 District)		THYMOL (Average for 16 Districts)	
	Number	Per Cent	Number	Per Cent
1. Census.....	281	.....	406	.....
2. Examined.....	222	96.1	371	91.4
3. Found Infected.....	182	82.0	250	67.4
4. Given First Treatment....	165	90.7	227	90.8
5. Cured.....	127	77.0	170	74.9
6. Total Number of Treatments Given.....	405	.....	609	.....
7. Average Number of Treatments Per Cure.....	3.19	.....	3.58	.....

**TABLE 3: Trinidad: Cumulative Summary Showing Number of Persons Cured after Successive Treatments: Comparison of Results Obtained in One District Treated with Chenopodium with the Average Result for Sixteen Districts Treated with Thymol**

	OIL OF CHENOPODIUM (1 District)		THYMOL (Average for 16 Districts)	
	Number	Per Cent	Number	Per Cent
1. Total Number of Persons Cured.....	127	.....	170	.....
2. Number of Persons Cured After:				
1) Two Treatments.....	59	46.5	78	45.9
2) Four Treatments ....	104	81.9	125	73.5
3) Six Treatments.....	116	91.3	156	91.8

last dose of chenopodium had been taken. One district was treated with beta-naphthol for purposes of comparison.

In all cases two treatments not less than one week apart were administered before re-examination. If the patient remained uncured, two more treatments were administered before the next re-examination. The cases remaining uncured after four treatments were treated with thymol. In all cases the medicine was swallowed in the presence of the nurse.

As to the comparative efficacy of oil of chenopodium and beta-naphthol, the figures in Table 4 indicate that 47.3 per cent of those examined after two treatments with oil of chenopodium were found to have been cured, as compared with 25.8 per cent of those examined after two treatments with beta-naphthol. Of those examined after four treatments, the table shows that 58.3 per cent of those treated with chenopodium were found to have been cured, as compared with 36.2 per cent of those treated with beta-naphthol. Inasmuch as thymol was used for treating all cases remaining uncured after four treatments, no data were secured as to the establishment of tolerance to chenopodium,—which in many cases has been urged as an objection to the use of this drug. (See Table 4, page 243.)

The principal objection noted to the use of oil of chenopodium in Grenada is the loss of

TABLE 4: *Grenada—Comparative Efficacy of Chenopodium and Beta-Naphthol: Results of Re-examination after Two Treatments and after Four Treatments*

	Examined After 2nd Treatment	Cured After 2nd Treatment	Percentage Cured After 2nd Treatment	Examined After 4th Treatment	Cured After 4th Treatment	Percentage Cured After 4th Treatment
Beta-Naphthol Cases.....	93	24	25.3	58	21	36.2
Oil of Chenopodium Cases.	241	114	47.5	156	91	58.3

TREATMENT

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more than a week between treatments, due to the necessity of waiting fourteen days to obtain a specimen for re-examination. This necessity was indicated by the re-examination of 55 cases which had been re-examined from six to thirteen days following treatment and found negative. All fifty-five of these cases were again re-examined at the end of fourteen or more days after treatment, and twelve of the cases were found to be positive. In the re-examination of specimens the same technique was followed as in Trinidad.

Dr. Colwell reports that distaste for the drug and irritating symptoms are more marked with chenopodium than with thymol. The symptoms noted are mainly dizziness and faintness, which may continue for several days. No serious or permanent symptoms have been observed.

In St. Lucia a trial of chenopodium was made with liberal samples of five and ten-minim capsules. A small area was chosen, having a census of 92, of whom 41, or 44 per cent, were infected. One person left the locality before treatment was started.

The dosage adopted for adults (16 years and upwards) was three capsules of ten minims each: one capsule every half hour, followed by a dose of Epsom salts after the third capsule. On the evening before the chenopodium was administered, a dose of salts was given. The dose of

salts following the capsules was graduated according to the effects that had already been produced. To children 9 to 15 years of age, three capsules of five minims each were given, with still smaller doses for those who were younger.

No complaints were heard other than of an occasional heavy purgation. The activity of the oil in expelling roundworms was often a source of gratification to the patient or parent. Of the 40 who took the first treatment, 29 were registered as cured as the result of the treatment; 7 were cured after two treatments; 3 required a third; and one is doubtful, not having yet taken the second treatment.

During the early months of the work in Ceylon, oil of chenopodium was administered in maximum doses of eight minims, repeated in two hours. Castor oil was the only purgative used at this time. Subsequently, the dose was increased to ten and then to twelve minims, until, upon the recommendation of the Malaya Board and of Colonel W. Perrin Norris, Associate Director for the East, it was increased to a maximum of sixteen minims, repeated hourly for three doses. Towards the end of the year, magnesium sulphate was used almost to the exclusion of castor oil as a purgative. With the 8 minim doses, it was rare that more than 20 to 30 per cent of cures were secured after two treatments. As the size of the dose was increased better results were obtained, until,

among one group of patients, there were 65.7 per cent of cures after two treatments.

At the present time, the dispensers in Ceylon are given the following instructions concerning the administration of chenopodium:

1. Oil of chenopodium may be administered in accordance with the following table:

<u>Age</u>	<u>Dose of Chenopodium</u>
1 to 2 years.....	3 minims hourly for three doses
3 to 5 years.....	4 to 5 minims hourly for three doses
6 to 10 years.....	6 to 9 minims hourly for three doses
11 to 16 years.....	10 to 13 minims hourly for three doses
17 to 50 years.....	14 to 16 minims hourly for three doses
Above 50.....	12 to 14 minims hourly for three doses

In any instance where it is impossible or impracticable to give three doses for a treatment, the maximum dose may be divided into two equal parts, and the second portion be administered at an interval of one or two hours after the first.

2. The drug may be administered on sugar, in milk, or in gelatin capsules or globules.

3. On the evening before the treatment is to be given, a dose of Epsom salts is administered in accordance with the following table:

<u>Age</u>	<u>Dose of Epsom salts solution</u>
1 to 5 years.....	4 drams of the solution
6 to 10 years.....	8 drams of the solution
11 to 15 years.....	12 drams of the solution
16 to 20 years.....	16 drams of the solution
21 and above.....	24 drams of the solution

Five pounds of Epsom salts dissolved in five gallons of hot water makes the above solution.

In case this solution is objectionable to certain persons, castor oil may be given as the purgative, in which case give as follows:

<u>Age</u>	<u>Dose of castor oil</u>
1 to 3 years.....	2 drams
4 to 8 years.....	3 to 5 drams
9 to 16 years.....	6 to 10 drams
Above 16 years.....	8 to 16 drams

One and one half ounces is usually the maximum dose that should be given to a female.

4. At, say, 6 o'clock the following morning give the first dose of chenopodium and repeat this dose at 7 and 8 o'clock; at 10 o'clock give a purgative similar in size to, or, if the bowels moved thoroughly, smaller than, the one given on the previous evening.

5. Only a light meal should be eaten the evening before treatment, and no food and very little water should be taken on the morning of treatment, until after the bowels have moved well following the second purgative.

6. No alcohol in any form, or acids, should be taken for a period of twelve hours before and after taking oil of chenopodium, as these substances assist in the absorption of the drug into the system, and this is very undesirable. Symptoms of poisoning may follow if this precaution is disregarded.

7. Dispensers on estates should keep their cases under direct observation until after the last dose of the purgative has been given and has acted. Dispensers in the villages should arrange to be notified in case any of their cases become ill after treatment, or if the purgative does not move the bowels thoroughly, in which case it should be repeated.

8. No treatment should be given until a medical officer has examined the person. The dispenser must not treat persons who have developed the following conditions after previous treatment, until after re-examination by a medical officer:

(a) Very old or emaciated persons, who are made weak by, or after, treatment;

(b) Persons suffering from acute diseases, such as malaria, dysentery, rheumatism, etc.;

(c) Children under two years of age, who become ill after treatment;

(d) Pregnant women, who should not be treated in any instance.

9. No re-examination of the excrement should be made until one week has elapsed after the second treatment; such examination should be made one week after each succeeding treatment. Treatments should be repeated every ten days until the case is cured.

In case only two doses are given for a treatment, it may be repeated at the end of eight days. The excrement should not be re-examined in less than one week after treatment, for the reason that the drug causes the female worm to stop laying eggs for a number of days, and if examination is made in less than one week, the specimen may be negative when in reality the worms have not all been expelled.

In connection with the use of thymol as a specific for hookworm disease, experiments conducted in Trinidad seem to indicate that when this drug is mixed with equal parts of sodium bicarbonate it produces cures more promptly and with fewer disagreeable symptoms than when mixed with equal parts of sugar of milk. The first mixture has also the advantage of being more economical.

For conducting the experiments two districts were chosen, in the first of which sugar of milk and thymol were used; in the second, sodium bicarbonate and thymol. In the first district, of the total number of persons cured, 43 per cent had been cured at the end of two treatments and 76 per cent at the end of four treatments, as compared with 51 per cent at the end of two treatments and 83 per cent at the end of four treatments in the second district. This shows a greater effectiveness on the part of the sodium bicarbonate mixture of 8 per cent at the end of two treatments, and of 7 per cent at the end of four treatments.

The conditions of the test were strongly favorable to the thymol-sugar of milk combina-

tion. In the district in which this mixture was used, the percentage of infection was lower, being 82.5 as compared with 95.2 in the district where the thymol-sodium bicarbonate mixture was used. It has been found that the degree of infection is usually most severe and the individual cases most difficult to cure in districts having the highest percentage of infection, the large proportion of infected persons and the absence of sanitary accommodations in such districts tending to produce a constant source of infection. Again, the population of the second district was composed almost entirely of East Indians, who, because of their insanitary mode of living, always present large numbers of heavily infected cases.

The following statement gives in tabular form a comparison of the results obtained by the two different methods of mixing thymol. In the two columns to the right, the total number of persons cured by each method is shown, followed by the number of persons cured after each treatment.<sup>1</sup> The figures in the two columns to the left represent the percentage of persons cured after each treatment, 100 per cent representing the total number of persons cured in each district. (See Table 5, page 250.)

In addition to the patients treated with thymol and sodium bicarbonate in District II,

<sup>1</sup> In Trinidad, microscopic re-examinations for determining cure are made following the first and third treatments.

TABLE 5: *Trinidad: Comparison of Results Obtained with Thymol when Mixed with Sugar of Milk and when Mixed with Sodium Bicarbonate*

	PERCENTAGE OF PERSONS CURED		NUMBER OF PERSONS CURED	
	District I (Thymol and Sugar of Milk)	District II (Thymol and Sodium Bicarbonate)	District I (Thymol and Sugar of Milk)	District II (Thymol and Sodium Bicarbonate)
<b>1. Persons Cured.....</b>	..	..	154	186
<b>2. Persons Cured by:</b>				
1) Two treatments.....	43	51	66	69
2) Four treatments.....	33	32	51	44
3) Five treatments.....	18	8	27	11
4) Six treatments.....	3	4	4	6
5) Seven treatments.....	4	4	6	6
<b>Cumulative Summary</b>			<b>District I</b>	<b>District II</b>
Percentage of persons cured after two treatments.....			43	51
Percentage of persons cured after four treatments.....			76	83
Percentage of persons cured after five treatments.....			94	91

fifteen cases taken at random were treated before work in this district was opened. In these fifteen cases, cures were obtained much more promptly than in either District I or District II, and no disagreeable symptoms were experienced by any of the patients.

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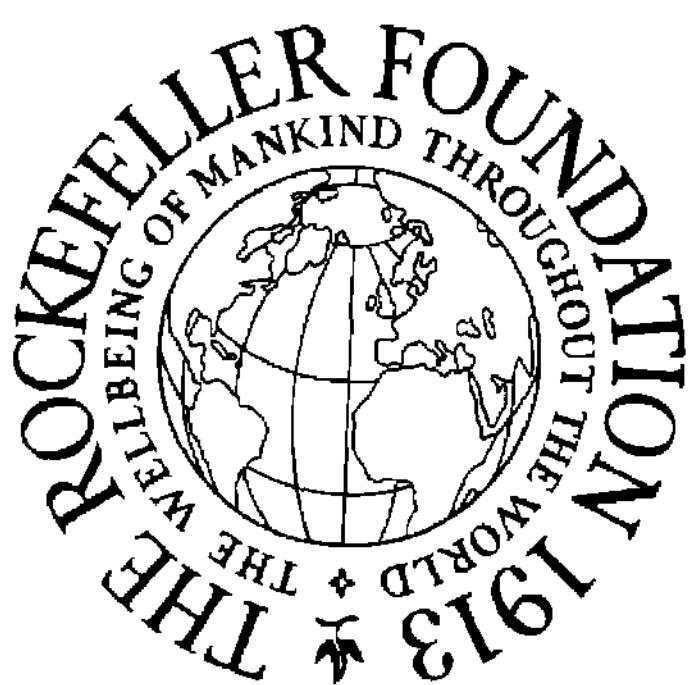
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## **IV. ILLUSTRATIONS.**

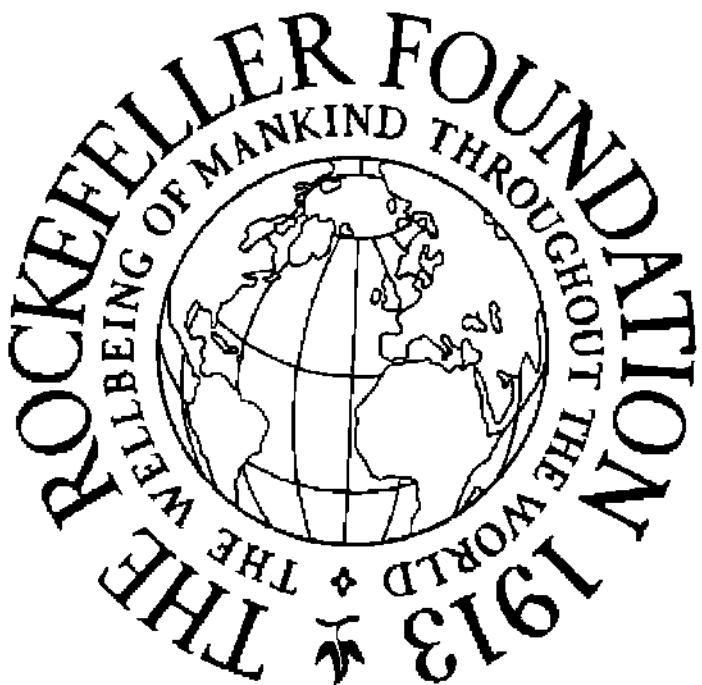
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## Photograph Excised Here

Fig. 1. Group assembled for microscopic demonstration on day of religious festival. Nine Buddhist priests, in robes, are seen in the center. The dispenser, wearing a white helmet, stands to the right. Ceylon



## Photograph Excised Here

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Fig. 2. Dispensary group awaiting treatment. Coffee plantation. Guatemala



## Photograph Excised Here

Fig. 3. Family of ten, all infected, hemoglobin 30 to 50 per cent, all cured. Guatemala

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## Photograph Excised Here

Fig. 4. Headmaster of village school and family; all infected, all cured. Two of the smaller girls were suffering from chronic leg ulcers. Ceylon



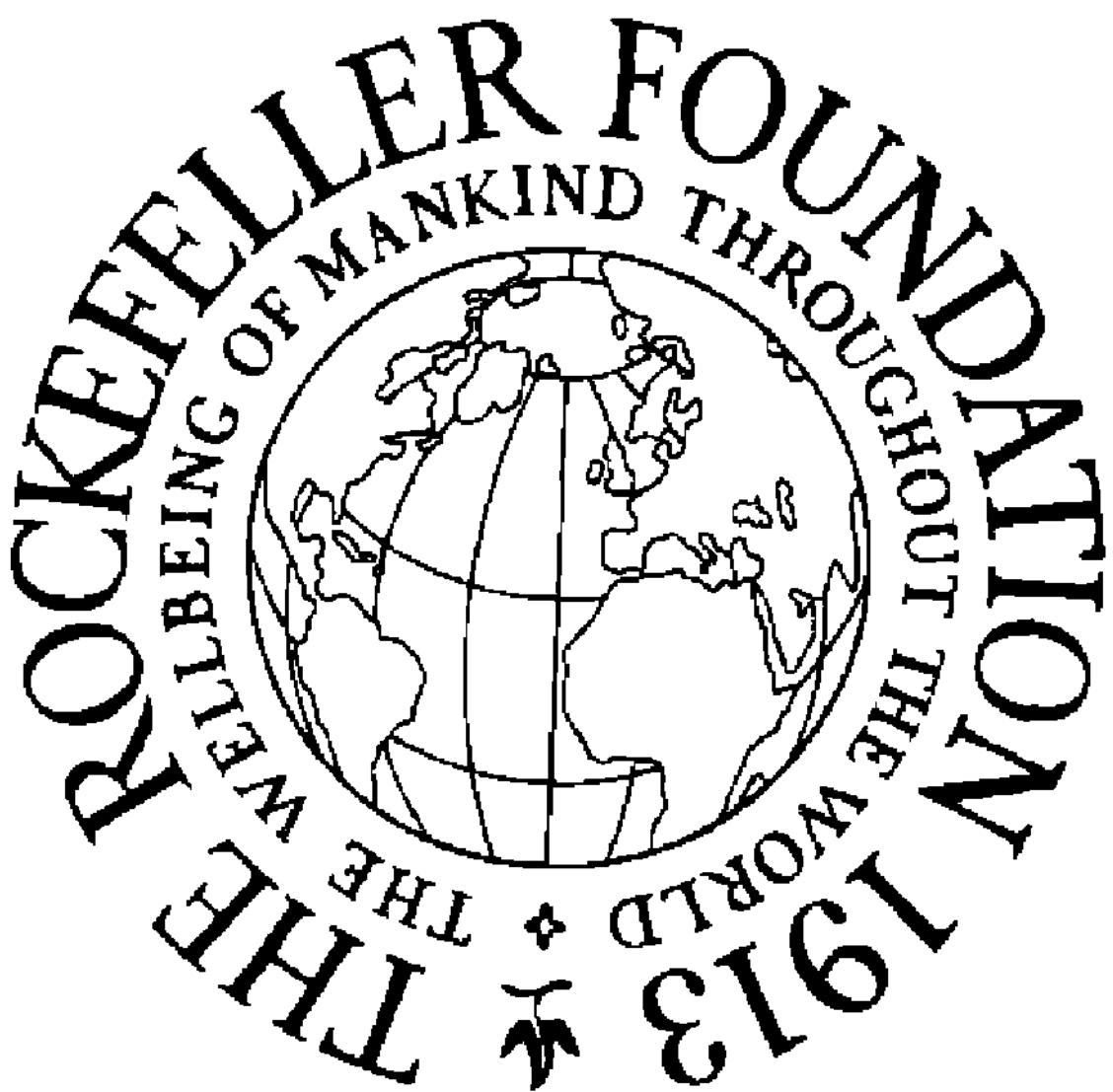
## Photograph Excised Here

Fig. 5. Severe case of hookworm disease; age, 18 years, weight, 90 pounds; hemoglobin, 40 per cent. Cured. Guatemala



## Photograph Excised Here

Fig. 6 Child, heavily infected with hook worm disease. Dull, listless facial expression; "pot-belly." Cured. Guatemala



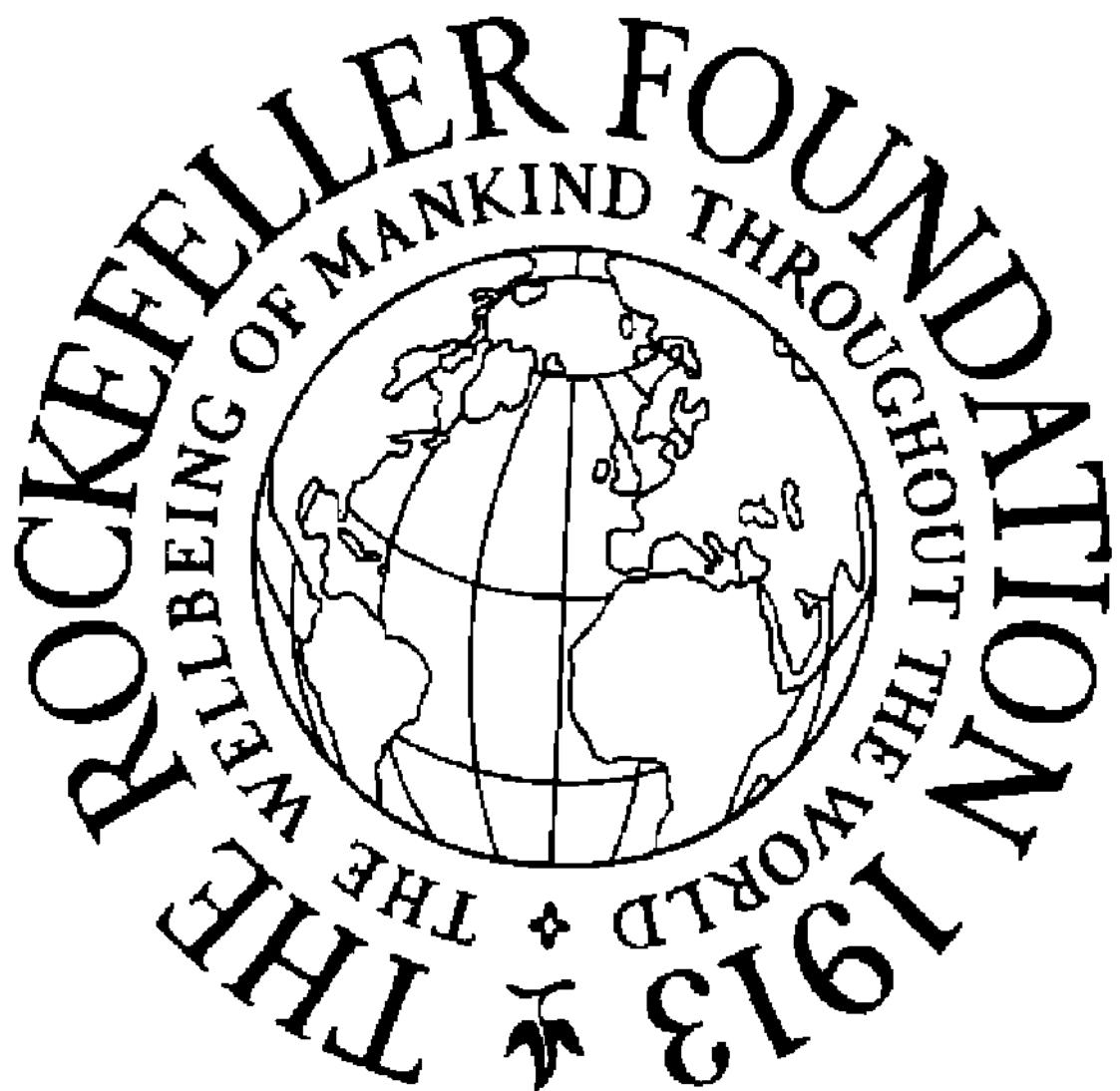
## Photograph Excised Here

Fig. 7. Patient in last stage of hookworm disease—Fatal termination. Ceylon



## Photograph Excised Here

Fig. 8. Two boys of the same age; the one on the right has hookworm disease. Guatemala



## Photograph Excised Here

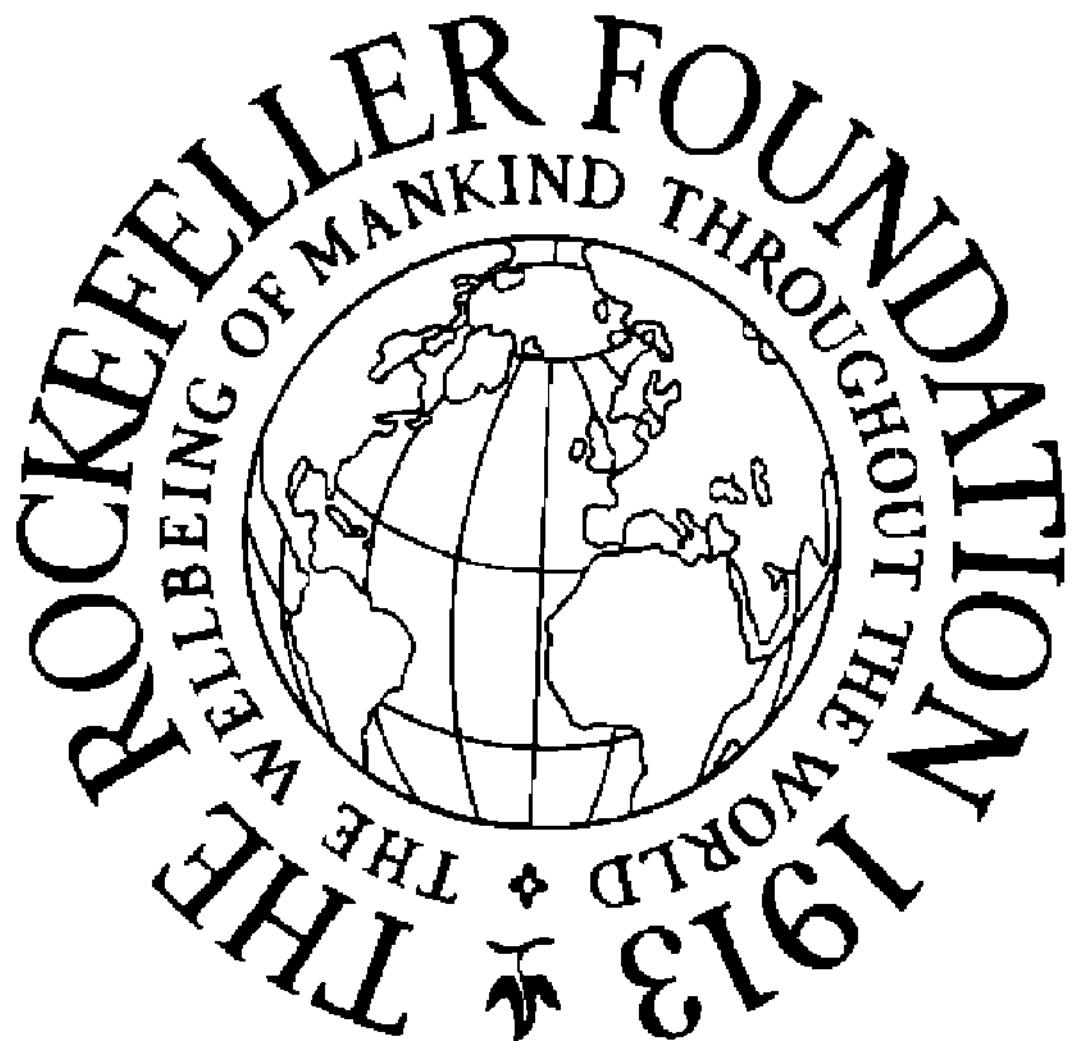
Fig. 9. Negro, aged 48, infected with hookworm disease. Had been unable to work for eighteen months. Trinidad

Fig. 10. Same patient four months later, after being cured



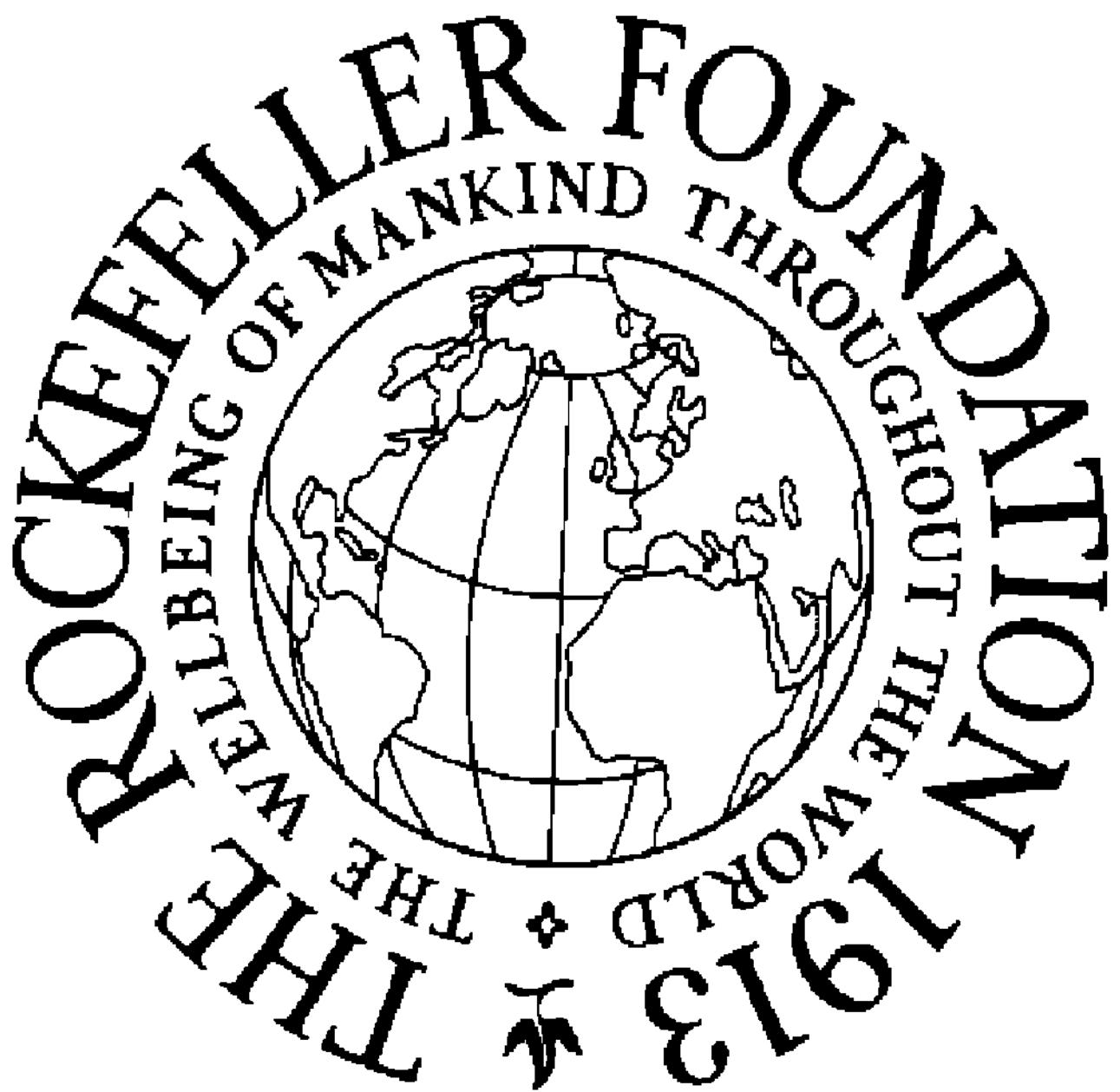
## Photograph Excised Here

Fig. 11. Lecture and microscopic demonstration at Alawatugoda village, Ceylon



Photograph Excised Here

Fig. 12. Dispenser administering preliminary dose of castor oil.  
Ceylon



Photograph Excised Here

Fig. 13. Dispenser administering dose of oil of chenopodium  
on sugar. Ceylon



## Photograph Excised Here

Fig. 14. Three dispensers (standing, extreme left) and their patients. Plantation, Dutch Guiana



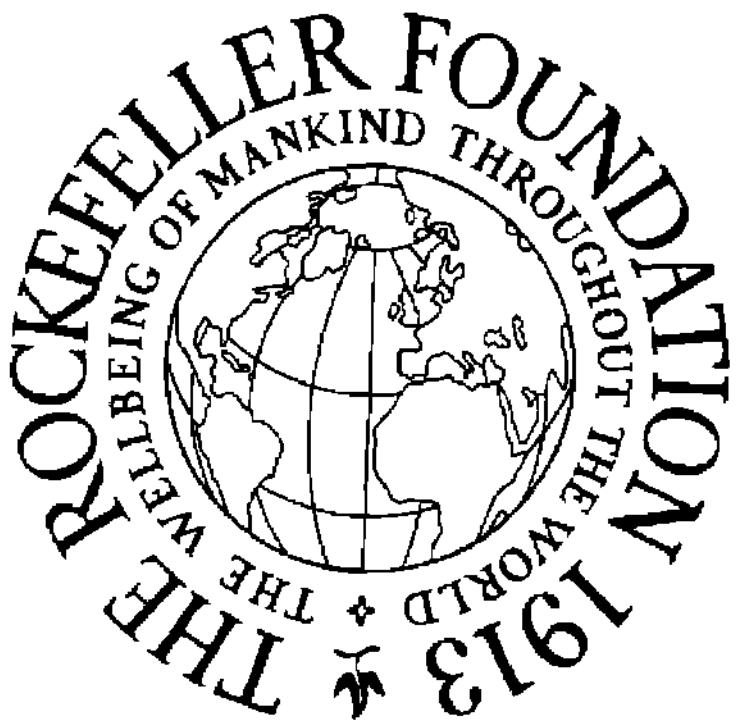
## Photograph Excised Here

Fig. 15. Portion of staff in Nicaragua on inspection trip, with (1) Dr. D. M. Molloy, Director; (2) Dr. M. E. Connor, Acting Director, December 1, 1916, to April 21, 1917; and (3) Dr. José Dolores Tijerino, Medical Assistant



Photograph Excised Here

Fig. 16. Patients assembled for treatment. Coffee estate, Costa Rica



## Photograph Excised Here

Fig. 17. Staff for the relief and control of hookworm disease in Salvador. Dr. C. A. Bailey, the Director, seated in the centre

## **V. FINANCIAL STATEMENT**

## V. FINANCIAL STATEMENT

The statement on the following pages shows that in the work of the International Health Board during 1916, a total of \$503,349.74 was expended. This statement is based on expenditures actually made during the calendar year 1916, regardless of when financial reports were received at the New York office. It will be seen that the figures differ from those given in the Treasurer's statement, pages 358 to 359. The Treasurer's report includes amounts paid in the field during the first three quarters of 1916, to which in many instances have been added amounts paid during the fourth quarter of 1915 but not recorded until early in 1916. This discrepancy between the two reports is caused by the necessity of closing the Treasurer's books shortly after the first of the calendar year, before detailed financial reports can be received from the foreign countries in which a large part of the work of the International Health Board is conducted.

**Statement of Expenditures by the International  
Health Board for the Year 1916**

FIELDS OF ACTIVITY	Amount Expended
<b>Grand Total.....</b>	<b>\$503,349.74</b>
RELIEF AND CONTROL OF HOOKWORM DISEASE.....	287,210.68
EXPERIMENTS IN MALARIA CONTROL.....	54,496.97
YELLOW FEVER COMMISSION.....	41,863.17
MEDICAL COMMISSION TO BRAZIL.....	18,513.47
UNCINARIASIS COMMISSION TO ORIENT.....	16,625.62 <sup>1</sup>
INVESTIGATION OF SEWAGE DISPOSAL AT RURAL HOMES.....	664.39
ADMINISTRATION.....	79,287.99
FIELD STAFF SALARIES AND EXPENSES NOT PRO- RATED TO SPECIFIC BUDGETS.....	4,687.45
RELIEF AND CONTROL OF HOOKWORM DISEASE:	
Southern States.....	47,565.09
West Indies.....	88,845.12
Central America.....	88,166.29
South America.....	4,779.77
The East.....	57,854.41
Southern States:	
Kentucky.....	4,866.63
Louisiana.....	1,813.19
Mississippi.....	8,786.77
North Carolina.....	3,282.34 <sup>2</sup>
South Carolina.....	5,643.52
Tennessee.....	5,797.57
Texas.....	9,971.36
Virginia.....	7,403.71
West Indies:	
Administration.....	9,271.18
Antigua.....	9,316.68
Barbados (Survey).....	1,651.31 <sup>3</sup>
British Guiana.....	18,554.45
Dutch Guiana.....	11,672.46
Grenada.....	10,154.65
St. Lucia.....	6,295.20
St. Vincent.....	6,825.15
Trinidad.....	15,104.04
Central America:	
British Honduras (Survey).....	4,273.47 <sup>4</sup>
Costa Rica.....	18,089.98
Guatemala.....	11,954.29
Nicaragua.....	18,473.69
Panama.....	24,449.62
Salvador.....	10,925.24 <sup>5</sup>

**Statement of Expenditures by the International  
Health Board for the Year 1916—Continued**

FIELDS OF ACTIVITY	Amount Expended
<b>RELIEF AND CONTROL OF HOOKWORM DISEASE</b> <i>—Continued</i>	
South America:	
Brazil.....	\$4,779.77 <sup>a</sup>
The East:	
Administration.....	22,473.78
Ceylon.....	21,585.84
Fiji Islands.....	3,386.37 <sup>b</sup>
Java.....	327.66 <sup>c</sup>
Seychelles Islands.....	3,933.29 <sup>d</sup>
Siam.....	6,147.52 <sup>e</sup>
<b>EXPERIMENTS IN MALARIA CONTROL:</b>	
Arkansas.....	11,104.58
Mississippi.....	43,392.39
<b>ADMINISTRATION:</b>	
Home Office.....	60,916.87
Survey and Education.....	17,683.62
Panama-Pacific Exposition.....	788.00

<sup>a</sup> No report received from the Uncinariasis Commission for the quarter ending December 31, 1916.

<sup>b</sup> Work began August 5, 1916.

<sup>c</sup> September 4 to November 16, 1916.

<sup>d</sup> February 7 to May 24, 1916.

<sup>e</sup> Work began March 6, 1916.

<sup>f</sup> Work began October 1, 1916.

<sup>g</sup> Inaugural expenses; actual work began February 13, 1917.

<sup>h</sup> August 6 to December 11, 1916.

<sup>i</sup> Inaugural expenses; actual work began February 8, 1917.

<sup>j</sup> Inaugural expenses; actual work began February 7, 1917.

## **ADDENDA**

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## ADDENDA

In interpreting the statistics included in the reports for the separate countries (see Chapter II), the following explanations may be helpful:

1. For Guatemala, Nicaragua, Panama, and Salvador the figures represent the total results accomplished up to December 31, 1916, in both completed and uncompleted areas.
2. For the countries except Guatemala, Nicaragua, Panama, and Salvador, the figures relate only to the results accomplished in areas in which the work had been completed by December 31, 1916. This should be borne in mind when the results of one year with another are compared.
3. The figures given in this report under the heading of "Prior to 1916" do not always agree with the figures published in the second annual report under the heading "Up to December 31, 1915." This is due in part to a change in the method of reporting which went into effect during 1916, and in part to a revision of figures which was undertaken in certain countries.
4. In interpreting the figures relating to the number of persons found infected, the technique of examination is an important consideration. In the various states and countries, different techniques, all directed to the same end, are in use, but all are not equally accurate or reliable. The following summary offers, in succinct form,

a comparison of the methods used in examining specimens. It indicates whether or not the centrifuge is used, and the maximum number of slides for the microscope which are prepared from each specimen:

<u>COUNTRIES<sup>1</sup></u>	<u>TOTAL</u>	<u>SLIDES EXAMINED</u>	
		<u>BEFORE CENTRI- FUGING</u>	<u>AFTER CENTRI- FUGING</u>
<b>West Indies:</b>			
Antigua.....	5	2	3
British Guiana.....	14	7	7
Grenada <sup>2</sup> .....	4	2	2
St. Lucia.....	5	2	3
St. Vincent.....	4	1	3
Trinidad.....	4	2	2
<b>Central America:</b>			
Costa Rica <sup>3</sup> .....	3 <sup>4</sup>	..	..
Guatemala <sup>5</sup> .....	3	..	..
Nicaragua <sup>6</sup> .....	3	..	..
Salvador.....	5	2	3
<b>The East:</b>			
Ceylon.....	5	2	3

5. The number of persons cured is based upon the number previously infected in whose feces no ova could be detected on re-examination following the last treatment. In considering these figures it should be borne in mind that in practically all dispensary work, and to a more limited extent in the intensive work in the Southern States, re-examinations for determining

<sup>1</sup>The countries omitted from this summary have not reported the methods being used in examining specimens.

<sup>2</sup>In Grenada this technique has been used only since August 26, 1916.

<sup>3</sup>The centrifuge is not used.

<sup>4</sup>If the patient appears to be clinically infected, and all three slides are negative, another specimen is taken.

<sup>5</sup>In Nicaragua the use of the centrifuge was begun in the central office during the third quarter of the year, and it is proposed to use this method of examination exclusively in the work to be conducted during 1917. When the centrifuge is used, four specimens are examined, two before and two after centrifuging.

whether cures have been effected are lacking. In work by these methods, all persons reported as "Given First Treatment" receive one or more treatments, and as a result a large majority of them are doubtless much benefited in health if not actually cured; there may be some, however, who accept the medicine but either do not take it or take it contrary to instructions. It is manifestly impossible to correct this error in the records. In work conducted by the intensive method, the patients actually swallow the medicine in the presence of the nurses.

6. In interpreting the figures relating to cures, allowance should be made for the possibility of error in examining specimens. In some cases a patient may remain infected, but a careful search may fail to reveal ova in his stool. The number of such cases will depend upon the thoroughness of the microscopic technique, but in any event will be relatively small and will consist mainly of persons who are lightly infected. For this and for another reason—that a certain proportion of the persons who for various reasons were not examined were doubtless infected—the actual number of persons remaining in the areas uncured at the close of work will probably be greater in every instance than the tables show.

7. In figuring the percentage of persons remaining in the areas uncured at the close of work, the original number of infected persons

and not the total population of the areas has been taken as the base. If the figures for the total population were used as the basis of calculation, the percentage of persons remaining uncured would be considerably lower, but in order to arrive at such a percentage figure it would be necessary to take into consideration a number of estimated factors.

8. In the tables exhibiting the detailed results of work by the intensive method, the terms "Not Treated for Medical Reasons" and "Not Cured for Medical Reasons" relate to very old or emaciated persons, pregnant women, or sufferers from acute heart or kidney disease, typhoid fever, malaria, dysentery, and diarrhea. To administer treatment for hookworm disease to these persons might cause serious complications and possibly death. Consequently the treatment is spoken of as withheld for medical reasons.

9. Persons who have taken one or more treatments for hookworm disease, but have abandoned treatment before being cured, are classed as "Refused." These persons may be divided into two groups: those who refuse to accept even the first treatment, and those who accept one or more treatments but do not continue treatment until cured. Persons who die within the areas of operation while the work is in progress are included in the table as "Removed" from the areas.

**CHINA MEDICAL BOARD**  
**Report of the Director**



CHINA MEDICAL BOARD  
Report of the Director

*To the President of the Rockefeller Foundation:*

Sir:

I have the honor to submit herewith my report as Director of the China Medical Board for the year 1916.

*Respectfully yours,*

WALLACE BUTTRICK,  
*Director.*

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# CHINA MEDICAL BOARD

## OFFICERS

### *Chairman*

JOHN DAVISON ROCKEFELLER, JR.

### *Vice-Chairman*

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### *Director*

WALLACE BUTTRICK

### *Resident Director in China*

ROGER SHERMAN GREENE

### *Secretary*

EBEN CHARLES SAGE

### *Executive Committee*

Wallace Buttrick

Starr Jocelyn Murphy

Frederick Taylor Gates

Francis Weld Peabody

John Davison Rockefeller, Jr.

### *Members<sup>1</sup>*

*To serve until the annual meeting of 1919*

Harry Pratt Judson

Francis Weld Peabody

Frederick Taylor Gates

Starr Jocelyn Murphy

Roger Sherman Greene

*To serve until the annual meeting of 1918*

John R. Mott

Simon Flexner

Wallace Buttrick

Frank Johnson Goodnow

Frederick Lamont Gates

*To serve until the annual meeting of 1917*

William Henry Welch

John Davison Rockefeller, Jr.

Wickliffe Rose

<sup>1</sup>On January 24, 1917, George Edgar Vincent was elected a member to serve until the annual meeting of 1920.

# TRUSTEES OF THE PEKING UNION MEDICAL COLLEGE

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JOHN R. MOTT

### *Vice-Chairman*

JAMES LEVI BARTON

### *Secretary*

WALLACE BUTTRICK

### *Executive Committee*

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Arthur Judson Brown  
Wallace Buttrick

Simon Flexner  
Frank Mason North

## Members

*To serve until the annual meeting of 1919*

Wickliffe Rose	Francis Henry Hawkins
William Henry Welch	Frank Mason North

*To serve until the annual meeting of 1918*

Simon Flexner	John Davison Rockefeller, Jr.
John R. Mott	James Auriol Armitage
James Levi Barton	

*To serve until the annual meeting of 1917*

Wallace Buttrick	Arthur Wenham
Frederick Taylor Gates	Arthur Judson Brown

These members have been elected as follows:

### *By the Rockefeller Foundation*

Wallace Buttrick	John R. Mott
Simon Flexner	John Davison Rockefeller, Jr.
Frederick Taylor Gates	Wickliffe Rose

William Henry Welch

### *By the London Missionary Society*

Francis Henry Hawkins

### *By the Society for the Propagation of the Gospel in Foreign Parts*

James Auriol Armitage

### *By the Medical Missionary Association of London*

Arthur Wenham

### *By the Board of Foreign Missions of the Presbyterian Church in the United States of America*

Arthur Judson Brown

### *By the American Board of Commissioners for Foreign Missions*

James Levi Barton

### *By the Board of Foreign Missions of the Methodist Episcopal Church*

Frank Mason North



## STATEMENT OF THE PURPOSES AND PLANS OF THE CHINA MEDICAL BOARD

In creating the China Medical Board, it was the aim of the Rockefeller Foundation to promote the gradual and orderly development of a comprehensive and efficient system of medicine in China. For a long time the Foundation had been considering the need of scientific medicine in China, and in 1914 a Commission was sent out, consisting of Harry Pratt Judson, President of the University of Chicago; Francis W. Peabody, M.D., of the Harvard Medical School, Boston; and Roger S. Greene, at that time Consul General of the United States at Hankow, now Resident Director in China of the China Medical Board. This Commission visited the several medical schools in China and a large number of hospitals, missionary and other, and upon its return to the United States made a detailed report to the Foundation.<sup>1</sup> This report contained a series of recommendations which were adopted by the Foundation as a working basis, subject to such changes as experience and further knowledge might invite. In addition to this, the Foundation had at its disposal valuable material collected by the Oriental Educational Commission, composed of Dr. Ernest D. Burton

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<sup>1</sup> This has been published under the title "Medicine in China," and will be sent to any address on application.

and Dr. Thomas C. Chamberlin, who were sent out by the University of Chicago in 1909 to study general educational conditions in the East. Late in 1914 the Rockefeller Foundation created the China Medical Board, which held its first meeting on December 11, 1914, to effect an organization. A report covering the activities of the China Medical Board for the year ended December 31, 1915, has been published and will be sent on request to any address.

Realizing the importance and value of the work the medical missionaries are doing for the people of China, the China Medical Board has endeavored to co-operate sympathetically with the several missionary societies in strengthening their medical schools and hospitals. To this end the Board has made grants in aid for equipment and other facilities in a limited number of hospitals and at two medical schools, and has also made grants in aid for the support of foreign trained physicians and nurses on their staffs.

A number of fellowships have been granted to doctors and nurses, both foreign and Chinese, for graduate study in this country.

The main work of the Board, however, will be the founding of two medical schools, one at Peking and another at Shanghai, which shall be of the same grade and character as the better medical schools of the United States and Europe.

During the year 1916 five meetings of the China Medical Board have been held as follows:

January 28, April 6, May 26, October 24, and December 22. The Executive Committee has held thirteen meetings as follows: January 21, February 29, March 7, March 27, April 25, June 12, June 16, June 29, July 10, September 29, October 5, November 20, and December 26.

On January 26, the Rockefeller Foundation elected Dr. Frederick L. Gates and Mr. Roger S. Greene members of the China Medical Board, the former to serve until the annual meeting of 1918, and the latter until the annual meeting of 1919.

For convenience the work of the China Medical Board may be classified as follows: I. Medical Education; II. Aid to Missionary Hospitals; III. Fellowships and Scholarships.

## I. MEDICAL EDUCATION

### 1. THE PEKING UNION MEDICAL COLLEGE

#### A. ACTIONS TAKEN BY THE TRUSTEES OF THE PEKING UNION MEDICAL COLLEGE

##### **First Meeting**

The first meeting of the Trustees of the Peking Union Medical College was held on January 24, 1916, when the following officers were elected: Chairman, John R. Mott; Vice-Chairman, James L. Barton; Secretary, Wallace Buttrick; Executive Committee: Frederick T. Gates, Chairman, Arthur J. Brown, Wallace Buttrick, Simon Flexner, Frank Mason North. None of the English trustees were present; they were represented, however, by Dr. Thomas Cochrane, President Emeritus of the Union Medical College of Peking, who held proxies for Mr. Hawkins and Mr. Wenham, and by Dr. William H. Jefferys of Philadelphia and formerly connected with St. Luke's Hospital, Shanghai, who held the proxy of Dr. Armitage.

##### **Present Students of the Union Medical College**

At this meeting Dr. Welch, of the Commission sent to China in 1915, read from the report and recommendations of the Commission the section relating to the Union Medical College. After discussion, the Trustees decided that no new students should be admitted to the institution in the fall of 1916, and that the students of

the first, second and preparatory classes should be transferred to the Union Medical College at Tsinanfu, Shantung Province, for the completion of their medical training, provided the Chinese government would confirm the diplomas of students so educated upon examination by the members of the Peking faculty. Later the Chinese government consented to this arrangement and the plan has been carried out to the satisfaction of all the parties interested. The two upper classes are completing their clinical work at Peking.

#### Committee of Control

Pending the opening of the reorganized college, a Committee of Control was appointed to administer the local affairs of the college, consisting of Mr. Roger S. Greene, Resident Director in China of the China Medical Board, Dr. Charles W. Young, Dean of the College, and Dr. Edward J. Stuckey, a member of the faculty.

#### Language

At this same meeting, the English language was determined upon as the medium of instruction, and it was decided that while a knowledge of the Chinese language would undoubtedly be valuable, it will not be required of all members of the faculty. These actions were in accordance with the recommendation of the China Medical Commission, which may be found on page 91 of "Medicine in China."<sup>1</sup>

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<sup>1</sup> See also pp. 81-85 of "Medicine in China" for discussion.

### Organization

At the first annual meeting of the Trustees of the Peking Union Medical College held on May 23, 1916, organization was effected under a provisional charter granted by the Regents of the University of the State of New York, by-laws were adopted, and the lease of the property from the China Medical Board was accepted as contemplated in the memorandum of agreement with the London Missionary Society made in 1915. At this meeting it was our pleasure to welcome Mr. F. H. Hawkins, Secretary of the London Missionary Society, who represents that Society as trustee, and Dr. R. Fletcher Moorshead of the Baptist Missionary Society (England), who held the proxy of Mr. Arthur Wenham of the London Medical Missionary Association. The officers chosen at the meeting of January 24, enumerated in the first paragraph of this section, were unanimously re-elected. It was decided to hold the annual meeting of the Trustees on the second Wednesday of April in each year.

### Appointment of Executive Head

On June 20, 1916, the Executive Committee of the Peking Trustees elected Franklin C. McLean, Ph.D., M.D., of the Rockefeller Institute Hospital, Professor of Medicine and Physician-in-Chief. Dr. McLean visited China and made a careful study of the situation there, returning in October, when he submitted a report of his findings and recommendations.

### Premedical School

At the meeting of the Executive Committee held December 20, it was decided to open a Premedical School at Peking in September, 1917. Students in preparatory schools and colleges in China at the present time are not receiving sufficient instruction in science to enable them to undertake work in a high grade medical school. The Board, therefore, faced the dilemma of either aiding a number of colleges to strengthen their scientific departments, or of creating a school of its own. After careful consideration, the conclusion was reached that for the present it will be necessary to conduct a premedical school in connection with the Peking Union Medical College. This, however, is considered a temporary arrangement, and it is hoped that within a few years the colleges of North China will be able so to advance their courses in science as to prepare students for the medical school.

### Meetings

The Board of Trustees has held two meetings, on January 24, and on May 23. The Executive Committee has met twice, on June 20, and on December 20.

**B. ACTIONS OF THE CHINA MEDICAL BOARD AFFECTING THE PEKING UNION MEDICAL COLLEGE**

In furtherance of the action of the Peking Trustees in sending the first, second, and preparatory classes of the Peking College to the Union Medical College at Tsinanfu to complete their education, the China Medical Board on March 7 made two substantial appropriations to the Tsinanfu Union Medical College: for buildings and equipment \$50,000, and for maintenance during a period of five years a total sum of \$100,000, which may be drawn against at any time at their discretion. The object of this gift was to cover the cost to the Tsinanfu Medical College of educating the students sent to them by us, and also of the enlargements of their plant made necessary for the accommodation of these students. The Board also had in mind the wish of the China Medical Missionary Association to establish a high grade medical school to be taught in the Chinese language.

**Land Purchases**

Through the negotiations of Mr. Greene, the Resident Director, the Board has acquired the palace of Prince Yu, known as the Yu Wang Fu property, a tract of over eight acres located about 300 feet from the present medical school buildings. On this land the laboratories, outpatient department, hospitals, nurses' home, and religious building for the reorganized medical

school will be constructed. Mr. Greene has also purchased some small parcels of land adjacent to the Ying property, and a considerable tract adjoining the present hospital.

#### Architects

Mr. Charles A. Coolidge, head of the firm of Coolidge & Shattuck, Boston, was engaged as consulting architect. He visited China and made careful study of our architectural problems, returning to this country in October when he made a full report of his conclusions and recommendations.

On December 22 the Executive Committee requested Mr. Harry Hussey, of the firm of Shattuck & Hussey, architects, of Chicago, who has had considerable experience in building in China, to prepare plans and recommendations for buildings at Peking. Mr. Hussey, with the co-operation of Mr. Coolidge, prepared tentative plans for the consideration of the China Medical Board, and was later instructed to make permanent plans.

## 2. THE SHANGHAI MEDICAL SCHOOL

At its meeting held April 6, 1916, the China Medical Board formally voted to establish a medical school at Shanghai. On April 11, the Rockefeller Foundation approved this action and designated funds in sufficient amount to provide the plant and maintain the school. The following persons have been selected as Trustees

of the Shanghai Medical School of the Rockefeller Foundation:

Fletcher S. Brockman	Starr J. Murphy
Wallace Buttrick	Francis W. Peabody, M.D.
Walter G. Cannon, M.D.	Robert E. Speer
Simon Flexner, M.D.	George E. Vincent
Frederick L. Gates, M.D.	William H. Welch, M.D.
	John W. Wood

No meetings have yet been held.

### 3. RED CROSS HOSPITAL, SHANGHAI

Until July of 1916 the Harvard Medical School of China conducted its school in the laboratories and hospital owned by the central committee of the Chinese Red Cross Society. When the Harvard Medical School closed its work in July, 1916, the China Medical Board assumed the support of the hospital for a period of two years. This action insures the maintenance for that period of a much needed institution in Shanghai and will also afford a place for work to members of the staff of the Shanghai Medical School who may be sent out before the new buildings have been constructed.

The services of Dr. Henry S. Houghton, formerly Dean of the Harvard Medical School of China, were engaged by the China Medical Board from July 1, 1916. He will have charge of the Red Cross Hospital and will co-operate with Mr. Greene in directing the Board's activities in China. There were some vacancies in the hospital staff, occasioned by the withdrawal of

teachers of the Harvard School, and the Board has sent out on temporary appointment Dr. Roger I. Clapp, an eye, ear, nose and throat specialist, and Dr. William B. Sharp, an internist.

#### 4. HUNAN-YALE MEDICAL SCHOOL, CHANGSHA

The China Medical Commission of 1914 recommended a grant for a laboratory at the Hunan-Yale Medical School in Changsha. An application for such a laboratory was presented to the Board on October 24, and \$30,000 was appropriated, of which \$25,000 is to be used for the building and \$5,000 for equipment.

#### 5. ST. JOHN'S-UNIVERSITY OF PENNSYLVANIA MEDICAL SCHOOL, SHANGHAI

As stated in the Report of the Director for 1915, the St. John's-University of Pennsylvania Medical School, the University of Nanking, and the Harvard Medical School of China have decided to discontinue their medical work because of the China Medical Board's purpose to found a medical school in Shanghai. Pending the establishment of the school of the China Medical Board, however, the St. John's-University of Pennsylvania School continues its work. An appropriation of \$1,500 has been made to the school for the salary of a teacher of anatomy.

## II. MISSIONARY HOSPITALS

In aiding missionary hospitals the Board has for its main purpose the desire to co-operate with the missionary societies in strengthening their valuable work. It has also had in mind the needs of future graduates from its medical schools. When these graduates leave the medical school they will need to spend at least one year as internes. It is important, therefore, that there shall be a number of well-developed hospitals where they can serve internships. In making its appropriations the Board, therefore, has sought to select hospitals which are accessible from Peking and Shanghai.

It is also the hope of the China Medical Board that when its two medical schools are well established, it may be possible for missionary doctors to be released from their duties for, say, three months every year, to take graduate work in one or other of the schools. It is obvious that such work in association with other missionary doctors and under the general guidance of members of the faculties, will be of great service to the physicians who are working in missionary hospitals. Such an arrangement would not be practicable for hospitals which have but one doctor on their staffs. Appropriations for the increase of staffs of the hospitals, therefore, serve as steps toward the consummation of this larger plan.

Grants in aid have been made during the year 1916 to the following missionary organizations:

American Baptist Foreign Mission Society (North).

Foreign Mission Board of the Southern Baptist Convention.

American Board of Commissioners for Foreign Missions.

Board of Foreign Missions of the Methodist Episcopal Church (North).

Board of Missions of the Methodist Episcopal Church (South).

Board of Foreign Missions of the Presbyterian Church in the U. S. A. (North).

Executive Committee of Foreign Missions of the Presbyterian Church in the U. S. (South).

Foreign Christian Missionary Society.

London Missionary Society.

Church of Scotland Foreign Mission Committee.

Canton Christian College for the Canton Hospital.

Nanking Hospital (Union).

Huchow Hospital (Union).

#### Five-Year Terms

On April 6 the Board resolved that as a rule its appropriations for the support of medical missionaries and nurses, including grants already made, should be for periods of five years.

#### Conditions of Gifts

On May 26 the Board took the following action:

*"Resolved, that hereafter appropriations to hospitals in China shall be made only upon the understanding and agreement that societies making application shall contribute at least one fourth of the total sum desired for increase of staff, equipment, or plant."*

It was the belief of the Board that this policy would tend to promote larger contributions from churches and individuals and in general stimulate interest in medical missions.

**Union Hospitals**

In Nanking several missions have united to maintain one general hospital, connected with the University of Nanking. This was the hospital formerly connected with the medical school of the University of Nanking which has been discontinued because of the proposed China Medical Board school soon to be established at Shanghai. Toward the general expenses of the Union Hospital at Nanking the Board has voted to provide for five years the salaries of one physician and three nurses, together with the further sum of \$3,000 a year for maintenance, on condition that the missionary societies and the University shall provide three physicians, one nurse superintendent, and \$3,000 a year for maintenance during the same period. The Board has further contributed \$25,000 toward \$50,000 for buildings and equipment.

At Huchow the Northern Baptists and Southern Methodists have joined to maintain a Union Hospital. They propose to build and equip a new hospital plant at a total cost of \$48,500, toward which sum the China Medical Board has subscribed \$20,000, payable when a further sum of \$28,500 shall be secured by the two societies. The Board has also pledged a sum averaging about \$2,000 a year for five years to cover three fourths of the cost of one additional foreign doctor, one additional foreign nurse and one additional Chinese doctor for this Union Hospital.

To the Canton Christian College a grant of \$4,500 a year for five years has been made, of which \$2,500 is for a business manager in the Canton Hospital and the remaining \$2,000 for the general maintenance of the hospital. This hospital, which is supported by the Chinese in co-operation with several missionary societies, is one of the largest and oldest hospitals in China.

#### Details

The total amount appropriated to these mission hospitals for expenditure during the year 1916 was \$158,502.20, of which \$78,704.20 was for capital expenditure and \$79,798 for annual maintenance. A further sum of \$271,087 has been pledged for current expenses during the next five years, and \$20,000 will be payable in 1917 on capital account. A detailed list of these appropriations for mission hospitals, giving the location of hospitals, the organization under whose auspices they are conducted, and the amount and specific designation of the appropriations will be found in the Treasurer's Report, pp. 364 to 370.

### III. SCHOLARSHIPS AND FELLOWSHIPS

#### Medical Missionaries on Furlough

Twenty-seven medical missionaries on furlough from China have received appropriations from the China Medical Board during 1916 for graduate study in the United States. Three of these grants have been renewals for a second year of work. These missionary physicians have studied in various institutions in the United States, including the Johns Hopkins Medical School, the Harvard Medical School, the Mayo Clinic in Rochester, Minnesota, Rush Medical College, Chicago, the Massachusetts Eye and Ear Infirmary, Manhattan Eye and Ear Hospital, the New York Post-Graduate Hospital, the New York Polyclinic Hospital, the Skin and Cancer Hospital, New York, the Lakeside Hospital, Cleveland, the Philadelphia Polyclinic, and the New York Presbyterian Hospital. In two instances a doctor and his wife (in one case a nurse and in the other herself a doctor) have both been given fellowships. The total amount appropriated for payment during 1916 for these fellowships was \$26,750. The names of the missionaries who have received such grants follow:

John Todd Anderson, Southern Baptist Mission, Cheng-chow, Honan.

N. Worth Brown, Nanking Hospital, Nanking, Kiangsu.

A. M. Dunlap, Harvard Medical School of China, Shanghai, Kiangsu.

J. M. Gaston, Southern Baptist Mission, Laichowfu, Shantung.

F. W. Goddard, American Baptist Mission, North, Shaohsing, Chekiang.

N. S. Hopkins, Southern Methodist Mission, Peking, Chihli.

Harvey J. Howard, Canton Hospital, Canton, Kwangtung.

Allen C. Hucheson, Southern Presbyterian Mission, Kashing, Chekiang (recently transferred to the Nanking Hospital).

Claude M. Lee, American Episcopal Mission, Wusih, Kiangsu.

Charles Lewis, American Presbyterian Mission, North, Paotingfu, Chihli.

Dr. and Mrs. O. T. Logan, American Presbyterian Mission, North, Changteh, Hunan.

W. McClure, Union Medical College, Tsinanfu, Shantung.

Frederick P. Manget, Southern Methodist Mission, Huchow, Chekiang.

J. Preston Maxwell, English Presbyterian Mission, Yungchun, Fukien.

W. R. Morse, American Baptist Mission, Chengtu, Szechuen.

Way Sung New, Harvard Medical School of China, Shanghai, Kiangsu.

B. E. Read, Union Medical College, Peking, Chihli.

J. E. Skinner, American Methodist Mission, North, Yenping, Fukien.

John A. Snell, Southern Methodist Mission, Soochow, Kiangsu.

Mary Stone, American Methodist Mission, North, Kiukiang, Kiangsi.

Adrian S. Taylor, Southern Baptist Mission, Yangchow, Kiangsu.

W. S. Thacker, Society for the Propagation of the Gospel, formerly at the Union Medical College, Peking, Chihli.

J. G. Vaughan, Northern Methodist Mission, Nan-chang, Kiangsi.

Volrath Vogt, Norwegian Mission Society, Yiyang, Hunan.

Mrs. Volrath Vogt, Norwegian Mission Society, Yiyang, Hunan.

Among the above named missionaries, seven have completed their studies and returned to China.

#### Fellowships for Chinese Doctors

In 1914 and 1915 six Chinese doctors were carefully chosen from a large number of applicants and sent to this country for graduate study in medicine. One of these, Dr. Li Tsing-meu, has returned to China and is working at the Peking Union Medical College. The remaining five, Drs. Li Tsing-liang, Hsieh En-tseng, Shen Szejen, Tsen Tsung-hsien and Peter Kiang applied for and were granted fellowships for a second year. Appropriations were also made for the return of all six to China. Two other Chinese physicians, Dr. F. C. Yen of the Hunan-Yale Medical School and Dr. George Y. Char of the Church General Hospital, Wuchang, have also received fellowships during the year.

#### Chinese Nurses

In 1914 five nurses' scholarships were created. Two nurses were appointed to these scholarships in 1915, Miss Mildred Wu of Changsha and Miss Lillian Wu of Kiukiang, and this year Miss Elizabeth Li Sing Sze of Soochow has been added to their number. The scholarship for Miss Mildred Wu was extended for an additional period of three months.

#### Chinese Pharmacists

In 1915 the Board appropriated \$3,900 for scholarships for three pharmacists, covering the

cost of travel to America and return to China, together with maintenance for one year. These scholarships were not filled until April of this year, when Messrs. Cheng Tsung-yi of Peking, and How Kyan-tsing and Hsi Yin-dah of Changsha were appointed, and came to America to study at the University of Maryland Medical School in Baltimore. Later in the year the amount of their stipend was slightly increased, because the maintenance allowance was found to be inadequate for their needs.

## IV. MISCELLANEOUS

### Harvard Medical School of China

In June, 1916, the Harvard Medical School of China closed its work. As already noted, the Board took Dr. Houghton, formerly Dean of the Harvard Medical School of China, upon its permanent staff. Two former members of the Harvard Medical School faculty, Dr. A. M. Dunlap and Dr. W. S. New, have been granted fellowships in this country and are now studying at the Harvard Medical School, Boston.

Pursuant to agreement, the China Medical Board is completing the education of selected students from the Harvard Medical School of China. Six of these students are pursuing their studies at the Harvard Medical School, Boston; one other will arrive later for study here; and six students are pursuing their studies in China. The total cost to the Board for completing their medical education will be not more than \$29,800. The students who are working at the Harvard Medical School in Boston have the benefit of the advice and guidance of Drs. Dunlap and New, who are taking graduate work there.

### Translation

On October 24 a grant of \$4,500 for the years 1916-17 and 1917-18 was made to Dr. P. B. Cousland, Secretary of the Publication Committee of the China Medical Missionary Association.

ciation, for the translation of medical textbooks. Dr. Cousland and his assistant are now at work in Yokohama under this appropriation.

Seven hundred dollars was appropriated as a renewal of the grant to the Nurses' Association of China for the translation of nursing textbooks.



**WAR RELIEF COMMISSION**

**Report of the Chairman**



## WAR RELIEF COMMISSION

### Report of the Chairman

*To the President of the Rockefeller Foundation:*

Sir:

I have the honor to submit herewith my report as Chairman of the War Relief Commission for the year 1916.

*Respectfully yours,*

WICKLIFFE ROSE,  
*Chairman.*



## WAR RELIEF COMMISSION

The War Relief Commission of the Rockefeller Foundation was established, it will be remembered, in the latter part of the year 1914. The purpose underlying the establishment of this Commission was to secure authoritative reports of the actual conditions in areas where relief measures were required and recommendations as to work to be undertaken based upon first-hand knowledge of the problems to be met.

The difficulties experienced by the Foundation during 1915 in making its relief plans effective and in keeping closely in touch with conditions in Europe, made it evident that in order to achieve satisfactory results in war relief activities the War Relief Commission should be placed on a more permanent footing in Europe. Accordingly, the Director of the War Relief Commission, Mr. Warwick Greene, accompanied by Mr. William J. Donovan of Buffalo and Mr. Reginald C. Foster of Boston, sailed for Europe in March, and shortly thereafter established the headquarters of the Commission at Berne, Switzerland.

The War Relief Commission consists of Wickliffe Rose, Chairman, Warwick Greene, Director, and the following members: Ernest P. Bicknell; Dr. Hermann M. Biggs; Dwight F. Davis; Dr. Alphonse R. Dochez; William J. Donovan; Charles H. W. Foster; Reginald C.

Foster; Henry James; Wallace C. Sabine; Jeremiah Smith, Jr.; Edward R. Stoever; Eliot Wadsworth, and Frederic C. Walcott.

An account of the war relief projects initiated by the Commission during 1916, and also of those to which the Foundation contributed directly is given in the following pages.<sup>1</sup>

#### RELIEF OF BELGIAN CHILDREN

The Rockefeller Foundation received, early in July, from Mr. Warwick Greene, an appeal to the American public for the relief of about five hundred children who were at that time living in the fighting zone in that part of Belgium which had not been occupied by the German forces.

Arrangements had already been made, and money subscribed from Swiss sources, for the removal of seven hundred and sixty children who had been similarly situated to the canton of Fribourg in Switzerland, where provision was made for their protection, maintenance, and education under the direction of Baroness de Montenach, President, and Mlle. Clément, Vice-President of the International Young Girls' Protection Society.

From a careful investigation of this work it had appeared to be carried on in an efficient, economical and sympathetic manner. When the needs of five hundred additional children

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<sup>1</sup> A statement of expenditures made by the Rockefeller Foundation from the beginning of the European war to December 31, 1916, will be found in Appendix VI, pp. 428-431.

were brought to the attention of those in Switzerland who had been interested in the matter, it became apparent that their already over-taxed resources were unequal to this new demand. The Queen of the Belgians then asked that an appeal be transmitted to America.

Upon the receipt of this appeal the Rockefeller Foundation took the matter up with the Belgian Relief Fund of New York and the New England Belgian Relief Fund of Boston, and received immediate assurances of co-operation. The cost of taking care of the additional five hundred children in the manner suggested had been estimated at \$73,000 for the first year, or a cost of forty cents per capita per day. In case the prolongation of the war should necessitate continued provision for these children, the cost for the second year was expected to be \$51,000, or twenty-eight cents per capita per day.

In order that the removal of the children might not be unnecessarily delayed, the Rockefeller Foundation instructed the Director of the War Relief Commission to authorize their removal from Belgium and guaranteed the cost of carrying out the plan for their maintenance in Switzerland. Toward the necessary cost for the first year the Belgian Relief Fund of New York City appropriated \$25,000; the New England Belgian Relief Committee appropriated \$10,000, and the Refugees Relief Fund appropriated \$3,000.

Acting under this authority from the Foundation, the Director of the War Relief Commission entered into an agreement with the Comité Central Suisse de Secours aux Réfugiés Belges, whose activities included the transportation of Belgian children to Switzerland. The arrangement was consummated in detail with the sub-committee at Fribourg. Following the completion of the arrangements between the War Relief Commission and the Comité Suisse de Secours, the ladies of the committee busied themselves with preparations for the coming of the children. Baroness de Montenach and Mlle. Clément found four buildings suitable to the reception of the children—three at Fribourg and one at Vaulruz near Brulle, about thirty miles from Fribourg. The building at Vaulruz is the historic Chateau de Vaulruz, which now belongs to the state. The state has made no charge for the use of the building. The buildings were rapidly adapted to their new purpose. Furniture was purchased and clothing prepared. The sharp advance in the prices of food and other supplies made it very difficult to keep within the estimated expense. The committee was greatly aided to this end by some fifty women of Fribourg and Vaulruz, who worked voluntarily for two months sewing the wearing apparel and bed clothing for the children.

The first contingent of Belgian children to be hospitalized in Switzerland under the grant of

the Rockefeller Foundation arrived on September 20. There were 75 children in all—32 girls, 43 boys. They were first taken to Lausanne, where many of the women met them at the railroad station to give them affectionate welcome, and to care for them on their way to the hospital where they were clothed with the garments which had been sent down from Fribourg and Vaulruz. The doctors and nurses at the hospital spent the day in examining and vaccinating them. All of this was voluntary service. In the evening they were taken on; the girls to Fribourg and the boys to Vaulruz. The children were most of them from five to six years of age, though one was as young as two years and another, who had been the mother to the whole party and of inestimable value on the journey, was sixteen years of age.

On account of the difficulty of mail communication only fragmentary reports have come to hand concerning the Belgian children brought into Switzerland under the Foundation's guarantee. It is probable that about 200 have been received up to the present time. A member of the Commission saw some of the children in the latter part of November, and also inspected their living quarters. He reports that the clothing provided is amply warm and serviceable, and that the children are comfortably housed and well managed. Photographs are appended of some of the Belgian children, of the building

in which they are housed and of one of the dormitories in the building (pages 335 to 338).

#### STIPENDS FOR BELGIAN PROFESSORS

The grant made by the Foundation to provide stipends for Belgian professors of scientific subjects who are refugees in England was continued throughout 1916, \$15,000 being appropriated for that purpose.

#### POLAND

Throughout the year the War Relief Commission in co-operation with the Commission for Relief in Belgium made every effort to bring about an agreement between the belligerent countries whereby foodstuffs and other supplies might be brought into Poland and distributed to the distressed population by representatives of neutral countries. Mr. Frederic C. Walcott, a member of the firm of William P. Bonbright & Company, in company with Mr. Caspar Whitney of the Commission for Relief in Belgium, visited Poland on behalf of the Rockefeller Foundation. They found conditions of indescribable misery and suffering which had been steadily growing worse since the wholesale devastation of factories, homes and crops in the fall of 1915. Mr. Walcott and Mr. Whitney were able to negotiate a tentative agreement with officials of the German government covering the importation of food and supplies into Poland. Upon returning to England, Mr. Wal-

cott and Mr. Herbert C. Hoover, Chairman of the Commission for Relief in Belgium, took up the matter of the relief of the Polish population with the British government. The Director of the War Relief Commission subsequently took Mr. Walcott's place in the negotiations, Mr. Walcott being obliged to return to the United States.

The Trustees of the Rockefeller Foundation at their meeting of May 24, 1916, seconded the efforts being made to assure relief for Poland by appropriating the sum of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania. It was thought probable that the Balkan countries could be included in any arrangement covering the importation of supplies into territory occupied by the Central Powers, which made it seem desirable to make provision for them in this appropriation.

While Mr. Hoover and Mr. Greene were successful in securing from the British government a statement of the conditions upon which they would allow food and other supplies to be sent into Poland, it ultimately proved to be impossible to reconcile the conflicting stipulations of Great Britain and Germany with respect to this undertaking.

The failure of the general plan of relief for the Polish people did not cause the members of the War Relief Commission to relax their efforts in behalf of that afflicted population. On the contrary, they pushed forward with increased energy

the development of certain special relief enterprises, which while only slightly mitigating the general misery and suffering, nevertheless offered distinct opportunities to save many thousands of lives.

In the latter part of September the Commission was able to purchase one hundred and ten tons of condensed milk in Switzerland and to secure permission to ship it to Poland. Eighty tons of the condensed milk were shipped to Warsaw and thirty tons to Lodz. Mr. Reginald C. Foster, a member of the War Relief Commission, conducted with officials of the Swiss and German governments the negotiations concerning the shipments of milk into Poland and gave the necessary guarantees concerning its proper distribution. By permission of the German government he visited Warsaw and Lodz late in October, and made arrangements with the local officials and representatives of relief societies in each city for controlling the apportionment and distribution of the milk supply.

In Warsaw, Mr. Foster found the relief work well organized. The city, with a population of 900,000, had been divided for the purposes of relief work into twenty-six districts. Each of these districts was a complete unit containing five soup kitchens in which over 120,000 portions of a wholesome vegetable meat soup with a piece of bread was given daily; institutions for the care of children, such as asylums for orphans

and day nurseries where working parents might leave their children during the day, and stations for the distribution of milk to the infants. In each district also was a medical unit which examined and cared for the poor.

Using this method of distribution as a basis, a Rockefeller Warschauer Hilfsausschuss (Rockefeller Warsaw Relief Commission) was formed, combining the heads of the various departments and committees already engaged in relief work in the city. The names of the members of the Commission follow:

Prince Lubomirski, mayor of the city.

Mr. Leon Goldstand, representing Prince Lubomirski.

Mr. Hernando de Soto, American Consul.

Mr. Witold Fuchs, American Vice-Consul.

Mr. Geisler, head of the Children's Relief Committee.

Mr. Hirzel, head of the soup kitchens.

Mr. Przanowski, representative of the Deutscher Lebensmittelverein.

Mr. S. Natanson, Jewish representative.

Mr. R. C. Foster, Rockefeller War Relief Commission.

With the exception of the American Consul and the representative of the War Relief Commission the members named above are all Poles.

In order to safeguard the distribution of the condensed milk the Rockefeller Warschauer Hilfsausschuss was directed to observe the following instructions:

The milk is intended only for Polish children.

It is to be distributed without regard to religious faith.

It is primarily for children up to three years of age and is intended to supplement whatever quantities of fresh milk the various local committees can obtain.

The quantity shall be distributed equally over the thirty days of the month.

The milk shall be given out only in prepared form, employing day nurseries and other institutions wherever possible so as to assure that only children receive it.

The empty tins shall be checked by the representatives of the Rockefeller Warschauer Hilfsausschuss, which in turn will turn them over to some organization employing the destitute in making various saleable articles from this metal.

Substantially the same arrangements for distributing the milk were made by Mr. Foster at Lodz. The distribution of the milk began about November 15. All told a sufficient quantity of condensed milk was shipped to Warsaw and Lodz to feed approximately 16,000 children daily. It was estimated that the total supply imported would last until the middle of January.

In connection with his visit to Warsaw and Lodz, Mr. Foster found the need for clothing to be very immediate in those cities and learned that a similar condition existed in the other large centers of Poland. Men, women, and children were walking the streets without shoes or stockings and in rags that provided small protection against the cold of the winter. Knowing that from time to time the American Relief Clearing House in Paris received large shipments of new and second-hand clothing, Mr. Foster appealed to that organization for help. At the same time he caused the need for clothing to be brought to the attention of the Polish Relief Committee in London and the Commission for

Relief in Belgium. Learning also of the possibility of purchasing odd lots of clothing, cloth, shoes and stockings in Switzerland, Mr. Foster asked the Foundation to appropriate one hundred thousand dollars to take advantage of such opportunities. The amount requested by Mr. Foster was promptly sent to him by the Foundation.

Mr. Foster was able to purchase in Berlin in the fall some forty-five tons of cocoa, which, although not of the usual nutritive standard, contained sufficient food value to make it of use for the destitute in Poland. The cocoa was distributed in Warsaw and Lodz through the committees already organized for distributing condensed milk.

#### SERBIA

The invasion of Serbia by the Central Powers in the fall of 1915 created conditions of extreme distress among the civilian population. Hundreds of thousands of the people fled before the invading armies, and it is estimated that fully fifty per cent of these refugees succumbed to exposure, disease and hunger.

Following the conquest of Serbia, the control of her territory was divided between Austria and Bulgaria. Mr. Edward Stuart, of the American Red Cross, who had charge of relief activities in Serbia for that organization, exerted himself vigorously to negotiate agreements with the

Austrian and Bulgarian governments whereby effective relief work might be conducted in Serbia.

Early in January, the Rockefeller Foundation contributed \$15,000 to the American Red Cross to be sent to Mr. Stuart for the purchase of supplies, Mr. Stuart at that time expecting to receive permission from Bulgaria to proceed with relief work. But the Bulgarian government declined to permit the Red Cross to furnish relief in that part of Serbia under its control. Mr. Stuart thereupon proceeded to Vienna where after extended negotiations he succeeded in making satisfactory arrangements with the military representatives for relief work in Belgrade. The distribution of food supplies by the Red Cross, assisted by a citizens' committee, commenced April 14, 1916.

Mr. Stuart succeeded also in securing an agreement permitting relief work in the interior of Serbia, in so far as it was controlled by the Austrian authorities. Upon receiving word to this effect from Mr. Stuart, the officials of the American Red Cross at Washington took steps to press forward the transportation to Serbia of the supplies which were shipped from New York by the steamer *Frixos* on January 1. These supplies had been diverted to the port of Marseilles where they were stored pending the outcome of the negotiations with the Austrian government. Dr. Edward W. Ryan, of the Red

Cross, who had done splendid work in Serbia in connection with the typhus epidemic, was in France when the arrangements for Serbian relief were successfully consummated. Under instructions from the Red Cross he arranged with the French and Swiss governments for the supplies to go forward from Marseilles into the territory of the Central Powers. There were about thirty carloads of supplies all told. They finally reached Belgrade about July 1.

The relief of the population of Belgrade proceeded smoothly under Mr. Stuart's direction during the year. Food was furnished at first to about 15,000 persons out of a total population of 50,000. This number increased steadily until September, 1916, when approximately 35,000 people were receiving relief. In July, 1916, the Foundation contributed an additional \$15,000 to the Red Cross for this work.

The extension of relief work to the interior of Serbia was fraught with difficulty. In the original agreement with Austria relief work outside of Belgrade was permitted only if supplies were furnished from this country. As it was impossible to secure the passage of supplies from this country to Serbia through the blockade it was necessary to secure a modification of the agreement permitting the purchase of foodstuffs in Roumania. Not until June 1 was the consent of the Austrian authorities secured to this change in the agreement. With the way open at last

for more comprehensive relief operations, plans were set afoot to establish an adequate relief organization for Serbia. These plans were being perfected rapidly when the declaration of war against the Central Powers by Roumania put a stop to their further consideration by cutting off the source of food supply. Dr. Ryan distributed in the interior of Serbia, however, the supplies brought overland from Marseilles. Mr. Stuart had succeeded in having shipped out of Roumania before war was declared all of the food which he had purchased there for the Serbians. This good fortune made it possible for him to continue his work in Belgrade until November 1.

The Director of the War Relief Commission reported in September that the crops in Serbia were excellent and would probably be sufficient to care for the needs of the population even though there were no other sources of food supply. He stated that there was great need for social service work in Serbia such as promoting the welfare of infants, caring for the aged and orphans, relieving the destitute, acting as an agency for the distribution of relief funds sent into Serbia by friends and sympathizers of the Serbian people. It was proposed to attempt to establish in Belgrade a commission charged with such duties, but the consent of the Austrian government has not yet been secured.

## ARMENIAN AND SYRIAN RELIEF

During 1916, the Rockefeller Foundation contributed \$490,000 to the American Committee for Armenian and Syrian Relief, toward a total amount of approximately \$2,400,000. The relief work which this money has supported is divided into three main departments:

1. The relief of Armenians and other non-Moslem inhabitants of that part of Turkey which is within the control of the Constantinople government. In order to reach the centers of need the Committee has relied upon the American Embassy and upon the American Consuls and missionaries in touch with the Embassy.

2. The region in the Trans-Caucasus around Tiflis and such points of Armenia as have been brought within reach through Russia by the western advance of the Russian forces in Asia Minor. A very large refugee movement, amounting to some hundreds of thousands, took place at the time of the Armenian massacres and deportations. Relief in this section is administered by an American Committee, of which the American Consul, Mr. Felix Willoughby Smith, is Chairman.

3. Northwestern Persia: To this region there was a refugee movement consisting chiefly of Syrians who were driven out of their houses by the Kurds. The numbers suffering want in this region have probably been in the neighborhood of 60,000. A committee of missionaries, with

the co-operation of American consular officers, has administered relief in this section. A report received concerning the disbursement of the funds sent for use in this region during the summer of 1915 indicates that thousands of people were kept alive by the expenditure of about a cent and a half per day per capita.

Early in the year the Foundation made a small contribution toward the expenses of an English expedition to the Trans-Caucasus, Armenia and Northwestern Persia, for the purpose of ascertaining the need and appraising the efficiency of the various relief agencies. In the report of this committee appears a brief account of the work of the American relief agents. Mention is made of the emphasis laid by the American agents on the importance of encouraging self-help. To this end assistance was given in the form of loans of seed to be repaid in full out of the harvest, and loans of oxen at the rate of one yoke for three families with a scheme of payment beginning after the first year. The American Committee also made a special point of developing industrial work and employed a considerable number of men in gardening, sawing timber, joinery, etc. It has also assisted small tradesmen to re-open their shops for the benefit of themselves and the public.

The energy and devotion with which the American missionaries have worked under the stress of the past two years have been given at

a grave cost of life and health. During the congestion of refugees at Urumia, dysentery, typhus, and typhoid fever broke out. Many of the missionaries fell ill and five died of typhus.

In the latter part of the year, the American Committee for Armenian and Syrian Relief supplied the cargo for a relief ship, a government collier under Red Cross auspices, which sailed for Beirut about December 15th.

The collier reached Alexandria in safety, but has been unable to proceed further owing to the inability of the Turkish government to furnish a safe conduct for the ship to and from Beirut.

Owing to its increasing support of relief work in Turkey, and to the probability that aid would be required over a long period of time, the Rockefeller Foundation determined to send a representative to Constantinople to inform himself concerning the effectiveness of the various relief agencies, and to acquaint himself thoroughly with the conditions of destitution and disease. In April, Mr. Edward R. Stoever was appointed to represent the Rockefeller Foundation in Turkey. From 1911 to 1914, Mr. Stoever was the engineer in charge of the American Expedition to Sardis, where archaeological excavations were carried on under the direction of Professor Howard Crosby Butler of Princeton University.

Mr. Stoever reached Constantinople in July. Shortly after his arrival he found an opportunity to render service apart from his routine duties by

taking charge of the purchase and distribution of supplies for the prisoners of war interned in the interior of Turkey.

In November, in response to Mr. Stoever's cabled recommendation the Foundation appropriated \$100,000 to be spent for general relief purposes in Constantinople and other parts of Turkey. Twenty-five thousand dollars of this amount was forwarded at once to Mr. Stoever, the balance awaiting further reports from him as to the success of his endeavors.

In March, 1916, the Constantinople chapter of the American Red Cross cabled to that organization at Washington stating that the Turkish government would welcome the co-operation of the Red Cross with the Red Crescent in the conduct of relief work in Turkey for the civilians of all races. The cablegram stated that there was great suffering throughout the country, that hundreds of thousands needed food, and that many were dying of starvation. The Turkish government offered satisfactory guarantees covering the conduct of the work in Turkey. A conference was held of representatives of the various organizations doing relief work in Turkey and it was decided to send to Constantinople \$50,000 in response to the appeal. Toward this sum the Rockefeller Foundation contributed \$25,000.

## PRISONERS OF WAR WELFARE WORK

The widespread activities of the International Committee of Young Men's Christian Associations in military and prisoner-of-war camps in the countries on both sides of the present struggle have continued to command sympathetic support from the Rockefeller Foundation. In Europe, Asia, and Africa representatives of the International Committee are working tirelessly making provision for the physical, mental, and moral welfare of the millions of men held as prisoners, and also for those comprising the vast armies facing each other in the various areas of conflict. Toward a total expenditure for welfare work in military and prisoner-of-war camps by the International Committee of Young Men's Christian Associations during 1916 of approximately \$900,000 the Rockefeller Foundation contributed \$200,000.

During the period of their service in Europe members of the War Relief Commission devoted a considerable part of their time to a thorough-going study of the question of welfare work among prisoners of war. They observed that while a few organizations, such as the International Committee of Young Men's Christian Associations and the International Red Cross at Geneva, were doing efficient work for prisoners of war sufficiently wide in scope to be of great value to all the belligerents, there was unfortunately a confusion of effort resulting from

attempts made by hundreds of small private and semi-private relief associations to aid in caring for the interests of the prisoners. It became apparent that proper co-ordination of the work could be brought about only by the building up of a single strong organization which would command the attention and respect of the belligerent powers.

In the latter part of the year, the Director of the War Relief Commission, who had returned from Europe to submit a report of the activities of the Commission, laid before the Trustees of the Foundation plans looking to the formation of a commission for the welfare of prisoners of war through the co-operation of the Foundation, the International Committee of Young Men's Christian Associations, and the International Red Cross at Geneva. The Trustees approved the plan in substance and authorized the Director of the War Relief Commission to undertake the necessary negotiations on behalf of the Foundation. Five hundred thousand dollars was appropriated to forward the plan if it should become effective. The Director of the Commission sailed for Europe on December 28 to initiate the negotiations.

#### ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

During the year 1916 the Rockefeller Foundation continued the support, through the Rockefeller Institute for Medical Research, of the

investigations at the special hospital at Compiègne, France, to the direction of which the French Service de Santé had detailed Dr. Alexis Carrel. At this hospital Dr. Carrel and his staff continued their study of procedures for the sterilization and treatment of infected wounds. No successful preventive analogous to anti-tetanus serum has yet been discovered, nor has a prophylaxis been found against gas gangrene and the pus organisms with which most wounds are contaminated under conditions surrounding trench warfare. One of the greatest problems of modern war surgery has thus been that of sterilizing the already infected wounds. The procedures worked out by Dr. Henry D. Dakin and Dr. Alexis Carrel have produced excellent results. In connection with these studies Dr. Carrel and his assistants have also made studies on the healing process in wounds. Incidental to the work of the Compiègne hospital, studies on nervous shock and bacteriological studies of the gas organism were carried out by Dr. William T. Porter of the Harvard Medical School and Dr. J. P. Simonds of the North Western University Medical School. The Institute has used a part of the appropriation made by the Foundation to manufacture and supply meningitis serum and anti-dysentery serum to the British, French and Italian governments for use in their armies and in controlling epidemics.

References to the work of Dr. Carrel and his assistants, and Dr. Porter may be found in:

*Journal of Experimental Medicine*, November 1, 1916, Vol. 24, No. 5: Carrel, DuNouy and Hartmann.

*Journal of Experimental Medicine*, May, 1917; Vol. 25, No. 5. DuNouy.

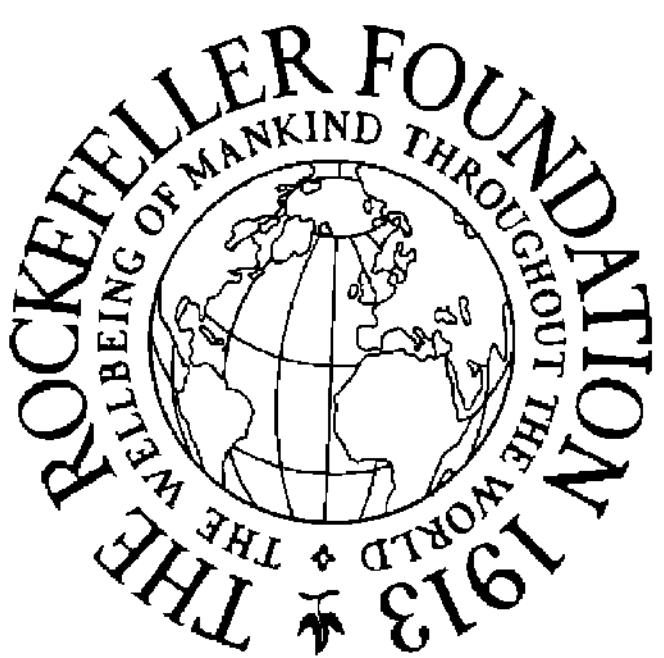
*Boston Medical and Surgical Journal*, December 14, 1916. W. T. Porter.

To appear in *Journal of Experimental Medicine*, June, 1917. J. P. Simonds.

#### MISCELLANEOUS CONTRIBUTIONS

In order to make it possible for the Director of the War Relief Commission to contribute moderate sums of money to meritorious projects, where large questions of policy were not involved, and where prompt action was desirable, a fund of \$25,000 was placed at his disposal to be expended at his discretion for purposes of relief. The following gifts have been made by him from this fund.

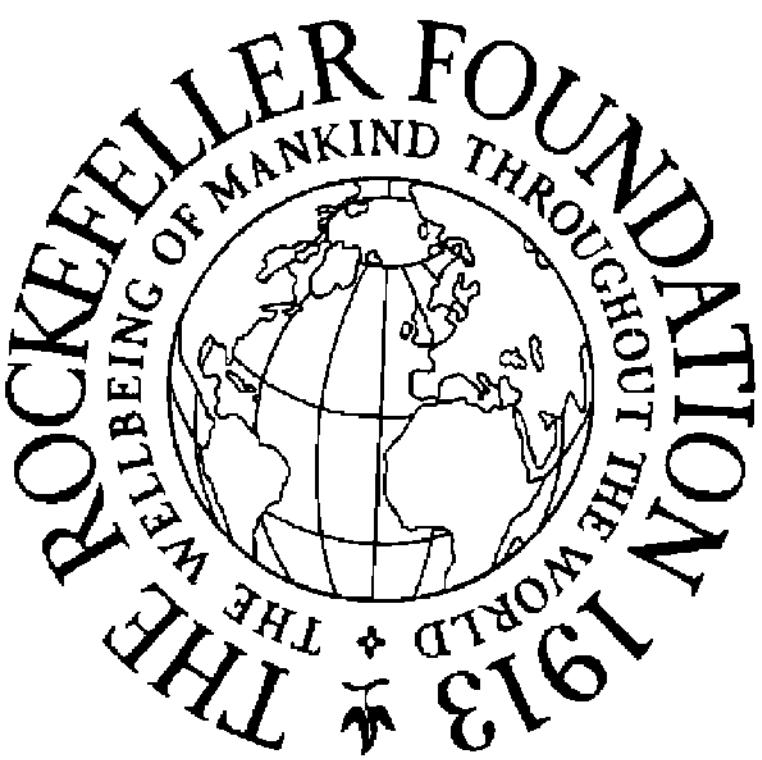
Buxton Party—Armenian Refugees (Lord Mayor's) Fund, London...	\$487.00
American Benevolent Association, Berlin.....	475.00
Kriegsblindenheim, Berlin.....	475.00
Jewish Asylum, Warsaw.....	190.00
International Red Cross, Geneva ..	4,750.00
	_____
	\$6,377.00



885

## Photograph Excised Here

The villa at Fribourg where the Belgian children are housed



## Photograph Excised Here

Some of the Belgian children at Fribourg, Switzerland, who are being cared for under the guarantee of the  
Rockefeller Foundation



## Photograph Excised Here

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Dining-room in the villa

88



Photograph Excised Here

Dormitory in the villa

**THE ROCKEFELLER FOUNDATION**  
**Report of the Treasurer**

**339**

**12**



## TREASURER'S REPORT

NEW YORK, January 1, 1917.

*To the Members of The Rockefeller Foundation:*

Gentlemen:

Herewith I send you a report of the financial operations of the Rockefeller Foundation and its subsidiary organizations for the year ending December 31, 1916.

The income for the year from general funds was \$6,226,-709.71; the balance from the previous year, after adding sundry refunds, was \$5,229,300.22; making a total of \$11,456,009.93 available for disbursement. The sum of \$6,065,847.99 was disbursed, including \$2,535,846.13 on account of Mr. Rockefeller's designations, leaving a balance of \$5,390,161.94, divided as follows;

Amount to the credit of Mr. Rockefeller's reservation .....	\$907,488.11
Amount payable on appropria- tions.....	4,099,482.86
Amount available for appropria- tion .....	383,190.97
	<hr/>
	\$5,390,161.94

The above figures do not take into account pledges amounting to \$1,284,189.94, payable in 1917, nor \$715,-050, payable in 1918 and subsequent years.

The year's income of \$6,226,709.71 is \$2,043,625.52 in excess of that for the year 1915. This increase is accounted for as follows:

Decrease in amount of income credited to 1915 owing to change of method mentioned in report for that year .....	\$1,053,293.43
Income from bonds formerly in default, or from bonds re- ceived in exchange therefor, including arrears of 1914 and 1915 interest.....	657,675.00

Amount heretofore carried in suspense, representing 1914 and 1915 interest on St. Louis & San Francisco Refunding 4 % bonds—now credited to income by order of Finance Committee	\$120,000.00
Miscellaneous increases of dividends, and interest on additional investments, etc. . . . .	212,657.09
	<hr/>
	\$2,043,625.52

The income from general funds for the year 1917 may be closely estimated at \$6,000,000.

The principal funds increased during the year from \$101,751,749.78 to \$102,034,447.79, a difference of \$282,-698.01, as follows:

Gifts from the Estate of Laura S. Rockefeller . . . . .	\$86,860.00
Net gain on securities sold, redeemed and exchanged. . . . .	432,970.39
Increased value of securities delivered to beneficiary at market prices . . . . .	12,867.62
	<hr/>
	\$532,698.01
Deduct appropriation from principal of Estate of Laura S. Rockefeller Fund . . . . .	250,000.00
	<hr/>
Net gain . . . . .	\$282,698.01

In addition to the above, the amount invested in lands, buildings, equipment and inventories increased during the year from \$319,241.04 to \$630,959.37, a difference of \$311,-718.33. This sum was expended from income, as shown in Exhibit K.

The present financial condition of the Foundation and its operations during the year are set forth in the following exhibits:

Balance Sheet . . . . .	Exhibit A
Receipts and Disbursements of Income . . . . .	Exhibit B

Foundation Appropriations.....	Exhibit C
Mr. Rockefeller's Designations.....	Exhibit D
International Health Board Disbursements.....	Exhibit E
International Health Board Appropriations.....	Exhibit F
China Medical Board Disbursements	Exhibit G
China Medical Board Appropriations	Exhibit H
War Relief Disbursements.....	Exhibit I
Joint Account Belgian Children in Switzerland.....	Exhibit I
War Relief Appropriations.....	Exhibit J
Statements of Principal Funds.....	Exhibit K
Land, Buildings and Equipment Fund.....	Exhibit K
Finance Committee's Report of Transactions Relating to Invested Funds.....	Exhibit L
Schedule showing Investment of General Funds.....	Exhibit M
Schedule showing Investment of Special Funds.....	Exhibit N

Respectfully submitted,

L. G. MYERS,  
*Treasurer.*

## EXHIBIT A

## BALANCE SHEET

## ASSETS

## I. INVESTMENTS:

General Schedule (Exhibit M).....	\$105,955,986.55
Less amount of income investments (see below).....	4,007,838.76
	<hr/>
Special (Exhibit N).....	86,900.00
	<hr/>
	\$102,084,447.79

II. LAND, BUILDINGS, EQUIPMENT AND INVENTORIES  
(Exhibit K).....

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\$630,959.37

## III. INCOME ACCOUNTS:

CASH IN THE HANDS OF AGENTS, TO BE ACCOUNTED FOR, AND SUN-DRY ACCOUNTS RECEIVABLE:	
General Funds (Exhibit B) .....	\$437,557.41
CASH ON HAND:	
General Funds (Exhibit B).....	\$445,480.58
Special Funds (Exhibit B).....	16,687.65
Joint Account Belgian Children (Exhibit I).....	48,750.00
	<hr/>
CASH LOANED ON CALL .....	530,000.00
INCOME INVESTED TEMPORARILY (Exhibit M).....	4,007,838.76
	<hr/>
GRAND TOTAL.....	\$108,151,721.56

## EXHIBIT A

DECEMBER 31, 1916

## FUNDS AND OBLIGATIONS

## I. FUNDS:

General Fund (Exhibit K) .....	\$100,000,000.00
Gift from Estate of Laura S. Rockefeller (Exhibit K) .....	177,733.00
Reserve (Exhibit K) .....	1,770,414.79
	<hr/>
Special Funds (Exhibit K):	
Gifts from John D. Rockefeller ...	\$37,000.00
Gifts from Laura S. Rockefeller ..	49,300.00
	<hr/>
	86,300.00
	<hr/>
	\$102,034,447.79

## II. LAND, BUILDINGS AND EQUIPMENT

## FUND:

Appropriations from income (Exhibit K) .....	<hr/> \$630,959.37
--	--------------------

## III. INCOME ACCOUNTS:

Joint Account Belgian Children in Switzerland (Exhibit I) .....	\$48,750.00
Sundry accounts payable .....	30,714.81
Income reserved for payment on account of Mr. Rockefeller's designations (Exhibit D) .....	\$907,488.11
*Balance payable on appropriations (Exhibit C) .....	4,099,482.86
*Income available for appropriation .....	5,016,270.77
	<hr/> 383,190.97
	<hr/> 5,390,161.94

## Balance of income:

Gift of Estate of Laura S. Rockefeller (Exhibit B) .....	<hr/> 16,687.65
	<hr/> \$5,486,314.40
	<hr/> \$108,151,721.66

\* It should be noted that appropriations payable in 1917 and subsequent years have already been made aggregating \$1,999,239.94 and that, as the balance of unappropriated income amounted to only \$383,190.97 on December 31, 1916, there is an excess of appropriations over income amounting to \$1,616,048.97 which represents an additional obligation of the Foundation payable out of its future income, except for such appropriations as may be canceled by the Foundation.

## EXHIBIT B

STATEMENTS OF RECEIPTS AND DISBURSEMENTS OF  
INCOME

## GENERAL FUNDS

## RECEIPTS

Balance January 1, 1916.....	\$5,009,007.82
Refunds from 1915 Accounts:	
Items charged as payments out of 1915 income now carried as accounts re- ceivable.....	\$191,617.92
Unexpended appropriation for war re- lief.....	25,000.00
Ying property in Peking, China.....	3,674.48
	<hr/>
	220,292.40
Total balance.....	\$5,229,300.22
Income collected during the year.....	<hr/> <hr/> 6,226,709.71
GRAND TOTAL.....	<hr/> <hr/> \$11,456,009.93

## EXHIBIT B

STATEMENTS OF RECEIPTS AND DISBURSEMENTS OF  
INCOME

## GENERAL FUNDS

## DISBURSEMENTS

PAYMENTS MADE TO UNAFFILIATED ORGANIZATIONS ON ACCOUNT OF FOUNDATION APPROPRIATIONS (Exhibit C).... \$1,341,108.01

PAYMENTS ON ACCOUNT OF MR. ROCKEFELLER'S DESIGNATIONS (Exhibit D).. 2,535,846.13

## AFFILIATED ORGANIZATIONS AND ADMINISTRATION:

International Health Board (Exhibit E).	\$505,900.99
China Medical Board (Exhibit G).....	549,558.57
War Relief (Exhibit I).....	966,667.55
Industrial Relations.....	15,048.27
Scientific Studies of Governmental Problems.....	50,000.00
Secretary's office.....	\$80,179.08
Treasurer's office.....	13,981.66
	<hr/>
	94,160.74
	<hr/>
	2,181,336.12

EQUIPMENT, ETC., CARRIED IN LAND,  
BUILDINGS AND EQUIPMENT FUND  
(Exhibit K)

Furniture and fixtures.....	\$2,597.88
Library.....	567.73
Grand Chenier Tract—taxes, fees, etc..	2,728.18
Merchandise, drugs, etc.....	1,663.94
	<hr/>
	7,557.73

TOTAL DISBURSEMENTS..... \$6,065,847.99

## BALANCE:

Securities (Exhibit M).....	\$4,007,838.76
Cash.....	445,480.58
Call loans.....	530,000.00
Accounts receivable.....	\$437,557.41
Less accounts payable.....	30,714.81
	<hr/>
	406,842.60
	<hr/>
	5,390,161.94

GRAND TOTAL..... \$11,456,009.93

## EXHIBIT B

STATEMENTS OF RECEIPTS AND DISBURSEMENTS OF  
INCOME

## ESTATE OF LAURA S. ROCKEFELLER FUND

Income collected during the year.....	\$16,734.50
Less Balance of accrued interest on bonds in 1915.....	46.85
	<hr/>
	\$16,687.65
<hr/>	<hr/>
Accounted for in cash on deposit.....	\$16,687.65
	<hr/>

## LAURA S. ROCKEFELLER FUNDS

Income collected during the year.....	\$3,000.00
Amount paid to the several societies des- ignated by Mrs. Rockefeller.....	\$3,000.00
	<hr/>

## JOHN D. ROCKEFELLER FUND

Income collected during the year.....	\$1,850.00
Amount paid to the society designated by Mr. Rockefeller.....	\$1,850.00
	<hr/>

## EXHIBIT C

**FOUNDATION APPROPRIATIONS MADE IN 1916, UNPAID  
BALANCES AND INSTALLMENTS OF APPROPRIATIONS  
MADE IN PREVIOUS YEARS AND PAYMENTS  
THEREON MADE IN 1916**

TO UNAFFILIATED ORGANIZATIONS*	APPROPRI- ATED PRIOR to 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
American Academy in Rome. (R.F. 215) For general purposes, \$10,000.00 a year for ten years be- ginning with 1914. (In- stallment due 1916)....	.....	\$10,000.00	\$10,000.00
American Social Hygiene Association (R.F. 2177) For cur- rent expenses 1915- 1916).....	.....	7,000.00	7,000.00
(R.F. 2188) For cur- rent expenses. Total pledge of \$20,000.00 ex- tending over two years. (First installment due 1916-1917).....	.....	10,000.00	10,000.00
Brooklyn Bureau of Char- ties. (R.F. 2189) For the after care of infantile paralysis cases. Total pledge of \$12,000.00 ex- tending over two years. (First installment due 1916).....	.....	6,000.00	6,000.00
Bureau of Municipal Re- search. (R.F. 251) For studies in New York State gov- ernment.....	\$1,225.00	.....	1,225.00
(R.F. 265) For construct- ive studies in govern- ment of New York, \$10,000.00 a year for five years beginning with 1915. (Install- ment due 1916).....	.....	10,000.00	10,000.00
CARRIED FORWARD.....	\$1,225.00	\$48,000.00	\$44,225.00

## EXHIBIT C—Continued

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$1,225.00	\$43,000.00	\$44,225.00
Bureau of Municipal Re- search (Continued).			
(R.F. 295) For an in- vestigation of prisons of the State of New York.	2,000.00	.....	2,000.00
(R.F. 2102) For its New York City work, \$15,- 000.00 per year for four years beginning with 1916. (Installment due 1916). . . . .	.....	15,000.00	15,000.00
(R.F. 2154) For an in- vestigation of prisons of the State of New York.	.....	1,000.00	1,000.00
Committee of Reference and Counsel of the An- nual Foreign Missions Conference of North America.			
(R.F. 228) For carrying on its program of co- operation and co-ordi- nation in foreign mis- sionary work of the principal American Mis- sion Boards. Total pledge of \$425,000.00 extending over a period of ten years beginning with 1914. (Installment due 1916). . . . .	.....	50,000.00	50,000.00
General Education Board. (R.F. 2167) For its cor- porate purposes.....	.....	1250,000.00	1250,000.00
Johns Hopkins University. (R.F. 2170) For the es- tablishment and main- tenance of a School of Hygiene and Public Health. . . . .	.....	267,000.00	30,000.00
CARRIED FORWARD.....	\$3,225.00	\$626,000.00	\$392,225.00

## EXHIBIT C—Continued

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$3,225.00	\$626,000.00	\$392,225.00
<b>National Committee for Men-</b>			
<b>tal Hygiene.</b>			
(R.F. 2107) For a survey under the direction of the committee of the care and treatment of insane in various states.	17,800.00	.....	15,000.00
(R.F. 2141) For adminis- tration expenses.....	.04	7,000.00	7,000.00
(R.F. 2158) For a survey to determine the num- ber of mentally defect- ive persons in Nassau County.....	.....	10,000.00	10,000.00
(R.F. 2168) To defray for one year the cost of a proposed psychiatric de- partment for the exam- ination of prisoners at Sing Sing Prison.....	.....	10,000.00	5,000.00
(R.F. 2191) For the pur- pose of completing the survey of Cook County, Illinois, under the direc- tion of the Committee.	.....	3,000.00	3,000.00
(R.F. 2207) For the serv- ices of an expert to as- sist the Kentucky Com- mission on the Feeble- minded .....	.....	4,000.00	4,000.00
<b>National Committee for the Prevention of Blindness.</b>			
(R.F. 233) For general purposes, \$5,000.00 a year for five years be- ginning with 1914. (In- stallment due in 1916).	.....	5,000.00	5,000.00
<b>New Rochelle Department of Health.</b>			
(R.F. 2182) For an inves- tigation of the sources of infantile paralysis in- fection in New Rochelle	.....	1,000.00	1,000.00
CARRIED FORWARD.....	\$21,025.04	\$666,000.00	\$442,225.00

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EXHIBIT C—*Continued*

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$21,025.04	\$666,000.00	\$442,225.00
New York Association for Improving the Condi- tion of the Poor.			
(R.F. 239) For the pur- pose of providing pen- sions for dependent widows with families, \$20,000.00 a year for ten years beginning with 1915. (Installment due 1915).....	20,000.00	.....	20,000.00
(Installment due 1916)	.....	20,000.00	5,000.00
New York Committee on After Care of Infantile Paralysis Cases.			
(R.F. 2181) For the or- ganization of after care of infantile paralysis cases in New York City	.....	25,000.00	10,306.28
New York City Department of Health.			
(R.F. 2176) For an inves- tigation of the sources of infantile paralysis in- fection in New York City.....	.....	50,000.00	22,491.42
New York Palisades Inter- state Park Commission.			
(R.F. 2144) Toward the sum of \$5,000,000.00 to be used for the enlarge- ment and improvement of the Palisades Inter- state Park.....	.....	1,000,000.00	1,000,000.00
New York Training School for Dental Hygienists.			
(R.F. 2180) For adminis- tration expenses.....	.....	2,500.00	2,500.00
Police Department of New York.			
(R.F. 2187) Toward the cost of Christmas trees to be held in precinct station houses for the children of their neigh- borhoods.....	.....	1,000.00	1,000.00
CARRIED FORWARD.....	\$41,025.04	\$1,764,500.00	\$1,503,522.70

## EXHIBIT C—Continued

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUE ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$41,025.04	\$1,764,500.00	\$1,503,522.70
Rockefeller Institute for Medical Research.			
(R.F. 2185) For its cor- porate purposes.....	1,000,000.00	.....	.....
(R.F. 2172) For current expenses.....	.....	80,000.00	.....
(R.F. 2173) For altera- tion of buildings.....	.....	80,808.72	.....
(R.F. 2184) For publica- tion of pamphlet on polio- myelitis.....	.....	5,000.00	3,561.72
(R.F. 2190) For experi- ments relating to polio- myelitis.....	.....	10,000.00	10,000.00
State Charities Aid Associa- tion.			
(R.F. 2187) For the or- ganization by the Asso- ciation, in co-operation with the State Depart- ment of Health, of the after care of infantile paralysis cases in New York State outside of New York City.....	.....	7,000.00	5,000.00
Wellesley College.			
(R.F. 234) Toward a fund for building and endowment.....	69,028.59	.....	69,028.59
	<hr/>		<hr/>
		\$1,110,048.63	
Unexpended portion of ap- propriation allowed to lapse.....	.04	.....	.....
	<hr/>		<hr/>
TOTAL.....	\$1,110,048.59	\$1,946,808.72	†\$1,591,108.01
	<hr/>		<hr/>

\*Other than war relief organizations.

†The appropriation of \$250,000 to the General Education Board was paid from the principal of the gift from the Estate of Laura S. Rockefeller (See Exhibit K). The balance of above total was paid from income from general funds (See Exhibit B).

## EXHIBIT C—Continued

To AFFILIATED ORGANIZATIONS AND ADMINISTRATION:	APPROPRIATED PRIOR TO 1916	APPROPRIATED DURING 1916	PAYMENTS DURING 1916
International Health Board.....	\$685,479.23	\$111,557.16	\$505,900.99
China Medical Board....	273,061.12	1,072,428.60	549,558.57
War Relief.....	80,000.01	2,590,000.00	966,667.55
Industrial Relations.....	280.82	20,000.00	15,048.27
Scientific Studies Governmental Problems.....	40,000.00	24,000.00	50,000.00
Administration of Rockefeller Foundation .....	<b>54,140.16</b>	<b>41,914.07</b>	<b>94,160.74</b>
	<b>\$982,910.84</b>	<b>\$3,859,899.89</b>	<b>\$2,181,336.12</b>

UNEXPENDED PORTIONS OF APPROPRIATIONS ALLOWED TO LAPSE (other than Unaffiliated and China Medical Board):

International Health Board.....	\$25,405.22
War Relief... .	437.28
Administration of Rockefel- ler Founda- tion .....	1,895.01
	<b>\$27,737.51</b>

Less Item written off in 1916... .	1.52
	<b>\$27,735.99</b>
	<b>8,287.58</b>
	<b>10,448.41</b>
	<b>.....</b>

TOTALS FOR ROCKEFELLER FOUNDATION AFFILIATED ORGANIZATIONS AND ADMINISTRATION.. .	<b>\$974,623.26</b>	<b>\$3,840,451.42</b>	<b>\$2,181,336.12</b>
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## EXHIBIT C—Continued

## SUMMARY

## UNAFFILIATED ORGANIZATIONS:

Balances and installments of appropriations made prior to 1916 .....	\$1,110,048.59
Appropriations made in 1916.....	<u>1,946,803.72</u>
	<u><u>\$3,056,852.31</u></u>

## AFFILIATED ORGANIZATIONS AND ADMINISTRATION:

Balances of appropriations made prior to 1916.....	\$974,623.26
Appropriations made in 1916.....	<u>3,840,451.42</u>
	<u><u>4,815,074.68</u></u>
TOTAL APPROPRIATIONS.....	<u><u>\$7,871,926.99</u></u>

Payments on account of appropriations to  
Unaffiliated organizations..... \$1,591,108.01

Payments on account of appropriations for  
Rockefeller Foundation affiliated organizations and administration..... 2,181,336.12

TOTAL PAYMENTS.....	<u><u>8,772,444.13</u></u>
BALANCE PAYABLE ON ALL APPROPRIATIONS.....	<u><u>\$4,099,482.86</u></u>

In addition to the foregoing, Rockefeller Foundation pledges to unaffiliated organizations already reported will require for payment in future years the following amounts:—

Year 1917.....	\$1,103,552.94
Year 1918.....	110,000.00
Year 1919.....	100,000.00
Year 1920.....	70,000.00
Year 1921.....	65,000.00
Year 1922.....	60,000.00
Year 1923.....	55,000.00
Year 1924.....	15,000.00
	<u><u>\$1,578,552.94</u></u>

## EXHIBIT D

PAYMENTS MADE TO UNAFFILIATED ORGANIZATIONS  
ON ACCOUNT OF MR. ROCKEFELLER'S DESIGNATIONS

Alta Social Settlement: toward the budget, \$24,083.75; toward the repair fund, \$2,500.00; toward their musical work, \$1,000.00.....	\$16,917.05
American Baptist Foreign Mission Society.....	175,000.00
American Baptist Home Mission Society.....	90,000.00
American Baptist Publication Society, for providing plates for publishing the Scriptures in foreign tongues, \$15,000.00.....	2,883.63
American Female Guardian Society and Home for the Friendless.....	500.00
Baptist Church Extension Society of Brooklyn and Queens.....	2,500.00
Baptist City Mission Society, Cleveland.....	5,000.00
Baptist Convention, Ohio.....	4,500.00
Baptist Convention, New Jersey.....	800.00
Baptist Ministers' Home Society.....	250.00
Baptist Ministers' and Missionaries' Benefit (North), to be invested and kept inviolable for the purpose of endow- ment, the income to be used for the corporate purposes of the Board.....	50,000.00
Baptist Missionary Convention of the State of New York	15,000.00
Baptist Missionary Society, New York City: To be applied to the Grace Church Build- ing Fund, \$3,732.00.....	\$746.40
For the work of the year.....	25,000.00
	25,746.40
Baptist State Mission Board of Pennsylvania.....	700.00
Baptist Union, Western Canada.....	10,000.00
Blue Ridge Association, toward the maintenance of the Social Service Summer School of the Association, \$3,000.00.....	1,000.00
Boy Scouts of America.....	9,500.00
Brooklyn Bureau of Charities.....	2,000.00
Brooklyn Federation of Jewish Charities.....	1,000.00
Bureau of Municipal Research, for the expenses of the Training School for Public Service, \$5,000.00.....	1,250.00
Charity Organization Society, New York City.....	6,000.00
Children's Aid Society.....	2,500.00
Cleveland Federation for Charity and Philanthropy.....	16,500.00
Cleveland School of Art.....	350.00
Community Chorus of New York City.....	500.00
Federated Churches of Cleveland.....	200.00
Foreign Mission Board of the Southern Baptist Conven- tion, for the equipment of their work in foreign lands, \$100,000.00.....	31,047.84
George Junior Republic Association.....	2,500.00
CARRIED FORWARD.....	\$474,144.42

## EXHIBIT D—Continued

BROUGHT FORWARD.....	\$474,144.42
Hospital Saturday and Sunday Association.....	5,000.00
Laymen's Missionary Movement.....	8,550.00
Legal Aid Society of New York.....	1,000.00
National Association for the Study and Prevention of Tuberculosis.....	500.00
National League on Urban Conditions Among Negroes.....	3,000.00
New York Association for Improving the Condition of the Poor.....	4,000.00
New York Milk Committee.....	3,500.00
New York School of Applied Design for Women.....	25,000.00
Parks and Playgrounds Association of the City of New York.....	200.00
Paul Kimball Hospital.....	200.00
People's Institute.....	1,000.00
Prison Association of New York.....	500.00
Public Education Association of the City of New York, \$17,200.00.....	5,000.00
Public Schools Athletic League.....	800.00
Religious Education Association.....	750.00
Rockefeller Institute for Medical Research: Toward the construction of new buildings and endowment, \$2,550,000.00, Final payment.....	\$1,452,125.02
For endowment.....	350,000.00
For current expenses.....	24,501.69
	1,826,626.71
State Charities Aid Association: For a trained agent to work among the poor children of Westchester County.....	\$300.00
For expenses for the year.....	2,000.00
	2,300.00
Superintendent of the Poor, Westchester County: For an additional eugenic investigator.....	\$225.00
To be used for the care of the poor children of Westchester County who have been afflicted with infantile paralysis.....	1,000.00
	1,225.00
Syrian Protestant College.....	5,000.00
Travelers' Aid Society of New York.....	1,000.00
Vassar College, for the cost of improvements and alterations in Rockefeller Hall.....	10,000.00
Whittier House.....	1,000.00
Working Women's Protective Union.....	50.00
Young Men's Christian Associations: Brooklyn.....	\$1,000.00
Cleveland.....	2,000.00
New York City.....	6,000.00
State Executive Committee, New York.....	1,000.00
CARRIED FORWARD.....	\$10,000.00 \$2,378,346.13

**EXHIBIT D—Continued**

BROUGHT FORWARD.....	\$10,000.00	\$2,878,346.13
Young Men's Christian Association:		
Tarrytown.....	500.00	
University of Michigan, for land and building, \$60,000.00.....	30,000.00	
University of Minnesota, for building fund, \$60,000.00.....	25,000.00	<u>65,500.00</u>
Young Men's Christian Associations, International Committee of:		
For the work of the Foreign Department.....	\$35,000.00	
For the work of the Home Department .....	30,000.00	
For office expenses, \$25,000.00.....	10,000.00	<u>75,000.00</u>
Young Men's Christian Association (International College).....	.....	2,000.00
Young Women's Christian Associations:		
National Board.....	\$10,000.00	
New York.....	5,000.00	<u>15,000.00</u>
		<u>\$2,535,846.13</u>
Balance subject to Mr. Rockefeller's designation, January 1, 1916.....	\$1,443,334.24	
Set aside for Mr. Rockefeller's designation during the year.....	2,000,000.00	<u>3,443,334.24</u>
Balance subject to Mr. Rockefeller's designation, January 1, 1917.....	.....	\$307,488.11

**EXHIBIT E**

**STATEMENT OF DISBURSEMENTS OF THE  
INTERNATIONAL HEALTH BOARD  
FOR THE YEAR 1916**

## **Hookworm Work:**

## Southern States:

Alabama	.....	\$4,543.33
Georgia	.....	152.61
Kentucky	.....	7,920.78
Louisiana	.....	1,898.28
Mississippi	.....	7,041.21
North Carolina	.....	248.99
South Carolina	.....	9,039.06
Tennessee	.....	4,368.14
Texas	.....	5,446.18
Virginia	.....	8,522.92
	CARRIED FORWARD	\$48,981.44
		\$48,981.44

## TREASURER'S REPORT

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## EXHIBIT E—Continued

BROUGHT FORWARD.....	\$48,981.44
<b>Central America:</b>	
British Honduras.....	\$1,685.81
Costa Rica.....	16,737.82
Guatemala.....	12,474.83
Nicaragua.....	19,199.78
Panama.....	26,067.39
Salvador.....	6,154.07
	<hr/>
	82,319.70
<b>South America:</b>	
Brazil.....	2,066.27
	<hr/>
	2,066.27
<b>West Indies:</b>	
Antigua.....	\$5,852.76
Barbados—Survey.....	515.04
British Guiana.....	19,236.11
Dutch Guiana.....	8,429.93
Grenada.....	11,384.96
St. Lucia.....	5,520.71
St. Vincent.....	4,094.97
Trinidad.....	10,450.19
Administration.....	6,552.40
	<hr/>
	72,037.07
<b>The East:</b>	
Ceylon.....	\$12,151.98
Federated Malay States Hookworm Board.....	14,656.82
Fiji Islands.....	2,795.96
Seychelles Islands.....	3,369.46
Siam.....	3,689.17
Administration.....	13,961.92
	<hr/>
	50,625.31
<b>MALARIA Work:</b>	
Arkansas.....	\$9,603.54
Mississippi.....	37,687.83
	<hr/>
	47,291.37 °
<b>YELLOW FEVER COMMISSION.....</b>	
	40,395.84
<b>INVESTIGATION OF SEWAGE DISPOSAL IN RURAL HOMES.....</b>	
	664.39
<b>MEDICAL COMMISSION TO BRAZIL.....</b>	
	17,341.05
<b>SALARIES AND TRAVELING EXPENSES OF DIRECTORS IN THE FIELD PAID FROM THE HOME OFFICE.....</b>	
	64,890.56
<b>ADMINISTRATION:</b>	
Home office.....	\$60,916.37
Survey and Education.....	17,633.62
Panama Pacific Exhibition.....	738.00
	<hr/>
	79,287.99
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	\$505,900.99

## EXHIBIT F

INTERNATIONAL HEALTH BOARD APPROPRIATIONS  
FOR WORK DURING THE YEAR 1916

## HOOKWORM WORK:

## Southern States:

Kentucky.....	\$5,342.91
Louisiana.....	2,500.00
Mississippi.....	8,644.00
North Carolina.....	456.00
South Carolina.....	6,662.50
Tennessee.....	7,000.00
Texas.....	3,300.00
Virginia.....	7,741.64
	<hr/>
	\$41,647.05

## Central America:

British Honduras.....	\$2,055.00
Costa Rica.....	22,760.00
Guatemala.....	15,020.00
Nicaragua.....	24,500.00
Panama.....	23,491.70
Salvador.....	15,371.00
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	103,197.70

## South America:

Brazil.....	\$4,000.00
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	4,000.00

## West Indies:

Antigua.....	\$8,970.00
Barbados—Survey.....	600.00
British Guiana.....	24,428.00
Dutch Guiana.....	12,950.00
Grenada.....	10,814.40
St. Lucia.....	6,403.90
St. Vincent.....	9,444.00
Trinidad.....	18,870.00
Administration.....	7,760.00
	<hr/>
	100,240.30

## The East:

Ceylon.....	\$17,680.00
Federated Malay States Hookworm Board.....	28,000.00
Fiji Islands.....	3,000.00
Java.....	2,000.00
Seychelles Islands.....	7,960.00
Siam.....	5,000.00
Administration.....	16,100.00
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	74,740.00

CARRIED FORWARD.....\$323,825.05

## TREASURER'S REPORT

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## EXHIBIT F—Continued

BROUGHT FORWARD.....	\$323,825.05
<b>MALARIA WORK:</b>	
Arkansas.....	\$19,300.00
Mississippi.....	43,614.00
	—————
	62,914.00
YELLOW FEVER COMMISSION.....	46,400.00
INVESTIGATION OF SEWAGE DISPOSAL AT RURAL HOMES.....	1,000.00
MEDICAL COMMISSION TO BRAZIL.....	18,570.00
SALARIES AND TRAVELING EXPENSES OF DIRECTORS IN THE FIELD PAID FROM THE HOME OFFICE.....	70,604.00
<b>ADMINISTRATION:</b>	
Home Office.....	\$64,218.69
Survey and Education.....	18,419.00
	—————
	82,637.69
	—————
	\$605,950.74
	—————

NOTES. Referring to the International Health Board totals given in Exhibit C, there was brought forward from 1915 a balance on appropriations amounting to \$85,479.23.

For the International Health Board's work during the year 1916 the Rockefeller Foundation appropriated \$500,000 in October 1915 and \$111,557.16 during 1916. Of the \$111,557.16 so appropriated by the Rockefeller Foundation the International Health Board appropriated for its 1916 work only \$305,950.74.

## EXHIBIT G

**STATEMENT OF DISBURSEMENTS OF THE CHINA  
MEDICAL BOARD FOR THE YEAR 1916**

**ASSETS:**

Property of Peking Union Medical College.....	\$148,783.88
Property of Prince Yu.....	63,593.70
Miscellaneous land purchases.....	1,076.71
Purchase of land in China.....	64,417.38
Property of Harvard Medical School.....	28,800.00
Equipment.....	569.46
	<hr/>
	\$307,241.08

**ACCESSORIES:**

Red Cross Hospital.....	2,175.00
ADVISORY FEES, ETC., OF ARCHITECT .....	12,960.00

**ADMINISTRATION OF MEDICAL INSTITUTIONS IN CHINA:****Peking Union Medical College:**

Budget 1915-16.....	\$36,440.72
Less credits adjusting 1915-	
16 account.....	25,000.00
	<hr/>
Budget 1916-17.....	\$11,440.72
Reorganized Peking Union Medical College Budget 1916-17.....	7,259.89
Red Cross Hospital 1916-17.....	4,190.18
	<hr/>
	9,332.11
	<hr/>
	32,922.90

**ADMINISTRATION:****Home Office:**

Budget 1915-16.....	\$92,898.94
Budget 1916-17.....	12,707.81
Peking Office:	
Budget 1915-16.....	12,901.77
Budget 1916-17.....	5,283.14
	<hr/>
	69,781.16

<b>PAYMENTS ON ACCOUNT OF APPROPRIATIONS TO UNAFFILIATED ORGANIZATIONS.....</b>	<b>131,228.43</b>
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	<b>\$549,558.57</b>

## EXHIBIT H

**CHINA MEDICAL BOARD APPROPRIATIONS MADE IN 1916,  
UNPAID BALANCES AND INSTALLMENTS OF APPROPRIA-  
TIONS MADE IN PREVIOUS YEARS AND PAYMENTS  
THEREON MADE IN 1916**

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
<b>MEDICAL EDUCATION:</b>			
St. John's University of Pennsylvania Medical School, Shanghai.			
(C.M. 2134) For salary of a teacher of anatomy and dissection.....	.....	\$1,500.00	\$1,500.00
Tsinanfu Union Medical College.			
(C.M. 251) For buildings and equipment.....	.....	50,000.00	20,000.00
(C.M. 252) For educating students sent to Tsinanfu by China Medical Board during a period of five years .....	.....	100,000.00	10,000.00
Yale Foreign Missionary Society.			
(C.M. 27) For support of Hunan-Yale Medical School, Changsha, \$16,200.00 a year for five years beginning with 1915. (Balance of installment due 1915).....	\$9,594.10	.....	9,594.10
(Installment due 1916) .....	.....	16,200.00	8,100.00
(C.M. 2133) For laboratory and equipment at medical school Changsha.	.....	30,000.00	.....
<b>TRANSLATION:</b>			
Nurses' Association of China.			
(C.M. 250) For salaries of writer and translator of nursing textbooks.....	.....	700.00	700.00
(C.M. 2135) Dr. P. B. Cousland, nursing textbooks.....	.....	2,500.00	1,618.64
<b>SCHOLARSHIPS:</b>			
Students of the Harvard Medical School in China.....	.....	6,600.00	3,626.69
Chinese pharmacists.....	3,900.00	600.00	2,301.00
Chinese nurses.....	2,550.00	.....	950.00
CARRIED FORWARD.....	\$16,044.10	\$208,100.00	\$58,390.43

## EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$16,044.10	\$208,100.00	\$58,390.43
<b>FELLOWSHIPS:</b>			
Medical missionaries and nurses on furlough.....	1,000.00	26,750.00	15,733.32
Medical fellowships, Chinese. (C.M. 218) Miscellaneous fellowships.....	2,945.83	9,400.00	7,283.15
	8,465.00	.....	3,370.00
<b>MISSIONARY SOCIETIES:</b>			
American Baptist Foreign Mission Society.			
(C.M. 276) Ningpo Hospi- tal, for salaries of doctor and nurse \$2,250.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	2,250.00	.....
(C.M. 277) Shaohsing Hospital, for support of foreign nurse, Chinese business manager and foreign doctor, \$2,475.00 a year for five years begin- ning with 1916. (Install- ment due 1916).....	.....	2,475.00	.....
(C.M. 278) Shaohsing Hos- pital, for equipment and residences for Chinese staff, nurse, and physician	.....	8,512.50	.....
American Board of Commis- sioners for Foreign Mis- sions.			
(C.M. 294) Tehchow Hos- pital, for salary of two doctors, \$3,236.00 a year for five years beginning with 1915. (C.M. 211) (Balance of Installment due 1915).....	2,636.00	.....	454.00
(Installment due 1916) ..	.....	3,236.00	.....
(C.M. 296) Tehchow Hos- pital, for capital expendi- tures.....	.....	4,633.50	4,633.50
(C.M. 297) Tehchow Hos- pital, for employes' sala- ries, \$3,951.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	3,951.00	987.75
CARRIED FORWARD.....	\$31,090.93	\$269,308.00	\$90,852.15

## EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$31,090.98	\$269,308.00	\$90,862.15
<b>MISSIONARY SOCIETIES (Cont.):</b>			
American Board of Commissioners for Foreign Missions. <i>Continued.</i>			
(C.M. 2140) Tehchow Hospital, for doctor's residence	.....	\$3,000.00	\$3,000.00
Board of Foreign Missions, Methodist Episcopal Church.			
(C.M. 2102) Peking, salary of two doctors; Chang-chi, salary of physician and foreign nurse; Taianfu, salary of physician and foreign nurse, \$11,800.00 a year for five years beginning with 1915. (C.M. 293) (Installment due 1915).....	11,800.00	.....	.....
(Installment due 1916) ..	.....	11,800.00	.....
(C.M. 283) Wuhu Hospital, for salary and allowance of doctor, \$825.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	825.00	.....
Board of Foreign Missions, Methodist Episcopal Church, South.			
(C.M. 2105) Soochow Hospital, for nurse's residence, outfit, traveling expenses and medical allowance, \$3,500.00; for salary, \$600.00 a year for five years beginning with 1916. (C.M. 286) (Installment due 1916).....	.....	4,100.00	1,100.00
Board of Foreign Missions, Presbyterian Church, in the United States.			
(C.M. 284) Chefoo Hospital, for salary and allowance of doctor and nurse \$2,625.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	2,625.00	.....
CARRIED FORWARD.....	<u>\$42,890.98</u>	<u>\$291,658.00</u>	<u>\$94,952.15</u>

## EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$42,890.93	\$291,658.00	\$94,952.15
<b>MISSIONARY SOCIETIES (Cont.):</b>			
Board of Foreign Missions, Presbyterian Church, in the United States. <i>Con-</i> <i>tinued.</i>			
(C.M. 285) Hwaiyuen Hospi- tal, salary and allowances of physician and nurse, and running expenses, \$3,375.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	3,375.00	.....
(C.M. 286) Hwaiyuen Hospital, for residence of doctor and equipment ..	.....	5,250.00	.....
(C.M. 287) Paotingfu Hos- pital, for equipment and repairs .....	.....	3,377.50	3,760.00
(C.M. 295) Paotingfu, for salary of doctor and two nurses and residence; Shuntehfu, for salary of doctor and two nurses and residence. Salaries \$9,200.00 a year for five years beginning with 1915. (C.M. 214) (Installment due 1915) .....	17,200.00	.....	12,800.00
(Installment due 1916) ..	.....	9,200.00	.....
(C.M. 2141) Shuntehfu Hospital, for repairs and equipment .....	.....	6,452.93	6,452.93
(C.M. 2142) Shuntehfu Hospital, for mainte- nance expenses, \$750.00 a year for five years be- ginning with 1916. (In- stallment due 1916) .....	.....	750.00	750.00
(C.M. 2143) Paotingfu Hospital .....	.....	6,000.00	6,000.00
(C.M. 2144) Changteh Hos- pital, for current expenses, \$2,625.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	2,625.00	825.00
(C.M. 2145) Changteh Hospital, for capital ex- penditures .....	.....	13,050.00	.....
CARRIED FORWARD.....	<u>\$60,090.93</u>	<u>\$342,298.43</u>	<u>\$125,540.08</u>

EXHIBIT H—*Continued*

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$60,090.93	\$342,238.43	\$125,540.08
<b>MISSIONARY SOCIETIES (Cont.):</b>			
Board of Missions, Methodist Episcopal Church, South- American Baptist For- eign Mission Society, jointly.			
(C.M. 2151) New Union Hospital at Huchow, for building and equipment, \$20,000.00 (1917).....			
(C.M. 2152) Hospital at Huchow, for support of a foreign physician, \$5,- 025.00 extending over a period of five years be- ginning with 1917.....			
(C.M. 2153) Hospital at Huchow, for support of a foreign nurse, \$3,000.00 extending over a period of five years beginning with 1917.....			
(C.M. 2154) Hospital at Huchow, for support of a Chinese physician, \$2,250.00 extending over a period of five years be- ginning with 1917.....			
Canton Christian College.			
(C.M. 2189) Canton Hos- pital, for a business man- ager and current expenses, \$4,500.00 a year for five years beginning with 1916. (Installment due 1916) ..		4,500.00	
Church of Scotland Foreign Mission Committee.			
(C.M. 288) Ichang Hos- pital, for equipment.....		975.00	
(C.M. 289) Ichang Hos- pital, for support of a third foreign doctor and nurse, \$2,250.00 a year for five years beginning with 1916. (Installment due 1916).....		2,250.00	
CARRIED FORWARD.....	<u>\$60,090.93</u>	<u>\$349,368.43</u>	<u>\$125,540.08</u>

## EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRIA- TED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$60,090.93	\$349,363.43	\$125,540.08
<b>MISSIONARY SOCIETIES (Cont.):</b>			
Executive Committee of Foreign Missions of the Presbyterian Church in the United States (South).			
(C.M. 2101) Soochow, for salaries, outfit and travel to field of doctor and foreign nurse; Kashung, for salary, outfit and travel to field of foreign nurse. Salaries \$3,600.00 a year for five years beginning with 1916. (C.M. 221)	4,450.00	.....	300.00
(Installment due 1915) .....	.....	3,600.00	.....
(C.M. 234) Hospital in Kashung, X-ray outfit .....	.....	2,552.77	2,552.35
Foreign Christian Missionary Society.			
(C.M. 235) Luchowfu Hospital, for support of a Chinese physician.....	.....	120.00	120.00
(C.M. 269) Luchowfu Hospital, for support of a Chinese physician.....	.....	80.00	80.00
(C.M. 2100) Luchowfu, for salaries, allowances and outfit of doctor and nurse; Nantungchow, for salary, allowance and outfit of nurse. Salaries and allowances \$4,200.00 a year for five years beginning with 1915. (C. M. 215)	4,800.00	.....	.....
(Installment due 1915) .....	.....	4,200.00	.....
(C.M. 2146) Luchowfu Hospital, for support of a Chinese doctor.....	.....	336.00	336.00
CARRIED FORWARD.....	\$69,140.93	\$360,252.20	\$128,928.48

## EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$69,140.93	\$360,252.20	\$128,928.43
<b>MISsIONARY SOCIETIES (Cont.):</b>			
Foreign Mission Board, South- ern Baptist Convention.			
(C.M. 2103) Warren Me- morial Hospital, Hwan- ghien, for outfit and travel of a nurse, \$400.00. Sal- ary \$600.00 a year for five years beginning with 1916. (C.M. 226) (In- stallment due 1916).....	.....	1,000.00	400.00
(C.M. 2106) For outfit and travel of a doctor at Chengchow \$1,000, for salary \$1,200.00 a year for five years beginning with 1916. (C.M. 228) (Installment due 1916) ..	.....	2,200.00	1,350.00
(C.M. 2104) Yangchow Hospital, for outfit and travel of a nurse \$400.00. Salary \$600.00 a year for five years beginning with 1916. (C.M. 232) (Installment due 1916) ..	.....	1,000.00	550.00
(C.M. 279) Laichowfu Hospital, for salary of ad- ditional physician and wife, and nurse, \$1,650.00 a year for five years be- ginning with 1916. (In- stallment due 1916).....	.....	1,650.00	.....
(C.M. 280) Laichowfu Hospital, for equipment and outgoing expenses of a physician and wife.....	.....	750.00	.....
(C.M. 281) Hwanghien Hospital, for salary of physician, \$900.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	900.00	.....
(C.M. 282) Hwanghien Hospital, for outfit and travel of a physician.....	.....	750.00	.....
CARRIED FORWARD.....	\$69,140.93	\$368,502.20	\$131,228.43

## EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$69,140.93	\$368,502.20	\$131,228.43
<b>MISSIONARY SOCIETIES (Cont.):</b>			
Kuling Medical Missionary Association.			
(C.M. 21) For equipment of laboratory.....	1,000.00	.....	.....
London Missionary Society.			
(C.M. 2167) Siaochang Hospital, for support of an additional nurse. \$600.00 a year for five years beginning with 1917	.....	.....	.....
University of Nanking.			
(C.M. 2187) For current expenses of its hospital, \$9,250.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	9,250.00	.....
(C.M. 2188) For buildings and equipment.....	.....	25,000.00	.....
	<hr/>	<hr/>	<hr/>
	\$70,140.93	\$402,752.20	
Unexpended portions of appropriations allowed to lapse	1,376.44	1,550.42	
	<hr/>	<hr/>	<hr/>
	\$68,764.49	\$401,201.78	\$131,228.43
	<hr/>	<hr/>	<hr/>
TO AFFILIATED ORGANIZATIONS AND ADMINISTRATION	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
<b>ASSETS:</b>			
Peking Union Medical College.			
(C.M. 212-213) Purchase of property.....	\$178,300.00	\$6,000.00	\$148,783.83
(C.M. 289) Purchase of property of Prince Yu...	.....	125,000.00	63,593.70
(C.M. 248) Purchase of land adjoining Peking Union Medical College...	.....	1,080.00	.....
(C.M. 249) Miscellaneous land purchases.....	.....	20,000.00	1,076.71
(C.M. 224) Discretionary emergency fund.....	50,000.00	.....	.....
(C.M. 2165) Plans for hospital and laboratory at Peking.....	.....	1,000.00	.....
CARRIED FORWARD.....	\$223,300.00	\$153,080.00	\$213,454.24

## EXHIBIT H—Continued

TO AFFILIATED ORGANIZATIONS AND ADMINISTRATION	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$223,300.00	\$153,080.00	\$213,454.24
<b>Assets (Cont.):</b>			
(C.M. 2110) Purchase of land in China.....	.....	260,000.00	64,417.38
(C.M. 227) Property of Harvard Medical School . Equipment.	.....	28,800.80	28,800.00
(C.M. 2166) Furniture and Fixtures.....	.....	600.00	569.46
<b>Accessories:</b>			
Peking Union Medical College.			
(C.M. 266) Equipment purchased of American Presbyterian Mission....	.....	1,141.26	.....
(C.M. 2161) Preparatory school in Peking, supplies, etc.....	.....	15,000.00	.....
Red Cross Hospital, Shanghai.			
(C.M. 2109) Automobiles and ambulance.....	.....	2,685.00	2,175.00
ADVISORY FEES, ETC., OF ARCHITECT .....	.....	12,960.00	12,960.00
<b>ADMINISTRATION OF MEDICAL INSTITUTIONS IN CHINA:</b>			
Peking Union Medical College.			
Budget 1915-16.....	25,594.86	6,396.88	11,440.72
Budget 1916-17.....	.....	66,000.00	7,259.89
Reorganized Peking Union Medical College.			
Budget 1916-17.....	.....	16,502.50	4,190.18
(C.M. 2162) Preparatory school in Peking, to be established during 1917, for maintenance, \$26,000.00			0
Red Cross Hospital, Shanghai, 1916-17.....	.....	29,000.00	9,332.11
<b>ADMINISTRATION:</b>			
Home Office.			
Budget 1915-16.....	.....	44,485.75	32,888.94
Budget 1916-17.....	.....	23,252.83	12,707.91
Peking Office.			
Budget 1915-16.....	6,000.00	7,500.00	12,901.77
Budget 1916-17.....	.....	15,500.00	5,283.14
	<b>\$254,894.86</b>	<b>\$682,904.97</b>	
Unexpended portions of appropriations allowed to lapse..	50,598.23	11,678.15	
	<b>\$204,296.63</b>	<b>\$671,226.82</b>	<b>\$418,330.14</b>

## EXHIBIT H—Continued

## SUMMARY

## UNAFFILIATED ORGANIZATIONS:

Balances and installments of appropriations to unaffiliated organizations made prior to 1916.....	\$68,764.49
Appropriations made in 1916.....	<u>401,201.75</u>
	\$469,966.24

## AFFILIATED ORGANIZATIONS AND ADMINISTRATION:

Appropriations for affiliated organizations and for administration at home and in China prior to 1916.....	\$204,296.63
Appropriations made in 1916.....	<u>671,226.82</u>
	875,523.45

TOTAL APPROPRIATIONS.....	\$1,345,489.72
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Payments on account of appropriations to unaffiliated organizations.....	\$131,228.43
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Payments on account of appropriations to affiliated organizations and for administration at home and in China.....	<u>418,330.14</u>
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TOTAL PAYMENTS.....	549,558.57
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BALANCE PAYABLE ON CHINA MEDICAL BOARD APPROPRIATIONS.....	<u>\$795,931.15</u>
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In addition to the foregoing, China Medical Board pledges to unaffiliated organizations already reported will require for payment in future years the following amounts:

Year 1917.....	\$180,637.00
Year 1918.....	98,837.00
Year 1919.....	94,537.00
Year 1920.....	48,901.00
Year 1921.....	<u>2,775.00</u>
	\$420,687.00

## EXHIBIT I

STATEMENT OF DISBURSEMENTS FOR WAR RELIEF FOR  
THE YEAR 1916

ARMENIAN AND SYRIAN RELIEF.....	\$490,000.00
BELGIAN RELIEF:	
Belgian University Professors.....	\$5,000.00
Belgian Children.....	<u>25,000.00</u>
	30,000.00
INTERNATIONAL COMMITTEE OF YOUNG MEN'S CHRISTIAN ASSOCIATION.....	295,000.00
POLISH RELIEF.....	25,531.82
PRISONERS OF WAR WELFARE WORK.....	378.00
SERBIAN RELIEF.....	59,562.72
TURKISH RELIEF (American Red Cross)....	25,000.00
OTHER SMALL CONTRIBUTIONS:*	
Buxton Expedition for Armenian Re- lief.....	\$487.00
American Benevolent Association, Berlin	475.00
Kriegsblindenheim, Berlin.....	475.00
Jewish Asylum, Warsaw.....	190.00
International Red Cross, Geneva.....	<u>4,750.00</u>
	6,877.00
WAR RELIEF COMMISSION:	
Administration, At Home.....	\$24,377.82
Administration, Abroad.....	<u>10,440.69</u>
	34,818.51
	<u>\$966,667.55</u>
JOINT ACCOUNT BELGIAN CHILDREN IN SWITZERLAND:	
Belgian Relief Committee (New York)...	\$25,000.00
Belgian Relief Committee (New England)	10,000.00
Refugees' Relief Fund .....	3,000.00
	<u>\$38,000.00</u>
Appropriation R.F. 2178 of Rockefeller Foundation included in above as an expenditure.....	25,000.00
	<u>\$63,000.00</u>
TOTAL.....	14,250.00
Payments.....	
	<u>\$48,750.00</u>

\*Contributed by the Director of the War Relief Commission from a fund of \$25,000 appropriated March 14, 1916, to be expended at his discretion.

## EXHIBIT J

APPROPRIATIONS FOR WAR RELIEF MADE DURING THE  
YEAR 1916

## BELGIAN RELIEF:

Stipends for Belgian professors in England (R.F. 2139, \$5,000.00; R.F. 2192, \$10,000.00) ..... \$15,000.00

## Belgian Children:

For the protection, maintenance and education of 500 Belgian children in Switzerland ..... 25,000.00

Contributions from other agencies for this purpose have been received as follows:

Belgian Relief Fund of New York City .....	\$25,000.00
New England Belgian Relief Fund .....	10,000.00
Refugees Relief Fund .....	3,000.00
<hr/>	
	<b>\$38,000.00</b>

## SERBIAN RELIEF:

To the American Red Cross for Relief of destitution (R.F. 2136, \$15,000.00; R.F. 2174, \$15,000.00) ..... 30,000.00

## ARMENIAN AND SYRIAN RELIEF:

Contributed for the relief of the non-Moslem population within the Turkish Empire, and in Northwestern Persia and Caucasus (R.F. 2137, \$25,000.00; R.F. 2138, \$10,000.00; R.F. 2146, \$30,000.00; R.F. 2155, \$50,000.00; R.F. 2161, \$50,000.00; R.F. 2164, \$25,000.00; R.F. 2171, \$100,000.00; R.F. 2185, \$200,000.00; R.F. 2192A, \$100,000.00) ..... 690,000.00

## INTERNATIONAL COMMITTEE OF YOUNG MEN'S CHRISTIAN ASSOCIATIONS:

For the establishment of Y. M. C. A. organizations and buildings in military and prisoners' camps in Europe (R.F. 2143, \$50,000.00; R.F. 2166, \$100,000.00; R.F. 2169, \$50,000.00) ..... 200,000.00

For the establishment and maintenance of recreation centers in connection with the military forces on the Mexican border (R.F. 2175, \$50,000.00; R.F. 2195, \$50,000.00) ..... 100,000.00

CARRIED FORWARD..... \$960,000.00

## TREASURER'S REPORT

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## EXHIBIT J—Continued

BROUGHT FORWARD.....	\$960,000.00
For the purchase and administration of suitable collections of books to be maintained at the several brigade headquarters along the Mexican border (R.F. 2179) .....	15,000.00
<b>ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH:</b>	
Surgical Laboratory at Compiègne, under the direction of Dr. Alexis Carrel (R.F. 2142) .....	25,000.00
<b>Polish Relief:</b>	
For relief work in Poland, Serbia, Montenegro and Albania (R.F. 2165) .....	1,000,000.00
<b>PRISONERS OF WAR WELFARE WORK:</b>	
R.F. 2193 Administration .....	\$300,000.00
R.F. 2194 Supply Division .....	200,000.00
	500,000.00
<b>TURKISH RELIEF (American Red Cross):</b>	
For relief work in and about Constantinople (R.F. 2160) .....	25,000.00
<b>GENERAL RELIEF WORK:</b>	
At the discretion of the Director of the War Relief Commission (R.F. 2157) ...	25,000.00
<b>WAR RELIEF COMMISSION:</b>	
Administration (R.F. 2156, \$20,000.00; R.F. 2209, \$20,000.00) .....	40,000.00
	<u>\$2,590,000.00</u>

NOTE. Referring to the War Relief totals given on page 354; there was brought forward from 1916 a balance on appropriations amounting to \$30,000.01.

## EXHIBIT K

STATEMENTS OF PRINCIPAL FUNDS  
GENERAL FUNDS

## GIFTS FROM MR. JOHN D. ROCKEFELLER

Gifts from May 29, 1913, to December 31, 1916.....	<u>\$100,000,000.00</u>
The total fund is invested in the securities listed in General Schedule, Exhibit M.....	<u>\$100,000,000.00</u>

## ESTATE OF LAURA S. ROCKEFELLER FUND

Gifts to January 1, 1916.....	\$340,873.00
Received during year in securities, interest and cash.....	<u>86,860.00</u>
	<u>\$427,733.00</u>
Appropriated and paid to General Education Board.....	<u>250,000.00</u>
	<u>\$177,733.00</u>
The total fund is invested in the securities listed in General Schedule, Exhibit M.....	<u>\$177,733.00</u>

## RESERVE

Balance January 1, 1916.....	\$1,324,576.78
Gains on securities sold and redeemed during the year 1916.....	<u>445,898.01</u>
	<u>\$1,770,414.79</u>
The total fund is invested in the securities listed in General Schedule, Exhibit M.....	<u>\$1,770,414.79</u>

## SPECIAL FUNDS

## LAURA S. ROCKEFELLER FUNDS

Gifts.....	<u>\$49,300.00</u>
Invested in securities listed in Exhibit N.....	<u>\$19,300.00</u>

## JOHN D. ROCKEFELLER FUND

Gifts.....	<u>\$37,000.00</u>
Invested in securities listed in Exhibit N.....	<u>\$97,000.00</u>

## EXHIBIT K—Continued

## LAND, BUILDINGS AND EQUIPMENT FUNDS

Income appropriated up to December 31, 1915.....	\$319,241.04
Additional sum carried to the account from 1915 expenditures..	<u>594.00</u>
	<u><u>\$319,835.04</u></u>
Less refund on account of purchase of the Ying property in 1915...	<u>3,674.48</u>
	<u><u>\$316,160.56</u></u>
Income appropriated in 1916:	
Land, buildings, equipment, merchandise, drugs, etc., at home office (Exhibit B).....	\$7,557.73
China Medical Board assets (Exhibit G).....	<u>307,241.08</u>
	<u><u>314,798.81</u></u>
	<u><u>\$630,959.37</u></u>

Assets in account December 31, 1916:

## Rockefeller Foundation:

Grand Chenier Tract (Land, taxes, fees, etc.).....	\$233,874.47
Furniture and fixtures.....	15,026.04
Library, New York City.....	898.28
Inventory, drugs, etc.....	13,599.22
	<u><u>\$268,398.01</u></u>

## China Medical Board:

Property of Peking Union Medical College.....	\$188,678.95
Property of Mr. Yu at Peking, China.....	63,595.70
Property of Mr. Ying at Peking, China.....	20,381.51
Property of Harvard Medical School.....	28,800.00
Equipment—New York City	618.11
Purchase of land in China....	64,417.38
Miscellaneous land purchases	1,076.71
	<u><u>367,566.36</u></u>

\$630,959.37 \$630,959.37

## EXHIBIT L

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RE-  
LATING TO INVESTED FUNDS

The Finance Committee reports the following transactions relating to invested funds, which occurred during the year 1916:

On January 19, the Executors of the Estate of Laura S. Rockefeller made a further gift to the Foundation, consisting of securities, as shown in the following tables, having a market value of \$49,458.05, and accrued dividends of \$401.95.

During March, the Foundation, by reason of its ownership of \$1,065,-000.00 Erie R.R. convertible 4% bonds, and 21,400 shares Erie R.R. first preferred stock, received from the company the privilege of subscribing to \$391,500.00 of its new convertible bonds. This "right" was sold and the proceeds credited to the cost of the bonds and stocks on account of which it was issued.

During April, the Foundation received from the National Transit Company \$1,581,012.50, or \$12.50 per share, in cash, representing a distribution of the assets of the company, thereby reducing the par value of the stock from \$25.00 to \$12.50. The number of shares held by the Foundation remains the same (126,481) but the valuation is reduced by \$12.50 per share.

During May, the Foundation received from the Cleveland Trust Company a further sum of \$4,790.04, on account of the liquidation of the assets of the Euclid Heights Realty Company. The book value of the bonds representing the Foundation's interest in these assets having been already received, this sum was added to Reserve.

On June 1, the Foundation gave to the General Education Board, from the Estate of Laura S. Rockefeller Fund, securities and accrued interest amounting to \$250,000.00. A list of these securities is given in the following pages.

During June, thirteen hundred and eighty shares of new capital stock of the Chesebrough Manufacturing Company were received as a dividend and were added to the 690 shares already held. The total of 2,070 shares are now carried at the valuation of the original number.

On June 28, the Executive Committee adopted a resolution providing for the merging, into one general investment account, of the investments of the several funds heretofore received, or to be received, with the exception of those cases in which the conditions of a gift require the separate investment thereof. In accordance with this action the securities received from the Estate of Laura S. Rockefeller have been merged with the investments belonging to the General Funds.

During August eighty-six hundred and ninety-six shares of new capital stock of the Standard Oil Company (Ohio) were received as a dividend and were added to the 8,696 shares already held. The total of 17,392 shares are now carried at the valuation of the original number.

During September the Foundation received from the Executors of the Estate of Laura S. Rockefeller cash amounting to \$37,000.00, as an additional gift.

During October the Receiver of the International Mercantile Marine Company was discharged and the administration of the company resumed by its stockholders. Under a compromise agreement its International Navigation 5% bonds and its International Mercantile Marine

EXHIBIT L—*Continued*

4½% bonds were paid off as follows: 57% of the par of the above bonds in new collateral 6% bonds and 43% in cash, while all arrears of interest were paid in cash. For its holdings of \$3,692,000.00 4½% bonds and \$1,305,000.00 5% bonds, the Foundation received \$2,848,290.00 in new 6% bonds and \$2,148,710.00 in cash. The new bonds have been given a valuation of 97.50%, which was the market value on the day of receipt. Arrears of interest amounting to \$559,419.03 have been credited to Income Account.

During October, the reorganization of the Western Pacific Railway Company having been completed, the Foundation's holding of \$4,039,000.00 first mortgage 5% bonds were exchanged for 20,195 shares of preferred stock and 30,292½ shares of common stock of the new Western Pacific Railroad Company. These stocks were taken into the books at their market values on the day of receipt, namely 43½% and 15½%, respectively.

During the month of November the completion of the reorganization of the St. Louis & San Francisco Railroad Company resulted in the exchange of the Foundation's \$2,000,000.00 refunding 4% bonds for \$1,500,000.00 prior lien 4% bonds and \$500,000.00 adjustment mortgage cumulative 6% bonds of the new St. Louis & San Francisco Railway Co. These bonds were taken into the books at their market values on the day of receipt, namely, 72½% and 81.975% respectively.

To offset arrears of interest on the refunding bonds above mentioned, one year's interest to July 1, 1916, on the two new issues was paid by the company. The amount received, together with the proceeds of sale of coupons representing three interest periods of the refunding bonds, until now carried in a suspense account, have been credited to income account.

The reorganization of the New Orleans, Texas & Mexico Railroad Company was consummated during the month of November, and in exchange for its holding of \$450,000.00 St. Louis & San Francisco, New Orleans, Texas & Mexico Division first mortgage 5% bonds, the Foundation received \$180,000.00 5% income bonds and 1,125 shares of the capital stock of the New Orleans, Texas & Mexico Railway Company. These securities were taken into the books at their market values on the day of receipt, namely, 42% and 16% respectively.

The following tables of sales and purchases state the above transactions in brief and give the profits and losses on the various securities sold, redeemed and exchanged.

## EXHIBIT L—Continued

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**FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS**  
**SECURITIES SOLD, REDEEMED AND EXCHANGED**

		RATE PER CENT	TOTAL PROCEEDS		
\$6,000	Baltimore & Ohio R.R. First .....	4	\$5,497	Gain	\$37.50
278,548	Euclid Heights property mortgages liquidated to \$9,504.00 by a further payment.....		117,489.22		
5,692,000	International Mercantile Marine Co. Coll. Trust .....	4½	3,699,889.00	Gain	1,608,789.00
1,305,000	International Navigation Co. First, Skg. Fd.....	5	1,286,403.75	Gain	807,653.75
67,000	New York City, Two Year Revenue.....	6	67,000.00		
5,500	Norfolk & Western Ry. First Consol.....	4	5,218.18	Gain	213.18
5,500	Northern Pacific Ry. Prior Lien .....	4	5,176.88	Gain	61.88
56,000	Pittsburgh, Cin., Chic. & St. L. Ry .....	4	58,970.00	Loss	350.00
2,000,000	St. Louis & San Francisco R.R. Refunding.....	4	1,601,125.00	Loss	18,875.00
450,000	St. L. & San Fran. R.R. N.O.T. & M. Div. First .....	5	98,000.00	Loss	176,400.00
2,000	Seaboard Air Line Ry. First .....	4	1,627.50	Gain	47.50
8,000	Wabash R.R. Detroit & Chic. Extension .....	5	3,176.25	Loss	3.75
4,039,000	Western Pacific Ry. First.....	5	1,340,443.12	Loss	1,446,466.88
750	Woman's Hotel Co. Dividend Scrip.....		750.00	Gain	150.00
154	Shares American Shipbuilding Co. Preferred.....		18,778.07	Gain	683.07
2,121	Shares Cleveland Steel Co. Capital .....		274,957.53	Gain	62,857.53
619	Shares Colonial Oil Co. (acct. liq. assets) .....		61,900.00		
181	Shares Cumberland Pipe Line Co.....		27,109.89	Gain	14,077.89
120	Shares Delaware & Hudson R.R. Capital .....		17,980.20	Loss	289.80
500	Shares Great Northern Ry. Preferred .....		58,018.34	Gain	4,993.34
1,400	Shares International Agri. Corp. Common .....		40,706.50	Gain	63,706.50
800	Shares International Agri. Corp. Preferred .....		68,848.00	Gain	24,848.00

THE ROCKEFELLER FOUNDATION

500	Shares National Lead Co. Common.....	95,107.50	Gain	10,107.50
300	Shares Northern Pacific Ry. Common.....	32,991.50	Gain	5,462.75
300	Shares Ohio Fuel Supply Co. Capital.....	16,846.02	Gain	4,546.02
100	Shares Reading Company Common.....	10,322.39	Gain	2,199.06
450	Shares Swan & Finch Co. Capital.....	57,590.09	Loss	32,409.91
100	Shares Union Pacific Ry. Common.....	14,508.50	Gain	750.72
200	Shares U. S. Steel Corp. Common.....	25,296.00	Gain	12,296.00
39,150	Erie R.R. Rights.....	6,633.94		
65	Swan & Finch Co. Rights.....	209.22		
		\$8,873,159.59		\$428,180.95
2	National Transit Co., distribution of \$12.50 per share from assets reducing par, capital stock one-half.....	1,581,012.60		
3	Of refund received in adjustment of price of \$600,000.00 Anglo-French External Loan 5% bonds purchased in 1915....	982.80		
4	Euclid Heights Realty Co. bonds; amount received in further liquidation of assets.....	4,790.04		4,790.04
	Total amount received for securities sold, redeemed and exchanged			
		\$10,459,944.93		
	TOTAL NET GAIN ON THE ABOVE CREDITED TO RESERVE.....			\$432,070.89

## EXHIBIT L—Continued

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FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS—Continued  
SECURITIES GIVEN AWAY

		RATE PER CENT	MARKET VALUES	
Delivered to the General Education Board as a Gift from the Estate of Laura S. Rockefeller Fund:				THE ROCKEFELLER FOUNDATION
\$4,000 Atlantic Coast Line R.R. L. & N. Collateral.....	4	\$3,440.00	Loss	\$40.00
10,000 Chesapeake & Ohio Ry. Convertible.....	4	8,550.00	Gain	850.00
50,000 Chicago, Rock Island & Pac. Ry. Refunding .....	4	37,250.00	Gain	6,750.00
20,000 Colorado Industrial Co. First.....	5	15,300.00	Loss	300.00
£2,000 Imperial Chinese Government of 1911.....	5	7,200.00	Loss	800.00
\$20,000 St. Louis, Iron Mt. & Sou. R.R. Un. & Ref.....	4	16,200.00	Gain	3,600.00
25,000 U. S. Mortgage & Trust Co. First.....	4	24,000.00		
75,000 Western Maryland R.R. First.....	4	54,750.00	Gain	2,062.50
100 Shares Baltimore & Ohio R.R. Common.....		9,075.00	Loss	281.94
300 Shares Consolidated Gas Co. Capital.....		41,700.00	Gain	2,487.50
36 Shares Manhattan Ry. Co. Capital.....		4,618.00	Gain	10.00
75 Shares Title Guarantee & Trust Co. Capital.....		27,500.00	Loss	1,000.00
		\$249,583.00		\$12,888.06
Less cost of tax stamps.....				20.44
NET GAIN OVER BOOK VALUES CREDITED TO RESERVE....				\$12,867.62

## EXHIBIT L—Continued

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS—Continued  
SECURITIES BOUGHT AND RECEIVED THROUGH EXCHANGE

	NAME	RATE PER CENT	COST	PRICE PER CENT
\$100,000	American Tel. & Tel. Co. 30-yr. Collateral Trust.....	6	\$97,750.00	97.75
1,000,000	Armour & Co. Real Estate First.....	4½	932,500.00	93.25
	Chehalis & Pacific Land Co. assessment of 4% on 220 shares, for taxes, etc.....		880.00	
500,000	Government of the Dominion of Canada 15-yr. Gold.....	5	472,825.00	94.56
750,000	Interborough Rapid Transit Co. First.....	5	735,000.00	98.
2,848,290	International Mercantile Marine Co. First & Collateral First..	6	2,777,082.75	97.5
250,000	Kansas City Southern Ry. First.....	3	173,437.50	69.375
180,000	New Orleans, Texas & Mex. Ry. non-cumulative income Series "A".....	5	75,600.00	42.
250,000	New York Connecting R.R. First.....	4½	245,000.00	98.
500,000	Reading & Philadelphia—Reading Coal & Iron Co. General.....	4	471,250.00	94.25
1,500,000	St. Louis & San Francisco Ry. Prior Lien.....	4	1,091,250.00	72.75
500,000	St. Louis & San Francisco Ry. Cumulative Adjustment.....	6	409,875.00	81.975
750,000	Union Pacific R.R. Refunding.....	4	675,937.50	90.125
700,000	United King. Gr. Britain & Ireland 2-yr. secured loan.....	5	696,062.50	99.4375
350,000	United King. Gr. Britain & Ireland 3-yr. Notes.....	5½	346,937.50	99.125
350,000	United King. Gr. Britain & Ireland 5-yr. Notes.....	5½	344,812.50	98.875
1,125	Shares New Orleans, Texas & Mexico Ry.....		18,000.00	16.
20,195	Shares Western Pacific R. R. Preferred.....		878,482.50	43.5
30,202½	Shares Western Pacific R. R. Common.....		461,960.62	15.25
			<b>\$10,904,143.87</b>	

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## EXHIBIT L—Continued

## FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS—Continued

## SECURITIES BOUGHT AND RECEIVED THROUGH EXCHANGE

NAME	RATE PER CENT	COST	PRICE PER CENT
7. Received from the Swan & Finch Company, rights to subscribe to new stock represented by the ownership of 65 shares.			
8. Received from the Chesebrough Manufacturing Co. 1,380 shares of stock, representing a 200% dividend on holdings of 690 shares			
9. Received from Standard Oil Company (Ohio) 8,696 shares of stock representing a 100% stock dividend on holdings of 8,696 shares.			
10. Securities received from Estate of Leura S. Rockefeller as an additional gift.			
100 Shares Baltimore & Ohio R.R. Common .....		\$9,306.94	93.0694
120 Shares Delaware & Hudson R.R. Co., Capital .....		18,270.00	152.25
100 Shares Reading Co. Common .....		8,123.33	81.2333
100 Shares Union Pacific R. R. Common .....		13,757.73	137.5773
		<hr/> <b>\$49,458.05</b>	<hr/>

## EXHIBIT M

## SCHEDULE OF SECURITIES IN GENERAL FUNDS ON DECEMBER 31, 1916, REPRESENTING BOTH PRINCIPAL AND INCOME TEMPORARILY INVESTED

## BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
American Agricultural Chemical Co. 1st Mtg. Conv.	5	Oct. 1923	\$600,000	101.	\$505,000.00
American Telephone & Telegraph Co. 30-yr. Collateral Trust	5	Dec. 1946	100,000	97.75	97,750.00
Anglo-French External Loan	5	Oct. 18'20	600,000	98.0862	576,517.20
Armour & Co. Real Estate 1st Mtg.	4½	June 1939	1,000,000	93.25	932,500.00
Ashland Power Co. 1st Mtg.	5	Mar. 1928	8,000	100.	8,000.00
Atlantic & Birmingham Ry. 1st Mtg.	5	Jan. 1934	677,000	90.	609,300.00
Atlantic Coast Line Ry. 1st Consolidated Mtg.	4	July 1952	500,000	91.	455,000.00
Baltimore & Ohio R.R. Ridg. & Gen. Mtg.	5	Dec. 1995	650,000	99.75	648,375.00
Central Pacific Ry. 30-yr. Gtd. by So. Pac.	3½	Aug. 1929	2,000	89.	1,780.00
Chicago & Alton R.R. Refunding Mtg.	3	Oct. 1949	551,000	65.	358,150.00
Chicago & Alton Ry. 1st Mtg. Lien	3½	July 1950	884,000	53.	452,620.00
Chicago, Burlington & Quincy R.R. Gen. Mtg.	5	Mar. 1958	1,000,000	93.5	935,000.00
Chicago City & Connecting Rys. Collateral Trust	3	Jan. 1927	1,805,000	85.	1,109,250.00
Chicago & Eastern Ill. R.R. Refdg. & Imp. Mtg.	4	July 1955	300,000	63.	189,000.00
Chicago, Milwaukee & St. Paul Ry. Gen. Mtg. Ser. A	4	May 1939	30,000	97.	29,100.00
Chicago, Milwaukee & St. Paul Ry. Gen. Mtg. Ser. C	4½	May 1939	500,000	103.	515,000.00
Chicago, Milwaukee & St. Paul Ry. Debenture	4	July 1934	450,000	88.2898	397,277.50

## EXHIBIT M—Continued

## BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
Chicago, Milwaukee & St. Paul Ry. Gen. & Refdg. Ser. A.....	4½	Jan. 2014	500,000	91.0625	455,812.50
Chicago & North Western Railway Extension.....	4	Aug. 15'26	50,000	95.	47,500.00
Chicago & North Western Railway Skg. Fund Debenture.....	5	May 1933	80,000	102.	81,600.00
Chicago Railways 1st Mtg.....	5	Feb. 1927	600,000	97.	485,000.00
Cleveland, Cin., Chic. & St. Louis Ry., St. Louis Div. Collateral Trust.....	4	Nov. 1990	78,000	90.	65,700.00
Cleveland, Cincinnati, Chicago & St. Louis Ry. Gen. Mtg.....	4	June 1933	700,000	88.893	587,250.00
Cleveland Short Line 1st Mtg. Gtd. L. S. & M. S.....	4½	April 1961	500,000	95.	475,000.00
Colorado Industrial Co. 1st Mtg.....	5	Aug. 1934	2,000,000	80.	1,600,000.00
Consolidated Gas Co. of N. Y. Conv. Debenture.....	6	Feb. 1920	500,000	110.	550,000.00
Denver & Rio Grande R.R. 1st Consolidated Mtg.....	4	Jan. 1936	6,000	85.	5,100.00
Dominion of Canada, Gov't of, 15-yr.....	5	April 1931	500,000	94.565	472,825.00
Erie Railroad, Conv. Series B.....	4	April 1953	1,065,000	74.7175	795,742.50
Euclid Heights Realty Co. Cleve. Trust Co. participation certificates in certain mortgages on property formerly owned by, Participation Ctf. No. 1.....	6		202,400	Liq. to	2,228.93
Participation Ctf. No. 3.....	6		78,148	Liq. to	7,231.07
Illinois Central R.R. Refunding Mtg.....	4	Nov. 1965	300,000	97.	261,000.00
Interborough Rapid Transit Co. 1st Mtg.....	5	Jan. 1966	1,750,000	96.3571	1,695,000.00

International Mercantile Marine Co. 1st & Collateral Trust Skg. Fund.....	6	Oct.	1941	2,848,290	97.5	2,777,082.75
Kansas City Southern Ry. 1st Mtg.....	8	April	1950	250,000	69.875	173,487.50
Lake Erie & Western R.R. 2nd Mtg.....	5	July	1941	100,000	100.	100,000.00
Lake Shore & Mich. So. Ry. 1st Mtg.....	3½	June	1927	926,000	87.	805,620.00
Lake Shore & Mich. So. Ry. Debenture.....	4	Sept.	1928	762,000	92.	701,040.00
Lake Shore & Mich. So. Ry. Debenture.....	4	May	1931	2,673,000	92.	2,459,160.00
Long Island R.R. Refunding Mtg.....	4	Mar.	1948	8,000	90.	1,800.00
Louisville & Nashville R.R. Unifying.....	4	July	1940	6,000	90.	5,580.00
Magnolia Petroleum Company 1st Mtg.....	6	Jan.	1937	3,140,000	100.	3,140,000.00
Missouri, Kansas & Texas Ry. Gen. Skg. Fund.....	4½	Jan.	1930	1,825,000	84.	1,115,000.00
Missouri, Pacific Ry. 40-year Collateral Trust.....	4	Mar.	1945	2,198,000	60.	1,318,800.00
Morris & Essex R.R. 1st Mtg. & Refunding.....	3½	Dec.	2000	175,000	82.75	144,812.50
Mutual Fuel Gas Co. 1st Mtg.....	5	Nov.	1947	250,000	100.	250,000.00
National Railways of Mexico, Skg. Fund with Jan. 1915 and subsequent coupons attached.....	4½	July	1957	60,000	59.	22,500.00
National Railways of Mexico, Secured 6% Notes for coupon due January 1, 1914.....	...	Jan.	1917	1,125	59.	669.75
National Railways of Mexico, Guaranty Trust Co. Receipt for July 1, 1914 coupon.....	...	.....	.....	1,125	59.	669.75
New Orleans, Texas & Mexico Ry. Non Cumulative Income Series A.....	5	Oct.	1925	180,000	42.	76,600.00
N. Y. Central Lines Equipment Trust of 1913.....	4½	40M ea. yr.	Jan. 17-'28	432,000	99.089	427,849.81
N. Y. Central & H. R.R. R.30-year Debenture.....	4	May	1934	880,000	88.45	291,885.00
New York, Chicago & St. Louis R.R. 1st Mtg.....	4	Oct.	1927	95,000	95.	39,250.00
New York, Chicago & St. Louis R.R. Debenture.....	4	May	1931	1,303,000	87.	1,133,610.00
New York City Corporate Stock.....	4½	Mar.	1964	100,000	94.5	94,500.00
New York City 3-year Revenue Bonds.....	6	Sept.	1917	94,000	100.	94,000.00
New York Connecting R.R. 1st Mtg.....	4½	Aug.	1953	600,000	95.69078	478,463.65

**EXHIBIT M—Continued**  
**BONDS**

THE ROCKEFELLER FOUNDATION

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
Northern Pacific Ry. General Lien.....	5	Jan. 2047	250,000	65.	162,500.00
Northern Pacific Ry. Refunding & Imp. Mtg.....	4½	July 2047	380,000	91.5769	357,150.00
Ohio Fuel Supply Co. Debenture.....	6	Mar. 1927	51,925	100.	51,925.00
Pennsylvania R.R. Consolidated Mtg.....	4	May 1948	£2,400	99.	11,880.00
Pennsylvania R.R. General Mtg.....	4½	June 1965	\$1,500,000	98.25	1,473,750.00
Pere Marquette R.R. Consolidated Mtg.....	4	Jan. 1951	520,000	68.	327,600.00
Philadelphia Co. Convertible Debenture.....	5	May 1922	1,000,000	97.	970,000.00
Philadelphia Co. Convertible Debenture.....	5	Aug. 1919	600,000	95.	475,000.00
Pittsburgh, Cin., Chic. & St. L. Ry. Consolidated Ser. I	4½	Aug. 1963	600,000	103.	615,000.00
Province of Quebec, 5 year.....	5	April 1990	500,000	99.75	498,750.00
Reading Co.-Phila. & Reading Coal & Iron Co. General	4	Jan. 1997	500,000	94.25	471,250.00
Rutland R.R. 1st Consolidated Mtg.....	4½	July 1941	25,000	90.	22,500.00
St. Louis & San Francisco Ry. Prior Lien Series A.....	4	July 1950	1,600,000	72.75	1,091,250.00
St. Louis & San Francisco Ry. Adjustment Mtg.....	6	July 1955	500,000	81.975	409,875.00
Seaboard Air Line Ry. Adjustment Mtg.....	5	Oct. 1949	455,000	77.	350,850.00
Southern Pacific Branch Ry. 1st Mtg.....	6	April 1937	100,000	117.1402	117,140.20
Southern Pacific R.R. 1st Refunding Mtg.....	4	Jan. 1955	100,000	86.	86,000.00
Sunday Creek Co. Collateral Trust.....	5	July 1944	81,000	78.	63,180.00
Union Pacific R.R. Refunding Mtg.....	4	Jan. 2008	1,000,000	90.125	901,250.00
United King. of Gr. Brit. & Ire. 2-yr. Secured Loan.....	5	Sept. 1918	700,000	99.4375	696,062.50
United King. of Gr. Brit. & Ire. 3-yr. Notes.....	5½	Nov. 1919	350,000	99.125	346,937.50
United King. of Gr. Brit. & Ire. 5-yr. Notes.....	5½	Nov. 1921	350,000	98.875	344,312.50

Wabash R.R. Omaha Div. 1st Mtg.....	3½	Oct. 1941	45,000	65.	29,250.00
Wabash R.R. 2nd Mtg.....	5	Feb. 1939	120,000	97.8	117,360.00
Washington Ry. & Elec. Co. Consolidated Mtg.....	4	Dec. 1961	450,000	88.5	375,750.00
Western Maryland Ry. 1st Mtg.....	4	Oct. 1952	1,032,000	78.8918	814,158.76
Wheeling & Lake E. R.R. L. E. Div. 1st Mtg.....	5	Oct. 1926	140,000	100.	140,000.00
Wheeling & Lake E. R.R. 1st Consolidated Mtg.....	4	Mar. 1949	434,000	80.	347,200.00
<b>TOTAL BONDS.....</b>					<b>\$42,623,843.67</b>

**STOCKS**

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
<b>OIL COMPANY STOCKS:</b>				
Bonne-Scrymser Company.....	20	950	295.	\$103,250.00
Buckeye Pipe Line Company (par \$50).....	16	49,698	160.	7,950,880.00
Cheesbrough Manufacturing Company Consolidated.....	14	2,070	923.9333	462,900.00
The Colonial Oil Company 100 % paid % dissolution.....	..	619	.....	.....
The Continental Oil Company.....	12	7,000	190.	1,330,000.00
Crescent Pipe Line Company (par \$50).....	6	14,120	60.	847,200.00
Cumberland Pipe Line Company.....	5	2,800	72.	165,600.00
Eureka Pipe Line Company.....	24	12,357	361.332	4,464,995.59
Galena-Signal Oil Company Preferred.....	8	4,193	140.	587,024.18
Galena-Signal Oil Company Common.....	12	20,842	190.	3,958,978.12
Indiana Pipe Line Company (par \$50).....	16	24,846	125.111	3,108,395.28
National Transit Company (par \$12.50).....	4	126,481	28.5	3,604,708.50
New York Transit Company.....	16	12,892	900.	3,717,600.00

**EXHIBIT M—Continued**  
**STOCKS**

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
<b>OIL COMPANY STOCKS:</b>				
Northern Pipe Line Company.....	10	9,000	110.	990,000.00
Solar Refining Company.....	10	4,964	185.007	918,875.00
South West Pa. Pipe Lines.....	12	8,000	160.	1,280,000.00
Southern Pipe Line Company.....	24	24,845	229.5556	5,703,508.88
Standard Oil Company (Kansas).....	12	4,966	275.0167	1,365,783.13
Standard Oil Company (Kentucky).....	20	7,434	140.5094	1,044,547.83
Standard Oil Company (Nebraska).....	20	2,482	270.	670,140.00
Standard Oil Company (Ohio).....	15	17,802	210.	3,652,320.00
Swan & Finch Company.....	..	65	196.78	12,790.78
Union Tank Line Company.....	5	24,105	70.	1,687,350.00
Washington Oil Company (par \$10).....	40	1,774	30.	53,220.00
<b>TOTAL OIL COMPANY STOCKS.....</b>				<b>\$47,679,704.64</b>
<b>MISCELLANEOUS STOCKS:</b>				
American Shipbuilding Company Preferred.....	7	9,903	85.	8790,755.00
American Shipbuilding Company Common.....	..	14,972	85.	524,020.00
Atchison, Topeka & Santa Fe Ry. Preferred.....	5	5,000	98.25	491,250.00
Atchison, Topeka & Santa Fe Ry. Common.....	6	21,100	95.2563	2,009,908.88
Central National Bank of Cleveland.....	8	500	150.2222	75,611.10
Chehalis & Pacific Land Company.....	..	920	49.4545	10,880.00
Chicago City & Connecting Ry. Preferred Participation Certifi- cates.....	4½	17,530	69.1875	1,212,856.88

Chicago City & Connecting Ry. Common Participation Certificates.....		10,518	30.	315,540.00
Cleveland Arcade Company.....	8	2,500	98.6922	246,555.56
Cleveland Trust Company.....	10	286	238.195	68,129.77
Colorado & Southern Ry. 1st Preferred.....	4	7,000	54.	378,000.00
Consolidated Gas Company of N. Y. ....	6	20,000	127.50	2,550,000.00
Wm. Cramp & Sons, Ship & Engine Building Company.....		648	15.	9,720.00
Erie Railroad 1st Preferred.....		21,400	45.8305	980,779.78
Great Lakes Towing Company Preferred.....	7	1,527	88.7361	135,500.05
Great Lakes Towing Company Common.....		1,200	12.	14,400.00
International Agricultural Corporation Preferred.....		6,545	30.	196,350.00
International Agricultural Corporation Common.....		8,175	5.	40,875.00
H. H. Kohlaseat Company.....		1,900	50.	95,000.00
Manhattan Railway.....	7	10,000	128.775	1,287,750.00
National Fuel Gas Company.....	10	138	202.913	28,002.50
National Lead Company Preferred.....	7	1,400	104.	145,600.00
National Lead Company Common.....	4	29,400	50.	1,470,000.00
New Orleans, Texas & Mexico Ry. ....		1,125	16.	18,000.00
New York, Chicago & St. Louis R.R. 2nd Preferred.....	4	400	78.70	31,480.00
New York, Chicago & St. Louis R.R. Common.....		100	55.	5,500.00
Northern Pacific Ry. ....	7	700	91.7625	64,238.75
Ohio Fuel Supply Company (par \$25).....	8	4,054	40.9301	165,930.67
Otis Steel Company Preferred.....	7	140	90.	12,600.00
Otis Steel Company Common.....		329	20.	6,580.00
Pressed Steel Car Company Preferred.....	7	500	89.75	44,875.00
Provident Loan Certificates (par \$5,000).....	6	40	100.	200,000.00
Seaboard Air Line Ry. Preferred.....		4,300	54.	232,200.00
Seaboard Air Line Ry. Common.....		3,400	21.	71,400.00
Sheffield Farms-Shawson Decker Company Preferred.....	6	150	99.4	14,910.00
Superior Savings & Trust Company.....	12	300	297.6333	89,350.00

**EXHIBIT M—Continued**  
**STOCKS**

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
<b>MISCELLANEOUS STOCKS:</b>				
Tilden Iron Mining Company.....		1,780	27.35	48,683.46
U. S. Cast Iron Pipe & Foundry Company Preferred.....	2	1,987	44.444	88,810.89
U. S. Rubber Company 1st Preferred.....	8	800	101.2313	30,369.40
Western Maryland Ry. Preferred.....		500	46.	23,000.00
Western Pacific R.R. Corporation Preferred.....		20,195	43.5	878,482.50
Western Pacific R.R. Corporation Common.....		30,292 $\frac{1}{2}$	15.25	461,960.62
Wilson Realty Company.....		591	100.	59,100.00
Woman's Hotel Company.....	5	300	80.	24,000.00
<b>TOTAL MISCELLANEOUS STOCKS.....</b>				<b>\$15,652,438.24</b>
<b>TOTAL SECURITIES BELONGING TO GENERAL FUNDS PRINCIPAL AND INCOME ACCOUNTS.....</b>				<b>\$105,955,986.55</b>
 NOTE—The securities representing Special Funds, Exhibit N, are not included in the above.				
NOTE—All securities are valued at the price at which they were purchased or at the value assigned to them when they were donated, interest and dividends accrued at the date of purchase or donation being allowed for.				
NOTE—The foregoing investments are apportioned as follows:				
General Fund.....				\$100,000,000.00
General Fund Income.....				4,007,888.76
Estate Laura S. Rockefeller Fund.....				177,738.00
Reserve.....				1,770,414.79
<b>TOTAL.....</b>				<b>\$105,955,986.55</b>

EXHIBIT N  
SCHEDULE OF SECURITIES HELD IN SPECIAL FUNDS DECEMBER 31, 1916

JOHN D. ROCKEFELLER FUND  
BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE	YIELD
Canada Southern Ry. Consol. "A".....	5	Oct. 1962	\$37,000	100.	\$37,000.00	6.
<b>TOTAL BONDS.....</b>					<b>\$37,000.00</b>	

LAURA S. ROCKEFELLER FUNDS  
BONDS

Colorado Industrial Co. First.....	5	Aug. 1934	\$50,000	80.	\$40,000.00	6.95
Virginia Carolina Chem. Co. First.....	5	Dec. 1929	10,000	99.	9,900.00	6.18
<b>TOTAL BONDS.....</b>					<b>\$49,900.00</b>	

TREASURER'S REPORT

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## **APPENDIX**



# APPENDIX I

## CONSTITUTION OF THE ROCKEFELLER FOUNDATION<sup>1</sup>

### ARTICLE I

#### *Members*

The members of the Corporation shall consist of the persons named in the first section of the Act to incorporate The Rockefeller Foundation, being Chapter 488 of the laws of 1913 of the State of New York, *viz.*: John D. Rockefeller, John D. Rockefeller, Junior, Frederick T. Gates, Harry Pratt Judson, Simon Flexner, Starr J. Murphy, Jerome D. Greene, Wickliffe Rose, and Charles O. Heydt, together with such persons as they may associate with themselves, and their successors.

New members, whether as successors to those named in the Act of Incorporation or otherwise, and such additional members as they or their successors shall see fit to associate with them, shall be elected by ballot, either at the annual meeting of the Corporation or at a special meeting duly called for that purpose, by vote of a majority of the members of the Corporation attending such meeting.

Any member may withdraw from the Corporation by a notice in writing to the President or Secretary. The members shall be at all times divided into three classes, equal numerically, as nearly as may be, and the original members shall at their first meeting, or as soon thereafter as may be convenient, be divided into three classes, the members of the first class to hold their membership and office until the first annual meeting, the members of the second class until the second annual meeting, and the members of the third class until the third annual meeting, and

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<sup>1</sup>The amendments to the Constitution which have been adopted during 1916 are shown in italics.

in every case the member shall hold office after the expiration of his term until his successor shall be chosen. At each annual meeting the successors to those members whose terms of office then expire shall be chosen for the term of three years and until their successors shall be chosen. In case any member shall by death, resignation, incapacity to act, or otherwise, cease to be a member during his term, his successor shall be chosen to serve for the remainder of his term and until his successor shall be chosen. If and when the number of members shall be less than nine, the members remaining shall have power to add, and shall add to their number, until the number shall be not less than nine, but no act of the Corporation shall be void because at the time such act shall be done the members of the Corporation shall be less than nine.

All the powers of the Corporation shall be exercised by its members, and they may, by general resolution, subject to the provisions of this Constitution and the By-Laws to be adopted, delegate to other officers or to committees of their own number such powers as they may see fit, in addition to the powers specified in this Constitution and in such By-Laws.

## ARTICLE II

### *Quorum*

A majority of the members of the Corporation shall constitute a quorum for the transaction of business at meetings of the Corporation.

## ARTICLE III

### *Trustees*

The number of trustees by whom the business and affairs of the Corporation shall be managed shall be the same as the number of members, and all of the members of the Corporation shall be its trustees, and the election of any person as a member of the Corporation shall constitute him a trustee.

## ARTICLE IV

*Officers*

The officers of the Corporation shall consist of a President, Secretary, Treasurer and *Comptroller*, together with such other officers as may be determined by the By-Laws. These officers shall have the duties and exercise the powers assigned to them by this Constitution or by the By-Laws, or by resolutions adopted pursuant to the authority of this Constitution or the By-Laws. At each annual meeting of the Corporation or, in default of election at such meeting, then at an adjournment thereof, or at any meeting duly called for that purpose, the Corporation shall elect by ballot a President, Secretary, Treasurer and *Comptroller*, and it may choose such other officers as the By-Laws shall from time to time provide. All the officers, whether elected or appointed, shall hold office at the pleasure of the Corporation, but in no case beyond the time when their respective successors shall be elected and accept office.

## ARTICLE V

*President*

The President shall sustain an executive and advisory relation to the work and policies of the Corporation similar to that usually sustained by the chairman or president of commercial bodies. He shall preside at all meetings of the Corporation at which he shall be present. He shall appoint all committees unless otherwise ordered by the Corporation. In his absence, the members of the Corporation present shall appoint one of their own number to preside. The President, ex-officio, shall be a member of all committees, except as herein otherwise provided. He shall sign for the Corporation all deeds and other agreements and formal instruments.

In the absence or disability of the President he may by written instrument appoint a member of the Corporation

to discharge such of his functions as he may assign to such appointee.

#### **ARTICLE VI**

##### *Treasurer*

The Treasurer, subject to such regulations as may from time to time be prescribed by the Corporation, shall have the custody of the funds and securities of the Corporation, including all bonds, deeds and other papers and documents relating to such property, and shall also have the disbursement of its money. He shall keep *proper records of securities and other evidences of property belonging to the Corporation, and also* proper books of account, and other books, showing at all times the amount of funds belonging to the Corporation, which shall be at all times open to the inspection of the members of the Corporation. At each meeting he shall present an account showing in detail the receipts of the property belonging to the Corporation and of all disbursements thereof since his last report. He shall not pay any money except in the manner prescribed in the By-Laws, or as provided by resolution of the members of the Corporation, or the authority of the Executive Committee.

#### **ARTICLE VII**

##### *Comptroller*

*The Comptroller shall keep proper records of all appropriations, budgets, and other authorizations of expenditure, and shall maintain duly itemized and classified accounts of expenditures made in pursuance thereof. He shall also keep a duplicate record of the securities and other evidences of property belonging to the Corporation as recorded in the office of the Treasurer.*

#### **ARTICLE VIII**

##### *Secretary*

The Secretary shall conduct the correspondence of the Corporation except as otherwise provided in the By-Laws

or by resolution of the Corporation. He shall be the medium of communication with the Corporation. He shall be ex-officio a member of all committees except as herein otherwise provided.

He shall give notice of and attend all meetings of the Corporation, taking minutes of the proceedings and transcribing them in a book provided for that purpose, and attesting the same. Immediately upon the election and appointment of members he shall give notice to them of their election or appointment. He shall have the custody of the corporate seal. He shall keep the records of all committees of which he is a member.

#### ARTICLE IX

##### *Meetings*

The annual meeting of the Corporation shall be held on the Wednesday next preceding the fourth Thursday of January in each year. At this meeting the Trustees of the Corporation shall present a report, verified by the President and Treasurer, or by a majority of the Trustees, showing the whole amount of real and personal property owned by the Corporation, where located, and where and how invested, the amount and nature of the property acquired during the year immediately preceding the date of the report, and the manner of the acquisition; the amount applied, appropriated or expended during the year immediately preceding such date, and the purposes, objects or persons to and for which such applications, appropriations or expenditures have been made, and the names and places of residence of the persons who have been admitted to membership in the Corporation during such year, which report shall be filed with the records of the Corporation and an abstract thereof entered in the minutes of the proceedings of the annual meeting.

In addition to the annual meeting, stated meetings of the Corporation shall be held on the Wednesday next preceding the fourth Thursday of May and October in each year.

All meetings shall be held at such time and place in the City of New York, or elsewhere, as the Corporation shall from time to time order or direct. In the absence of such direction, the meetings shall be held at the office of the Corporation in the City of New York.

The President or any three members of the Corporation may call a special meeting of the Corporation by not less than five days' written notice given by the President or the Secretary, or the members calling such meeting.

If any member of the Corporation, other than Mr. John D. Rockefeller, shall be absent from three consecutive stated meetings, such absence, unexcused, shall *ipso facto* be deemed a resignation of membership of the Corporation, and the vacancy so caused shall be filled as herein provided. Any member of the Corporation may by writing or telegram appoint any other member of the Corporation to act as his proxy at any one or more specified meetings of the Corporation.

#### ARTICLE X

##### *Committees*

The Corporation may by By-Laws provide for such committees and may delegate to such committees such power as it shall deem wise.

#### ARTICLE XI

##### *Amendments*

This Constitution may be altered or amended by a majority vote of the members present at any duly called meeting of the Corporation, provided that written notice has been sent to every member of the Corporation at least ten days in advance of the date of meeting, stating specifically the proposed amendment.

**BY-LAWS OF THE ROCKEFELLER FOUNDATION<sup>1</sup>****ARTICLE I**

There shall be a standing committee of three members of the Corporation who with the President and Secretary shall be the Executive Committee. The Executive Committee shall be elected by the Corporation at the annual meeting by ballot. The Executive Committee may fill vacancies in its own number or in the Finance Committee in the interim of the Corporation meetings, reporting its action to the Corporation at the next meeting.

This Committee shall have and may exercise all the powers of the Corporation when the Corporation is not in session, except those specifically vested in the Finance Committee as herein provided. A quorum for the transaction of business shall consist of three members. The Committee shall elect its Chairman and shall make such rules and regulations as, from time to time, it may deem proper for its own government and for the transaction of business of which it may have charge, which are not herewith otherwise provided for. It shall direct and control the purchase of all supplies and the audit of all bills.

**ARTICLE II**

There shall be a Finance Committee consisting of three members of the Corporation, to be elected by the Corporation at the annual meeting by ballot. The President and Secretary shall not be ex-officio members of this Committee. This Committee shall have power to make investments and to change the same, and may from time to time sell any part of the bonds, shares, notes or other forms of investment held by the Corporation, or any rights or privileges that may accrue thereon. *The Committee shall have authority in its discretion in so far as may be proper for*

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<sup>1</sup>The amendments to the By-Laws which have been adopted during 1916 are shown in italics.

*the safeguarding of the investments of the Foundation to participate in the reorganization of any corporation which is insolvent or is in financial difficulty, the securities of which are held by this Corporation, and to deposit any securities held by this Corporation with such protective or reorganization committees and on such terms as the Finance Committee may deem proper.* In making investments or changes of investments, all the members of this Committee shall be consulted when this is reasonably practicable, but the Committee shall be deemed to be in continuous session, and may act without formal notice of meeting, and the joint action of any two members shall be valid and binding. The Committee shall elect its Chairman and shall make such rules and regulations as from time to time it may deem proper for its own government and for the transaction of business of which it may have charge. It shall keep regular minutes of its meetings and shall make report to the members of the Corporation of all investments and changes of investments made by it.

### ARTICLE III

There shall be a Nominating Committee consisting of three members of the Corporation, to be elected by the Corporation each year at the October meeting by ballot. The President and the Secretary shall not be ex-officio members of this Committee. It shall be the duty of this Committee to make recommendations regarding members, officers and elective committees who are to be elected at the annual meeting next ensuing, and also regarding members or officers to be chosen to fill vacancies which may occur during the year.

### ARTICLE IV

The Corporation at any stated meeting, or at any special meeting called for that purpose or when the Corporation is not in session, the Executive Committee, may by

resolution appoint one or more assistant treasurers, one or more assistant secretaries, a cashier, and such other officers as may be deemed necessary. The same person may be appointed to hold two or more of said offices. All such officers shall hold office at the pleasure of the Corporation, but in no case beyond the time when their respective successors shall be elected and accept office, and shall have such powers and be subject to such restrictions as shall be set forth in the resolution appointing them.

#### ARTICLE V

The Treasurer shall deposit the funds of the Corporation in such banks or trust companies as may from time to time be designated by the Executive Committee. Such deposits of funds shall be made subject to draft only on the signatures of any two of the following officers: President, Treasurer, Assistant Treasurer, and such member of the Corporation as the President shall designate in writing for that purpose. A current expense account of not to exceed Five thousand dollars (\$5,000) on deposit at any one time may be opened with such depository as may be designated by the Executive Committee, which shall be subject to draft upon the signature of the Cashier of the Corporation, who shall be bonded at the expense of the Corporation for such sum as the Executive Committee shall fix.

No bills shall be paid except those which have been incurred pursuant to a resolution of the Corporation or under the authority of the Executive Committee, and such bills shall be paid only on a voucher approving the same for payment and referring to the specific resolution or authorization pursuant to which they were respectively incurred, which voucher shall be signed by the Secretary or by such of the Assistant Secretaries as shall be designated by resolution of the Corporation or the Executive Committee, *and shall be certified by the Comptroller as not exceeding the funds available under such resolution or authorization.*

*The Treasurer and Assistant Treasurer shall be bonded at the expense of the Corporation for such sums as the Executive Committee shall fix.*

*The securities of the Corporation shall be deposited in some suitable deposit vault or vaults designated by the Executive Committee. Access to the securities may be had and they may be withdrawn by the Treasurer or Assistant Treasurer accompanied by the Comptroller or by such representative of the Comptroller as may from time to time be designated by the Executive Committee. In case of the absence or incapacity of both the Treasurer and the Assistant Treasurer, the Executive Committee may by resolution name a person to act in place of the Treasurer. The Executive Committee may also by resolution authorize any two members of the Corporation to have access to the securities for the purpose of audit or such other purpose as it may specify in the resolution.*

#### ARTICLE VI

Any two of the following persons, *viz.*: President, Secretary, Treasurer and Assistant Treasurer and members of the Finance Committee shall have authority to execute under seal such form of transfer and assignment as may be customary or necessary to constitute a regular transfer of any stocks or other registered securities standing in the Corporation's name. And a corporation transferring any such stocks, or other registered securities pursuant to a form of transfer or assignment so executed shall be fully protected and shall be under no duty to inquire whether or not the Finance Committee has taken action in respect thereof.

Either the President or the Treasurer may execute and deliver on behalf of the Corporation from time to time proxies on any and all stock owned by the Corporation, appointing such person or persons as they shall deem proper to represent and vote the stock owned by the Corporation at any and all meetings of stockholders, whether general or special, with full power of substitution,

and to alter and rescind such appointments at such time and as often as they see fit.

#### ARTICLE VII

##### *Notices*

All notices required by these By-Laws, or otherwise, for the purpose of the Corporation, shall be in writing and shall be either personally delivered or mailed to the members of the Corporation at their addresses as entered in the office of the Secretary of the Corporation.

#### ARTICLE VIII

No part of the principal of the funds of the Foundation shall be distributed except pursuant to a resolution, passed by the affirmative vote of two-thirds of all those who shall at the time be members of the Foundation at a special meeting held on not less than thirty days' notice given in writing to each member of the Foundation which shall state that the meeting is called for the purpose of considering a resolution to authorize the distribution of the whole or some part of the principal of its funds.

#### ARTICLE IX

##### *Amendments*

These articles may be altered or amended by a majority vote of the members present at any duly called meeting of the Corporation, provided that written notice has been sent to every member of the Corporation at least ten (10) days in advance of the date of meeting, stating specifically the proposed amendment.

## APPENDIX II

### RULES OF THE INTERNATIONAL HEALTH BOARD

**SECTION 1. Membership.** The International Health Board shall consist of the Executive Committee of the Rockefeller Foundation and the additional members heretofore or hereafter elected, and their successors.

**SECTION 2. Election of Members.** The additional members mentioned in the foregoing section shall be elected by the Rockefeller Foundation at its annual meeting to serve for a period of three years from the date of their election and until their successors shall have been elected. They shall be divided as nearly as may be into three equal classes, one class being elected each year. The Rockefeller Foundation or its Executive Committee may fill vacancies in the membership of the Board occurring between the annual meetings of the Foundation, but a member elected to fill a vacancy shall serve only for the remainder of the term of his predecessor.

**SECTION 3. President and Secretary.** The President and Secretary of the Rockefeller Foundation shall be respectively the Chairman and the Secretary of the International Health Board.

**SECTION 4. Director General.** The Director General shall be the chief executive officer of the International Health Board. It shall be his duty to direct and supervise the work of the Board, to nominate other administrative or medical officers, and to conduct the correspondence of the Board. He shall prepare and present the business to be acted upon at meetings of the Board or its Executive Committee, and execute the decisions thereof.

**SECTION 5. Assistant Director General.** The Assistant Director General shall act as the assistant and repre-

sentative of the Director General, and shall perform such duties as the latter shall assign to him. In the absence or incapacity of the Director General, the Assistant Director General shall assume the duties of the Director General.

**SECTION 6. *Other Officers.*** The more immediate administration, direction, and supervision of work in the field shall be committed to Directors entitled and ranking as follows:

1. Regional Directors.
2. Senior State Directors.
3. State Directors.
4. Junior State Directors.
5. Field Directors.
6. Junior Field Directors.

These officers shall be nominated by the Director General and appointed by the Board or the Executive Committee. Other officers may be similarly nominated and appointed at the discretion of the Board.

**SECTION 7. *Authorization of Work and Expenditures.*** All the operations of the Board and of its officers shall be in accordance with plans submitted by the Director General and duly approved by the Board, and all expenses or liabilities incurred thereunder shall be in conformity with approved budgets or other authorizations by the Board, and with the By-Laws of the Rockefeller Foundation.

**SECTION 8. *Expenditures Subject to Appropriation of Rockefeller Foundation.*** All authorizations of expenditures by the Board or its agents shall be subject to the appropriation of sufficient funds by the Rockefeller Foundation.

**SECTION 9. *Disbursements and Accounts.*** All disbursements of the Board shall be made, and all records and accounts pertaining thereto, shall be kept by the disbursing and accounting officers of the Rockefeller Foundation.

**SECTION 10. *Regulations of the Board.*** The Board shall be authorized to make such additional regulations for the

conduct of its affairs as it may find expedient provided such regulations are not inconsistent with these Rules or with the Constitution and By-Laws of the Rockefeller Foundation.

**SECTION 11. *Amendments.*** These Rules may be amended by resolution of the Foundation at any meeting duly called provided a notice stating specifically the proposed amendment be sent to each member of the Foundation at least ten days before the meeting.

## APPENDIX III

### INSTRUCTIONS TO MEMBERS AND EMPLOYES OF THE WAR RELIEF COMMISSION OF THE ROCKEFELLER FOUNDATION<sup>1</sup>

1. The objects of the War Relief Commission of the Rockefeller Foundation are to advise the Foundation in regard to the needs of non-combatants and the measures to be taken for their relief, and to execute or supervise such measures of relief as may be duly authorized by the Foundation and approved by the appropriate civil and military authorities.

2. Members and employes of the War Relief Commission who are sent to the countries at war or to neighboring countries are required to devote themselves exclusively to the objects of their mission.

3. Members and employes of the War Relief Commission are required to observe strict neutrality in word and act, to refrain from expressions of opinion on the issues of the war, and to preserve in the strictest confidence any knowledge as to facts of actual or potential military significance of which the correct performance of their purely neutral functions may make them cognizant. With a view to the faithful observance of this regulation, habitual reticence as to events and conditions in the belligerent countries is enjoined.

4. Owing to the restrictions necessarily placed upon travel in and between the belligerent countries, members and employes of the War Relief Commission are cautioned to show respect to officials charged with the duty of examining travelers and to submit with equanimity to

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<sup>1</sup> Adopted by the Executive Committee of the Rockefeller Foundation, March 14, 1916.

such detention as may be required for this purpose. In case the credentials exhibited should be deemed unsatisfactory or insufficient, an opportunity for communication with the appropriate Embassy, Legation or Consulate of the United States should be requested.

## APPENDIX IV

### LETTERS OF GIFT<sup>1</sup>

January 19, 1916.

The Rockefeller Foundation,  
61 Broadway, New York City.

Gentlemen:

The executors of the will of the late Laura S. Rockefeller, exercising the power vested in them under the will to distribute the résiduary estate to such charitable corporations as they may select, and in such sums as they may deem proper, hand you herewith the following securities, in addition to those delivered to you under date of September 30, 1915:

120 shares Delaware & Hudson Railroad stock,	
at 153.....	\$18,360
100 Reading Railroad common stock, at 82....	8,200
100 shares Union Pacific Railroad common stock,	
at 138.....	13,800
100 Baltimore & Ohio Railroad common, at 95	9,500
<hr/>	
Total.....	\$49,860

Kindly sign and return the enclosed receipt.

Very truly,  
(Signed) JOHN D. ROCKEFELLER, JR.,  
*Executor.*

26 Broadway, New York,  
September 29, 1916.

The Rockefeller Foundation,  
61 Broadway, New York City.

Gentlemen:

By the letter of Mr. John D. Rockefeller, Jr., January 26, 1916, you were advised that the executors of Laura S. Rockefeller, in exercise of the discretion vested in them by

<sup>1</sup> For previous Letters of Gift see Annual Reports for 1913-14 and 1915.

her will to apply her residuary estate to such charitable corporations as they might select, selected the Rockefeller Foundation to be the recipient of the residue of the estate after making provision for certain other charitable corporations.

Pending the adjudication of the question whether the legacies to charitable corporations are taxable under the transfer tax law, the executors have reserved a portion of the estate to cover that point. The question has now been passed upon by the Transfer Tax Appraiser, and on appeal from his decision by the Surrogate, both of whom have held that the legacies are not taxable. The State Comptroller still has the right of appeal from the decision of the Surrogate, but the executors are of opinion that it is highly probable that if the appeal is taken the decision of the Surrogate will be sustained.

As the Foundation is entitled to whatever residue there may be, the effect of a decision that the legacies are taxable would simply be to reduce the amount which the Foundation would receive. In view of the probability that the tax will not be imposed, the executors are willing now to pay over to the Foundation \$37,000 of the cash balance in their hands, with the understanding that if it is finally adjudicated that the estate is taxable or that in any other way the executors are subjected to liability by reason of paying over this money, the Foundation will to the extent of this payment hold them harmless, and will either discharge such liabilities itself or reimburse them for any sums that they may have been obliged to pay.

Upon receipt of advices that this suggestion is approved by you we shall be happy to make the payment at once.

(Signed)                          Very truly yours,

ESTATE OF LAURA S. ROCKEFELLER,

By JOHN D. ROCKEFELLER,

per STARR J. MURPHY,

*Attorney and Counsel.*

## APPENDIX V

The following report, prepared by Dr. William H. Welch and Mr. Wickliffe Rose, was presented to the Trustees at their meeting in January, 1916.

January 12, 1916.

### INSTITUTE OF HYGIENE

At a conference<sup>1</sup> on training for public health service held at the offices of the General Education Board in New York on October 16, 1914, discussion seemed to develop substantial agreement on the following points: (1) that a fundamental need in the public health service in this country at the present time is of men adequately trained for the work; (2) that a distinct contribution toward meeting this need could be made by establishing at some convenient place a school of public health of high standard; (3) that such an institution, while maintaining its separate identity, should in the interest both of economy and of efficiency be closely affiliated with a university and its medical school; (4) that the nucleus of this school of public health should be an institute of hygiene.

Mr. Rose and Dr. Welch were asked to formulate a plan for such an institute of hygiene and in compliance with this request offer the following report, which is designed to set forth the scope and general character of organization of the institute and the service which it should render in training in hygiene, preventive medicine and public health and in the advancement of these subjects. If desired, the

<sup>1</sup> Dr. A. C. Abbott, Dr. Hermann M. Biggs, Dr. Simon Flexner, Mr. Jerome D. Greene, Dr. Victor G. Heiser, Dr. Edwin O. Jordan, Mr. Starr J. Murphy, Dr. Wm. H. Park, Mr. Wickliffe Rose, Dr. M. J. Rosenau, Dr. Theobald Smith, Dr. George C. Whipple, Dr. C. E. A. Winslow, Dr. Wm. H. Welch, Prof. D. D. Jackson, Dr. F. Cleveland, Dr. Wallace Buttrick, Dr. E. C. Sage and Dr. Abraham Flexner.

report can be supplemented by a detailed statement of organization, plan of building, budget and courses of instruction.

### I. PUBLIC HEALTH AND HYGIENE IN ENGLAND AND IN GERMANY

The origins of the modern public health movement and of the cultivation of hygiene as an independent science may be found especially in the passage of the Public Health Act in England in 1848 and in the establishment of the first hygienic institute by von Pettenkofer in Munich in 1865. The greatest stimulus to further development came from the discoveries relating to the causation and mode of spread of the infectious diseases and the consequent vastly increased power to control these diseases. It is instructive for the present purpose to note the different conceptions and directions of development in this field in the two countries. In Germany every university has its department or institute of hygiene, conducted by a professor and corps of assistants, where the subject is represented broadly in all its varied aspects, students are taught by lectures, laboratory courses and field work, and the science is advanced by research. In England, on the other hand, the important hygienic laboratories are few and mostly governmental or independent. For training the emphasis is laid upon public health administration, in which respect Great Britain leads the world. Those desiring to qualify as medical officers of health must possess the diploma in public health, obtained by passing an examination after at least nine months of special preparation, most frequently under a qualified medical officer of health and in a hospital for infectious diseases. It seems obvious that lessons are to be learned from both the German and the English systems, and that the ideal plan will give due weight to both the scientific and the practical aspects of hygiene and public health.

## II. THE SITUATION AND THE NEEDS IN AMERICA

In this country we are wofully lacking both in laboratories of hygiene and in opportunities for training in public health work. Three or four medical schools have hygienic laboratories, but none is complete, and adequately equipped and supported. Still other schools attempt something in the way of instruction in this subject, but it is all inadequate and unsatisfactory.

The need for supplying these deficiencies is at present the most urgent one in medical education and in public health work, and is recognized on all sides. The cry comes loudest from public health officials, social workers and others interested in public health administration, national, state, municipal and rural, who realize the lack of trained leaders and trained workers in all grades of the service. Here with the rapidly growing appreciation of efficient public health organization new and promising careers of useful service are opening for those who are qualified by ability, character and training. Scarcely less important is it for medical students and physicians who engage in practice to be well grounded in the principles of hygiene and of preventive medicine. Furthermore, the advancement of knowledge in this field, the cultivation of hygiene as a science, is one of the great needs of this country and should be a fundamental aim of an institute of hygiene.

## III. VARIOUS CLASSES TO BE TRAINED

The first and in many respects the most important class of persons who will seek to be trained in a school of public health are those who expect to devote their lives to health work in some of its branches. These will aim to become for the most part public health officials or to be engaged in some capacity in public health service, but some may become teachers or be connected with institutions or find other opportunities for a career in the ever widening field of sanitation. It is of the first importance

to consider and to supply the needs for the education of prospective public health officials.

Without attempting an exhaustive analysis, the following classification will suffice to indicate the various types of officers or experts required in public health administration:

1. Higher administrative officials, as commissioners of health and health officers in cities and districts, and division or bureau chiefs in the larger state and city departments of health.
2. Health officers in towns, villages and rural communities.
3. Higher technical officials or experts, as statisticians, sanitary engineers, chemists, bacteriologists, diagnosticians, epidemiologists, etc.
4. Inspectors of various kinds, as school, sanitary, food, factory, etc. inspectors.
5. Public health nurses.

With this class may be included those preparing to enter the Public Health Service of the federal government.

An institute or school of hygiene should furnish suitable training for all of these, and while courses adapted for special needs will be supplied, it does not seem desirable to conceive of such an institute as constituted primarily to provide training for higher or lower grades of the service so much as to furnish opportunities for a good general education in all branches of hygiene.

While it is hardly possible to overestimate the importance of providing opportunities for the training of those who are to become public health officials, the need here is at present so acute that there is some danger of overlooking the conception of hygiene as a science and art which is much broader than its applications to public health administration. Hygiene includes much more than state medicine. It is not necessary to consider here the distinction sometimes made, especially in this country, be-

tween hygiene and sanitation. In this report the term "hygiene" is used to include both, that is, the whole body of knowledge and its application relating to the preservation and improvement of health of individuals and of the community and to the prevention of disease.

With this broad conception it is obvious that the educational and scientific opportunities of an institute of hygiene should not be limited to the use of those who intend to become specialists in public health work and should cover a wider field than that of state medicine or sanitation.

It is of the utmost importance that education in the principles of hygiene should be available for students and graduates in medicine who are to engage in the practice of their profession. With the present crowded medical curriculum obligatory courses in hygiene for undergraduate students of medicine must necessarily be restricted, but with the tendency toward greater freedom of election of medical studies there is the need and opportunity to provide more extensive optional courses in hygiene. There is a wide field for the establishment of graduate courses in hygiene for physicians. Even in Great Britain, where the character of training is designed almost wholly for public health officials, many who intend to become medical practitioners secure the diploma in public health. The mission of the practising physician is in many respects changing, and there can be no doubt that a year or more of graduate work in hygiene would be eagerly sought by many physicians and would greatly increase their capacity of useful service to their patients and to the community, if the proper opportunities for such work were provided.

Sanitary engineering has become a specialized profession, and the institute of hygiene should combine with the engineering school in supplying the requisite training.

The public health nurse, both as a part of the public health service and independently of such connection, is

destined to play a rôle of increasing importance in the improvement of conditions of healthy living and working and in the control of infectious and industrial diseases in this country. The institute of hygiene should co-operate with schools and organizations for training nurses in meeting the need for a supply of trained public health nurses.

When one considers the many points of contact between the modern social welfare movement and the public health movement, and to what an extent social and economic factors enter into questions of public health it is clear that an institute of hygiene must take full cognizance of such factors and that students of social science should profit by certain opportunities in the institute, as well as students of hygiene by training in social science and social work.

An important class to be provided for in an institute of hygiene will be those engaged in special advanced work in some branch of the subject and in original investigations of hygienic problems. A main function of the institute should be the development of the spirit of investigation and the advancement of knowledge, upon which intelligent public health administration and individual hygiene are absolutely dependent. It will be especially from this class of advanced workers and investigators and from the group of assistants in the institute that the teachers and the authorities and experts in hygiene will be recruited for service in different fields of activity and the standards of the profession of hygiene and of public health will be elevated.

#### IV. FIELD TO BE COVERED

The field covered by the terms "hygiene," "sanitary science," "public health," "preventive medicine" is so broad and varied that it is hardly possible within a brief compass to indicate all of the subjects here included. Strictly speaking the territory embraces a group of sciences or the application of various underlying sciences. Unity

is to be found rather in the end to be accomplished—the preservation and improvement of health—than in the means essential to this end. It is the focussing upon this definite purpose which gives coherence to the organized body of knowledge embraced under the designations "hygiene" and "sanitation," and makes important its study and cultivation as a professional pursuit.

Although the practitioner of medicine should have knowledge of hygiene and of the means of preventing disease and has abundant opportunity in the practice of his calling to apply this knowledge, and the public health worker, if he is to prevent disease, must have knowledge of the origin, mode of spread and diagnosis of disease, still it is becoming increasingly clear that public health work constitutes a distinct profession, and the wider recognition of this fact will be an important result of the creation of institutes or schools of hygiene.

The wide scope of the professional training required for the well equipped public health worker is sufficiently indicated by the mere enumeration of the more important subjects to which more or less attention must be given in an institute of hygiene, at least so far as their scientific groundwork in relation to sanitation is required. Such subjects are vital statistics; epidemiology or the causation, spread and prevention of transmissible diseases, including tuberculosis and the venereal diseases; diagnosis of infectious diseases; industrial hygiene; sanitary parasitology, including bacteriology and immunology; sanitary chemistry; sanitary engineering; hospital construction and administration; housing, ventilation, heating, lighting; disinfection; the hygiene of air, soil, water and climate; water supplies and sewage disposal; infant mortality and child hygiene; hygiene of schools; mental hygiene; heredity and eugenics; social hygiene; personal hygiene; diet and nutrition; rural, farm and dairy hygiene; milk supply; food and drug adulterations; nuisances; public health adminis-

tration and organization, sanitary laws and codes; quarantine and immigration; tropical hygiene; relation of animal diseases to human diseases; public education in healthy living; social service work; sanitary surveys.

#### V. AGENCY REQUIRED TO PERFORM THIS FUNCTION

The central, essential and main agency required to meet the needs which have been indicated is an institute of hygiene, housed in its own building, provided with the requisite laboratories and facilities and with its own staff of teachers giving their entire time to the work of teaching and investigating. Given such a central institute it is easy to add to the curriculum, when found necessary, certain courses which are now given, or could readily be supplied by various existing departments of the medical school, the engineering school or other faculties of the university. The mere assembling of such courses does not constitute a school of hygiene. The great need of the country to-day in the promotion of public health is the establishment of well equipped and adequately supported institutes or laboratories of hygiene, where the science of hygiene in its various branches is fruitfully cultivated and advanced and opportunities are afforded for thorough training in both the science and the art. It would be a misfortune if this broader conception of the fundamental agency required for the advancement of hygienic knowledge and hygienic education should be obscured through efforts directed solely toward meeting in the readiest way existing emergencies in public health service.

1. *Relation to a Medical School.*—The profession of the sanitarian or public health worker not being identical with that of the practitioner of medicine, the institute of hygiene, as the essential part of a school of hygiene, should have an independent existence and should not be regarded merely as a department of a medical school. But the medical school offers much which the institute of hygiene will require either as preliminary training or in course and

which it will not care to duplicate. In the interest of economy and efficiency, therefore, the school of hygiene should be closely related to a medical school of high standard in such way that the facilities of each should be open to the students of both.

It is likewise important for study and training in preventive medicine that the institute should have access to the facilities of a good general teaching hospital, as well as to various special hospitals. The need of opportunities for observation and study of patients in an infectious disease hospital is of course obvious.

*2. Connection with a University.*—To perform to best advantage its function, the institute should be a part of a university. The medical school has found such connection to be a practical necessity. The institute of hygiene would draw even more heavily upon certain schools or departments of the university, as those of engineering and of sociology. In addition to having at its disposal the facilities of the university, the institute would find the stimulating and sustaining scientific spirit and ideals of the university an indispensable asset.

*3. Separate Identity.*—While intimately related to the university and its medical school, the institute of hygiene should be established on its own foundation, and should preserve and emphasize its own identity as a separate institution devoted exclusively to the science and the service of health; it should have its own building, and its own corps of instructors with adequate provision for teaching and research.

While it is not difficult to bring together on paper a group of courses selected from the several schools and departments of the university and by the addition of a few new courses make a presentable prospectus of a school of public health, this is not the conception of such a school or institute as we believe will best fulfill the functions of developing the science and art of hygiene and of training

for this new profession. If the institute is to make itself felt as a constructive force it must have in it a group of scientific investigators and teachers whose absorbing interest is in developing the science of hygiene and applying it to the conservation of health.

While the concentration of work here advocated involves some duplication of equipment, this is not as large as might be supposed and, in view of the great advantages, does not constitute a serious objection. The institute must have its own chemical laboratory; it would be inconvenient and unsatisfactory in the extreme to attempt to use chemical laboratories devoted mainly to other purposes for the many important studies in sanitary chemistry. The principal microbiological laboratory of a medical school could without detriment be transferred to the institute of hygiene, although provision must exist for bacteriological work in the pathological laboratory, as well as in the hospital. Most of the other physical equipment of the institute would involve little duplication.

*4. Organization and Departments.*—At least in the beginning there should be a director of the institute, who will also be the head of one of the main divisions. Eventually the heads of these divisions may constitute a group or faculty with co-ordinate powers in directing the policy and affairs of the institute.

It is possible to indicate only in outline and in a general way the principal departments or divisions of an institute of hygiene, as details of organization and division of work should be left to the staff of teachers whose interests and qualifications will vary with the individuals.

a. *Chemical Division.*—The applications of chemistry to sanitary science and art are extremely important and varied, and already highly developed.

b. *Biological Division.*—Here there would be a number of subdivisions, as bacteriology, protozoology, medical zoology.

c. *Engineering or Physical Division.*—A part of this can best be provided for in the engineering school, but the institute should provide opportunities for the study of certain hygienic problems requiring the application of physical science.

d. *Statistical Division.*—While the various questions connected with the collection and study of vital statistics constitute the most important subject in this field, there are other important applications of statistical science to hygiene.

e. *Division of General Hygiene and Preventive Medicine.*—Under this broad heading may be included epidemiology, industrial hygiene, the principles of public health administration and other subjects not embraced under the previous captions.

The foregoing classification is not designed to be either final or exhaustive and is manifestly reduced to its simplest terms.

If qualified men can be found there should be three or four teachers of the rank of full professors, but in their absence it would be better to select even for some of the important divisions younger men of great promise with the grade of assistant professors or of associates. In addition to these probably at least eight or ten assistants at moderate salaries would be required.

As already stated, the institute once established on its own foundation will draw upon the medical school, the engineering school and other departments of the university for courses of instruction which it will not care to provide on its own grounds, and it will itself co-operate in furnishing instruction to students in other departments.

5. *Field Work.*—Hygienic excursions to inspect water-filtration plants, sewage disposal systems, methods of heating and ventilation and for kindred purposes constitute a valuable part of practical sanitary training. The most important training in the field, however, will be

provided by establishing working relations with state and municipal departments of health and with the United States Public Health Service. This arrangement will provide for giving to the students practical experience in every department of public health work. The students may in this way become acquainted under favorable conditions with the methods of handling the health problems of the large city as well as those of the rural community. There will be opportunity for participating in the work of sanitary surveys. Co-operation with the federal Public Health Service will give good opportunity for experience in quarantine work and in sanitary and epidemiological work on a large scale. Such relations will be mutually helpful. The states and cities will reap the benefit of intelligent and scientifically trained workers who will enter the service as real workers in all fields of its activities. The institute and its students in turn will have the benefit of this practical experience.

6. *Museum.*—An important feature of the institute will be a good hygienic museum, which will contain models, charts, preparations, and other material which can be gradually brought together. This will serve not only for demonstrative teaching, but also for the education of the public. The influence and usefulness of the institute will be extended by popular lectures, conferences and extension courses.

7. *Special Courses.*—The institute should provide for the needs of those already engaged in health work, who desire to pursue short courses or to do advanced work in special branches.

8. *Requirements for Admission; Certificates and Degrees.*—The details regarding the conditions for admission to the institute may be left to future consideration, but it should be stated that while the majority of candidates for diplomas and degrees will doubtless be graduates in medicine, these distinctions should not be limited to physicians.

The institute should be ready to receive and to reward with its diplomas and degrees all who come with a satisfactory preliminary education and pursue the required training, which need not be rigidly uniform for all matriculates. Even those who may not meet the requirements for matriculation and become candidates for the degree may find opportunity to pursue special courses of study. It has been abundantly demonstrated that the profession of public health work can be successfully followed by sanitarians whose principal training has been in sanitary engineering, sanitary chemistry and sanitary biology.

9. *Influence of the Institute.*—The benefits to be expected from the establishment of such an institute as that proposed are not to be measured solely by the number of students trained within its walls. The institute can supply only a relatively small number of those who desire to enter upon public health service. The far-reaching influence of the institute should be felt in the advancement of the science and the improvement of the practice of public health, in establishing higher standards and better methods of professional education in this field, in stimulating the foundation of similar institutes in other parts of the country, in supplying teachers and in co-operating with schools of a simpler character designed for briefer technical training which should be established in each state in connection jointly with boards of health and medical schools.

(Signed) WILLIAM H. WELCH.

(Signed) WICKLIFFE ROSE.

## APPENDIX VI

### EXPENDITURES FOR WAR WORK

To DECEMBER 31, 1916

#### RELIEF WORK

	1914	1915	1916	Totals
<b>ARMENIAN AND SYRIAN RELIEF:</b>				
Contributed for the relief of suffering in the Turkish Empire and Northwestern Persia.....	.....	\$70,000.00	\$490,000.00	\$560,000.00
<b>BELGIAN RELIEF:</b>				
Food Supply:				
The greater part of five cargoes of supplies sent to Belgium	\$979,042.57	2,839.54	.....	981,881.91
Clothing:				
Given to the Commission for Relief in Belgium for the purchase of material for clothing, to be imported into Belgium and manufactured by Belgian labor.....	.....	200,000.00	.....	200,000.00
Relief Work in Holland:				
Establishment of an organization in Rotterdam for receiving, sorting and shipping clothing contributed from all parts of the world for Belgian sufferers; organization of Belgian women refugees into sewing and knitting classes; sewing machines and materials.....	.....	78,410.94	.....	78,410.94
Stipends for Belgian professors in England.....	5,000.00	20,000.00	5,000.00	30,000.00

## WAR RELIEF EXPENDITURES

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<b>Belgian Children:</b>					
Expended under the Foundation's guarantee of the cost for one year of maintaining and educating 500 Belgian children in Switzerland. (Contributions from other agencies for this purpose have been received as follows:					
Belgian Relief Fund of New York City \$25,000.00					
New England Belgian Relief Fund.... 10,000.00					
Refugees Relief Fund..... 3,000.00					
	<b>\$38,000.00)</b>	.....	.....	<b>25,000.00</b>	<b>25,000.00</b>
<b>Polish Relief:</b>					
Expended from the appropriations of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania .....		.....	.....	<b>25,531.32</b>	<b>25,531.32</b>
<b>Serbian Relief:</b>					
Contributed to the American Red Cross for the relief of destitution .....		.....	<b>5,000.00</b>	<b>59,562.72</b>	<b>64,562.72</b>
<b>Turkish Relief:</b>					
To enable the Red Cross to respond favorably to an application from the Turkish government and the Red Crescent through the American Embassy, for aid in relief work in and about Constantinople.....		.....	.....	<b>25,000.00</b>	<b>25,000.00</b>
<b>Other Small Contributions:</b>					
Administration .....	<b>5,570.60</b>	<b>31,757.10</b>	<b>34,818.51</b>	<b>72,146.80</b>	
<b>Total, Relief Work.....</b>	<b>\$989,613.00</b>	<b>\$408,007.58</b>	<b>\$671,289.55</b>	<b>\$2,068,910.19</b>	

## SOLDIERS' WELFARE WORK

	1914	1915	1916	Totals
INTERNATIONAL COMMITTEE OF YOUNG MEN'S CHRISTIAN ASSOCIATIONS:				
For the establishment of Y. M. C. A. organizations and buildings in military and prison camps in Europe.....	.....	\$25,000.00	\$200,000.00	\$225,000.00
For the establishment and maintenance of recreation centers in connection with the military forces on the Mexican border.....	.....	.....	85,000.00	85,000.00
For the purchase and administration of suitable collections of books to be maintained at the several brigade headquarters along the Mexican border.....	.....	.....	10,000.00	10,000.00
WAR RELIEF COMMISSION:				
Prisoners of War Welfare Work.....	.....	.....	378.00	378.00
Total, Soldiers' Welfare Work.....	.....	\$25,000.00	\$295,378.00	\$320,378.00

## MEDICAL AND SURGICAL WORK

	1914	1915	1916	Totals
AMERICAN RED CROSS:				
To meet the expenses of sending a detachment of physicians and nurses to Europe.....	.....	.....	.....	\$10,000.00
AMERICAN SANITARY COMMISSION FOR SERBIA:				
Contributed for organization and maintenance of the Commission, in co-operation with the American Red Cross, to combat an epidemic of typhus.....	.....	\$99,832.00	.....	99,832.00
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH:				
Support of surgical laboratory at Campagne under the direction of Dr. Alexis Carrel.....	5,000.00	25,000.00	\$25,000.00	55,000.00
Total, Medical and Surgical Work.....	\$15,000.00	\$124,832.00	\$25,000.00	\$164,832.00

## SUMMARY OF EXPENDITURES FOR WAR WORK

TO DECEMBER 31, 1916

	1914	1915	1916	Totals
RELIEF WORK.....	\$989,613.06	\$408,007.58	\$671,289.55	\$2,068,910.19
SOLDIERS' WELFARE WORK.....		25,000.00	295,378.00	320,378.00
MEDICAL AND SURGICAL WORK.....	15,000.00	124,332.00	25,000.00	164,332.00
Total.....	<b>\$1,004,613.06</b>	<b>\$557,339.58</b>	<b>\$991,667.55*</b>	<b>\$2,555,620.19</b>

\*The total appropriations for 1916 were \$2,580,000. The amount of \$991,667.55 shown for 1916 represents merely the sum actually expended by the Foundation during 1916 on account of the various appropriations made during the year.



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