HIDEYO NOGUCHI
Syphilis, Oraya Fever and Leptospira

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Hideyo Noguchi (1876-1928) was born in impoverished circumstances, in a small Japanese village Fukushima. He had a physical handicap, a deformity on his left hand, due to burns during his early childhood. Notwithstanding his handicap, he entered in Tokyo Medical School and obtained his diploma in 1897. Later, he became an assistant in the Institute of Infectious Diseases, under its director Kitasato. Kitasato was trained by Koch in Berlin and had discovered tetanus organism. In 1898, Noguchi met Simon Flexner while on a visit to Tokyo. Flexner's casual offer of hospitality to come to America made Noguchi migrate to Philadelphia to work under him. Initially, Noguchi studied immunologic response to snake poisoning and published a monogram on snake venoms.

Flexner was invited to head the newly founded Rockefeller Institute of Medical Research in New York and brought Noguchi, his most trusted protégé there. In the earlier years of the institute, Noguchi earned the epithet, “human dynamo”. By 1910, he was one of the top researchers leading the Institute to world fame.

Noguchi’s first major project was cultivation of Treponema pallidum. While the organism was suggested as the causative agent of syphilis, Noguchi was the first one to grow *T. pallidum* in a pure culture in the testicular tissue of rabbits in 1911. By mass survey of brain slides, he proved *Treponema pallidum* as the pathological agent responsible for general paralysis of insane (GPI). Noguchi was awarded the Japan Imperial Academic Prize in 1915 for the discovery. Noguchi’s extraordinary appetite for research, and zeal to conquer the cause of disease, brought him to various places. He travelled to South-Western desert of US and to South America, to study trachoma and Oraya fever. Oraya fever was raging in Peru, characterised by fever, progressive anaemia, and a high rate of mortality. Alderto Barton described the micro-organism in the erythrocytes of patients suffering from Oraya fever, now called *Bacilliformis Bartonella*, in 1926. A new factor of the problem was the appearance of wart like eruptions on skin, called verriga peruana, known in Peru long since pre-Columbian days. Noguchi cultivated B. Bartonella from *V. Peruana*, as well as from Oraya fever,
and firmly established its Unitarian aetiology. He also proved that the transmitting vector was sand fly *phlebotomus Argentipis*.

During the final years, Noguchi isolated *Leptospira icteroides* from a patient with yellow fever in Ecuador, and tried to differentiate the organism from *Leptospira icterohaemorragica*, earlier isolated by Inada from patients of Weil’s disease. He erroneously assumed it to be the cause of yellow fever. This conjecture motivated Noguchi to set sail for Africa to work in Accra, Gold Coast (Ghana), then a British territory. He received cooperation of the London Tropical Research Institute in continuing his studies but could not find any further proof to support the hypothesis. Courage and passion, combined with field-based research, is the quality that made Noguchi and his contributions remarkable. His tragic mistake was his failure to protect himself against yellow fever, which he contracted in Accra, and died in 1928. His last words were “I don’t understand.”