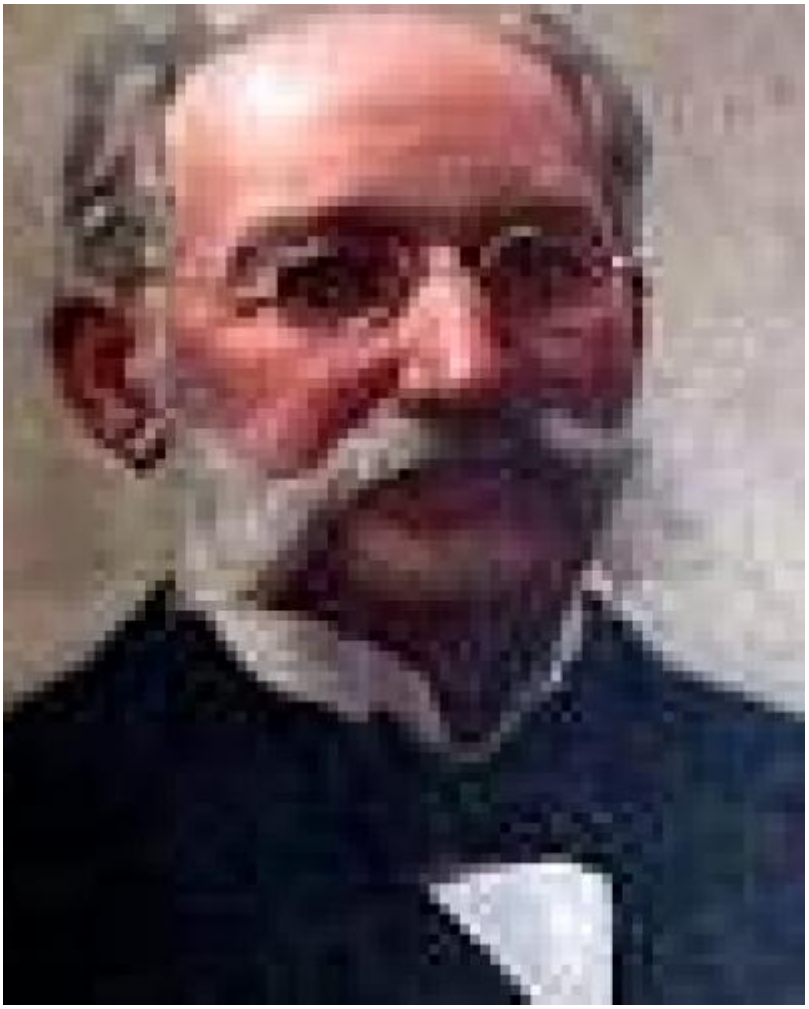
The Marvelous Science of Carlos J. Finlay



A scientific high-point, is the discovery in 1881 by Dr. Carlos J. Finlay Barres (1833-1915) of the metaxenic contagion theory of disease, a finding that was decades ahead of the scientific thinking of the time.

Through this revolutionary theory, which scientifically explained how infectious diseases spread through vectors and how to eradicate them, the eminent Cuban physician made his major contribution to world knowledge:- The discovery of the mode of transmission of yellow fever and black vomit, through the bite of the female mosquito, Aedes aegypti.

In announcing this new mode of disease transmission through an intermediate biological agent, capable of spreading a disease from a sick to a healthy person, Finlay challenged epidemiological concepts of his time, according to which diseases were spread due to direct transmission between humans or by the influence of an environmental factor.

On August 14, 1881 he presented at the Royal Academy of Medical, Physical and Natural Sciences of Havana - the original name of the current Academy of Sciences of Cuba - a work modestly titled, "The mosquito hypothetically considered as the transmitting agent of yellow fever", the work was endorsed after achieving a first group of successful inoculations in humans.

In his study, Finlay described the three necessary conditions for that disease to spread: The presence of a case of yellow fever, a subject suitable to contract the disease and a transmitting agent, subsequently classified as the mosquito Aedes aegypti, that is to say, the metaxenic transmitter.

From the habits of different species of mosquitoes in Havana, he showed that the transmitting agent of yellow fever was the female Aedes aegypti mosquito.

After verifying his theory of a biological vector in the transmission of infectious diseases, the brilliant Cuban scholar opened the doors to the explanation of diseases like malaria, dengue, filaria,

leishmaniasis, trypanosomiasis and other diseases misunderstood by the theories of the time, that presented the same method of transmission.

Thus began the studies of medical entomology in the world, of which Finlay is considered its founder.

Between 1881 and 1900 Finlay conducted experiments to verify the transmission by mosquitoes, and also found that the individual once bitten by an infected mosquito, remained immune to future attacks of the disease. In this way, the serum against yellow fever was born.

In 1893, 1894 and 1898 he formulated and disseminated the main measures to prevent epidemics of yellow fever, related to the destruction of the larvae of mosquitoes in their breeding sites, the same as have been successfully implemented, since 1901, in Cuba, Panama and other countries where the disease is considered endemic.

The vector control measures proposed by this wise man helped build the Panama Canal. A plaque placed there recognizes his contribution to this work.

In 1902 Finlay was appointed Senior Chief Health Officer and structured the health system of the country on new foundations. From that position he faced the final yellow fever epidemic in 1905 in Havana, which was eliminated in three months.

Parallel to his studies on the aetiology of yellow fever, he also studied and described the first case of filaria in the blood observed in America (1882).

He also ventured occasionally into scientific questions of a more theoretical nature and also practiced ophthalmology. On behalf of the Academy of Sciences, he advised the first commission investigating yellow fever sent to Cuba by the US government in 1879.

He made great contributions to the disciplines of entomology, virology and ophthalmology, the treatment of leprosy, filariasis, cancer, tetanus, malaria and tuberculosis, and helped to lay the foundation for the eradication of contagious diseases by means of immunology, vaccination and vector control.

Finlay, whose name was Juan Carlos, but signed "Charles J." was born in the city of Camagüey, on December 3, 1833, and died in Havana on August 19, 1915. His parents were the Scottish physician Edward Finlay, eye surgeon, and a descendant of French nobility Marie Elizabeth de Barres.

He attended primary and secondary education in France and Germany, and began studying medicine at the Liceo in Rouen, France. A very severe attack of typhoid fever made him return to Havana, where, after recovering, academic authorities would not allow him to continue his studies, so he moved to Jefferson Medical College in Philadelphia, where he graduated in 1855. In 1857 he revalidated his degree at the University of Havana.

He was elected Fellow of the Royal Academy of Medical, Physical and Natural Sciences of Havana in 1872, and in 1895 became a Member of Merit. He served as Correspondence Secretary, in charge of international relations of that institution for nearly 14 years.

After Finlay announced his theory to the world, health and government officials from United States tried to usurp the authorship of his discovery.

The debate was initiated by the controversial study on yellow fever carried out in Cuba in 1900 by the Second Sanitary Commission of the United States Army headed by Dr. Walter Reed, which was guided by the tenets of Finlay, and only checked what Finlay had already done.

However, the global scientific community recognizes Dr. Carlos J. Finlay, as the sole author of the discovery. In 1954 the XII Congress of the History of Medicine in Rome approved the motion that

attributes Finlay with the discovery of the transmitting agent of yellow fever.

On several occasions between 1905 and 1915, he was nominated for the Nobel Prize in Medicine, and although they never gave that distinction, he received many honors and awards such as the Mary Kingsley Medal from the Institute of Tropical Medicine in Liverpool, UK; the Bréant award from the Academy of Sciences in Paris, and the insignia of Officer of the Legion of Honor from the French Government.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) included him among the six greatest microbiologists in history, along with Leeuwenhoek, Pasteur, Koch, Mechnikov and Fleming, and instituted the "Carlos J Finlay" Award, at the initiative of the government of Cuba, as a stimulus to research in the field of microbiology (including immunology, molecular biology, genetics) and its applications.

In his honor, the date of his birth on December 3 was designated as Latin American Medicine Day, and the Cuban state awards the Carlos J. Finlay Order to scientific works relevant to the service of the welfare of man.

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