1919

# DESCRIPTIVE PAMPHLET, 1919

The Rockefeller University

# THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

## *Organization and Equipment*

NEW YORK
THE ROCKEFELLER INSTITUTE
FOR MEDICAL RESEARCH
1919

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## 1919-1920

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*Communications should be addressed to The Rockefeller Institute for Medical Research, Avenue A and 66th Street, New York, N. Y.*

The following members of the staff were commissioned officers during the war, assigned for duty at the Institute or elsewhere. Nearly all members of the staff as well as the administrative officers and employees through the war period directly or indirectly were largely devoted to patriotic service.

LT. COL. ALFRED E. COHN
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LIEUT. CARL TENBROECK

The following men, not staff members, served in the instruction corps.

MAJOR ADRIEN L. P. PIOLLET (France)
MAJOR GEORGE A. STEWART

CAPT. J. HAROLD AUSTIN
CAPT. ETHAN O. BUTLER
CAPT. GEORGES DEHELLY (France)
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LIEUT. KARL W. WAHLBERG

2ND LIEUT. WILLIAM C. L. HINES

* Died in Service.

## PURPOSES

THE Rockefeller Institute for Medical Research, founded in 1901, is a philanthropic corporation created under the laws of the State of New York. The charter states that:

"The objects of said Corporation shall be to conduct, assist, and encourage investigations in the sciences and arts of hygiene, medicine and surgery, and allied subjects, in the nature and causes of disease and the methods of its prevention and treatment, and to make knowledge relating to these various subjects available for the protection of the health of the public and the improved treatment of disease and injury. It shall be within the purposes of said Corporation to use any means to those ends which from time to time shall seem to it expedient, including research, publication, education, the establishment and maintenance of charitable or benevolent activities, agencies or institutions appropriate thereto, and the aid of any other such activities, agencies, or institutions already established or which may hereafter be established."

## ENDOWMENT

THE Institute has been generously endowed by Mr. John D. Rockefeller by a series of gifts which have from time to time capitalized its growing needs. A special fund supports a system of pensions for members of the Scientific Staff. The Institute's endowment also includes a legacy from the late Henry Rutherford for the promotion of cancer research.

## ADMINISTRATION

THE Institute's charter provides for a Board of Trustees and a Board of Scientific Directors. The Board of Trustees, which includes two representatives of the Board of Scientific Directors, is charged with the maintenance and care of the endowment and property of the Institute. Income from the endowment, after taxes and other charges on the capital have been paid, is available for expenditure by the Board of Scientific Directors. The Board of Scientific Directors has control of all the scientific work and of the administration of the several departments of the Institute. Its stated meetings are held quarterly. The expenditures are made under its direction in accordance with an annual budget framed by a Budget Committee consisting of three members of the Board of Scientific Directors and two members of the Board of Trustees.

The By-Laws and Rules create three Departments of the Institute: the General Laboratories, the Hospital, and the Department of Animal Pathology. At the head of each of these Departments is a Director.

The routine administration of the Institute is in charge of an Executive Committee of the Board of Scientific Directors which acts chiefly through a Business Manager.

The Trustees of the Institute who are the custodians of its property, and the Scientific Directors who have unrestricted charge of all phases of its scientific work, together constitute the Corporation which meets at least once a year to receive reports from the Trustees and Directors who consider together, from a common standpoint, the affairs of the institution as a whole. This organization of the Governing Boards has fostered in a most gratifying way the aims of the Institute, giving as it does to the Scientific Directors the advantage of wise and sympathetic counsel in the relationships of the institution to affairs and to the community, and affording to the Trustees opportunity to share in the problems, the outlooks, and the successes which are the inspiration of the scientific staff.

The names of the members of the Board of Trustees, of the Board of Scientific Directors, of the Scientific Staff, and of the higher Executive Officers, are given on pages 5, 6, 7, and 8 of this circular.

## ORGANIZATION AND PRESENT SCOPE OF THE WORK

THE GENERAL LABORATORIES, of which Dr. Simon Flexner is Director, were organized in 1905. The work is now conducted in the following Divisions: *Pathology and Bacteriology*, Dr. Flexner, with subsections in charge of Drs. Noguchi, Rous, Murphy, and Brown; *Physiology and Pharmacology*, Dr. Meltzer; *Chemistry*, Dr. Levene, with subsection in charge of Dr. Jacobs; *Experimental Surgery*, Dr. Carrel; *Experimental Biology*, Dr. Loeb.

The HOSPITAL, of which Dr. Rufus Cole is Director, was opened in 1910. It has a capacity of about sixty patients, who are selected for admission because they are suffering from diseases which for the time being have been chosen for observation and study in the hospital. The equipment of the hospital includes laboratories of bacteriology, pathology, physiology, and chemistry, as well as clinical facilities, so that the staff is enabled to study the clinical aspects of disease under con-

ditions as near as possible to laboratory standards of exactness and efficiency, and is also able to engage with a minimum waste of energy in such laboratory researches as it may be desirable to correlate with the clinical studies. Only graduate nurses are employed in the hospital, and a training school for nurses is not maintained.

The DEPARTMENT OF ANIMAL PATHOLOGY, of which Dr. Theobald Smith is Director, was organized in 1916 and is devoted primarily to the study of the diseases of animals which are of great economic importance, and from which light of fundamental significance may be thrown upon the problems of human pathology.

The three Departments of the Institute are organized for research only. Under normal conditions they give no instruction to students and thus the Institute absolves its staff from the necessity of devoting time and energy to teaching or to the consideration of subjects and problems chosen in the student's interest rather than because of their value and promise for the advancement of science.

The scope of the Institute's work is wider than the study of problems whose solution has an immediate application to human pathology. It has, in fact, been the theory of the Institute's organization that it can best serve medical science by devoting a great deal of attention to the investigation of fundamental biological, physical, and chemical subjects. Chemical laboratories in which this aspect of science as well as those of direct clinical importance constantly have been under investigation, and laboratories in which problems of general biological interest were chosen, have largely occupied a number of members of the staff and used a considerable share of the Institute's annual budget. In accordance with this view of the Institute's function the Directors recently established the Department of Animal Pathology. Furthermore, while the larger part of the research work of the Institute is carried on in its laboratories in New York and Princeton, from time to time field expeditions in the United States and elsewhere are undertaken for the solution of special emergency problems.

The Institute requires all who serve on its scientific staff to give full time to the work, permitting members of the staff to pursue no gainful occupations outside of its organization and paying to them a stipend fixed with reference to their complete devotion to whatever may be their special assignments.

While the various phases of research which are being carried forward at the Institute are more or less independently conducted in various Departments and Divisions, it is aimed, as far as is possible, so to coordinate them that they may be mutually helpful and stimulating. Thus through frequent symposia, by the common services of library, publication, illustration, and other accessory divisions of service, and the lunch room shared by the scientific staff, a gratifying and helpful community of interest is maintained.

It is not the aim of the Institute to perpetuate the lines of investigation in which it may engage, or even Departments and Divisions, should the usefulness or promise of these at any time become doubtful, from changes in the requirements and outlooks of science, or from lack of leaders of vision or achievement. On the other hand, the elucidation of fundamental problems under favorable conditions may proceed with adequate support for an indefinite period, unhurried and unhindered by the urgency of obviously practical or immediate results. The organization of the Scientific Staff of the Institute is thus flexible and adaptable to the ever shifting requirements of research, so that its Directors at any time may alter the emphasis of its work, and focus its various resources upon different aspects of complex problems.

## APPOINTMENTS TO THE SCIENTIFIC STAFF

APPOINTMENTS to the scientific staff are made by the Board of Scientific Directors, upon the recommendation of the Director of one of the Departments. The following grades are fixed by the rules of the Board: Member of the Institute, Associate Member of the Institute, Associate, Assistant, Fellow. The clinical staff of the hospital may have in addition to the appropriate Institute titles, as above, the following titles indicating their special functions: Physician to the Hospital, Assistant Physician to the Hospital, Resident Physician, Assistant Resident Physician. Appointments of Members of the Institute are made without limit of time; of Associate Members and Associates for a term of years; while all other appointments are made for a term not exceeding one year.

As has been stated, all appointments to the scientific staff, whether in the laboratories or in the hospital, are made with stipend and engage

the full time of the incumbents. No provision is made for the enrollment of individuals or classes for formal instruction in the medical sciences or in laboratory or clinical methods. Volunteer workers are sometimes, though rarely, admitted and then only when qualified to work upon the problems determined by the Institute.

Applications for appointment may be made at any time. Blank forms of application are furnished on request. Appointments are ordinarily made only as vacancies occur. They may be sought for the purpose of permanent or indefinite association with the Institute, or for the purpose of temporary association with the Institute with one of the following objects: (1) experience in methods of investigation generally; (2) training in a special line of investigation; or (3) opportunity to work more or less independently on a particular problem. The qualifications for appointments to the scientific staff include preliminary training such as would be represented by an M.D. or a Ph.D. degree and, in addition, a knowledge of research, or a training such as would ordinarily be appropriate to the higher degrees in the biological or physical sciences.

## ADMISSION OF PATIENTS TO THE HOSPITAL

THE work of the hospital at a particular time is determined by the selected cases that bear upon a limited number of subjects chosen for investigation. Among the subjects chosen have been acute lobar pneumonia, influenza, and other acute respiratory diseases, acute anterior poliomyelitis, syphilis, certain forms of disturbed metabolism, diabetes, nephritis, certain types of heart disease, and cancer. Patients are admitted only by the Resident Physician to whom they are referred by physicians or hospitals, or to whom they may apply directly. While making the fullest use of its opportunities for observation and study, the Institute recognizes at all times the paramount right of the patient to receive the most effective treatment within the power of the attending physicians. A patient does not impair that right by the voluntary character of his application for admission.

Under the By-laws of the Corporation, no charge can be made to persons treated at the hospital, for professional care or service rendered, or for board or lodging.

## GRANTS

BEFORE the Institute had organized and equipped its laboratories and hospital, the Directors voted a number of grants to carry on investigations in other institutions. Latterly grants have been limited largely to the support of investigations related to studies conducted at the Institute. All applications for grants should be in the hands of the Business Manager before May 1. Blank forms of application are furnished on request. Grants are made for a single academic year ending June 30, unless otherwise agreed.

A grant may be used for the requirements of the investigation, whether for the purchase of apparatus and materials or for the employment of assistants, subject to the following conditions: (1) A grant is never intended merely to eke out salaries or appropriations paid by other institutions for the same work; the use of each grant must be identified with the particular problem for which the support of the Institute is desired. The Board must be satisfied in the case of every application that the spirit of this rule will be observed. (2) Apparatus purchased from grants, at the discretion of the Executive Committee of the Board of Scientific Directors, may be claimed as the property of the Institute upon the completion of the investigation. (3) The requirements concerning accounts, acknowledgments, and publication, of which a full statement will be sent on application, must be observed.

## DISCOVERIES AND INVENTIONS

ALL discoveries and inventions made by any person while receiving compensation from the Institute become the property of the Institute, to be placed freely by it at the service of humanity in accordance with the beneficent purposes of the founder.

## EXPERIMENTS ON ANIMALS

THE Governing Boards of the Institute believe that the use of animals for the purpose of advancing the knowledge of disease, its prevention and cure, is justified on the grounds of humanity and necessity. They also believe that whenever the sacrifice of an

animal is required by the welfare of human beings or of the lower animals, that sacrifice should be exacted with the least possible infliction of pain or distress consistent with the attainment of the object in view. Members of the scientific staff are required to conform to this standard in all operations upon animals, and the chief of each laboratory is held responsible for the actions of his assistants in this regard.

## PUBLICATIONS

### SEMIANNUAL LIST

THE Institute publishes a SEMIANNUAL LIST of all papers by members of the staff and those working under grants from the Institute stating the title and place of publication of these reports. The SEMIANNUAL LIST will be sent regularly upon application.

### STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

Results of the investigations made under the auspices of, or with the cooperation of, or supported by The Rockefeller Institute for Medical Research, are first reported in a variety of publications. The reports are ultimately assembled in volumes designated STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH.

The STUDIES appear serially but at irregular intervals. The first volume of the series was published in 1904, and on July 25, 1919, the thirty-first volume appeared. Each volume contains about 600 pages. Beginning with the seventeenth volume, each is paged consecutively and is indexed. At present three or four volumes of the STUDIES appear annually. An INDEX of the first twenty-five volumes has been published.

**Subscriptions.** Owing to the irregularity of publication, subscription rates for the STUDIES are fixed not by the year but by the volume—at $2.00 per volume. Subscribers are requested to remit in advance for the first volume of their subscription. Thereafter a bill will be sent with each volume as it appears. Subscribers who find it convenient to pay for several volumes in advance will be duly credited on the subscription books.

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## THE JOURNAL OF EXPERIMENTAL MEDICINE

EDITED BY

SIMON FLEXNER, M.D., New York, N. Y.

THE JOURNAL OF EXPERIMENTAL MEDICINE publishes reports of work conducted in the laboratories of the Institute, or elsewhere under its grants, and it also accepts contributions from other sources. It is issued monthly, two volumes appearing in a year. Each volume contains more than 600 pages and many plates and text-figures. Vol. XXX, No. 1, appeared on July 1, 1919. An INDEX of the first twenty volumes has been published.

Contributions should be sent to the editor of THE JOURNAL OF EXPERIMENTAL MEDICINE. They should be limited preferably to twenty printed pages, not counting the space occupied by illustrations. Articles which exceed in length twenty-five printed pages will be returned to the authors in order that their contents may be reduced to this maximum. Authors receive 100 reprints of their papers free of charge; additional copies may be obtained at cost.

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THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

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FOUNDED BY CHRISTIAN A. HERTER AND SUSTAINED IN PART BY THE CHRISTIAN A. HERTER MEMORIAL FUND

EDITED BY



THE JOURNAL OF BIOLOGICAL CHEMISTRY is designed for the prompt publication of original investigations of a chemical nature in the biological sciences. It is issued monthly, and since its foundation in 1905 thirty-eight volumes of between 500 and 600 pages each have been completed. An INDEX of the first twenty-five volumes has been published. The price to subscribers is $2.00. The price to others is $3.00.

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## THE JOURNAL OF GENERAL PHYSIOLOGY

EDITED BY



THE JOURNAL OF GENERAL PHYSIOLOGY, the first number of which appeared on September 20, 1918, is devoted to the explanation of life phenomena on the basis of the physical and chemical constitution of

living matter. It is issued bimonthly, one volume of about 600 pages appearing in a year.

The editors invite contributions relating to the physicochemical explanation of life phenomena, in whatever field of science they may originate.

Contributions should be sent to the editors of THE JOURNAL OF GENERAL PHYSIOLOGY, Avenue A and 66th Street, New York, N. Y., or 60 Buckingham Street, Cambridge, Mass. The papers should preferably be limited to twenty printed pages, not counting the space occupied by illustrations. Authors receive 100 reprints of their papers free of charge; additional copies may be obtained at cost.

**Subscriptions.** The subscription price is $5.00 per volume, payable in advance. The price of single copies is $1.00.

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Under the head of MONOGRAPHS OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH are published from time to time scientific papers which are so long or require such elaborate illustrations as to be unsuited for current periodical issues. The MONOGRAPHS are published at irregular intervals determined by the available material on hand. The publication of new monographs is advertised on the cover of *The Journal of Experimental Medicine*, *The Journal of General Physiology*, and the *Studies*. Authors receive 50 reprints of their papers free of charge; additional copies may be obtained at cost.

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## BUILDINGS AND EQUIPMENT

### NEW YORK CITY

THE principal *laboratory buildings* of the Institute are situated on the cliff overlooking the East River, at the end of East 66th Street, New York City. The situation insures excellent light and air, and greater quiet than would be enjoyed in the more accessible and crowded central parts of the city. The central structure, the first erected (in 1905–06) (see frontispiece) is a laboratory and administration building with five floors and a light basement, and has a series of accessory rooms on the roof. It covers a ground area of 136 feet by 60 feet. Another laboratory building, containing six floors and two basements and covering 150 feet by 62 feet of ground, shown at the left of the frontispiece, was opened in 1916. In both buildings each floor is arranged with laboratories and offices about a central corridor. The construction of both buildings is fire-proof and such that all interior partitions can be altered or removed as occasion requires. Hot and cold water, steam, compressed air, suction, gas, and electric current are supplied to the laboratories. Refrigeration by means of a brine circulation is carried to central positions in the buildings and several large thermostats are a part of the construction. Pipes and drains, vents, and conduits, are exposed or carried through accessible ducts wherever possible, to facilitate inspection and alteration.

In addition to the laboratories these buildings provide administrative offices, an assembly room, library, publication division, a central supply room, illustration division, x-ray division, and facilities for section making, sterilization, and the making of culture media.

The *animal house* is an eastward extension of the new laboratory building. In it are kept small animals, such as rabbits, guinea pigs, monkeys, etc. There is also provision for ten horses and a smaller number of goats and sheep. Two cold rooms are arranged for aquaria. The building includes arrangements for the storage and preparation of foods, the repair and sterilization of cages, and the incineration of refuse. Walls and floors are finished so that they can be washed down with a hose. The cages are suspended on metal racks instead of being placed on the floor.

The *hospital* (see frontispiece) is a seven-story building, with two additional basement floors in the wall of the East River cliff, and a roof-house. It is connected by a covered bridge at the level of the third floor with a two-story and basement isolation pavilion, and with the laboratory building beyond. The first floor of the hospital provides for the administration and reception rooms, and for the quarters of the resident staff. The second floor is entirely occupied by the nurses' quarters. The third floor contains a number of small rooms for the accommodation of one or two patients each. The fourth, fifth, and half of the sixth floors are arranged for ward patients. The hospital is planned with the idea of enabling the staff and nurses to give an unusual amount of attention to each of a small number of patients. The general wards are for only six or eight beds each. The balconies at each end of the building are large enough to permit all the beds to be rolled out in pleasant weather. The seventh floor of the hospital and half of the sixth are devoted to laboratories.

It is the policy of the hospital to engage each member of the staff in both clinical and laboratory work, and to provide ample laboratory facilities as near the wards as possible. On the roof is a small operating suite. On this floor also is a sun room for patients.

A *power house* built and operated by the Institute provides the buildings with heat, light, electric power, pressure, refrigeration, vacuum, and filtered water. It has reserve capacity for future buildings.

## BUILDINGS NEAR PRINCETON, NEW JERSEY

In the autumn of 1914 the Institute acquired about 400 acres of land on the east side of Carnegie Lake, opposite Princeton, in the township of Plainsboro, for the Department of Animal Pathology. Here, in addition to the research work of this Department, serum horses of the Institute and other animals are cared for.

The features of the original building plan which have been carried out (see cut) are:

1. A *laboratory building* which is equipped for work in pathology, bacteriology, protozoology, and biochemistry. This contains the library and general offices. It is 140 feet long, of hollow tile covered with stucco and placed on the highest part of the land, facing Princeton and overlooking Carnegie Lake. It is three and a half stories high, the

floor of the first being below ground level. The equipment is such as to be easily changed as new problems are taken up. The furniture is largely movable, except in the chemical laboratory. It is furnished with the modern requirements of biological laboratories, such as hot and cold water, steam, gas, electricity, refrigeration, pressure, and vacuum.

2. *Animal buildings* which are designed for the maintenance of large and small animals. Two of the buildings are divided into units in which animals may be kept isolated for the study of infectious diseases. Each unit contains hot and cold water, steam, gas, and electricity, and the floor is drained. The stall partitions are removable. Provisions are made for the changing of the outer garments and footwear of attendants.

A third large building erected in 1917 for the production of curative serums to meet the urgent requirements of the war will eventually be used for experiments on a larger scale than was contemplated for the isolation units.

3. *Outdoor enclosures* for large and small animals under experimentation.

4. A *power house* which supplies the necessary heat, electricity, refrigeration, and water from a deep driven well.

5. An intermittent filtration *sewage plant* to provide for the safe disposal of fluid wastes from laboratory and animal buildings.

## WAR ACTIVITIES OF THE INSTITUTE

THE Institute was created to conduct, assist, and encourage research. It has left largely to other agencies the task of carrying into effect, on an extensive scale, discoveries and methods of immediate practical utility made and developed by its staff. But for the period of the belligerency of the United States the activities of the Institute were chiefly diverted to the service of our own nation and the other allied nations in their common struggle against the Central Powers.

Fortunately the Institute had made contributions looking toward the prevention and the curative treatment of disease which offered immediate application to the medical problems likely to arise in connection with the greatly enlarged personnel of the United States Army and Navy. For example, curative serums for epidemic meningitis and for one of the forms of pneumonia had been worked out here. Moreover, under the support of the Rockefeller Foundation, one of its members, Dr. Alexis Carrel, in conjunction with Dr. H. D. Dakin, had perfected at Compiègne, France, in the early period of the war, a method of treating infected surgical wounds, which had come to have wide applicability in practice. That important medical and allied problems would arise and call for investigation was also patent. The several laboratories of the Institute were so equipped in men and materials as to enable it to supplement the various research and other laboratories at the command of the Government. All these resources were placed at the disposal of the Surgeon General and other governmental agencies, and were freely used by them during the war.

The war activities of the Institute may be divided into three classes: first, the establishment of *teaching courses* in the surgical treatment of wounds, in bacteriology, specific treatment of pneumonia, cardiography, clinical chemistry, and the technical side of bacteriology and histology; second, *special research work* in various aspects of bacteriology, immunology, biochemistry of antiseptics, chemotherapy, effects of poison gas, acetone formation, and the methods of preparing certain drugs of German origin employed as therapeutic agents; and third, the *production of serum* on a large scale for the treatment of meningitis, pneumonia, and dysentery.

## TEACHING COURSES

**1. The Surgical Treatment of Wounds.**—The War Demonstration Hospital of the Institute was planned as a school in which to teach military surgeons the art of applying the Carrel-Dakin treatment. Moreover, it was considered desirable to erect in the United States a unit hospital which might serve in construction and equipment as a model for such structures to be established on the western front.

The hospital was composed of double-walled and double-roofed wooden buildings of paneled and take-down construction. In order to make it useful not only for the practical aims of war instruction in surgery, but as a model of a small hospital unit which might be copied, as in fact it was repeatedly, the details of structure and equipment were carefully attended to. Thus grouped conveniently about two central ward buildings (see frontispiece) each providing twenty-five beds, with necessary attendance and service facilities, were research and operating pavilions, kitchen, and mess-rooms for nurses and employees, laundry, laboratories, lecture rooms, executive offices, and storage, with separate dormitories for physicians, nurses, maids, and orderlies. These were all connected by covered corridors, the more essential of which were completely enclosed. Heat, light, and power were furnished from the Power House of the Institute. The wards were ventilated by ceiling louvres with fan sashes in the windows, which by a turn of the hand could be substituted by muslin screens. By the lowering of large panels in the sides of the wards these could be thrown open at will for air in hot weather, or as fire escapes in an emergency.

The patients in the hospital at first were drawn from the civilian community, and finally, as the wounded were returned from France to the United States, from the Army and Navy.

The teaching staff of the hospital consisted of surgeons, bacteriologists, and chemists assigned by the Surgeon General of the Army for instruction purposes, and of French military surgeons commissioned by the French Ministry of War. The course of instruction for medical officers covered a period of two weeks. The number of army and navy officers and enlisted personnel of various grades given instruction from the opening of the hospital in August, 1917, to its close in April, 1919, was about 1,100. Twenty-seven nurses and eighty-three civilians also received instruction.

**2. Courses in Bacteriology, Immunology, and Clinical Chemistry.**—The fact was early recognized by the Directors of the Institute that the Surgeon General would make heavy demands upon the personnel of the bacteriological and clinical chemical laboratories of the country. It was thought probable that the existing highly trained personnel would prove inadequate to meet the needs. On the other hand, the number of partially trained bacteriologists and clinical chemists in the United States among practitioners of medicine who had entered the United States service as commissioned medical officers and others was obviously much larger. Hence it was proposed to establish teaching courses in bacteriology, serology, and medical chemistry for the latter class of students.

The Surgeon Generals of the Army and Navy gladly availed themselves of this suggestion and nearly 600 medical officers and others attended the courses. The classes were conducted largely by members of the scientific staff of the Institute, many of whom were commissioned officers in the army and assigned to this duty.

**3. Treatment of Pneumonia.**—One of the most serious menaces to the health of our troops has been pneumonia. The serum developed at the Hospital of the Institute for the treatment of so called Type I pneumonia having been demonstrated to be efficacious, it was imperative that military surgeons of the United States should be familiar with the best methods of its application. Hence arrangements were perfected by which medical officers were sent as internes to the Hospital of the Institute, remaining there from six weeks to several months, during which period they learned the modern technique of diagnosis and specific treatment of the disease. The officers so trained were later assigned to base hospitals in this country and abroad.

**4. Cardiography.**—A small number of specially qualified medical officers were given instructions in modern methods of studying the heart by means of graphic methods: electrocardiograph, polygraph, and x-ray. This course was interrupted by the assignment of its head (Dr. Cohn) to overseas service.

The Institute Hospital and the War Demonstration Hospital were officially designated as United States Army Auxiliary Hospital No. 1, and the laboratories as United States Army Auxiliary Laboratory No. 1.

## SPECIAL RESEACH WORK

IN ADDITION to new questions which were investigated as they arose in connection with therapeutic serum manufacture on a large scale, to meet the emergency of war-time requirements, a number of special problems were taken up.

The special chemotherapeutic studies in progress at the Institute on the *treatment of syphilis*, the requirements of the Army and Navy in this respect, and the possibility of devising a more effective and less costly drug than the German preparation salvarsan led to a promising series of laboratory and clinical studies not yet completed.

Among the other activities carried forward by members of the staff of the Institute were: important contributions to the methods of preparing a protective and curative *serum for gaseous gangrene*, whose control became so serious a problem early in the war; the making of *acetone* in aircraft production, by a new process involving bacterial action; studies on the *synthesis of drugs*, leading to contributions on the manufacture of certain drugs having important uses in the medical service; studies on *poison gases*. When hostilities ceased, Dr. Carrel and his assistants brought to a close in France studies in *hemorrhage and shock*, well under way in his temporary hospital at St. Cloud to which they were driven by the German aggressions at Compiègne. A series of studies was undertaken on the occurrence and characters of *hemolytic and other streptococci* which had been found to be of serious import in certain pneumonias, complicating measles, and influenza, especially in military establishments.

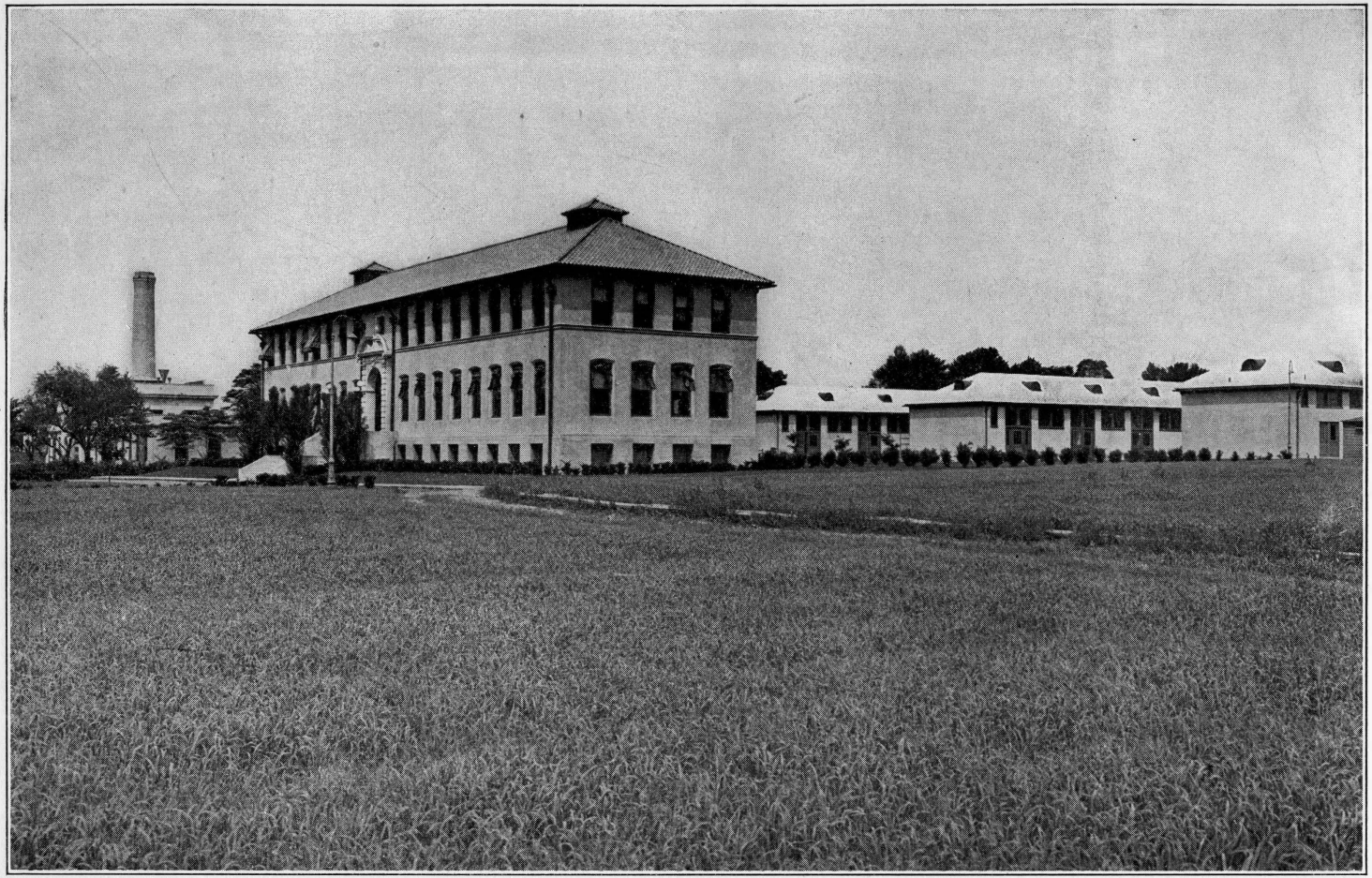
Researches on *pneumococcic and meningococcic vaccine and on meningitis carriers* were carried on in the Institute in New York or in field studies in various military camps and cantonments.

## SERUM PRODUCTION

In order to help meet the suddenly increased demand for the *curative serums* worked out at the Institute, a special stable for horses was quickly erected and a special and suitable laboratory staff assembled at the Department of Animal Pathology. In undertaking serum manufacture on a large scale, the officers of the Institute had another object in view; namely, the standardization of the product. This

latter consideration became of high importance in establishing standards for the commercial producers. Three kinds of curative serums were manufactured in quantity; namely, antimeningococcic, antipneumococcic Type I, and antidysenteric (polyvalent). Other serums intended for diagnostic purposes, such as Types I, II, III, and IV antimeningococcic, and Types II and III antipneumococcic serums were produced in smaller amounts. The quantities of the several kinds of serums distributed are as follows: 939.40 liters, or 46,970 bottles (20 cc.) of antimeningococcic serum; 344.79 liters, or 3,447 bottles (100 cc.) of antipneumococcic serum; 78.36 liters, or 3,918 bottles (20 cc.) of antidysenteric serum. The amounts partially include the various diagnostic serums issued.

Reference should be made to the fact that before the United States entered the war, the Institute had resumed the preparation of antimeningococcic serum, in order to meet the requests from England, France, Belgium, Italy, and other countries.



THE LABORATORY AND ASSOCIATED BUILDINGS OF THE DEPARTMENT OF ANIMAL PATHOLOGY OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH NEAR PRINCETON, N. J.

The main laboratory is in the center. At the right are seen the ends of the three isolation buildings for large animals. At the left is the power house. The laboratory building on slightly rising ground faces westward across Carnegie Lake toward Princeton, about 3 miles distant.