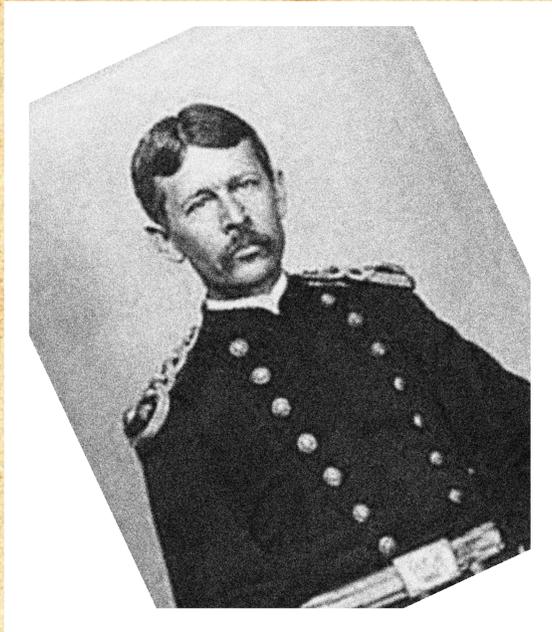


Tropical Diseases



Walter Reed (1851-1902)

After the Spanish-American War the Walter Reed Commission set up in Cuba

A series of experiments was conducted to explore how yellow fever is transferred from individual to individual and how the disease is spread within households.

The study was conducted in an experimental sanitary station in Cuba, where exposures and movements could be completely controlled. During the investigation, 12 non-immune persons underwent different exposures, including mosquitoes that had fed on yellow fever patients, blood from infected patients, and fomites belonging to infected patients.

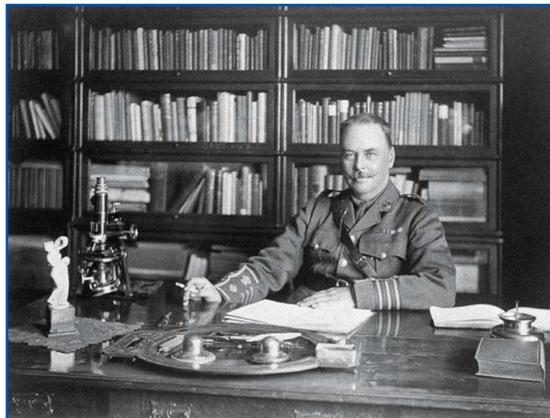
Observations Found:

Aedes aegypti mosquitoes transferred the disease from an infected individual to a non-immune person proving Carlos Finlay's Mosquito Hypothesis. At least 12 days were needed for the extrinsic incubation period in the mosquito before it could transmit the infection. Yellow fever can be transferred to a nonimmune person from the blood of an infected individual taken during the first two days of the illness. A filterable agent was responsible for infection. The incubation period for humans ranged between two and six days and yellow fever cannot be transmitted by fomites nor spread in a house without the presence of mosquitoes. The most significant conclusion was that the spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes.

Walter Reed later served on the typhoid commission.

Quinine

The bark of the cinchona tree is the only known natural source of quinine. The medicinal properties of the cinchona tree were originally discovered by the Quechua Indians of Peru and Bolivia; later, the Jesuits were the first to bring the cinchona to Europe. Quinine was the first effective treatment for malaria caused by *Plasmodium falciparum*, appearing in therapeutics in the 17th century. It remained the antimalarial drug of choice until the 1940s, when other synthetic drugs replaced it. Since then, many effective antimalarials have been introduced, although quinine is still used to treat the disease in certain critical situations.

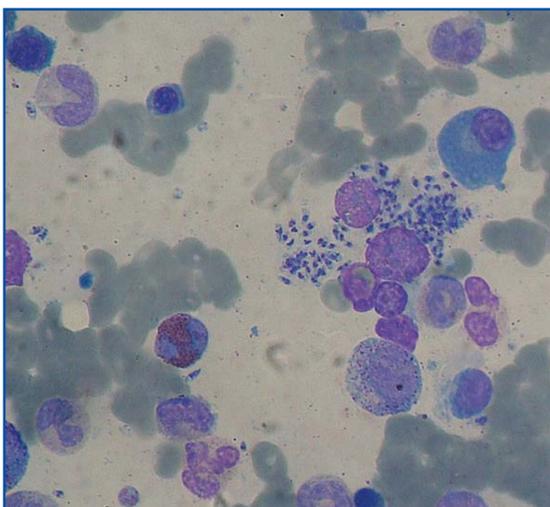


Sir Ronald Ross (1857-1932)

Malaria life cycle, Nobel Laureate

Graduated from St Bartholomew's Hospital Medical School 1881 and joined the Madras branch of the Indian Medical Service (IMS). He studied malaria between 1881 and 1899 at the Presidency General Hospital, Calcutta. In 1883, Ross was posted as the Acting Garrison Surgeon at Bangalore during which time he noticed the possibility of controlling mosquitoes by controlling their access to water. In 1897, Ross was posted in Ooty and fell ill with malaria. He was then transferred to Secunderabad, where the Osmania University Medical School is located. He discovered the presence of the malarial parasite within the *Anopheles* mosquito and went on to trace the means of transmission avian malaria.

In 1899 he resigned from the IMS and joined the infant Liverpool School of Tropical Medicine. In Sierra Leone he completed his work on the transmission of human malaria. He was called up in 1914. As well as being consultant physician to Indian troops stationed in England he went to Egypt to investigate dysentery, ending the war working for the War Office on the co-ordination of the treatment of men with malaria.



Leishman-donovan bodies - spleen smear Leishman stain

Each year there are, according to the World Health Organisation, more than 225 million cases of malaria worldwide. The majority of deaths are of young children in sub-Saharan Africa. Altogether 90% of the malaria related deaths occur in this region. Malaria is commonly associated with poverty and can indeed be its cause which in turn is a major hindrance to economic development.

Lieutenant-General Sir William Boog Leishman

(1865-1926)

Leishman Stain, Leishmaniasis

- Director-General of Army Medical Services from 1923 to 1926

- Leishman also helped elucidate the life cycle of *Spirochaeta duttoni*, which causes African tick fever

- In 1900 he became Assistant Professor of Pathology in the Royal Army Medical College

- Described a method of staining blood for malaria and other parasites - a modification and simplification of the existing Romanowsky method using a compound of Methylene Blue and Eosin dissolved in methanol. This became known as Leishman's stain and is still in use today and is endorsed by the WHO

- With Almroth Wright, he helped develop an effective anti-typhoid vaccine. Later, between 1904 and 1909, he tested and improved the vaccine, leading to its widespread use

- In 1901, Leishman identified oval bodies in smears taken from the spleen of a patient who had died from "dum-dum fever" found for the first time in India



- Captain Charles Donovan working independently confirmed the finding of what became known as Leishman-Donovan bodies in smears taken from patients in Madras, India

- Ross proposed that Leishman-Donovan bodies were the intracellular stages of a new parasite, which he named *Leishmania donovani*. He was first to suggest the link with the disease Kala-azar, this was confirmed by Charles Bentley's discovery of *Leishmania donovani* in patients with Kala-azar.

- The disease was a major problem for Allied troops fighting in Sicily during the Second World War

What is Leishmaniasis?

Leishmaniasis is found ranging from rainforests in Central and South America to deserts in West Asia and the Middle East. It affects as many as 12 million people worldwide, with 1.5-2 million new cases each year. The visceral form of Leishmaniasis has an estimated incidence of 500,000 new cases and 60,000 deaths each year, more than 90 percent of the world's cases of are in India, Bangladesh, Nepal, Sudan, and Brazil