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CONTENTS.

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THE FORMAL OPENING OF THE LABORATORY OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH.[1]

A SKETCH OF THE DEVELOPMENT OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH.

FIVE years ago there were in France, Germany, England, Russia and Japan well-equipped and endowed institutions for research in medicine. In this country not one existed. For pure and applied science, all our higher institutions of learning had their laboratories, their corps of instructors and fellowships, and both opportunity and encouragement were given to students to take up original work. But how great the contrast when we turn to medicine, whose problems are related not only to the health but even the life of the race. The poverty of the resources of the medical institutions was truly pitiful. Their laboratories were for the instruction of students and possessed but little equipment beyond what was necessary for this end.

It was at this time that a group of five men met in the Arlington Hotel at Washington just five years ago last week, at the request of the founder of this institute, to consider the question of the establishment of an institution to promote research in medicine. There could be but one opinion, and, at the conference only one was expressed, *viz.*, That the most urgent need existed and that the time was ripe for the foundation of such an institution in this country.

[1] May 11, 1906.

Never was a suggestion more warmly welcomed nor an offer more heartily appreciated by the profession and the medical press from one end of the country to the other.

To this group of five, two others were added a few weeks later, and on June 14, 1901, the institution was formally incorporated as The Rockefeller Institute for Medical Research, with the seven men referred to as its board of directors. They were William H. Welch, T. Mitchell Prudden, Christian A. Herter, Theobald Smith, Hermann M. Biggs, Simon Flexner and L. Emmett Holt. The same board has been continued up to the present time. At this first meeting a pledge of $200,000 was made to the board to be drawn upon at their discretion during a period of ten years, it being understood that this was for preliminary work.

In considering what use should be made of the funds placed at its disposal to make them immediately productive of some scientific results, and at the same time to get a general view of the field, the board decided not to centralize work in a single place, but to create a number of scholarships or fellowships to be distributed in existing laboratories throughout the country. In this way it was hoped several ends might be attained: first, to enlist the cooperation of various investigators in different places; secondly, to aid some promising lines of research which could not be continued for lack of funds; and, finally, to discover who and where were the persons who desired to undertake research work and what were their qualifications.

From a large number of applications received, twenty-three grants were made to eighteen different laboratories in this country, and three men were sent abroad to pursue special investigations, two in Ehrlich's laboratory in Frankfurt and one in Koch's Institute in Berlin.

At the end of the first year's work, it was evident to the directors that while much could be accomplished by individual workers carrying on their investigations in separate laboratories, widely scattered, the highest results in research could not be secured in this manner. Existing institutions did not afford adequate facilities for many phases of investigation which were of the greatest importance. Again, the heads of these institutions, although in many instances men of great ability, were so taken up with their duties as teachers as to leave comparatively little of either time or energy to devote to research work. It was gratifying to find that there were a large number of earnest men and women in America anxious to devote themselves to this branch of science; but it was quite clear that very few possessed the breadth of education combined with the technical training requisite for independent work. The directors, therefore, were united in the conviction that, although many important investigations might be fostered by continuing the plan of foreign grants, great progress was not possible in this way, and that this could be secured only by centralizing the most important lines of work in a fixed place, under a competent head or series of heads, and with special equipment. In other words, the institute must have a laboratory of its own with its own staff of workers who should devote their entire time to research.

These conclusions and the considerations upon which they were based were, therefore, placed before the founder, who at the second annual meeting, in June, 1902, made another and larger gift to the institute, to enable the board of directors to acquire land and erect a laboratory building in which to begin the work of organization along the broader lines contemplated.

The first question to be decided was where such an institute should be located.

After due consideration of the advantages offered in other cities, New York was unanimously selected as possessing greater advantages than were elsewhere to be found in America. The next step was to find a suitable site; one which should be adequate, not only to present needs, but for future expansion; near enough to the center of the city to be accessible, and yet sufficiently removed to secure for its workers the freedom from needless interruptions and the quiet necessary for scientific pursuits.

After a prolonged search, the committee on site reported in October, 1902, in favor of the Schermerhorn property, fronting East River at East 66th and 67th Streets, as meeting to a remarkable degree all the requirements. This entire property was purchased by Mr. Rockefeller a few months later, and a plot comprising twenty-six and a half city lots, upon which the present building stands, was deeded to the institute. Work was immediately begun upon plans for a laboratory building.

The next great question was the choice of a scientific director. After looking over the entire field in America and Europe, the board could find no one possessing the qualifications to so high a degree as one of its own members, Dr. Simon Flexner, who was prevailed upon to resign his position as professor of pathology in the University of Pennsylvania, and assume the directorship of the scientific work in the new laboratory. Dr. Flexner began his work July 1, 1903, and spent the following year in Europe, studying various questions connected with institutions for research, especially those of organization, construction and equipment. He also acquired the nucleus of a library for the institute.

Eighteen months and much careful thought were spent in completing the plans for the present laboratory building. During this time five of the directors visited Europe, in order to profit by the experience of other institutions of a similar character. Final plans were adopted June 13, 1904; and a few weeks later contracts were let, ground was broken for the new building and December 3 of the same year the cornerstone was laid.

It was quite clear to the directors that it was unwise to delay commencing work until the new laboratory was completed. It was decided to take steps at once to get together a nucleus of a future laboratory staff; that it was best that a beginning should be made with a small program, a few problems, in a small building, so that the institute should be in a position for a natural organic growth and development and avoid the dangers incident to rapid expansion. A building at the corner of Lexington Avenue and 50th Street was leased and fitted up for temporary use. In that place, in October, 1904, work was begun and continued for eighteen months until the completion of the new building a few weeks ago.

The staff at first consisted only of the director and four other workers. It has, however, been gradually increased until, at the time of removal, it numbered nine persons.

One of the most difficult problems presented to the board has been to secure a staff of scientific workers. Heads of laboratories and their assistants in this country are, almost without exception, men trained for the work of instruction rather than that of investigation. Many applications for positions in the institute have been received from England, France and Germany, but the feeling of the directors has been that it was the American type of mind, with its genius for practical results, that was wanted, and this has made the board doubtful as to the wisdom of choosing European heads for any of its departments. Many young men and women

were found in this country with evident capacity, yet few possessed necessary training which should fit them to work independently. With each year's experience the conviction has steadily grown that the institute must in large measure train its own staff, selecting from the promising young applicants such as gave evidence of a special fitness and giving them subsequently such training both here and abroad as would fit them for their special work.

To get in close touch with such a class, a number of resident scholarships and fellowships have been created. For these thirty-one applications were received during the present year and five have been awarded. This plan, if successful, will be continued and from this corps, from time to time, will be recruited the future workers of the institute.

The present organization provides for the following departments: pathology, bacteriology, physiological and pathological chemistry, physiology, comparative zoology. To these it is expected that a department of pharmacology and experimental therapeutics will soon be added.

The fully organized staff will consist of a chief director and a head for each of the different departments. Each head will have his associate and corps of assistants. The heads of departments, associates and first assistants, it is expected, will constitute the permanent staff of the institute. The other workers will be less closely attached. Besides, there are contemplated scholarships and fellowships for workers who may come for a limited period; and finally, it is expected to provide for a limited number of voluntary workers who will be given the facilities of the institute for working out, under supervision, their own problems.

While the purpose of the institute will be research, not instruction, it can not fail to exert a considerable influence in medical education, since many of those who will receive their training within its walls will, doubtless, go elsewhere to assume positions of responsibility in teaching institutions.

The present scientific staff consists of fourteen persons; the laboratory building, when fully equipped, will furnish facilities for about fifty workers.

Much work must always be done in the fundamental subjects of chemistry, biology, physiology and pathology, for upon these basic sciences future discoveries in medical science must largely rest. While fully realizing the importance of these and liberally providing for them in its laboratory, the institute aims at the same time to keep close to the practical side, and will endeavor to apply the latest discoveries in science to problems connected with the prevention and cure of disease. In order that the greatest good can be accomplished along these lines, the board realizes that a hospital closely affiliated with the institute is indispensable. Only in this way is it possible for those who work in the laboratory to appreciate the relation of their results to the problems of practical medicine. The hospital need not be large, but should be fully equipped. Such a hospital it is hoped may soon be added to the institute, in which the closest kind of scientific study may be given to obscure diseased conditions.

From the very beginning, the institute has sought not to monopolize the field, but to cooperate in all possible ways with existing agencies for medical research in this country. It has cooperated with the Health Department of New York in the study of the conditions surrounding the production and distribution of the milk supply of the city, and the effects of milk upon the health of the children in the tenements; also with the commission appointed by the city in 1904, to study the prevalence of the acute respiratory diseases, and with that appointed in 1905 to investigate cerebro-spinal

meningitis. It has united with Harvard University in sending a man to Manila to study certain phases of smallpox. With the same end in view, also, it has made grants each year to assist important investigations which were being carried on in various places.

While it has been impossible to aid more than a small proportion of the even suitable ones asking for assistance, still an average of twenty grants has been made each year, and much excellent work done which otherwise could not have been undertaken.

With the opening of a central laboratory for research in New York, these foreign grants will necessarily become a less important part of the work. It is not, however, the intention of the institute to discontinue them altogether. The board hopes always to be ready, with a grant of money or by sending a trained man, to assist in the solution of any important emergency problem which may arise in connection with the public health in any part of the country.

The work done entirely or in part under the auspices of the institute and published in various scientific journals has been collected in volumes of reprints; four such volumes of about five hundred pages each having already been issued, two in 1904 and two in 1905; a fifth volume is now in press. The need of a special organ of publication was early felt by the board and in 1904 negotiations were opened with the editor of the *Journal of Experimental Medicine* with a view to transferring its control to the institute. This has been accomplished.

In February, 1905, the institute took charge of the publication of this journal, under whose auspices it has since been issued. In it are published not only the work of the institute, but also other scientific contributions of a similar nature.

In the five volumes of reprints appear 137 original papers; they may be classified under the following heads: There were 50 papers relating to etiology, or the causation of disease; 28 relating to pathology; 12 to bacteriology; 22 to physiology; 8 to chemistry; 9 to toxicology; 7 to experimental therapeutics, and 1 to pathological anatomy.

Among the most important researches in point of the attention which has been given to them may be mentioned: 21 papers upon dysentery and diarrhœal diseases; 5 papers upon milk; 4 papers upon smallpox; 12 upon various pathological conditions of the blood; 3 upon diabetes; 5 upon trypanosomiasis, and 6 upon snake venom. The other topics are widely distributed over the field of scientific medicine.

To many, five years may seem a long time to be taken up with the work of preliminary organization. Many difficulties have been encountered and many perplexing questions have come up for decision. It has been the policy of the board of directors to proceed deliberately, and no step has been taken until a conviction regarding the wisdom of it was practically unanimous.

To outline the development of an institution which should secure the highest possible efficiency has been no easy task. European models have aided greatly, but it was believed that what was needed in America was an institution different in many important respects from those of Europe. While many years will be required for the full development of the institute, the board has felt that the general policy should be reflected from the outset. Throughout it has striven to keep constantly in mind the intention of the founder, expressed in his letter of gift, that the trust was to be administered in such a way as 'to accomplish the most for humanity and science.'

The present staff of the institute is composed of the following persons:

Department of Pathology and Bacteriology—Dr. Simon Flexner, Dr. E. L. Opie, Dr. H. Noguchi, Dr. J. E. Sweet, Dr. H. S. Houghton.

Department of Physiology—Dr. S. J. Meltzer, Dr. John Auer.

Department of Chemistry—Dr. P. A. Levene, Dr. W. Beatty.

Resident Fellows and Scholars—B. F. Terry, zoology; R. D. MacLaurin, chemistry; Chas. A. Rouiller, chemistry; E. H. Schorer, bacteriology; Bertha I. Barker, bacteriology.

L. Emmett Holt.

THE ENDOWMENT OF RESEARCH.

The support of hospitals has always made a strong appeal to the philanthropy of the state and of individual citizens, and the importance to the community of educated physicians has been appreciated, although in this country until recent years most inadequately, but the recognition of medical science as a rewarding object of public and private endowment is almost wholly the result of discoveries in this department of knowledge made during the last quarter of a century. An eloquent witness to the awakening of this enlightened and beneficent sentiment is the establishment, in 1901, of the Rockefeller Institute for Medical Research with its laboratories formally opened to-day.

While the scientific study of infectious diseases is, of course, not of recent origin and had been pursued as a part of the functions of health departments and of university laboratories of hygiene and of pathology, the first provision of a special laboratory for this purpose was made by the German government in 1880, in the Imperial Health Office in Berlin, and to the directorship of this laboratory was called from his country practise Robert Koch, who four years before had startled the scientific world by his memorable investigations of anthrax.

The supremacy of Germany in science is due above all to its laboratories, and no more fruitful record of scientific discoveries within the same space of time can be found than that afforded by this laboratory during Koch's connection with it, from 1880 to 1885. Thence issued in rapid succession, the description of those technical procedures which constitute the foundation of practical bacteriology and have been the chief instruments of all subsequent discoveries in this field, the determination of correct principles and methods of disinfection, and the announcement of such epochal discoveries as the causative germs of tuberculosis—doubtless the greatest discovery in this domain—of typhoid fever, diphtheria, cholera, with careful study of their properties.

The leading representative, however, of the independent laboratory devoted to medical science is the Pasteur Institute in Paris, founded in 1886, and opened in 1888. The circumstances which led to the foundation of this institute made probably a stronger appeal to popular sympathy and support than any others which have ever occurred in the history of medicine.

There stood in the first place, the personality and the work of that great genius, Louis Pasteur, of noble and lovable character, one of the greatest benefactors of his kind the world has known, who for forty years had been engaged, often under adverse conditions, in investigations which combined the highest scientific interest with important industrial and humanitarian applications. Pasteur's revelation of the world of microscopic organisms in our environment—the air, the water and the soil—and his demonstration of their relation to the processes of fermentation and putrefaction, had led Lister in the late sixties, even before anything was definitely known of the causative agency of bacteria in human diseases, to make the first and most