

Dr. Carlos Justiniano Ribeiro das Chagas (1879–1934): A giant of the Third World

This year marks the centenary of the discovery of Chagas Disease. The protagonist of the research was Dr. Carlos Justiniano Ribeiro das Chagas, or just Carlos Chagas, the internationally-acknowledged Brazilian sanitary physician, scientist, and bacteriologist.

The son of coffee-growing farmers, he was born on 9 July 1879 in the city of Oliveira, Minas Gerais, Brazil, losing his father at the age of four.

Aged eight, he was enrolled at the Jesuit Colégio São Luís at Itu, in the interior of São Paulo, and later he made the preparatory course to enter the Escola de Minas at Ouro Preto, in São João Del Rey, Minas Gerais, following his mother's desire that he should become an engineer.

Aged 18, he entered the School of Medicine of Rio de Janeiro. He finished the course in 1902. The following year, he presented his final thesis entitled 'Hematologic Study of Malaria'. This topic brought him into contact with Oswaldo Cruz, the great figure of bacteriology of his time.

In 1905, Chagas conducted a prophylaxis campaign against malaria in Itatinga in the interior of São Paulo, controlling the outbreak. It was the first successful anti-malarial campaign in the history of the disease. His method consisted of observing and describing in detail the intra-house transmission of malaria. The work formed the basis for the effective fight against malaria around the world.

In 1906 he started working at the Oswaldo Cruz Institute, where he would continue to work throughout his life. The following year he was sent by Cruz to fight an epidemic of malaria in the Baixada Fluminense.

At the end of 1907, Chagas settled in a small town (Lassance in Minas Gerais) on the margins of the São Francisco River, where malaria was devastating the camp of the workers of the Central Railway Station of Brazil. In an old train wagon he set up his home, laboratory and office. In the town, he observed numerous haematophagus bugs, 'vinchucas' or 'barbeiros', living in the walls of the precarious wattle and daub cottages, and he decided to investigate them. He found a new parasite in these bugs, which he called *Trypanosoma cruzi* in hom-

age to his mentor Oswaldo Cruz. He verified that the parasite was pathogenic for laboratory animals and he found its presence in domestic animals. Meanwhile, Chagas had already detected in the inhabitants of the region, inexplicable pathological alterations. He then started researching the links between the new parasite and the morbid condition of the population. On 23 April 1909, Chagas discovered for the first time the parasite in the blood of a three year-old child called Berenice in the full acute phase.

The discovery by Chagas is unique in the history of world medicine: the identification of a new pathogenic agent, the anatomical pathology, the hosts, the clinical aspects of the acute phase, and several aspects of the chronic phase (especially the cardiac disease), the role of autoimmunity in its pathogenesis, and the anticipation of the epidemiological aspects of the social impact of the disease [1]. It was a breakthrough in the field of biological research achieved by a single researcher. Unlike all other discoveries, all stages of this work were accomplished within a few months. It was widely recognized at home and abroad [2].

In 1912, Chagas made an expedition to the valley of the Amazon, making a thorough medico-sanitary survey on the living conditions of the inhabitants of the region.

He was appointed Director of the Instituto in Manguinhos when Oswaldo Cruz died in 1917. The following year, he led a campaign against the epidemics of Spanish flu in Rio de Janeiro. A short time later he was commissioned by President Epitácio Pessoa to prepare a new Code for Public Health. The new regulations, a second sanitary reform, were passed in 1919, and came into effect in 1920 to create the National Department of Public Health replacing the old General Direction of Public Health, in charge of the land, sea, and river sanitary services, and of rural prophylaxis services.

He established several health services specializing in childhood hygiene, and in fighting rural endemics, tuberculosis, hanseniasis and sexually transmitted diseases. He set up nursing schools and established the education of sanitary physicians.

In 1925 he was appointed Professor of the School of Medicine of Rio de Janeiro, where he started the Chair on Tropical Diseases, and established the whole basis of the study of hygiene in Brazil.

Carlos Chagas was a permanent member of the Committee on Hygiene of the League of Nations. The repercussions of his discoveries were widespread, especially in Germany [3], where the Academy of Medicine made Chagas an extraordinary member.

During his fruitful scientific life, he received numerous awards and honors: the Schaudinn award from the Institute on Tropical Diseases in Hamburg, Germany, for the best work on protozoology (1912), doctor honoris causa from the prestigious American university of Harvard (1921), the hors-concours award in the commemorative Lecture on the 100 years of Louis Pasteur, in Strasbourg; the Kummel award from the University of Hamburg; honoris causa from the Universities of Paris (1926), of Lima (1929), and the Free University of Brussels (1934). He was twice nominated for the Nobel Prize, though never awarded it. Even the Brazilian Academy treated him harshly from 1920 to 1922, and his discovery was under suspicion for a while. This hostile campaign may have been instrumental in costing him the award [4]. Why was it that in 1907 the Nobel Prize was given to Alphonse Laveran for his discovery of the plasmodium malariae, and yet it was refused to Chagas for his discovery in 1909?

Laveran was a military biologist from the French colonial army, who researched the malaria that afflicted French soldiers. This may lead us to think that the Institute granting the Nobel Prize was more interested in a contribution related to the interests of a colonial country than in the equally or more significant discovery of another protozoan parasite, but one that affected a Third World country, formerly a Portuguese colony. This is mere speculation. Analysis of the database of the Nobel

Prize archives, with the revelation of the names of nominators, nominees, and prize winners spanning the years 1901–1951, brought information not only about what was considered to be a scientific achievement at that time, but also about who the important scientists were and what the relationships between them were. The non-recognition of Carlos Chagas' discoveries by the Nobel Committee appears to be more correctly explained by these factors rather than by the negative impact of the local opposition [5].

The discovery of Chagas Disease makes an extraordinary story. It encompasses the pinnacle of scientific achievement and has some unique features. In addition, there is a background of controversy, jealousy, and power politics to the story [6].

The work of this giant of medicine was not restricted to Chagas Disease. He was the first to describe the lesions of the bone marrow in malaria, he discovered new and significant transmitters, and brought about a revolution in his time by stating that malaria was a home infection, which he later proved through the success of his campaigns.

References

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