



Dissecting slander and crying for justice: Carlos Chagas and the Nobel Prize of 1921

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ABSTRACT

Chagas disease was discovered by Carlos Chagas in 1909. Chagas worked at Oswaldo Cruz Institute, where the bases of experimental medicine were settled in Brazil, and that had no connection with the Faculty of Medicine of Rio de Janeiro. Chagas had several enemies at Oswaldo Cruz Institute mainly because of his election to Head of Service in 1910, and for the position of Oswaldo Cruz Directorship in 1917. Furthermore, Chagas gained enemies at Faculty of Medicine of Rio de Janeiro, which did not like to see the economical political autonomy of Oswaldo Cruz Institute. This allowed the Institute not only to perform top experimental research, but also to take the leadership of research in the country.

Chagas was nominated to the Nobel Prize of 1921 in December, 1920. None was awarded the Nobel Prize in that year. He seems to have been evaluated by the Noble Committee of Karolinska Institute from March to May of 1921. At that time, his enemies were denying his discovery of *Trypanosoma cruzi*, a key point in Chagas' nomination by Karolinska Institute, and giving no epidemiological importance for the disease. By the same way, the obligation of small pox vaccination was tarnishing his public image. Having taken into account the epidemiologic importance of Chagas disease, the strong historical mistake in the process of Chagas evaluation, and the inequity behind all these facts, we insist on a posthumous Nobel Prize for the man who made the most complete medical-scientist discovery of all time.

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1. Introduction

Chagas disease affects about 11 million people in South and Central America; the other 100 million are at risk of acquiring the disease [1]. On account of international immigration the disease has become global, provided that about 750,000 people living outside Latin America are carriers of Chagas disease [2]. Chagas disease is caused by the protozoa *Trypanosoma cruzi* (*T. cruzi*), which is transmitted to humans through the feces of a bloodsucking insect deposited on the eye mucosae. Heart involvement is the main clinical manifestations of Chagas disease, affecting about 30% of infected people and can arise until 20 years after infection. Sudden cardiac death and chronic heart failure are the main cardiac manifestations of chronic Chagas heart disease [3,4]. To date, there is no specific treatment for Chagas heart disease.

The disease was discovered by the Brazilian doctor Carlos Ribeiro Justiniano das Chagas in 1909. Details of this discovery have been reported elsewhere [5]. In a period of 11 consecutive years, Chagas, a young researcher team leader, was able to describe the etiology, the vector, the reservoir, the morphological features, the acute and chronic stages, and the clinical aspects of the new disease; besides raising the possibility of autoimmunity in the pathogenesis of it. Because Chagas perceived that the disease is associated with people's

poverty and poor living conditions, he foresaw the spread the disease could have, since the beginning. In fact, by 1920, the disease had already been detected in several countries of Latin America [5].

The impact of Chagas' work was great in Europe, receiving for this reason the Schaudinn Prize in 1912. Chagas competed with more than 80 scientists for the Nobel Prize in 1921; but none won the Nobel Prize that year [5]. In this paper, we will present new and detailed facts that could have lead Chagas not to win the Nobel Prize.

2. Political background: 1909–1920

From 1910 to 1920, the Brazilian political setting was characterized by marked nationalism, which was taken as necessary by Brazilian intelligentsia to construct Brazilian society and the country's progress. However, the manner by which the nationalists thought of doing this was not uniform. There were actually two nationalist strands which envisioned different ways to improve the socio-economic status of the nation.

The first one believed that the Brazilian rural workers were unable to work properly because they belonged to an inferior race [6], the result of climatic and racial determinism [7]. Therefore, in their view, immigrants' presence that came to work at coffee plantations could be important to improve Brazilian rural workers breed through intermarriage, similar to what occurred in the USA [8], thus promoting the country's wealth [6]. Among the representatives of this school of thought there were several medical scientists, which were called *nationalist hygienists* [9]. The rural

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oligarchy, which economically depended on coffee plantation, also shared this thought [10]. Many members of the Faculty of Medicine of Rio de Janeiro (FMRJ) belonged to this school, and as private doctors, they defended the remedial rather than the preventive medicine [9]. The main problem that could hinder immigration was the presence of infectious diseases, like malaria and yellow fever. The fear of such diseases led the Italian government to prohibit Italian citizens' immigration, the coffee plantation's most important manpower, in 1886 and 1889 [11].

The other nationalist school of thought believed that endemic diseases that raged in the countryside were the cause of poverty and lack of economic development. According to this view, the incompetence to raise wealth from agriculture was not due to climate and race determinism; rather, it was the consequence of the presence of chronic endemic diseases affecting the rural workers. Actually, ancylostomiasis, malaria, and Chagas disease might have affected 70%, 40%, and 15%, respectively, of rural Brazilian population according to Rockefeller Foundation statistics at that time [6]. Several medical scientists were among the members of this school of thought; they were named *nationalist sanitarians* [9]. One of the members of this school of thought was Carlos Chagas.

In 1910, at a National Medicine Academy speech about the newly discovered Chagas disease, Chagas emphasized the need for government involvement to improve the living conditions of rural workers, thus promoting their welfare and the country's economic progress. "It is terrible scourge of a large area of the country, disabling a lot of rural workers for vital activity, creating successive generations of lesser men, which make them useless in the progressive evolution of the country", Chagas wrote about American Trypanosomiasis. "Will there be an effective mean of mitigating the harm?" he asked and already answered: "We believe so if such a problem.... becomes a desire of a statesman scientifically well oriented" [12].

In 1912, Chagas was sent to the Amazon Valley in the North region of Brazil to study the region's medical-sanitary conditions in order to improve rubber exportation, which at that time was of high economic importance for the country. After remaining 9 months in that region, Chagas noticed that the poor health conditions of the tappers, which were severely affected by curable and avoidable diseases, were paramount to preclude the social development of that region [13]. From that moment on Chagas was no longer just a laboratory researcher to be a scientist engaged in addressing national health problems [14].

3. Dissecting slanders

3.1. The game begins abroad

The attacks against Chagas' work were started by Kraus et al. [15] in Argentina in 1915. These authors stated that they found several patients with goiter, a clinical manifestation ascribed to Chagas disease at that time, but no patient was found to have *T. cruzi* in the blood circulation. Moreover, Kraus et al. [15] reported that they had found several *T. cruzi* bugs infected in areas where no patient had the parasite in the blood circulation. Such observations had previously been made by Neiva and Penna in Brazil in 1912 [16].

Neiva worked in Argentina in 1913 and in 1915 at Bacteriological Institute of Buenos Aires, an opponent of Oswaldo Cruz Institute in Brazil, where he established profitable and sociable scientific relationship with colleagues from that institute [17]. Neiva was hired to work there due to the lack of specialists in Entomology in Argentina, inasmuch as the scientific orientation at that institute was predominantly dependent on Pasteur's influence about disease etiology (disease transmission due to water, air, and infected clothing, and not by insects) [18]. Unprepared to work with insects, Kraus et al. [15] was certainly influenced by Neiva's opinion.

Kraus et al. [15] ascribed the presence of goiter to the "endemic goiter", a condition whose etiology was unknown at that time; however,

infectious etiology was an acceptable cause of this disease [19]. Furthermore, these authors ascribed the neurological symptoms described by Chagas, including those consistent with cerebral palsy, to idiocy because in such cases "there are uncharacteristic lesions in cranial bones as well as in pia mater". They ignored the morphological studies carried out in patients with chronic Chagas disease, which showed chronic inflammation in the brain tissue instead of lesions found in the skull and meninges only, as commonly observed in patients with endemic European goiter. In a subsequent paper published in 1916, Kraus et al. reinforced this criticism and stated: "the insect infected in Argentina does not cause with great likelihood Chagas disease" [20].

Kraus et al. [15] studied only 13 patients which were supposed to have chronic Chagas disease; 7 of them had goiter, and 6 idiocy. No parasite was found in the blood of such patients. Had Kraus et al. [15] studied more patients they would certainly be able to find the parasite in the patients' blood, as did Müellens in the same region, years later [21]. From the beginning, Kraus et al. [15] completely ignored Chagas statement about the importance of cardiac abnormalities (particularly arrhythmias) on clinical examination to make the diagnosis of chronic American Trypanosomiasis, as serology was not yet available as a diagnostic tool [5]. Kraus et al.' criticism to Chagas' work was discussed at an Argentinean meeting in 1916. At the end of the discussion, Kraus stated that "he was convinced that the reason was beside Manguinhos" [14].

3.2. Oswaldo Cruz Institute scientists come into play

From the beginning, there were two Head of Service at Oswaldo Cruz Institute: Figueiredo de Vasconcellos and Rocha Lima. In 1910 an assistant researcher position of Head of Service was available at Oswaldo Cruz Institute because of Rocha's Lima immigration to Germany. Cruz held a contest to fill Rocha's Lima position, and assistant researchers of Oswaldo Cruz Institute took part in the election. Seniority and relevant services to Oswaldo Cruz Institute were taken into account in this election by peers, but one of the items with the highest score was the publication of scientific papers "having important discoveries or new methods of great practical value." Interestingly, the paper in which Chagas describes the new disease received the highest score of all Oswaldo Cruz' Institute members. Chagas won the contest. Aragão, a member of Oswaldo Cruz Institute with political importance because of the international recognition of his work on malaria, passed over [14].

In 1912, Oswaldo Cruz granted royalties to Alcides Godoy and Astrogildo Machado for their vaccine against plague of lameness discovery. Some members of Oswaldo Cruz Institute (including Figueiredo de Vasconcellos) were against such measure believing that the profit from the sale of vaccines should go for Oswaldo Cruz Institute only. However, the most ones including Chagas were in favor of Cruz' determination. From this point in time, Vasconcellos became a persistent Chagas opponent [14,22]. In 1915, Artur Moses, who had worked many years at Oswaldo Cruz Institute without passing for a contest for the position, asked the Brazilian government to keep him in office. Oswaldo Cruz disagreed and requested a contest opening for the job. Again there was a split in the scientific community; Chagas stood by Oswaldo Cruz for the need of calling for competition, but Aragão took the opposite position. This controversy got to newspapers and exposed Oswaldo Cruz Institute community as had never happened before [14,22].

Oswaldo Cruz died in February in the year 1917, thus leaving the Oswaldo Cruz Institute directorship place vacant. According to Aragão, the scientific community waited for Chagas' indication to hold the position of Oswaldo Cruz Institute Director [23]. However, there is some doubt about this. Figueiredo de Vasconcellos, who was working at the Oswaldo Cruz Institute from the beginning, was the staff member who usually used to replace Oswaldo Cruz in his absence in the Institute Directorship. During the course of Cruz's disease, Vasconcellos replaced him at the Oswaldo Cruz Institute Directorship. It seems, therefore,

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