

## THE UNCINARIASIS PROBLEM

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To Porto Rico belongs the honor of being the first country in the New World to conduct a campaign against the greatest of tropical scourges, Uncinariasis. The plan of treatment developed here has been used as the basis for the campaign against hookworm disease that has since become world-wide in extent. But even in Porto Rico the number of people afflicted with the disease is still very high, and the campaign in the last few years has become more active than ever before in the history of the Island. The prospect is that if the present campaign is continued for a few years more, the disease will have been controlled.

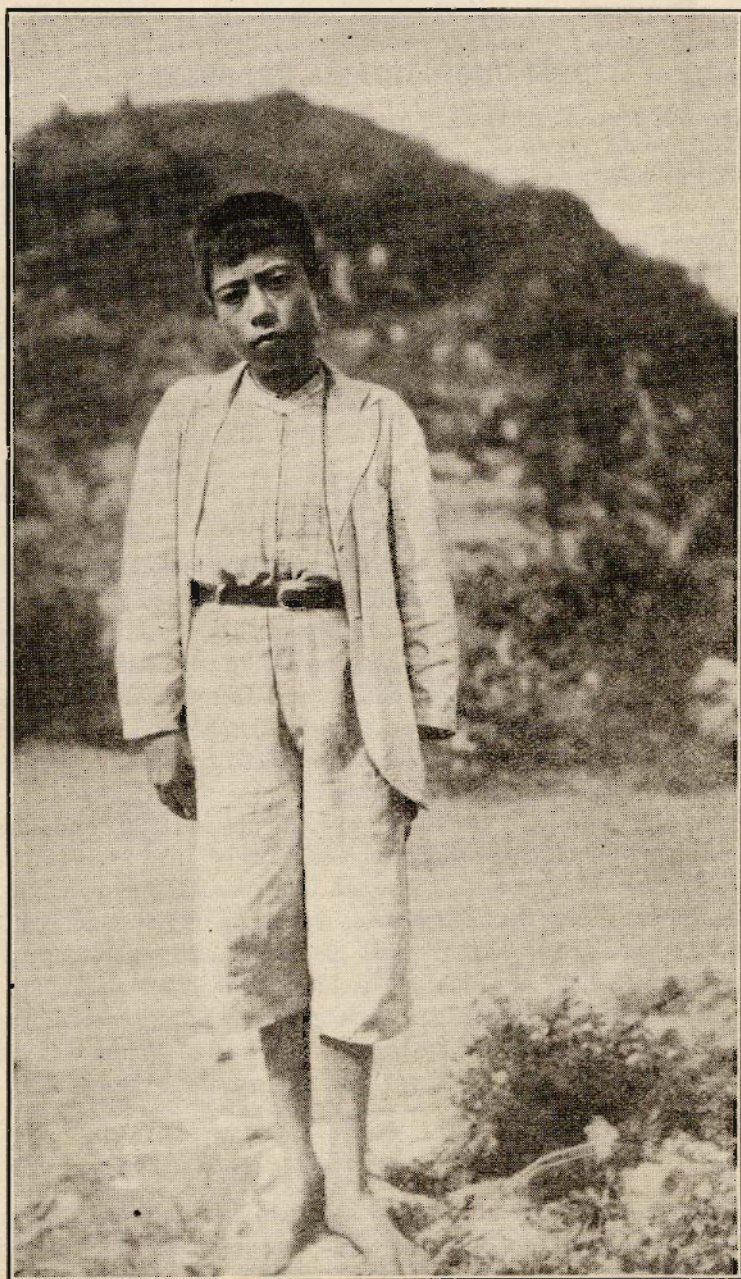
### DISCOVERY OF THE CAUSE OF TROPICAL ANEMIA

The story of the discovery that the prevalent anemia of the Island was due to uncinariasis has often been told. What was then supposed to be *A. duodenale* had been reported before from the Americas, but it remained for Capt. B. K. Ashford of the United States Army to discover the parasite in Porto Rico and to establish the relationship between the worm and the disease in the Island. The parasite, sent to Washington, was afterward identified by Prof. C. W. Stiles as *Necator Americanus*, a new species.

Following Ashford's treatment of patients in 1900, and largely as a result of his efforts, the Porto Rican Legislature in 1904 passed a bill creating the Porto Rico Anemia Commission, and voted \$5,000 for treatment. This first commission was composed of Drs. Ashford, King and Gutiérrez. Armed with medicines and microscopes, the group set up a field hospital in Utuado. The people flocked to the dispensary, and the money was soon exhausted, but not before the great benefits of treatment had been demonstrated. Thus was begun what afterward came to be known as "dispensary treatment". The methods then established are still used.

### PORTO RICO ANEMIA COMMISSIONS

Seeing the results, more money was voted, and the work continued. In 1906, the Legislature authorized the formation of the permanent commission for the extermination of Anemia in Porto Rico. This commission was composed of Drs. Gutiérrez Igaravidez, González



Boy of 22 years of age, badly infected with uncinariasis.  
Physical development about 16 years.

Martínez, and Seín. Dispensaries were opened all over the Island, 42 being in operation in 1907-08. Work was carried on until 1911, through the anemia dispensary service after 1908, when the work was turned over to the "division of tropical and transmissible diseases" of the Service of Sanitation. The collected reports of the commissions (Senate Document No. 808, 1911) states that 287,508 patients were treated, at a cost of 63.9 cents per patient, \$183,898.38 being spent. The authors estimate that nearly one-third of the population of Porto Rico received treatment in the years from 1904 to 1911.

With diminished funds, the Division of Sanitation carried on dispensary work until 1919, but the number of stations gradually lessened, and the number of treatments given fell off greatly.

During this time there was forming in the public mind the idea that "uncinariasis" was synonymous with "anemia", that a person was not suffering from the disease unless he was noticeably anemic, and almost incapacitated for work. This was one reason why the people did not continue to attend the dispensaries as they had at first. Unless they were very sick, they did not think they should go to the dispensary.

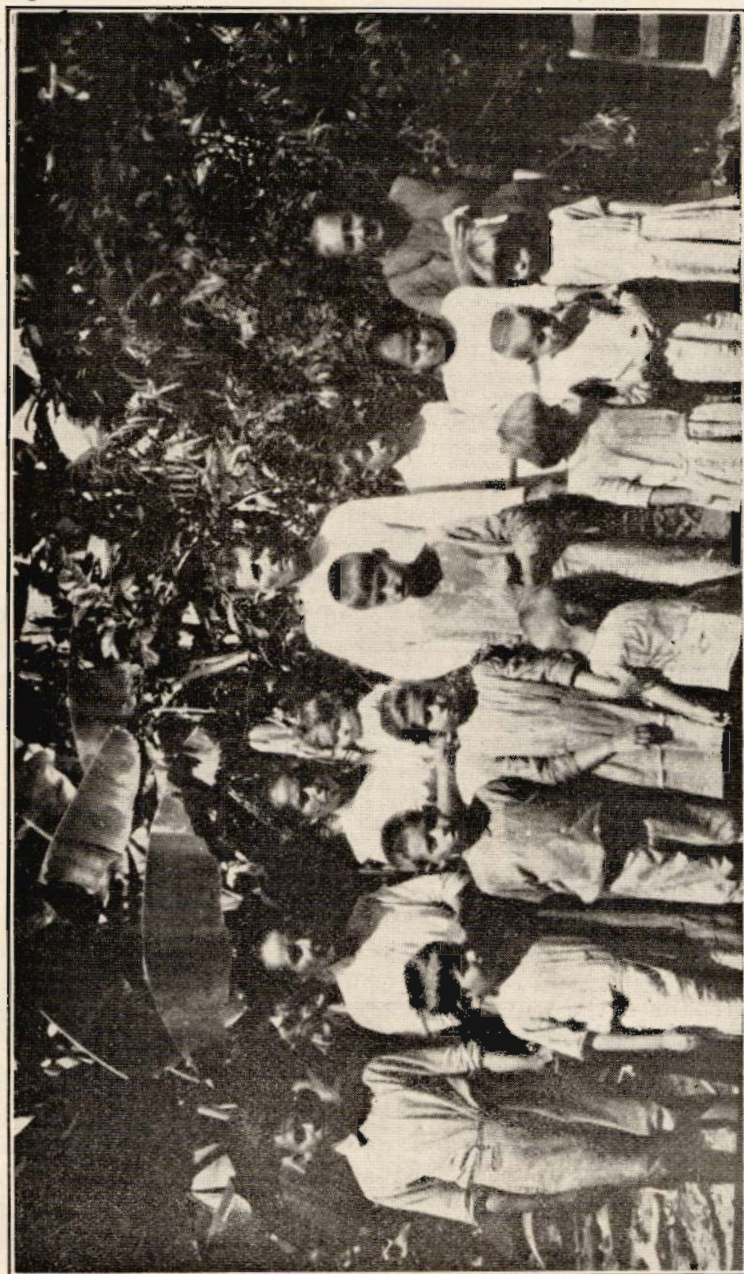
Unfortunately at the same time, public interest, the interest of the influential men of the Island, also lessened. After the first vigorous efforts, after the novelty of a new disease had worn off, the public, if not indifferent, at least accepted the disease as natural to the Island and did very little about it.

#### LACK OF EARLY SANITATION

The first and subsequent commissions stressed the fact that in sanitation lay the means of preventing reinfestation. At the same time they wisely recommended the use of shoes whenever possible. But the major advice was disregarded, and there gradually grew up the idea that the wearing of shoes was the essential feature in the prevention of uncinariasis. Since shoes are beyond the means of most country people, it follows that reinfestation was very rapid.

The sanitarians of course continued to preach sanitation. The building of latrines was urged from the dispensaries. In 1915, Dr. W. F. Lippitt, then Director of Sanitation, endeavored to obtain funds for this purpose, and he actually started latrine construction in 1916, which however, was not long continued. Nevertheless, up to 1919, approximately 10 per cent of the country houses had provided themselves with latrines.

Thus ends the first phase of the hookworm campaign.



Family of 16, all infected with uncinariasis.

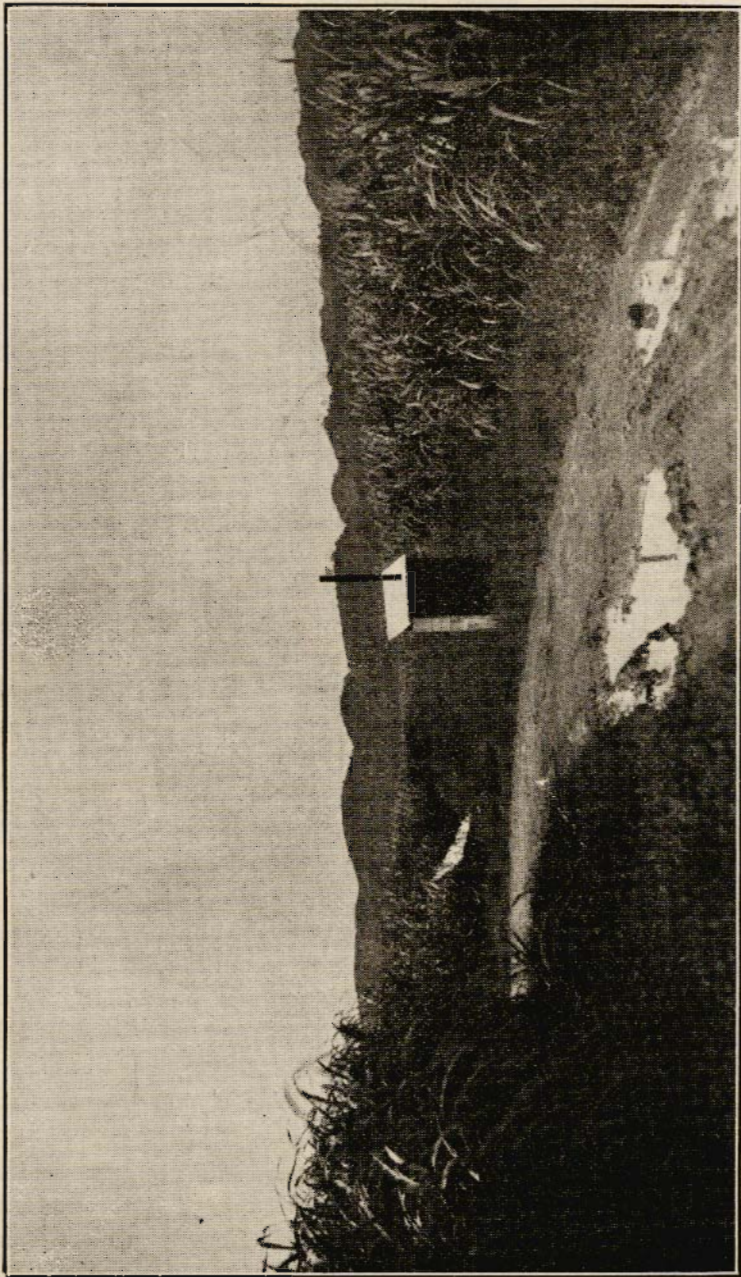
## RURAL SANITATION

In 1919, Dr. A. Ruiz Soler, Commissioner of Health, in view of the increasing amount of uncinariasis, invited the coöperation of the International Health Board of the Rockefeller Foundation in investigating conditions. The resulting survey in 1920 revealed the fact that approximately 90 per cent of the rural population were suffering from hookworm disease. A joint program was approved, which provided that the board for a period of five years would conduct a demonstration-treatment campaign in areas previously sanitized by the Department of Health.

Under this agreement the Department began sanitation in 1920 with a force of eight inspectors. This number has gradually increased until at the end of 1924 there are thirty-five inspectors who devote their full time to this work, and seventy-six others who devote one-third of their time. Up to the end of 1924 over 40,000 latrines have been constructed in the northwestern part of the Island, providing sanitation for over one-fifth of the total rural population. In addition, many thousands of latrines have been built outside the zone of intensive operations. It is now usual to find that 20 per cent of the houses are provided with latrines when a campaign is begun, instead of the former 10 per cent. The inspectors have always succeeded in providing over 90 per cent of all occupied houses with latrines. The method used, in brief, is to notify the owner of the house to construct a latrine in accordance with the plans of the Department. Failure to comply is punishable in the courts.

On July 1, 1924, orders were issued by the Department extending the campaign to the entire Island. Each local inspector, of which there are one or more in each of the 76 municipalities (counties) responsible for the general sanitary condition of his municipality, now devotes one-third of his time to rural sanitation. To the end of November, 1924, over 2,500 latrines had been reported by these inspectors, in addition to the 8,425 reported since January 1, 1924, by the regular inspectors. This number should increase from month to month.

Whenever a campaign is finished in any municipality, at least one inspector is left in the area, whose sole duty it is to constantly reinspect the area in his charge, keep the latrines in perfect condition and continue the educational work. At present there are thirteen inspectors on this duty.



Type of latrine erected by the Plazuela Sugar Company in their sugar-cane fields to prevent soil pollution.

## TREATMENT CAMPAIGNS

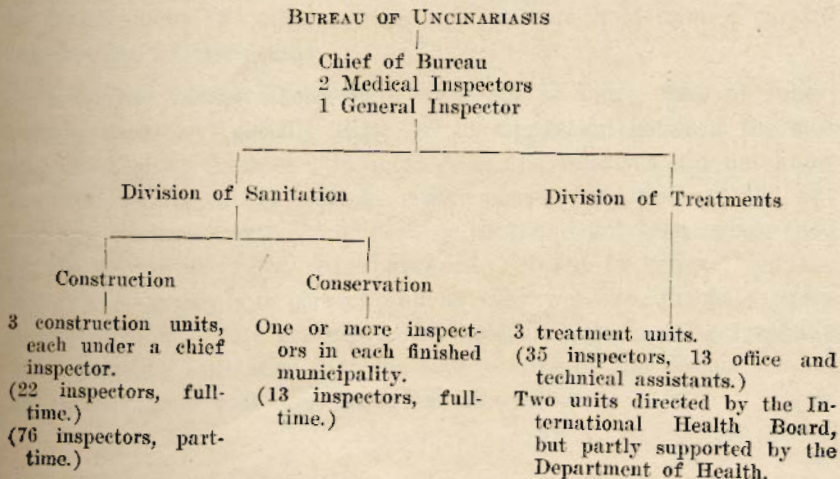
On January 1, 1921, the International Health Board began its treatment campaign with eight inspectors. In 1923, a second unit was added by the board. In addition, the Department of Health provided inspectors for two other treatment units in 1921 and 1922, one of which was afterwards used for sanitation. The other is still in operation. At the end of 1924 there were three doctors and thirty-five inspectors, with the necessary office and technical assistants, giving treatments. All treatments are personally administered by the inspectors in house-to-house visits.

During these four years over 400,000 treatments have been administered to 130,000 persons in the sanitated districts in the north-western part of the Island. Thus over one-eighth the total rural population has received treatments.

## THE BUREAU OF UNCINARIASIS

Up to 1922, the anemia-prevention work of the Department of Health was under the immediate control of the Commissioner of Health. In 1922, the Commissioner of Health appointed the representative of the International Health Board a medical inspector of the Department of Health, and placed him in direct control of all Department operations. In the latter part of 1923, the Bureau of Uncinariasis was formed to handle the increasing amount of work, and the International Health Board representative was made the first chief of the bureau. In the same year two medical inspectors' positions were created, these being now held by Dr. J. G. Bajandas and Dr. D. A. Crescioni.

The Bureau of Uncinariasis is organized as follows:



## FINANCIAL

Porto Rico has spent a great deal of money on hookworm treatment. From 1904 to 1909 the Anemia Commissions spent approximately \$183,500. From 1910 to 1920, the Government spent \$203,262.87. From 1920-23, the Department of Health appropriated yearly \$30,000, and in July, 1923, this was raised to \$60,000 per year, which is the appropriation for the current year.

In spite of the amounts already expended, money and yet more money is the key to the situation. Great, but temporary benefits were received from the money expended up to the time sanitation was begun. The disease was being treated, and large numbers of people were temporarily relieved. Now, however, all emphasis is being devoted to the prevention of disease, and the plan being followed—of sanitation and treatments with adequate provision for holding the gains now being made—should, if the appropriations are made adequate, control uncinariasis in a relatively short time; but if interest is again allowed to lapse, the situation will soon return to what it was in 1920, when 90 per cent of the people were found to have uncinariasis, after a continuous fight of twenty years against the disease.

Future articles will deal with the details of campaign organization and with some of the more important results of the investigations that have been carried out.