

**DR. CARLOS JUSTINIANO RIBEIRO DAS CHAGAS (1878-1934):
A GIANT OF THE THIRD WORLD**

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This year marks the centenary of the Chagas Disease discovery. The protagonist of the Chagas research was Dr. Carlos Justiniano Ribeiro das Chagas, or just Carlos Chagas, a Brazilian sanitary physician, scientist, and bacteriologist; the most acknowledged by the international community ever.

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

At his 8th year 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 would become an Engineer.

With 18 years of age, he entered the School of Medicine of Rio de Janeiro. He finished the course in 1902. A year later, he presented his final thesis titled "Hematologic Study of Malaria." This topic got him in touch with Oswaldo Cruz, the great figure of bacteriology of his time.

In 1905 he conducted the first successful 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 was the basis for the effective fight against malaria around the world.

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

At the end of 1907, he settles 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 sets up his home, laboratory and office. In the town, he observed numerous haematophagous 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 them, which he called *Trypanosoma cruzi*, as an homage 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 April 23rd, 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). Never in the field of biological research, a discovery so complete had been made by a single researcher. Unlike all other discoveries, all the stages of this work were accomplished in a few months. Chagas' discovery 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 life conditions of the inhabitants of the region.

He assumed the direction 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 appointed by the 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. It created the National Department of Public Health to replace the old General Direction of Public Health, in charge of the land, sea, and river sanitary services, and of rural prophylaxis services.

He created several specialized health services, such as on childhood hygiene, to fight rural endemics, tuberculosis, hanseniasis, sexually transmitted diseases, nursing schools, and he established the education of sanitary physicians.

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

Carlos Chagas was a permanent member of the Committee on Hygiene of the League of Nations. The repercussions of his discovery were huge, mainly in Germany(3).

The Academy of Medicine made Chagas an extraordinary member, a singular fact in its history, since back then, there were no vacancies available.

During his fruitful scientific life, he received numerous awards and honors: the Schaudinn award, from the Institute on Tropical diseases from Hamburg, Germany, for the best work on protozoology (1912), doctor Honoris causa in the prestigious American Harvard University (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 in the University of Paris (1926), Lima (1929), and the Free University of Brussels (1934). He received two nominations for the Nobel Prize, recorded in the Karolinska Institute, however he was not granted the prize. 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 in 1907 the Nobel Prize was given to Alphonse Laveran for his discovery of the plasmodium malariae, and it was refused to Chagas for his discovery in 1909? Laveran was a military biologist from the French colonialist army, who researched the malaria that affected the 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 colonialist country, than in the contribution equally or more significant, the discovery of another protozoan parasite, but that affected a third-world country, formerly a Portuguese colony. These are mere speculations. The 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 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 story line of controversy, jealousy, and power politics(6).

The work of the giant 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 with the success of his campaigns.

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