SPECIAL ARTICLES.

ROBERT KOCH: AN APPRECIATION.

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To be asked by the BRITISH JOURNAL OF TUBERCULOSIS to write an appreciation of the greatest living medical scientist, not only of Germany, but of the entire world, is an honour which I highly value. Yet I fear that my pen is too feeble to do justice to the theme, even were the space at my disposal unlimited. But whatever may be the shortcomings of this tribute to the greatest master of modern medical science, I want him and the readers of the BRITISH JOURNAL OF TUBERCULOSIS to be assured that this appreciation comes from the heart, and is written by one who, through twenty-five years of labour in the tuberculosis field in this country and abroad, in many climes and under various social conditions, has learned to appreciate, more perhaps than many others, the full value of Koch's immortal discoveries and his tireless labours.

Among the literature at my disposal, one of the most significant books regarding the life of Koch is the "Festschrift," which was presented to him by his pupils on the occasion of his sixtieth birthday, on December 11, 1903. As an introduction to the book, his pupils quote the words of the German poet:

"Weite Welt und breites Leben,
Langer Jahre redlich Streben,
Stets geforscht und stets gegründet,
Nie geschlossen, oft geründet."

This might be translated into English as follows:

"A larger world, a broader life,
Many years of honest strife,
Ever searching, e'er creating,
Never ending, oft attaining."

These words, indeed, are applicable to the life of Koch.

To give a list of only the most important of this master's works, beginning with his first prize essay as a student in 1865, on "The Anatomy of the Nerve-Ganglions of the Uterus," and ending with his great address at the International Tuberculosis Congress held in Washington last year, would take far more space than can be allotted to this article. Thus I can only enumerate some of the epoch-making

contributions made to science by this great man, such as the discovery of the spores of the anthrax bacillus in 1876; his monograph on "Researches in the *Ætiology* of Surgical Infections," 1878; the discovery of the bacillus of tuberculosis in 1882; the discovery of the bacillus of Asiatic cholera in 1883; and the discovery of tuberculin in 1890. His more recent works on tropical malaria, sleeping sickness, and on typhus fever, are of no less importance.

Few men have travelled as much and as far as Koch in order to be helpful in the combat of endemic and epidemic diseases. In 1883, at the time when a fearful epidemic of cholera decimated the population of Egypt, he went thither to study the causes and prevention of the disease. In civilized countries we are now in a position, by early and accurate diagnosis, quarantine, proper hygiene and sanitation, to reduce the mortality from cholera to a minimum, and we owe the victory over this once so prevalent and fatal plague to Koch.

Because of his extraordinary thoroughness as a bacteriological diagnostician, hygienist, and sanitarian, the German Government avails itself of his services every time it has a local epidemic of a serious infectious disease anywhere in the Empire.

In the year 1906 Koch extended his researches far beyond his native land, going to South Africa, East India, and later on to German East Africa. In Africa he was able to discover a vaccination method as protection against the rinderpest. He studied the bubonic plague and other tropical diseases where they were endemic, and wherever he went he instituted such prophylactic and sanitary measures as to bestow lasting benefit on regions which were formerly devastated by seemingly unconquerable diseases and plagues.

Without minimizing any of the great master's discoveries or scientific labours, I do not believe I commit any error in saying that the communication which he made, on the evening of March 24, 1882, before the Physiological Society of Berlin, entitled "The *Ætiology* of Tuberculosis," was his most important contribution to medical science. When we bear in mind the sociological aspect of the disease whose *ætiological* factors and primary cause were revealed to the world in this communication, well may we say that the 24th of March of 1882 was a "red-letter day," to be for ever remembered in the annals of medical history and human progress. Thanks to Koch, tuberculosis can be considered to-day a preventable disease. It was he who showed us where to find the cause of this enemy of mankind, and how to combat it. Because Koch taught us that the infectious agent—the tubercle bacillus—was alone responsible for the disease, and could be found in the pulmonary secretions of the consumptive, and that, if carelessly deposited, the dried and pulverized sputum containing the germ could be inhaled and ingested by others, producing the disease:

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anew, we have virtually become masters of what was once considered not only the most prevalent, but the most fatal, affliction of man and beast. Through the discovery of the tubercle bacillus alone, Koch has made mankind his everlasting debtor. When to-day, as is the case in some localities in America, in England, and in Germany, the mortality from tuberculosis has been reduced to wellnigh half of what it was prior to Koch's discovery and isolation of the tubercle bacillus, the saving of life, the lessening of physical suffering, this diminution of the social misery which accompanies all diseases of the masses, is all due to Robert Koch. The financial gain which has accrued to countries and communities which have followed Koch's teachings regarding the prophylaxis of tuberculosis in man, by preventing costly invalidism, saving countless valuable lives, and retaining them as breadwinners and useful citizens, is beyond human calculation.

By his discovery of tuberculin he has added an invaluable agent to our methods of early diagnosis of tuberculosis in man and beast, and given to our armamentarium in tuberculo-therapeutics a very important remedy. Through the tuberculin test in cattle, the weeding out of tuberculous animals has been made practical, and an incalculable benefit bestowed upon animal industry and the dairy business; and possible sources of tuberculous transmission from beast to man have been reduced to a minimum. The same may be said of Koch's discoveries regarding anthrax and rinderpest.

The vast and inestimable good this one man has been able to bestow upon mankind by his scientific labours will for ever remain unique in the history of human possibilities.

The life of Robert Koch should serve as an inspiration, not only to us who are his humble disciples, but to all mankind. The motto of his first scientific communication was "*Nunquam otiosus*" ("Never idle"), and he has adhered to it to this day. In scientific research, in constant work to combat disease and make mankind healthier and happier, this great man finds his reward. His honours and distinctions are numerous. He has the title of Excellency, is a Real Privy Councillor, and an Honorary Professor of the University of Berlin. He is a member of nearly all the great scientific societies of the world, and has been decorated by nearly all the monarchs of Europe and Asia.

May this great master's life be spared for many years to come, and may he be privileged to see the fruits of his labours—the banishment of disease, and the spread of health, peace, and happiness throughout the world!

We are indebted to the courtesy of Professor Knopf and his publishers (Messrs. Moffat, Yard and Company, of New York) for permission to reproduce the excellent photograph of the subject of this "appreciation." Robert Koch's portrait appears as frontispiece in Dr. Knopf's recently published "*Tuberculosis: A Preventable and Curable Disease.*"—EDITOR, *B.J.T.*