Shibasaburo Kitasato - Samurai Bacteriologist

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Baron Kitasato (1852-1931) was a physician and one of the foremost Japanese bacteriologists during pre-war period. He was born in a country village in the mountains of Kumamoto prefecture. He enrolled in the newly founded medical college in the city of Kumamoto, but finally received his medical degree after joining Tokyo Imperial University in 1883.

Following recommendation of The Public Health Bureau chief, Kitasato went to Germany for further study at Robert Koch’s laboratory (1886-91). Working under Koch, many of Kitasato’s papers are milestones in the history of bacteriology. In 1889, he published a paper on his method of culturing the anaerobic bacterium clostridium chauvoei that caused black leg in cattle and found that bacterium could grow in solid media surrounded by a hydrogen atmosphere. In the same year he obtained a pure culture of clostridium tetani- the causative agent of human tetanus. Earlier it was thought that it was impossible to get a pure culture of the organism, which had hitherto been grown in symbiosis with other bacteria but Kitasato thought otherwise and discussed his belief with Koch and other colleagues. He found that the spores of the bacillus, strongly heat resistant, could be heated to 80 degree c. without perishing. After heating the mixed culture for 40 to 60 minutes and then culturing it in a hydrogen atmosphere, he obtained the first pure culture of clostridium tetani.

He co-operated with Behring and in 1890, published a paper on immunity to diphtheria and tetanus. Section on diphtheria was written by Behring and greater part of the paper, on tetanus, by Kitasato. This report opened a new field of serum therapy and provided the first evidence that immune serum can serve in cure of infectious disease. The existence of tetanus toxin in the culture filtrate of C. tetani was unknown until Kitasato’s discovery. He used it to obtain immune serum from animals. He established the minimal lethal dose for obtaining immune serum, which would have a prophylactic and therapeutic effect against tetanus infection in non immune animals. Nocard demonstrated the protective effect of passively transferred antitoxin (1897). Passive immunization was used during...
WW-I. Tetanus toxoid was described by Descombey and effectiveness of active immunization was used during WW-2.

In 1894, there occurred an outbreak of bubonic plague at Hong Kong, and Kitasato was dispatched to the city by Japanese government. There, he identified the causative bacterium of plague, *Pasteurella pestis* in collaboration with James Lawson, a British naval surgeon. Alexander Yersin, working separately, identified the responsible bacillus several days later. Because Kitasato’s initial reports were vague and contradictory, Yersin is given the sole credit for the discovery.

During final period of his stay in Germany, Kitasato worked with Koch on tuberculin. He returned home from Germany and with Fuzukawa and Morimura, founded the Institute for Infectious Diseases, and Kitasato became the director. When the Institute was incorporated into Tokyo Imperial University in 1914, he resigned in protest and founded Kitasato Institute (the forerunner of Kitasato University). Most of his researchers joined him there. He headed the institute for rest of his life. In 1917, Kitasato became the first Dean of the school of medicine of Keio University. In 1923, when Japanese Medical Association was founded, he was elected the first president. The following year, he was created Baron by the emperor, then a supreme honor for Japanese scientist.

Among Kitasato’s notable disciples was Kiyoshi Shiga, discoverer of *Shigella dysenteriae*, the causative agent of bacillary dysentery. Kitasato was decorated by the government of Prussia, Norway and France.

In 1908, Koch visited Japan at the invitation of Kitasato and was officially welcomed by Japanese government. After Koch’s death (1910), Kitasato built a small shrine in front of his laboratory, in honor of German bacteriologist. In 1931, Kitasato died of cerebral hemorrhage and was laid to rest in the shrine of his respected teacher.