

Robert Koch.

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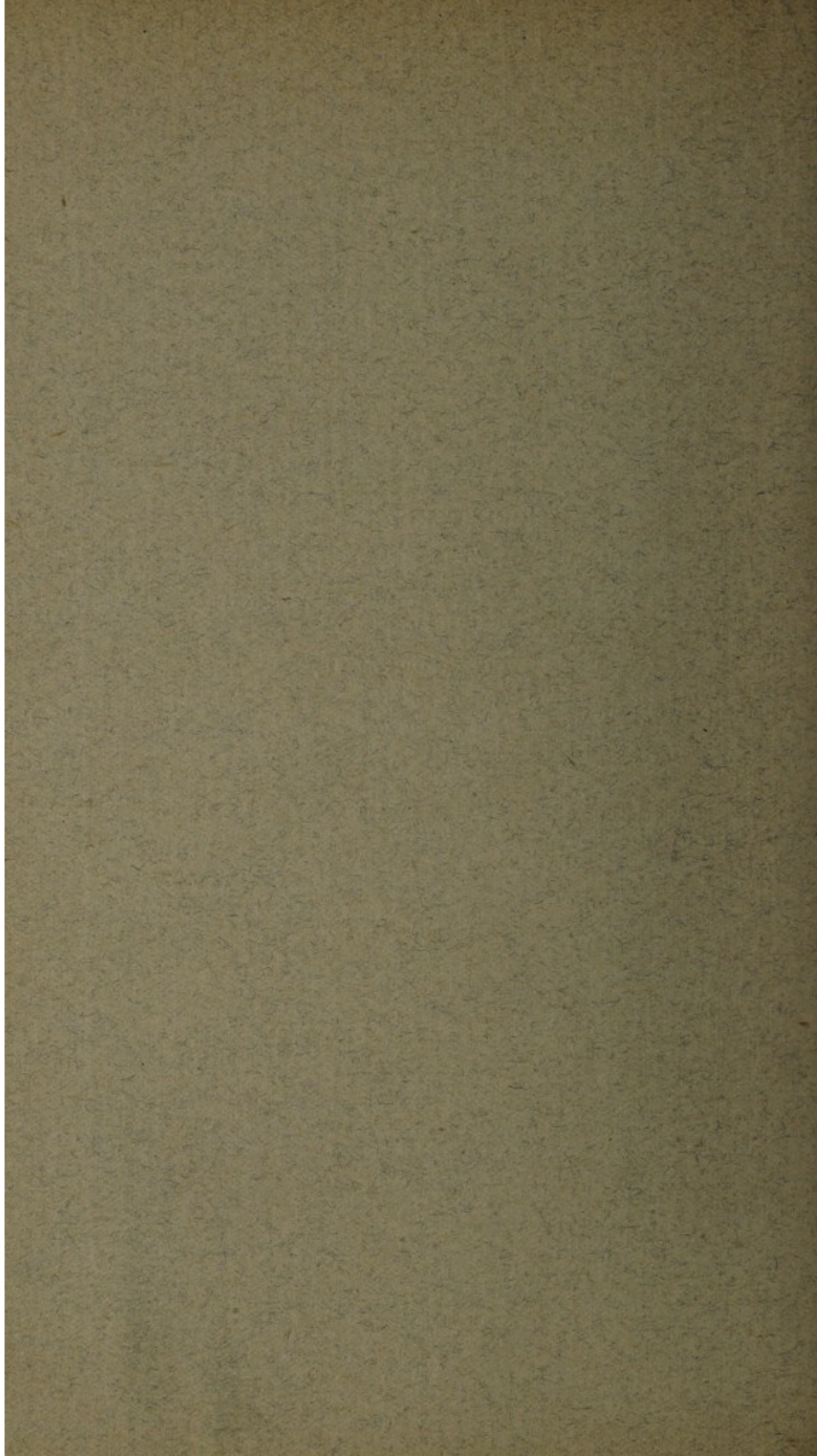
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(December 11, 1843–May 27, 1910.)

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TUBERCULOSIS.

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For the privilege of being with you here to-night and of [425]
joining in the tribute which this Society, founded for the
study of tuberculosis, is to pay to the lately departed master
of the modern science of tuberculosis, I feel profoundly grate-
ful. We who are outside of the justly celebrated Johns
Hopkins Medical School look upon it as a Mecca to which a
pilgrimage means hearing and seeing the best that exists in
modern medical science, and for this reason I feel all the
more glad to be with you and much honored by the invita-
tion extended to me by the officers and members of this
Society.

With all your eagerness for the study of the latest things
which may help to throw light on unsolved medical problems
or relieve human sufferings, you remain true to the tradition
established by the two most distinguished founders of the
medical department of this great university, Professors Osler
and Welch, in that you do not neglect the historical study of
medicine and, whenever occasion presents itself, you pay
tribute to the pathfinders or heroes in our beloved profession.
By naming this society the "Lænnec" you honored one who

*Address delivered before the Lænnec Society for the Study of
Tuberculosis, The Johns Hopkins Hospital, Baltimore, March
27, 1911.

[425] was perhaps the greatest savant in the science of tuberculosis of his day, the immortal René Théophile Hyacinthe Laennec (February 17, 1781–August 13, 1826). It was he who taught us so much about the tubercle as the characteristic macroscopic evidence of tuberculosis and who invented for us the stethoscope, that valuable instrument almost indispensable in the diagnosis of pulmonary and cardiac diseases.

To-night you are here under the auspices of this society to honor the memory of one whom I believe we can justly call the father of the modern science of tuberculosis. The officers of this society have graciously assigned to me the task of speaking on Robert Koch's achievements regarding tuberculosis.

Koch's brilliant career as father of the modern science of tuberculosis began, of course, on that memorable evening of the 24th of March, 1882, when he gave to the world the result of his painstaking work. It was the usual monthly meeting of the Physiological Society of Berlin, but it was perhaps the largest gathering which that body ever had. Koch's paper was announced under the title, "The Etiology of Tuberculosis." Taking into consideration what Koch had given to science before along the same lines (I refer to the discovery of the spores of the anthrax bacillus and his concomitant bacteriological studies), the hearers were, of course, expectant and looked for great things in store for them. It was characteristic of Koch's modesty and true scientific spirit that he had preferred to refrain from talking about his researches in tuberculosis until he could conclusively prove his thesis to the satisfaction of everyone and show absolutely accurate results.

[426] To students of bacteriology it must be recalled that Koch was the first to seek the production of a solid medium for the purpose of getting pure cultures, and it was only after he was in possession of such a medium that he attempted to isolate the germ found in tuberculous tissue.

It is of historical interest that on the evening of March 24, 1882, after Koch had finished reading his paper, there was no applause or any enthusiastic manifestation of approval, and for the first time in the history of that society the paper, though listened to with the most profound and respectful

silence, was not discussed. The facts presented by that [426] master of bacteriological science were too convincing for discussion. The audience looked expectantly to that most honored member and veteran debater, father of cellular pathology, the immortal Rudolph Virchow, but he too remained silent. He felt that another great master in medicine had arisen, and that the evidence of Koch's conclusions did not permit any doubt or dispute. The original communication announcing the discovery of the tubercle bacillus as the prime and only cause of tuberculosis appeared in the *Berliner klinische Wochenschrift* of 1882 (No. 15, p. 221). It is a masterpiece of scientific demonstration.

It might be interesting to my young hearers to know that they can get access to an exact reproduction of this paper in the *Zeitschrift für Tuberkulose* of July, 1910 (Band 16, Heft 2). The editors of this periodical very justly stated that a more fitting memorial could not be printed at the time of Koch's death than that important paper which gave rise to all our modern tuberculosis research work and at the same time gave to its author a well-deserved recognition and world-wide reputation.

In his paper Koch did not fail to pay tribute to the works of Villemin, Cohnheim, Salomonsen, Baumgarten and Tappeiner, who had given us conclusive proof that tuberculosis was a transmissible disease, but through Koch—and Koch alone—we have come to know the actual factor of infection and direct cause of all tuberculous diseases. It is he who showed us the presence of the germ in the pulmonary secretions and involved tissues, and also, to a minor degree, in other secretions of man and beast afflicted with tuberculosis. It is because of this knowledge that the new science which we might call the modern prophylaxis of tuberculosis was created.

And now, after a lapse of nearly thirty years since the memorable discovery, we can statistically prove, beyond the shadow of a doubt, that, thanks to the rational, practical yet simple methods of prophylaxis which soon followed the discovery of the bacillus of tuberculosis by Robert Koch, the

[426] mortality from tuberculosis has been on a steady decrease in nearly all civilized countries.

When we consider that the present morbidity and mortality from tuberculosis in the countries which have adopted rigorous anti-tuberculosis measures is in some instances two-thirds and in some even one-half what it formerly was, we must also admit that the material wealth which is the gain of thousands of communities, because Koch lived and labored, is beyond human calculation. Our sociologists and economists have estimated the value of a single human life as an economic asset of \$5000 to a community. Thus the figures in material gain to the world at large for which this one man is responsible must stagger our imagination. But we as physicians do not look upon life only as representing a financial asset to the community. We come into too close contact with human suffering and sorrow for that. We rather emphasize the value of the discovery of our great Koch by the number of fathers, mothers, wives, husbands and children who were saved from an untimely death. We think of the tears and sorrow, of the anxiety and worry spared to untold numbers; we appreciate the joys and happiness which were preserved to thousands because the great white plague did not enter their homes. And all this preservation of human joy and happiness has been brought about because of one single discovery of Koch and the resulting indication of how to prevent disease.

But this phase of our medical science, which is truly preventive medicine, is not the only one whereby we as physicians and the world at large have been benefited by Koch's discovery. The presence of the bacillus in the sputum gives in doubtful cases a well-nigh irrefutable evidence of tuberculous infection of the respiratory tract.

In the discovery of tuberculin Koch has given us another adjuvant of great value in the diagnosis of tuberculous diseases in man and animal.

A word regarding tuberculin as a therapeutic product. It is now generally conceded that when in 1890 Koch announced to the world the discovery of tuberculin as a means of curing tuberculosis, he did it against his better judgment, for he felt

that he had not experimented with it long enough. The year [426] 1890 was indeed an unhappy one in Koch's brilliant career. The powerful product used in far too large doses by inexperienced men indiscriminately in early and late cases was followed by disastrous results. But time has justified Koch's original claim, and to-day his tuberculin in the hands of careful clinicians has certainly proven to be, in certain cases of tuberculosis, a valuable therapeutic adjuvant.

Koch did not limit his researches to the bacteriological causes of tuberculosis or to the discovery of tuberculin, and it may be a surprise to many to learn what a deep interest he took in the sociological aspect of tuberculosis. He studied all sides of the question—municipal control, popular education, the housing problem, etc. More than once did he express to me personally his approval of Professor Biggs' work in New York relating to the municipal control of tuberculosis, and he also referred to it in his celebrated London address in 1901.

In regard to this communication made before the British Congress, justice requires us to say that Koch's conclusions as to the rarity of the transmission of bovine tuberculosis to human beings were too sweeping, this having been borne out by subsequent investigations. But had it not been for Koch's London address, much scientific work which has now cleared [427] up the controversy would not have been done.

Koch's last paper, read before the Academy of Sciences of Berlin on April 7, 1910, only about six weeks before his death, and published in the *Zeitschrift für Hygiene und Infektionskrankheiten* October 28, 1910 (Vol. LXVII, No. 1), showed his deep interest in the sociological aspect of tuberculosis. The article was entitled "The Epidemiology of Tuberculosis." In it he very justly ascribes the still very great prevalence of tuberculosis in certain sections of Europe to the unfortunate housing conditions and particularly to the overcrowded sleeping quarters of the masses. He also came to the conclusion that where institutional care had been most readily available, the morbidity and mortality from tuberculosis has been reduced to the greatest extent, and vice-versa.

[427] Koch believed in popular education, and I have received many a kindly word from him to encourage me in my humble labors in that direction. In his last letter to me, a few months before his death, he wrote:

Popular works on tuberculosis are destined to play an important part in the enlightenment of the people, and the American people seem to be particularly susceptible to such education.

I hope we may deserve this gracious compliment paid to the American people by the great Koch.

And now, in conclusion, a few words on the personal side of this great man. On the evening of the 11th of April, 1908, Koch was the guest of the German Medical Society of New York. It was indeed a distinguished gathering. Professor Karl Beck, as the president of the Society, was the toastmaster of the evening. Your own distinguished teacher, Professor Welch, being one of Koch's first pupils, welcomed the great scientist to our shores, and spoke in eloquent words of the achievements of his master. Equal praises were bestowed upon Koch by the Nestor of the New York and the entire American medical profession, Professor Abraham Jacobi. Andrew Carnegie, the philanthropist, who had given 500,000 marks for the Koch Institute in Berlin, praised Koch as a hero of civilization and peace, far greater than a hero in war, and concluded by saying:

Every age has its ideals, and the servants and saviors of mankind are our present-day ideals, for I firmly believe that service to mankind is the highest service to God.

And what did the great Koch reply to all this praise and eulogy? His answer was of so inspiring and modest a character that I believe it to be worth while to reproduce it in the original words. I will repeat it here in German as it was delivered, and translate it into English as exactly as possible:

Wenn ich alles zusammenfasse, was hier zu meinem Lobe gethan und gesagt worden ist, und die grosse Auszeichnung, die Sie mir zu Theil werden liessen, in Betracht ziehe, dann entsteht in mir ein Bedenken, ob ich auch wirklich berechtigt bin, mich so feiern zu lassen. Manches von dem, was mir Rühmliches nachgesagt wird, kann ich, wie ich glaube, mit gutem Gewissen akzeptieren. Aber ich habe nichts anders gethan, als, was Sie jeden

Tag thun, nämlich ich habe gearbeitet was ich konnte, und meine [427] Pflicht und Schuldigkeit gethan. Wenn etwas mehr dabei herausgekommen ist, so liegt das daran, dass ich auf meinen Wanderungen durch das medizinische Gebiet auf Strecken stiess, wo das Gold noch auf dem Wege lag. Es gehört allerdings Glück dazu, das Gold von dem Unedlen scheiden zu können; das ist aber kein besonderes Verdienst. Es freut mich besonders, Herrn Carnegie hier zu sehen, dessen hochherzige Spende zur Koch-Stiftung allenthalben einen tiefen Eindruck gemacht hat. Ich möchte Herrn Carnegie meinen bescheidenen aber herzlichen und warmen Dank aussprechen. Die meinen Namen tragende Stiftung ist berufen, grosse Resultate auf dem Gebiete der Erforschung der Tuberkulose zu zeitigen. Während die Gründung von Krankenhäusern und Sanatorien in der Bekämpfung der Tuberkulose von lokaler Bedeutung sind, soll die Koch-Stiftung uns ermöglichen, in das Wesen der Krankheit tief einzudringen, um so Vorteile zu schaffen, die der ganzen Menschheit zu Gute kommen. Herr Carnegie ist für mich die Verkörperung der besten Eigenschaften des Amerikaners. Er hat seinen Blick gerichtet auf die höchsten und edelsten Ziele.

TRANSLATION.

When I now consider the honor you have conferred upon me here this evening, when I consider all that has been said and done in my praise, there arises in my mind a doubt as to whether I am really entitled to such distinction. Some of the kind things which have been said of me I believe I may accept with a clear conscience, but I have done nothing else than what you are doing every day. I have worked as hard as I could and have fulfilled my duty and obligations. If the success really was greater than is usually the case, the reason for it is to be found in the fact that in my wanderings through the medical field I came upon regions where gold was still lying by the wayside. Fortune is necessary to be able to distinguish gold from the base metals, but that is no great merit. I am glad to see Mr. Carnegie here, whose generous gift to the Koch [428] Foundation in Berlin made everywhere such a deep impression. I would wish to thank Mr. Carnegie with all my heart. The foundation which is to bear my name is, I hope, destined to show great results in the field of tuberculosis research. While special hospitals and sanatoria for the treatment of tuberculosis are of local importance in the combat against tuber-

[428] culosis, the Koch Institute or Foundation is destined to study the underlying causes and as yet unsolved problems of the disease and thus will benefit mankind at large. Mr. Carnegie is to me the embodiment of all the best qualities of an American. His ideals are the highest and noblest.

Koch had a remarkable genius for research work, yet his aim was always eminently practical and his sympathies genuine and real. By hard work and diligent application he revealed to us the hidden mysteries of disease.

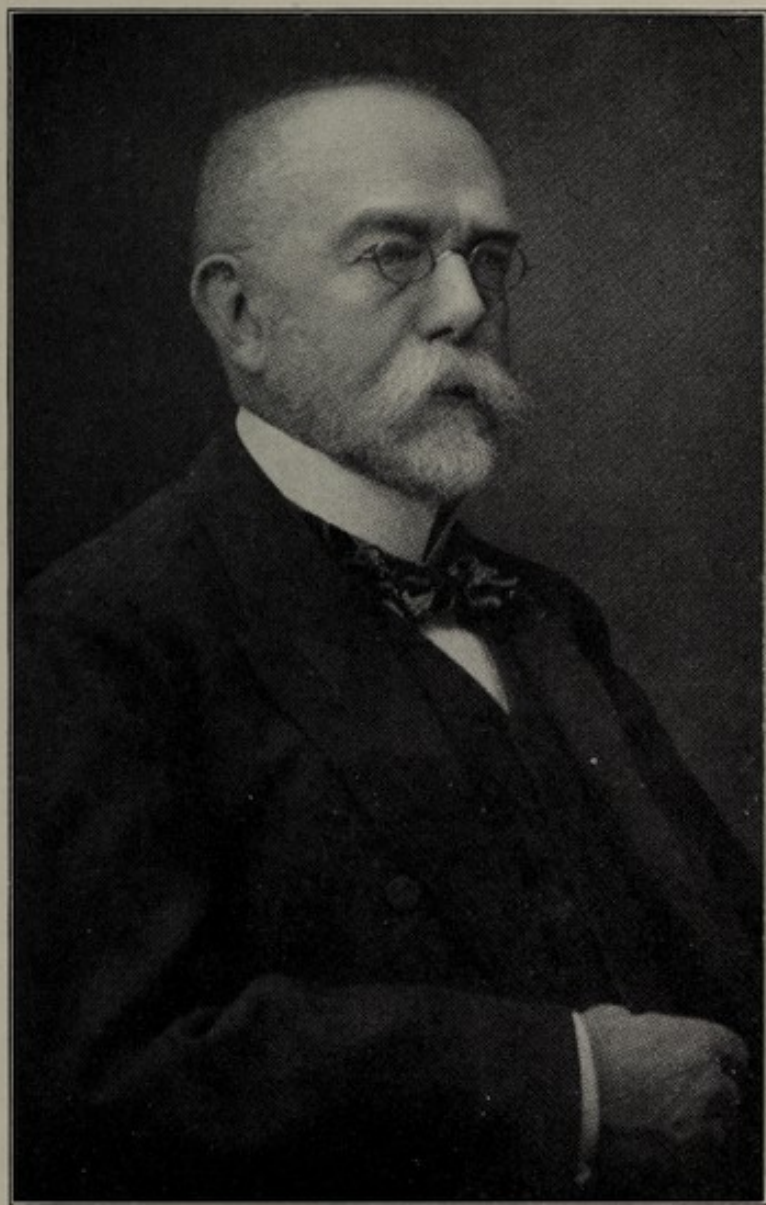
Koch was not privileged to see the foundation for further tuberculosis research work, bearing his name, completed. He died on May 27, 1910, surrounded by devoted pupils and friends. By indubitable right he now takes his place with the Immortals and his name will be handed down through generations to come as one who lived and labored for the good of mankind.

In accordance with Koch's last request, his funeral was of the simplest kind, and as an enthusiastic sanitarian he had directed his body to be cremated. His admirers and pupils gathered the ashes of the beloved master and enshrined them in a mausoleum located in the *Institut für Infektionskrankheiten* in Berlin, of which Koch had been a director for many years.

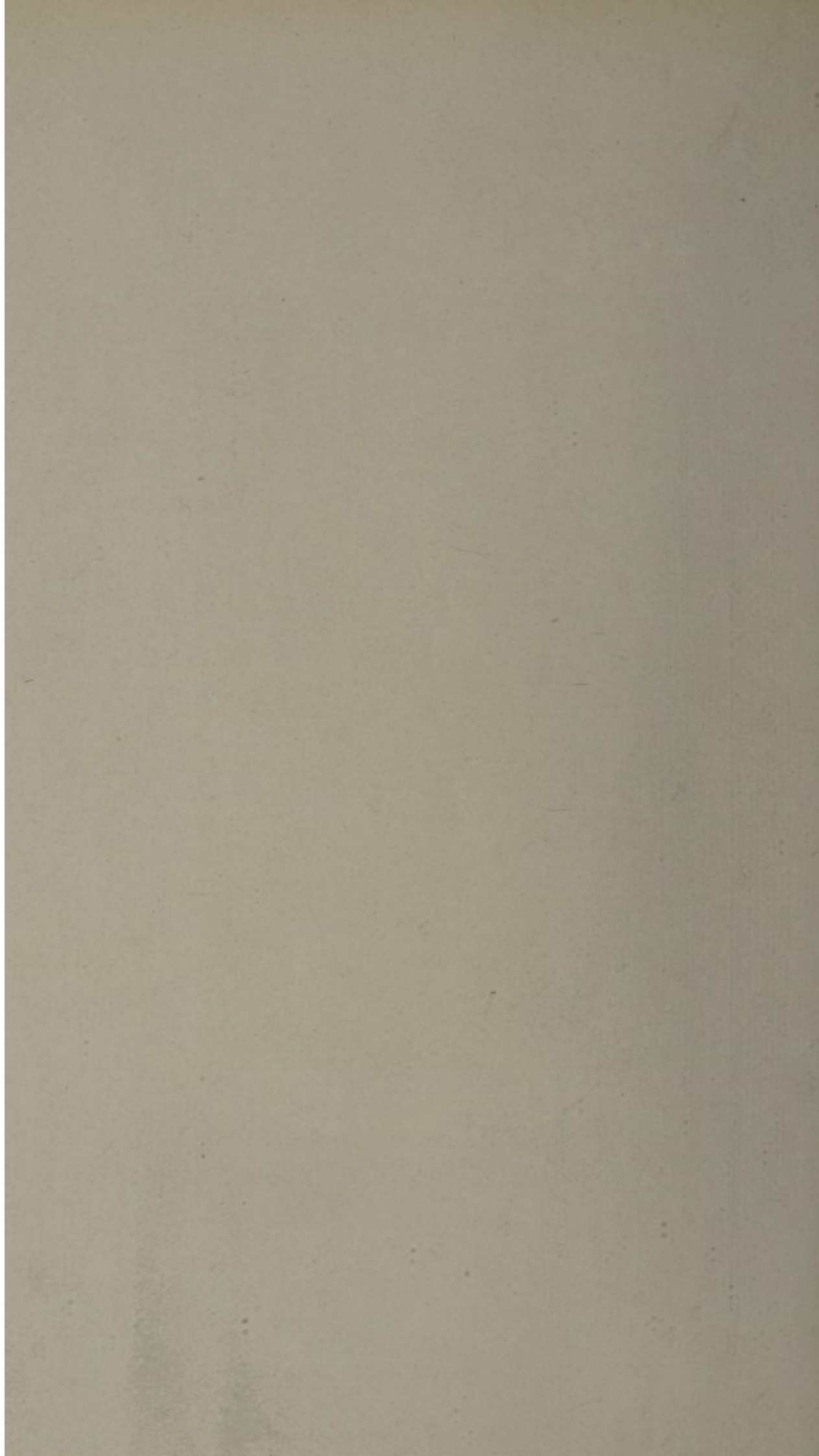
I venture to say that for generations to come, all physicians and likewise the many men and women outside of the profession who are interested in scientific or preventive medicine will, on visiting Berlin, deem it a pious duty to make a pilgrimage to this last resting-place of the ashes of Robert Koch.

When Professor Koch wrote me the last time he honored me by sending his photograph taken a short time before he fell ill. This picture is considered by all who knew Koch one of his best. He graced it with his signature dated February 9, 1910. In availing myself of the permission granted to me to present you with an enlarged reproduction, I beg you to accept it from one of the thousands of humble disciples of the great master as a feeble tribute to him and as a token of esteem for the officers and members of your society.

Let this portrait, which shall henceforth grace the walls of this great university, this likeness of a prince of science,



R. Kohn. 9/II 1910



a teacher of teachers, one of the greatest physicians of his [428] time, remind present and future members of the Lænnec Society and all the students of this great university of Koch's motto in life: *Nunquam otiosus* (Never be idle). Let it be to all of us, to you and to me, an inspiration, an incentive to work and a reminder of the fact that though much has been done, there is still more to do.

