

IN MEMORIAM.

WALTER REED.

It is with profound regret that we announce the death of Walter Reed, whose investigations into the etiology and prevention of yellow fever constitute one of the most valuable contributions to modern medicine.

In a letter to the Secretary of War of the United States, Professor Wm. H. Welch, of the Johns Hopkins University, stated that in his judgment, and in this all who are familiar with the subject must concur, Reed's researches form "the most valuable contributions to medicine and public hygiene which have ever been made in this country (America) with the exception of the discovery of anaesthesia. They have led and will lead to the saving of thousands of lives." His name will be remembered as that of a benefactor to mankind, for no discovery has yet been made in medicine which has been followed by such immediate and practical benefit.

Major Walter Reed, M.A., M.D., LL.D., Surgeon in the United States Army, was born in Gloucester County, Virginia (13 Sept. 1851), his father, the late Rev. Lemuel Sutton Reed, being a clergyman of the Methodist Church. His boyhood was spent in Virginia, and at an early age his tastes drew him to the study of medicine. After graduating as Doctor of Medicine from the University of Virginia he pursued his studies in Bellevue Hospital Medical College, New York, and in 1872 graduated from that Institution. He joined the U. S. Army Medical Department in 1875^(2,3). In 1890-2 he was assigned to duty in Baltimore, in order that he might pursue research work in pathology and bacteriology under Professor Welch. In 1891 he published the results of a research upon the causes of hepatic lesions in typhoid fever. The writer was then Assistant in Hygiene and Bacteriology at the Johns Hopkins University, and the daily association with Reed in the

laboratory gave him an exceptional opportunity of judging his qualities. Suffice it to say that Reed's personality left an indelible impression on all of us with whom he associated. He was remarkably accurate and full of resolution in his work, and when he left us we were convinced that some day he would make his mark. In this he more than fulfilled our expectations.

Reed was next assigned to duty at St Paul, Minnesota, and subsequently was appointed bacteriologist to the office of the Surgeon-General and Curator of the Army Medical Museum at Washington. Here he developed the laboratories of pathology and bacteriology which have since become valuable departments of the Army Medical School. His time was mainly occupied with research. During the Spanish-American War he was made a member of a commission of medical officers "to investigate and report on the prevalence of typhoid fever in home camps," and it was at his instigation that the commission adopted a plan of collecting excreta in galvanized tanks which proved of considerable benefit, checking the disease at the Presidio, in California.

Turning his attention to yellow fever in 1900, being associated in his work with Major Carroll of his service, a sharp controversy ensued with Sanarelli, whose claim to the discovery of the *Bacillus icteroides* as the specific cause of yellow fever was denied. After the conclusion of the Spanish-American War, Reed was sent as president of a commission to study yellow fever at Havana. In view of the fundamental importance of the discoveries which followed, the Editors of the *Journal of Hygiene* subsequently requested Major Reed to send them a summary of the work done by the commission. His paper appeared in our second volume⁽¹⁾, and it is a source of gratification to the Editors to have since learnt from an official document⁽²⁾ (p. 8) that "The history of the work is best given in Dr Reed's own words, in an article published in the *Journal of Hygiene*," the paper being republished *verbatim* in the document referred to. We can therefore but refer our readers to the paper we have cited.

Reed was the soul of the commission; in the words of General Leonard Wood⁽²⁾, "His was the originating, directing, and controlling mind in this work, and the others were assistants only." And Professor Welch writes, "I am in a position to know that the credit for the original ideas embodied in this work belongs wholly to Major Reed." It seems necessary to quote these opinions in justice to Reed's memory for the reason that there has been a tendency in certain directions to

take from him the credit of discoveries which belongs to him and him only. Thus some would attribute the discovery of the part played by *Stegomyia fasciata* in the etiology of yellow fever to Dr Carlos Finlay of Havana, and it appears desirable to the writer to consider these claims so as to dispose of them in the manner they deserve.

To begin with, as far as I can ascertain from an exhaustive perusal of the literature of the subject, it was not Finlay, but Nott (1848) who appears to have been the first to attribute a part to insects in the dissemination of yellow fever. As stated in a monograph of mine published in 1899⁽⁴⁾, Nott did not claim the "insect theory" as his own, and he believed it applied also to malaria. Speaking of yellow fever, he dwells upon the fact that it occurs at times and places and under conditions favouring the development of insects; in other words, that the natural history of yellow fever is closely allied to the natural history of insects. He considered that yellow fever was most likely due to micro-organisms, "infusoria or animalcula," and that its spread from one locality to another is accomplished by the higher forms of insect life. Finlay (1881-1886) accused mosquitoes of playing the chief part in spreading yellow fever, stating that the limits of extension of the tropical mosquito, due to temperature, accounted for the geographical limitations of the disease. He considered that immunity to yellow fever might be produced by allowing mosquitoes which had sucked the blood of a yellow fever patient to subsequently bite the individual who was to be protected. He experimented with "*Culex cubensis*," and *Culex fasciatus* (known now as *Stegomyia fasciata*). In 1891 Finlay reported having subjected 67 persons to the bites of his supposedly infected mosquitoes. The experiments possess absolutely no weight, they are entirely unscientific. I shall not detail them here because I have always considered them worthless, they are described in detail in my monograph. *Finlay did not prove that any protection was afforded through the bites of infected mosquitoes, and he never attempted to show that these insects transmitted the disease.* It was natural that he stumbled on *Stegomyia fasciata*, a mosquito which has been all-too prevalent in Havana in the past. If he had been a scientific man he would have submitted his loose hypothesis to scientific tests, but he did nothing of the kind, though he has lived many years in Havana, where he has seen hundreds dying of yellow fever. Finlay advocated the mosquito-hypothesis for 19 years without supporting it by a single piece of evidence which could be accepted by men of science.

A vastly more suggestive observation was that of Carter of the

U. S. Marine Hospital Service, who studied the spread of yellow fever at Ormond, Miss. He showed that although the period of incubation of the disease was 5 days, 15 or 20 days had to elapse before a house became infected after a yellow fever patient had occupied it. This, combined with the demonstration by Ross and others of the part played by *Anopheles* in the etiology of malaria, led Reed to infer that the difference between the time of incubation and the time needed to infect a building was due to the fact that the infective agent passed through a stage of development in some insect host. He soon convinced General Wood, the military Governor of Cuba, with regard to the desirability of testing the theory experimentally, and he proceeded to do so in a manner worthy of modern science, being ably seconded by General Wood, to whom much credit is due for clear-sightedness.

If the writer has entered upon what may appear to be a matter of some controversy, it is due to the fact that he wishes to see justice done to the memory of Reed, whose dignified position in the matter placed him high above those who doubtless from party motives have striven to belittle his service to mankind. Unfortunately numerous Journals of lower order in America whose contributors are incapable of separating nonsense from scientific truth, have aided in belittling Reed's work, instead of being the first to give their countryman his due. It is doubtless for this reason that Reed failed during his lifetime to obtain official recognition of the great work he accomplished. We hope that the United States Government will do what it should toward aiding the widow of this distinguished officer, for he served his country well. At a memorial meeting recently held in Washington in Reed's memory, General Wood showed that he appreciated the magnitude of the service rendered when he said, "*I know of no other man on this side of the world who has done so much for humanity as Dr Reed. His discovery results in the saving of more lives annually than were lost in the Cuban War, and saves the commercial interests of the world a greater financial loss each year than the cost of the Cuban War*". He came to Cuba at a time when one-third of the officers of my staff died of yellow fever, and we were discouraged at the failure of our efforts to control the disease. In the months when the disease was ordinarily worst the disease was checked and driven from Havana. That was the first time in nearly two hundred years that the city had been rid of it. The value of his discovery cannot be appreciated by persons who are not familiar with

¹ The passage is not italicised in the original.

tropical countries. Hereafter it will never be possible for yellow fever to gain such headway that quarantine will exist from the mouth of the Potomac to the mouth of the Rio Grande. Future generations will appreciate fully the value of Dr Reed's services."

In an obituary notice which appeared in the *Virginia Medical Semi-Monthly* (3) it is stated that "There is good reason to believe that Dr Reed's health was severely shaken by the anxious experiences he had in investigating the cause and prevention of yellow fever, and he did not regain his former vigour up to the time that he was attacked by that dreaded disease, appendicitis, for which an operation was performed November 17, 1902. He did not rally from the operation, and died November 23rd."

The writer in conclusion wishes to express the thanks of the Editors to Surgeon-General George M. Sternberg, U.S. Army, retired, as also to Major J. R. Kean, U.S. Army, for assistance in procuring data regarding Dr Reed, the last-named kindly sending us the excellent likeness which we have reproduced as a frontispiece to this number of the *Journal*.

G. H. F. N.

REFERENCES.

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- (2) The Scientific Work and Discoveries of the late Major Walter Reed, Surgeon in the Army of the United States. Prepared by Major Jefferson Randolph Kean. U. S. Senate, Document No. 118, 57th Congress, 2nd Session. Ordered to be printed, 28 Jan. 1903. (Washington: Government Printing-Office, 1903.)
- (3) Life of Surgeon Walter Reed, U.S.A.—the Discoverer of the Cause of Yellow Fever and the Means of its Prevention. *The Virginia Medical Semi-Monthly*, vol. VII., pp. 450-453. (9 Jan. 1903.)
- (4) Nuttall, G. H. F. (Oct. 1899). On the rôle of Insects, Arachnids and Myriapods, as Carriers in the spread of Bacterial and Parasitic Diseases of Man and Animals. A critical and historical study. *Johns Hopkins Hospital Reports*, vol. VIII., pp. 154, 3 plates. (See especially pp. 25-27.)