A Rockefeller Foundation Health Primer for US-Occupied Nicaragua, 1914-1928

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Abstract. The article presents views from above and below of the Rockefeller Foundation’s International Health Commission’s (IHC’s) hookworm control program in Nicaragua from 1914 to 1928. It looks at the meaning, impact, and unique configuration of the Nicaraguan mission, while taking into account the larger global institutional project of this important international health actor. Although the IHC program in Nicaragua complemented some of the social policy goals of the US intervention in Nicaragua, which was a de facto protectorate during this period, the institution cannot be considered a direct expression or agent of US foreign policy. Ultimately the shape and limits of the IHC mission to Nicaragua were determined by the institutional project of the international public health agency itself, and by local considerations ranging from the characteristics of the staff to the response of rural communities to the anti-hookworm campaigns.

Résumé. L’article présente les objectifs du programme de contrôle de l’ankylostome au Nicaragua de 1914 à 1928 de la Commission internationale de la santé (CIS) de la Fondation Rockefeller. Il expose la signification, l’impact, et la configuration unique de la mission du Nicaragua, tout en tenant compte d’un grand projet institutionnel plus global de cet important acteur international en santé. Bien que le programme de la CIS au Nicaragua ait complété certains des buts de la politique sociale de l’intervention américaine au Nicaragua, qui était un protectorat de fait pendant cette période, cette institution ne peut pas être considérée comme étant une expression directe ou comme un agent de la politique étrangère des États-Unis. Finalement, la forme et les limites de la mission...
In January 1917, Conservative General Emiliano Chamorro, brought to power with the help of US military might, delivered his first speech as president of the republic.\(^1\) Three years earlier, while heading up the Nicaraguan legation in Washington in the wake of a full-scale US military intervention to prop up the regime of Adolfo Díaz (1911-1917), Chamorro had brokered a formal invitation to the Rockefeller Foundation’s International Health Commission (IHC) to carry out a campaign against hookworm disease in the country.\(^2\) In his inaugural address to the nation, Chamorro offered profuse thanks to International Health for teaching the Nicaraguan people “the beautiful ABC’s of sanitation.”\(^3\) Indeed, in a very short time the Rockefeller hookworm mission in Nicaragua had made their didactic mark on Nicaraguan culture, campaigning intensively in the densely populated Pacific plains and Western cordillera of this country of roughly 400,000 people, giving basic lessons on the benefits of hygiene, and especially modern toilet habits, while testing and treating tens of thousands of Nicaraguans for hookworm disease.

The campaign lasted from 1915 until the formal withdrawal of the mission in 1928 following another massive introduction of US troops to impose an end to yet another civil war between Liberal and Conservative factions. The new intervention of the late 1920s would turn into a full-fledged war of counter-insurgency against the forces of Augusto Sandino, a Liberal rebel leader who refused to abide by the US-imposed ceasefire of 1927 and carried on an increasingly radical anti-imperialist guerrilla war against the US Marines in the mountainous jungles of the North. The International Health mission, then, spanned a crucial and unsettled moment in the history of Nicaragua, a period in which its
modern subordination to the United States was forced on it, hotly contested, and finally consolidated through the creation of state institutions under the direction of agents of US foreign policy. To what degree was the Rockefeller primer on sanitation part of US imperialism, as opposed to simply coterminous with it?

The past 20 years of scholarship on the Rockefeller Foundation and its International Health Commission has moved beyond an earlier school that saw it as a blatant tool of US imperialism masquerading as a humanitarian philanthropy. Historians have begun to draw out the complexities of the encounters between an evolving institution and a variety of political and cultural configurations, whether in the American South or in a medical college built beside the Forbidden City in a Chinese architectural style. There is now a greater willingness to treat International Health officers from the United States sympathetically and take the stated motivations of the Foundation at face value. This does not mean, however, that critical historians no longer see the International Health project as part of an imperial venture—most do. The emphasis of current scholarship is in developing a richer understanding of the nature of the American empire by looking at the role of the Rockefeller Foundation in creating an institutional model of international biopolitical control, in developing and reproducing the racist suppositions of tropical medicine, and in strengthening an ongoing attack on popular medicine and promoting its replacement by biomedical models of health care.

Nicaragua was one of four Central American states where the Rockefeller Foundation’s International Health Commission established its first operations shortly after the philanthropy was created in 1914. Rockefeller philanthropy had chosen Central America because its directors understood the area, in classic fashion, as “America’s backyard”: close at hand, dependent on the US politically, militarily, and economically, and where experiments could be conducted out of the limelight of international media and power politics. The Nicaraguan episode thus offers a chance to study a blueprint of the world’s first programmatic international public health institution—one track where it test drove and tinkered with a model it would later export to countries of much greater geopolitical importance and visibility (Brazil, Sri Lanka, and Mexico, for example). Nicaragua, a fiscal and military ward of Uncle Sam and with an especially pro-US government, was an extreme case of American imperial sway in Central America. For that reason, the hookworm campaigns provide a chance to reveal the imperial roots and character of Rockefeller International Health in a country that was not quite a colony of the United States. The Nicaraguan case also allows us to consider what impact this extreme dependency had on the shape of the health program established, and on the relationship between the institution and the popular communities who were the object of its health intervention.
The article presents views from above and below of the International Health intervention—an overview and an “underview” designed to assess the meaning, impact, and unique configuration of the Nicaraguan mission, while taking into account the larger—indeed global—institutional project of this extraordinarily ambitious and unprecedented international actor.

We propose that in building an infrastructure to address public health questions, but doing so under the aegis of the Nicaraguan state, Rockefeller International Health provided the governing, US-backed Conservative faction with a public agency it would not otherwise have been able to afford, and to extend state power into domains of municipal and individual life, especially in the rural areas, that it was incapable of achieving by other means. In these terms, Nicaragua’s International Health mission involved, like later institutions begun more formally under the auspices of the American occupation regime (such as the National Guard), an external, US actor organizing and deploying a local state agency that would enact modernizing reforms and spread official ideology in the rural areas. This took on special importance in Nicaragua, where an incipient public education system in the rural areas had collapsed following the overthrow in 1909 of the Liberal regime by US-backed forces. The pedagogical dimension of the International Health project provided surrogate instruction in secular and scientific modernity.

This is not to say, however, that we should understand the International Health mission in terms of the successful imposition of an imperial will on Nicaraguans—either in geo-political terms as a mere extension of American state power, or in terms of health science and technology. As in virtually every place where Rockefeller hookworm projects set up, Nicaraguan physicians had a prior experience with studying and treating hookworm disease, and at the elite level its medical and political community had some understanding of what the United States had to offer. The solitary US national who directed the mission had to negotiate a modus operandi with a team of professionals, technicians, and inspectors hired locally. Meanwhile at the grassroots, when International Health came calling in municipalities and on large estates, a complex negotiation of the terms of engagement ensued. The Rockefeller medicine men often had to give ground on important issues and struggle, with variable success, against popular medical and folkloric beliefs. They were often rebuffed entirely and sent packing, sometimes even by angry local officials. As happened in so many places where Rockefeller public health had established a program for treating hookworm disease, the character of the mission was ultimately shaped by the dynamics and limitations of the host society.
THE UNITED STATES OCCUPATION OF NICARAGUA, 1912-1934

Like many Latin American countries in the late 19th and early 20th centuries, Nicaragua assumed a tenuous nation-statehood on the basis of a boom in export agriculture and a dictatorship. After coming to power in 1893, Liberal strongman José Santos Zelaya carried on a juridical and infrastructural reform project designed to promote agrarian capitalism and introduce the popular classes to “civilization” through the expansion of a secular public education system. Zelaya also made efforts to overcome the historic regional rift between Conservative factions entrenched in the south around Granada, and the Liberal factions of the north whose centre was Leon. The partial success of this project was expressed in the growth of Managua as the capital city. The dictator was overthrown in a 1909 rebellion led by a coalition of Liberal and Conservative dissident strongmen, but only made viable because of the American censure of Zelaya’s regime. This hostility was due to a variety of moves by the dictator that threatened US commercial interests and took Nicaraguan sovereignty too seriously, especially over the country’s right to explore developing an alternative inter-oceanic canal route. Liberal and Conservative factional strife continued, however, provoking a more direct intervention of US Marines in 1912.6

Like Cuba and Panama, Nicaragua was an extreme incarnation of the kind of Big Stick police actions and creation of hybrid neo-colonial mechanisms of domination within a structure of nation-state sovereignty, that characterized the US approach to its Latin American empire during this era. The United States began to reorganize the Nicaraguan state, imposing a treaty that barred allies of Zelaya from participating in politics, and creating a system of controls over Nicaragua’s finances that favoured American banks and investors and gave the imperial power direct influence over aspects of politics and public institutions.7 These political and fiscal policies did just what they were designed to do, diverting the greatest possible share of what would otherwise have been state finances outside the country and imposing strict public spending limits that seriously debilitated the capacity of a fragile and incipient state administration. Historians tend to agree that this quasi-colonial fiscal oversight had disastrous effects on the social and economic development of the country. Debt-servicing ate up 43% of public revenues between 1917 and 1927, and the government was prevented from the kind of new borrowing that fuelled a growth in public spending elsewhere in Latin America during the 1920s.8 What modest sanitary activities that had been undertaken in Nicaragua under Zelaya came to an end, and public education (which had included the teaching of elementary hygiene) was severely curtailed, especially in the rural and semi-rural areas of the country as teachers’ salaries went unpaid, and complementary
resources dried up. The International Health hookworm mission in Nicaragua then was implanted within a much diminished state apparatus run from 1913 to 1926 by Conservative governments that, if not quite puppet, were beholden to the external power of the US State Department and its associated representatives in Nicaragua.

ORIGINS OF INTERNATIONAL HEALTH IN NICARAGUA

The Rockefeller Foundation was created in 1913 to bring public health to the world via the International Health Commission. International Health was an outgrowth of the Rockefeller Sanitary Commission for the Eradication of Hookworm Disease, which had carried out a four-year program to work with the public health authorities of various states in the US South to treat uncinariasis, a soil-transmitted helminthiasis, among poor rural dwellers. Hookworm disease was produced by worms that attach themselves to the duodenum and jejunum of the host and suck blood. The more hookworms one has in the intestines, the greater the loss of blood, until eventually chronic blood loss leads to iron deficiency anemia that can have severe, even fatal, effects, and make one susceptible to a host of other diseases. Female adult hookworms are very fertile, laying thousands of eggs each day, which are expelled in human faeces. If people are defecating on the ground in warm and moist conditions, the eggs become larva and grow through a number of stages, until they can invade a human host on contact with skin—usually the soft skin between the toes of people who go barefoot. From there they work their way through the body and complete their life cycle. Based on the relative success of Rockefeller philanthropy’s experience in the US South, and a 1911 world survey confirming that the affliction was endemic in an inter-tropical “hookworm belt” (as the directors called it) that contained half the population of the globe and was of increasing interest to the young imperial United States, the disease was deemed to be the “perfect entering wedge” for the Foundation’s new global work. The Rockefeller Foundation hoped to spread basic notions of hygiene and germ theory while treating—perhaps even eradicating—hookworm disease. More than a technical operation to treat people for parasites, the Rockefeller project planned to use the hookworm and hookworm disease as vehicles for introducing the global masses to hygiene, germ theory, public health, and the power of laboratory-based biomedicine.

The early International Health agreements with the Central American governments were the product of a tour of the isthmus by Joseph H. White, a lynchpin of the United States Public Health Service who had been on the frontlines of epidemic disease control in San Francisco and New Orleans, and was recruited by the Rockefeller directors when they decided to work internationally. In the spring of 1914 White was dis-
patched to Central America to solicit invitations for the International Health Commission. He did not visit Nicaragua but in May, while in Panama, he met Marcos E. Velasquez, the head of the Nicaraguan Legation who wrote favorably to the Nicaraguan Minister of Foreign Relations about the agreement that the government of Panama had signed with International Health. Velasquez was careful to explain that the fiscal commitment of the local state to the enterprise was minimal at the outset, confined to some limited infrastructural support, and he also underlined the potential economic benefits of productivity increases that would come from eradicating hookworm disease among agricultural labourers. The diplomat’s counsel was relayed to the Nicaraguan representative in Washington, Emiliano Chamorro, who wrote to Wyckliffe Rose, the Director of International Health, in October 1914 with a formal invitation to have an International Health staffer visit the country to evaluate the possibilities of “extending your noble mission to our country.”14 After some months of negotiation involving “officials of the Nicaraguan Government, physicians and other influential citizens of Nicaragua,” an agreement was reached to establish an International Health hookworm mission as a dependency of the Superior Council of Public Health (which, having disbanded after the collapse of Zelaya, had to be re-constituted for that purpose).15 By mid-1915, then, Rockefeller public health was at work in Nicaragua, established with some delay, but on the same model and from the same period of overtures to local states that had produced the other Central American campaigns.

It is questionable whether the Nicaraguan government was in a condition to honour such a commitment. International Health offered to pay for the lion’s share of the cost of treating hookworm and carrying out a generalized sanitary campaign. Local states needed to reciprocate with services in kind (such as discounted postal, phone and telegraph service, printing, some transportation costs, and office supplies), and to commit to assume the costs of the campaign gradually over a period of years. This so-called Demonstration Effect sought to implant an institutional node and a set of expertise and procedures in a host state, with the local public powers incorporating it “naturally” to the degree that it could live on and grow following withdrawal of Rockefeller funds.16 This may have been the reason that Nicaragua does not seem to have been a priority for International Health, as evidenced by White bypassing the country on his tour. Indeed, the Foundation may have avoided the country precisely because of the extraordinary American influence there, and their knowledge that Nicaragua lacked an autonomous state. Though the Rockefeller directors understood their role very much in terms of the general expansion of American power, culture and interests (which they understood as “US civilization”) overseas, they were insistent that International Health not be seen as a handmaiden of US impe-
rrial policy in the region, or have too close an association with US diplomatic, corporate, or military agents. As the letters of overture sent to Central American governments stressed, “the Commission itself has no connection whatsoever with the service of the United States nor with any other Governmental Agency.” In person, White explained to a Guatemalan medical official that “the Commission wished to, as far as possible, appear to the people of the country in the light of an adjunct to their own government and not as foreign interlopers.” In sum, it is worth noting that International Health would not have established an operation in US-occupied Nicaragua had it not been for the initiative of the local political elite. Rockefeller public health was not introduced into Nicaragua as part of a neo-colonial project of the kind, say, established by the US Army and Public Health Service in the Philippines. It was created on the same model, and through the same mechanisms, as its other operations in the Central American republics, and later the other independent Latin American nation-states.

Moreover, as was the case in virtually every Latin American country where International Health set up hookworm eradication programs, Nicaragua had a prior history of medical research into, and treatment of, hookworm disease. In the 15 years after Edoardo Perroncito’s celebrated discovery of the source of the fatal anaemia afflicting workers on the St. Gotthard tunnel north of Turin, physicians with scientific aspirations on peripheries everywhere, especially in the tropics, were on the lookout for hookworm disease. Soon after, Luis H. Debayle, a young doctor from León, was looking for signs of hookworm disease in Nicaragua after returning from medical studies in Paris where in 1885 he had attended a lecture on the parasite by Raphael Blanchard (who himself had been influenced by knowledge of the tropical discoveries, including some in Latin America and the West Indies). Debayle presented the findings of his research on hookworm disease in Nicaragua to the 1900 International Congress on Hygiene and Demography in Paris, and in 1911 published a book on the subject whose title (La higiene. Estudio sobre la anquilostomiasis) explicitly linked hygiene and hookworm disease. Other discoveries were made in Central America in the 1880s and 1890s, and so Nicaraguan medical students who studied in León, San Salvador, or Guatemala City were trained in environments where there was considerable knowledge of hookworm disease. In the early 20th century a number of other physicians in Nicaragua would carry out further research on ancylostomiasis.

Rockefeller public health, then, was not the conveyor of an alien epistemology, or possessor of special medical knowledge. When it came to hookworm disease, local medical elites and health authorities had no trouble comprehending the disease on the terms it was being conceptualized by the foreign behemoth. What International Health introduced to
Nicaragua was, first and foremost, resources to carry out an ambitious public health program that was fiscally impossible for the local state given the political limits on public spending. Second, Rockefeller public health had a radical new method—one that came to be known as the “intensive method”—whose genealogy can be traced to the celebrated triumphs of US military medicine over yellow fever in Cuba and the Panama Canal Zone, and which had as its objective disease eradication through the systematic testing and treatment of all residents of a specific political jurisdiction for hookworm infection. And it brought a concrete commitment to institutionalize a public health apparatus in Nicaragua with the gradual transfer of responsibility for maintaining the department to the local government.

THE NICARAGUAN MISSION AND ITS STAFF

It is important to stress that the International Health teams did not comprise US nationals as, for example, the core units of the Philippines Health Service did. There was one American national acting as director and trying to avoid associating professionally or institutionally with other US agencies in an effort to maximize incorporation of the mission by locals. His staff, including senior staff, was made up of Nicaraguans with an already established knowledge and practice of a certain style of medicine and public health, including that pertaining to the treatment of hookworm disease. This allowed the mission to acquire a national character that was more than merely a cloak for imperial penetration; it also meant that the local staff influenced the shape of the mission and determined to a large extent whether or not it would be successful. This was, in fact, as the IHC wanted it. As the mission director’s task was outlined by Rose in a February 1914 memorandum to White, “It will be his duty to discover this local material, to organize it; to train it to efficiency. There will be great advantage in having the services thus rooted in the life and traditions and intimate confidence of the people.”

Daniel Molloy, the man assigned to direct the International Health mission in Nicaragua, was a native of Alabama, and the product of the kind of apprentice medical school training typical of the US prior to the Flexner Report reforms of the early 20th century. He spent a year in an agricultural college prior to attending medical school at the University of Nashville where, after his first year, he was licensed as a medical practitioner in Mississippi and worked there for three years prior to returning to Nashville to finish his degree, graduating with honours in 1908. Following a short stint as an intern, and later assistant to the Division Surgeon of the Santa Fe Railroad hospital in Albuquerque, he sat the civil service exam and was appointed a physician in the Philippines Medical Service. From 1909 to 1913, Molloy worked at over a dozen posts,
including detection, collection, and transportation of lepers to the Culion Leper Colony, Director in Charge of Cholera in Bulacan Province, and Medical Officer for the “Wild Tribes” (District Health Officer Mountain Province). According to his application letter to International Health, Malloy had “considerable experience in the organization of local health departments, hospitals, and dispensaries throughout the Islands, as well as the training of health officers, nurses, and ‘practicantes’ for provincial health work.” His Philippine service had left him with good Spanish. 22

Returning to the US in 1914, he transferred to the Federal service of the USPHS and, while headquartered in New Orleans, was engaged in the field investigation of malaria in Arkansas, Alabama, and Mississippi. In late 1914, after a meeting in Jacksonville with Joseph Ferrell, director for Central America, Molloy applied for work with International Health, specifically requesting that he be posted to Central America. 23 It is worth pointing out that, although Molloy specifically requested work as a director of a Central American program, he did not specify Nicaragua as a preference, nor did International Health plan to send him there. He was slated for the Guatemalan mission, but agreed to change at the last minute when Helen Rowan, the wife of the man originally chosen to direct Nicaraguan operations, stated a strong preference for going to Guatemala. Therefore, neither Molloy nor the Rockefeller directors assumed any natural affinity between the colonial health experience of Molloy and the plans for work in occupied Nicaragua. Of course, Molloy’s experience in the Philippines raises questions about the degree to which he transferred his colonial medical baggage to Nicaragua. As recreated brilliantly in Warwick Anderson’s recent study, Colonial Pathologies, the United States had trained and deployed a new cadre of public health experts to help make the Philippines occupation work. The focus on quarantine work (co-ordinated with brutal counterinsurgency warfare, especially during the rebellion of 1899-1902) and general sanitation evident early in the US occupation when health was still a military jurisdiction gave way to the creation of a numerous Philippine Medical Service, a division of the United States Public Health Service, comprising US nationals. Although civilian in nature, the medical service nonetheless incorporated much of the military culture of their predecessors. 24

Molloy was in many ways atypical of the men appointed to direct missions in the early stage of International Health work. He was single, while most were married (often to health professionals, who assisted them in establishing operations and managing the local office). 25 He was much more experienced than most, and had a more variegated experience as a medical practitioner and public health manager. Many of those recruited in 1914 were recent graduates of medical schools with little or no experience in medicine, or sometimes with two or three years working with the Rockefeller Sanitary Commission for the Eradication of
Hookworm Disease in the southern states. Most were not as worldly as Molloy, nor with anything approaching the kind of managerial and training responsibility that would fall on the shoulders of a mission director. Also atypical in an agency where physician-directors tended to circulate rather regularly from one post to another, Molloy would remain in charge for the entire 13-year duration of the hookworm program in Nicaragua.

A profile of the Nicaraguan staff hired by Molloy reveals what appears to have been an astute attempt to assemble some reasonably experienced health practitioners in a manner that overcame the tense regional political divide, and gave the mission a national character. First of all, he courted Luis Debayle, the former dean and still influential sponsor of the medical school at the University of León. As per the original agreement of 1915, International Health donated laboratory equipment to the León medical school (particularly welcome as the school’s only microscope had been lost in the civil war of 1912). The agreement, upon which Debayle had advised the government, contemplated using this school as a training ground for the Nicaraguan staff, and as the site for a central laboratory. Though this did not come to pass, except during times when the mission was working the areas around León, curry ing favour with León was especially important since the city was the capital of Liberal Party power. Given that a Conservative government had extended the invitation to International Health, the mission was vulnerable to Liberal attack. Molloy hired a man with León connections, José Dolores Tijerino, to be the Assistant Director—a key position since, as the highest ranking national in the mission, his skills were crucial for eliciting cooperation from government officials and local authorities alike. Tijerino had capped a Bachelor of Science at the University of León with a medical degree from the University of El Salvador. Molloy employed one field director from León, balancing out the northern Liberal contingent with two other field directors from the rival Conservative city, Granada. All three had university training in either Medicine or Pharmacy, as did the senior technical assistants, and two of these five senior staff members were “practicantes”—that is, men licensed to practice medicine in areas that were without a titled physician—while one had been a teacher at the high school in Masaya, another important town and site of the heroic stand taken by Benjamín Zeledón, a Liberal, against the US Marines in 1912. The other four junior technical assistants were all high school graduates, and three of them had practical experience in pharmacy.

The local staff of international health programs, whether of the Rockefeller Foundation or of later agencies like the Pan-American Health Organization, are often taken for granted by historians, assumed to be dutiful minions without character or prior skills or social or political ties. Although it is difficult to retrieve much information about most of the
nationals who staffed the hookworm missions, even a sketch like the one presented above underlines the degree to which they might give the International Health work legitimacy, bring wisdom and experience on popular medical and educational matters to the culturally neophyte US director, bridge political and regional divides, and effectively translate (in the widest sense) the discourse of modern hygiene and germ theory for a local subject population. In 1910s Nicaragua, this was a high-powered team of educated, licensed and experienced health practitioners to introduce into the very plazas, schools, yards, and houses of rural areas—where even the rudimentary primary school system built under Zelaya...
had crumbled some years earlier, and where the doctor, the pharmacist and the high school teacher were figures associated with the prestige and power of large town centres. They were not simply a group of generic technicians carrying out the instructions of a US director following an institutional manual written in the New York office; the Nicaraguan hookworm mission was a modernist vanguard of educated nationals used to engage the popular classes over medical matters, directed by an expert US public health physician and manager. Together, through a series of improvised translations of a standardized method, they would enact a complex, modern public health campaign.

THE INTENSIVE METHOD

The campaign against hookworm disease had two sides to it, one preventive and the other curative. The former was concentrated on educational work: public lectures, microscope demonstrations, and the distribution of pamphlets explaining the nature of hookworm disease and the life-cycle of the parasite; and the promotion of latrine-building and modern habits of defecation. The latter was carried out according to two distinct methods. In areas that were difficult to reach and had little transportation infrastructure, the teams usually pursued the “dispensary method,” establishing a laboratory at a central point in the area (or perhaps moving about from point to point over a period of time), and making efforts to publicize their presence and encourage people with the symptoms of hookworm disease to visit the lab, submit to an exam, and receive treatment. The dispensary method ceded the ideal objective of eradication, instead seeking to reduce the number of those disseminating eggs.²⁹ For the most part, however, the Nicaraguan mission was able to establish an ambitious intensive method on the Pacific plains and piedmont of the country where the great majority of Nicaraguans lived. The intensive method, adapted from the grid-mapping techniques developed by the US military in Cuba and Panama to eradicate yellow fever, involved a complete enumeration and examination of all residents within the designated work area, followed by treatment of positive cases with a powerful vermifuge (usually oil of chenopodium), followed by re-examination and re-treatment until cured.³⁰

The dual campaign began with the selection of a town or group of villages for operations, usually corresponding to the political jurisdiction of the municipio (the “municipality,” though according to the Spanish tradition more like a hierarchical canton made up of a major town, subsidiary towns and their environs).³¹ The medical director would visit the area and meet with local authorities to try to get their support for the campaign, and to agree upon a site that might house the laboratory. Subsequently letters would be sent to all local notables explaining the
campaign objectives and methods, inviting their support for this work of civilization and progress, and suggesting that they set an example by building their own latrines if they did not already have them. Notices would be posted in central places around the district announcing the inaugural date of the laboratory and inviting the residents to the grand opening and a public talk on the disease. On that day the mission personnel, with the help of stereopticons (and later motion pictures), microscope demonstrations, and posters explained the different stages of the disease and the sanitary conditions that permitted it to propagate, and they outlined the testing and treatment regimen and the way to build a latrine. The preparatory work sometimes also involved the erection of a model toilet in the central plaza of the town, and efforts were made “to attract the people there during the process of construction, explaining to them the different steps of the construction and use of the privy;” given the symbolic pre-eminence of the town plaza in the Latin American town, this was a bold and potentially controversial announcement that modern toilet practices must occupy a central and pre-eminent place in the political and cultural life of the people. 32

The inspectors then began to visit each house in the area to carry out their census and map the district. Each house was assigned a number

Figure 3

Map of Nicaragua IHC coverage. Courtesy of the Rockefeller Archive Center.
(which, extraordinarily, was stencilled on the exterior) and its occupants registered according to name, age, sex, and race. The Rockefeller Foundation Health Primer

Talks on hookworm disease and its prevention were given at each home, general hygiene counsel was dispensed, while at the same time the employees dispensed simple literature popularizing hygiene accompanied by instructions on how to build a sanitary privy. Finally, properly marked specimen containers were left for each member of the family, and the people were invited to present their fecal samples at the district dispensary on a certain day for examination. All this had to be done with great care and elaborate explanations to avoid people getting the impression that the work was “a guise for making a list of men that might be available as soldiers...; this is a very important point because the people have been fooled so often on various occasions by the Government; the thought that any person or institution would give their money to help others does not fit in with their code of life; they are inclined to feel that there must be something behind it.”

While the laboratory was up and running in a particular area, the inspectors and microscopists would carry out informal propaganda work designed to instruct and to win the trust of the residents. In the late afternoons and early evenings, when these labouring people had left the scorching fields for repose, conversation and play in the leafy yards outside their homes, the mission men would drop by, strike up a conversation, and if they sensed that a small lecture and perhaps micro-
scope demonstration on hookworm would be a welcome break from the ennui of country life, they would set up a table or hang a “high-candle-power” gasoline lamp from a tree and get to it, knowing that the activity and the lights would attract everyone in the neighbourhood. Any schools present in the district would also be a focus of work, with children instructed in using latrines, and given lectures on hookworm disease and hygiene using materials that Molloy had brought from the Philippines and had adapted for the Latin American setting.

By this imposing method, the Department of Uncinariasis was able to cover an impressive swathe of Nicaragua between 1915 and 1923 (see Table 1), examining over 50% of the national population of roughly 400 thousand, especially those in the semi-rural and rural districts stretching from Matagalpa, Jinotega, and Chinandega in the North, through the Managua hinterland, and south to Granada and down to Rivas. Almost one third of the country’s people received treatment for hookworm disease, and at least 12,000 families built privies in their homes for the first time (though many of these later fell into disuse, or were destroyed by the homeowners on the grounds that they were attracting mosquitoes and increasing incidences of malaria). The campaign against hookworm disease can be seen to have introduced modern hygiene and laboratory-based medical examination and treatment to a significant portion of the non-urban people of Nicaragua at a time when neither the medical profession nor the state was capable of doing so, or inclined to try. The influence was also felt in the main cities, Managua, Granada, and León, where International Health established permanent laboratories and, as a way of winning over prickly physicians to the mission, offered analyses of their patient samples for hookworm infection free of charge.

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<td>1919-1920</td>
<td>25,682</td>
<td>14,915</td>
<td>58.07%</td>
<td>4091</td>
</tr>
<tr>
<td>1920-1921</td>
<td>25,392</td>
<td>18,785</td>
<td>73.97%</td>
<td>2293</td>
</tr>
<tr>
<td>1921-1922</td>
<td>29,416</td>
<td>22,521</td>
<td>76.56%</td>
<td>1457</td>
</tr>
<tr>
<td>1922-1923</td>
<td>19,927</td>
<td>11,860</td>
<td>59.5%</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>209,183</td>
<td>138,748</td>
<td>66.32%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Informes del Departamento de Uncinariasis.

Table 1
Exams Undertaken and Number of People Found to be Infected by Uncinariasis in Nicaragua, 1915-1923
RESISTANCE AND OBSTACLES

Though Molloy appears to have had few complaints about the quality, competency, or work ethic of his staff, the comprehensive pretensions of the intensive method were, of course, never met. In some areas, particularly the mountainous areas north and east of Matagalpa where Sandino would later operate so successfully, the difficulty of the terrain made it impossible to reach the target populations in any but the most haphazard manner. Particularly intense periods during the rainy season could also sabotage a campaign, making it even more of a burden than usual for people to present themselves for lectures or treatment, and impeding the mapping of the district. Migratory work schedules meant that labourers would try to elude enumeration so as not to get trapped in a process of examination and treatment that might take weeks, or they would abandon the treatment mid-way. Large estates, initially thought to provide ideal concentrations of bodies for mass treatment, proved extremely cumbersome to work effectively due not only to the resistance of labourers, but to the refusal of owners and overseers to interrupt work schedules or invest in infrastructure for better drainage around workers’ quarters or in new camp latrine facilities. A few weeks all but wasted at the very outset of the campaign in 1916 at Central America’s biggest sugar complex, the Ingenio San Antonio in Chinandega, convinced Molloy to steer clear of such work.39

In some areas popular medical beliefs severely disrupted the work. Certainly popular healers tended to resent the intrusion of International Health into their domains. Aside from having their authority undermined, the provision of free anthelmintics and purgatives was a direct affront to their trade in medicines—a concern that also led many physicians and practicantes in district centres to resent the missions, and quietly undermine them.40 Taking blood samples could also generate highly negative reactions, especially among indigenous groups. In Nicaragua, this resistance born of ethno-medical beliefs was combined with anti-imperialism. There was sometimes a fear that the sample might be sent “to Yankee-land for some cabalistic purpose.”41 In the adjacent towns of Diriomo and Diria, where witchcraft reportedly was still being practiced by local curanderos, International Health found it impossible, especially in certain parts of town, to do the initial haemoglobin tests they liked to perform in order to establish a sense of the “anaemia quotient” they were facing (essentially a measure of the degree of hookworm infection). According to Molloy, it was later ascertained that:42

a rumor had circulated among these people that the little scraps of paper on which the blood was collected were turned over to the heads of the witch-spirits (El Viejo and La Vieja) who were supposed to live in a nearby cave. It was stated that the field director in charge of this work took these slips of
paper with the blood on them, and on which the names of the people had been written, to this cave at midnight every night, where the following dialogue took place:

“El Viejo”: “How many have you brought me tonight?
Assistant: “Fifty”
El Viejo: And who are they?

The Assistant reads off the names, which are forthwith inscribed in the “Book of Doom,” leaves the blood with “El Viejo,” and, after making some mystic signs, retires without comment. This process is repeated every night with the same ceremonies; and the field director is certain that he was watched on more than one occasion when, for some reason, he happened to be out at the “watching hour”….It took a great deal of explaining to dissipate the rumors, as well as to calm the fears of certain ignorant people that the microscope was an instrument of the Devil.

Around the work in Chinandega, other devil-pact beliefs circulated: it was said by some “that ‘So-and-So’ of some neighboring town was examined in one of the laboratories and took the medicines prescribed, which converted him into a steer, or some wild animal, and that he may be heard in some nearby mountain forest, where he, like Nebucadnezzor, eats the grass and roots which are to be found in abundance.” In any case, such rumors kept “hundreds of people away from the laboratories, and interfere with any positive work…in no inconsiderable degree.”

Indeed, they interfered so much that it was necessary to counter the beliefs in the publicity pamphlets distributed during campaigns. These devil-pact narratives echo ones discovered by Jeffrey Gould among sugar workers in Chinandega, Nicaragua at this time involving a metaphorical translation of capitalist exploitation and expropriation. There it was believed that some large landowners, having made a pact with the devil in order to establish their power, were capable of turning labourers into animals. Here we have a more general magical understanding of how the International Health work, with its special corporeal intrusions, was constituting a new field of political power over the villages.

While dramatic, the representative nature of these episodes should not be overstated. One of the great advantages of concentrating on hookworm disease was that the entire biomedical cycle of identification of the microorganism and treatment was potentially intelligible, given slight translation, within popular medical traditions. The micro-parasite was a worm, and could be blown up in picture and in microscope demonstration, while very large worms were even visible to the naked eye. People were highly aware of round-worms (ascaris) as a source of illness, and the oil of chenopodium followed by a strong purgative that International Health employed to treat hookworm was a standardized, pharmaceutical rendition of the medicine that Nicaraguans had used
as their principal vermifuge for centuries. As Molloy explained in 1916, “Chenopodium anthelminticum is a very common plant in all Central America, being known by the common name Apazote. Concoctions made from the seeds, pods and flowers of this plant are prescribed by the ‘curanderos’ in the treatment of all sorts of intestinal disorders, and its vermifugal action is known to all.”\textsuperscript{46} Indeed by late 1916 Molloy was concerned that people’s knowledge of the drug was translating into a loss of mystique (and power) for the campaign. “I have personally heard the criticism that we were using ‘quack medicine’ (‘medicina de curandero) more than once….It was at first thought that this familiarity with the drug might be turned to advantage; but later experience has proved that here, as elsewhere, ‘familiarity breeds contempt’.” The comment gives a sense of how close to established popular medical traditions the hookworm campaign might seem in some circumstances.\textsuperscript{47}

Moreover, the hookworm mission had significant successes in a number of important indigenous areas. In Masaya, where anti-US sentiments ran high, and the indigenous barrio of Monimbó was an autonomous jurisdiction, it was determined to soft-peddle the campaign rather than descend upon the community. A representative from Monimbó began to observe the work in the district laboratory over the course of a number of days; once he was satisfied that the process was not a threat, the teams were invited to treat the entire indigenous community. In Matagalpa, the indigenous capitanes de cañada (leaders) were successfully convoked and convinced to authorize the mission’s entry into their communities.\textsuperscript{48}

If popular medical practices posed only intermittent trouble for the campaigns, obligatory latrine construction was a constant source of discontent and resistance from residents and local authorities alike. Alongside the issue of forcing people to change a fundamental and quotidian daily physical ritual, there was a very acute issue of cost. As Molloy put it succinctly, “the owner of a rancho, consisting of four posts and thatched roof, cannot be expected to build a latrine.”\textsuperscript{49} Local authorities were extremely averse to enforcing the mandatory latrine laws and edicts passed by the central government in 1917 to bolster the hand of the hookworm teams since they were little interested in spending their own municipal resources let alone spending political capital forcing people to spend their resources, in order to construct an alien and unproven edifice of defecation. From the point of view of the hookworm teams, however, little in the way of preventive inroads could be made unless the toilet habits of barefoot folk could be corralled, and at one point Molloy decided to delay any treatment in a district unless 60% of homes had constructed latrines. This figure proved absolutely unattainable, and in the town of Santa Teresa the resistance of people and authorities amounted to rebellion—“the protest [against the ordinance for the construction of latrines] was signed by a large number of people, including
practically all of the municipal officials,” reported Molloy. The policy was quickly reversed.\textsuperscript{50}

The most systemic resistance met by the hookworm mission came from local authorities. This had more to do with the nature of political power in Nicaragua at this point, which had devolved to municipalities who were hostile to a central state that demanded much, delivered little, and had fallen into the grip of an alien power. In late 1916 Molloy reported that “political conditions have hindered, or rather, have made impossible the work in some localities. In some cases Assistants are refused admittance to houses….In some instances the reason given is that they do not wish to have anything to do with the ‘Yankee interference in the affairs of Nicaragua,’ confusing our work with what is harped on by certain local politicians as the American dominion (dominio Americana [sic]), or domination of their political affairs.”\textsuperscript{51} This anti-imperialist critique was also adopted by Liberal intellectuals of national stature, like Mariano Barreto, who in 1917 published an attack on President Chamorro for failing to see what was hidden behind the discourse of the Rockefeller public health venture. His perspective underscores the fact that critics were already voicing concerns that would be levelled at Rockefeller public health by the dependency theorists and Marxists of the 1970s. Barreto equated the public health mission as yet another example of the United States’ efforts to “exercise supreme power over all the branches of public administration…in order to exploit all economic avenues for their own gain.” He noted that the latrine construction campaign was simply part of a plan to create “toiletry throughout the Republic,” and the procession of filters and medicines would “become a brilliant business for the Americans.” After that, he wrote, “will come sewers and thousands of other requirements which certainly are important for the health and ornamentation of communities, but which in times of economic crisis are a violent attack on the health of those communities that lack the basics of life.”\textsuperscript{52}

Molloy tried to follow the lead of Louis Schapiro, his Costa Rican counterpart, who had considerable success piggy-backing the hookworm work onto the public primary school system. The Nicaraguan staff reported that teachers displayed a special interest in teaching students about hookworm disease and preventive hygiene, to the point that the national curriculum planners introduced hygiene classes into the primary schools\textsuperscript{53} and starting in 1918 manuals of popular hygiene were distributed to school children with the official textbook imprimatur of the government.\textsuperscript{54} This was meshed with the hookworm campaign further when it became mandatory for all students in public and private schools to be examined and treated for hookworm disease, and to present a certificate of health guaranteeing that they had been “cured” prior to enrolment in subsequent school years.\textsuperscript{55} This generated a School
Health Service under the direction of the Department of Uncinariaisis, which was responsible for invigilating and inspecting all matters of health in schools. However, the great difference between the impact of this initiative in the two countries was the lack of a primary school infrastructure in the rural areas of Nicaragua whereas primary education was virtually universal in the rural districts of Costa Rica by this time. The incipient network that had been built in the late 19th century was abandoned after the fall of Zelaya, and no effort was made by the Conservative governments of the US-occupation era to rebuild them. This limited the ability of the International Health mission to work through rural school infrastructure, and it also meant the rates of literacy in the Nicaraguan countryside were less than 30 percent in 1920, depriving the staff of a repertoire of didactic and conceptual advantages that their counterparts were able to make use of in Costa Rica, where literacy rates in the rural areas for men and women were almost 60 percent by 1920.56

In Costa Rica, rural schools and rural literacy allowed the missions to tap into the modernist energies of school teachers, especially women teachers, even in some of the most isolated parts of the country. The strong civic culture of what was already a frequently functional electoral democracy with widespread male suffrage was also tapped into: the inauguration of the district labs in Costa Rica were transformed into “turnos,” or “fiestas cívicas,” and the different strata of officials from the party in power would address the folk and provide civic sanction to the program. These mediating influences were all but absent in rural Nicaragua. Notably, the hookworm campaign directors turned to the priesthood for help—and got it. The single greatest ally of the work, according to the reports of Molloy, were the parish priests who “help materially, especially in sections where opposition is met.” In Church they gave sermons “from the pages of the book of Deuteronomy so familiar to all public health people,” and accompanied the inspectors in their house-to-house visits, “preaching the gospel of clean living in every sense of the word.”57

CONCLUSION

In his report to the Nicaraguan government in 1922, with the hookworm work winding down, Molloy rather wearily admitted to the Nicaraguan public sphere what had become apparent to all those involved around the world in International Health hookworm eradication work. “As a result of our long experience combating uncinariaisis in Nicaragua, we have arrived at the conclusion that we cannot try to expel uncinariaisis totally from a particular community or from all parts of the country, since the campaign would be long and tedious and the results obtained in no way commensurate with the high cost of carrying out the work.”58 The
dream of eradication was being abandoned, and it was precisely in places like Nicaragua that the realization of failure had been so evident. Not even where a relatively taut intensive method grid had been laid down, and where a competent and coherent team under the direction of a constant and assiduous overseer had completed work in all major populated sectors of the country, was it possible to make any long-term inroads against re-infection of those once pronounced “cured.”

This does not mean, however, that the program was a failure. Familiarity also bred better strategies for campaigning on the part of the hookworm missions and the target populations alike. Especially in the wake of the influenza pandemic that hit Nicaragua in 1919-20, and with growing awareness of the work of the mission, regional political authorities began to risk calling for a district lab to be set up, or noting that the general hygienic culture of their jurisdiction had been improved after the campaign had passed through.39 Depending on the municipality in question, the modernist sanitarian energies of International Health might be incorporated to achieve material cultural transformation and political or religious mobilization. Perhaps most relevant for the long-term goals of International Health’s demonstration model, the hookworm work did help public health institutions to crystallize. Starting in the early 1920s the Nicaraguan government, authorized by the High Commission, began to appropriate meaningful annual sums for the Department of Uncinariasis and for sanitation.

<table>
<thead>
<tr>
<th>Year</th>
<th>Appropriation</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919</td>
<td>4,922.00</td>
<td>Inspector of hygiene salary, purchase of sanitary articles, yellow fever campaign, Dept. of Uncinariasis</td>
</tr>
<tr>
<td>1920</td>
<td>11,043.00</td>
<td>Subsidy Dept. of Uncinariasis. salaries and expenses inspectors of hygiene</td>
</tr>
<tr>
<td>1921</td>
<td>5,700.00</td>
<td>Hygienization of country</td>
</tr>
<tr>
<td>1922</td>
<td>4,662.50</td>
<td>Expenses Dept. of Uncinariasis, hygienization of Republic, sanitary maintenance</td>
</tr>
<tr>
<td>1923</td>
<td>2,705.00</td>
<td>Sanitary maintenance</td>
</tr>
<tr>
<td>1924</td>
<td>4,500.00</td>
<td>Sanitary maintenance, yellow fever campaign</td>
</tr>
<tr>
<td>1925</td>
<td>7,350.00</td>
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</tr>
<tr>
<td>1926</td>
<td>3,000.00</td>
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</tr>
<tr>
<td>1927</td>
<td>16,800.00</td>
<td>Sanitary maintenance</td>
</tr>
<tr>
<td>1928</td>
<td>30,270.00</td>
<td>Dept. of Health</td>
</tr>
</tbody>
</table>

Source: Memorias del Recaudador de Aduanas y la Alta Comisión, 1919-28.
In 1919 the government, faced with a yellow fever epidemic, asked International Health to extend its containment efforts to Nicaragua. In the wake of this joint effort the Department of Uncinariasis hosted a sanitary engineer who began to develop a malaria control plan for the country. Out of these efforts at mosquito control, the government agreed to permanent funding for a Corps of Inspectors who were to enforce the sanitary laws, and follow up with municipalities to see that they were continuing the hygiene tasks begun by the Department of Uncinariasis. International Health considered the securing of public funding for this corps to be one of their greatest achievements.60 In 1922 Nicaragua signed onto International Health director Frederick Russell’s program to underwrite Public Health laboratories for the Latin American republics, and the facilities subsequently established in Nicaragua played a major role in improving the sanitation of Managua. Also in 1922 the government committed to creating a Director General of Sanitation and a National Hygiene Council as central units in a National Department of Public Health. Even this required three years of political wrangling, however, and the final entity, under the direction of a Nicaraguan physician trained with a Rockefeller fellowship at a US school of public health, fell short of the full International Health objective of having its institutional health implants evolve to the point that they might receive ministerial status, rather than remaining a relatively powerless appendage to the Ministry of the Interior.61

One could make the argument that the International Health mission served the interests of US imperialism in Nicaragua as an unintentional by-product of realizing its own mission, since it provided some coherent social policy and institutional health presence for the state in rural areas at a time when the state had no capacity to mount such initiatives, and re-built tenuous bridges between local and national authorities that were part of the re-emergence of the new Nicaraguan state in the early 1930s. Yet, if anything, the goals of Rockefeller International Health in Nicaragua were damaged and limited by the imperial intervention, since it meant a fractured and under-funded state which was unable to provide dynamic guidance or fiscal charge to the mission, and more deeply-embedded suspicion of the US origins of the program among the popular classes, local authorities, and some members of the national elite who might otherwise have been more vocal and active supporters.

There is a notable, if perhaps incidental, connection between the IHC public health mission and the rise of one of Latin America’s most notorious dynastic dictatorships, that of the Somoza family. The first Somoza, Anastasio Somoza García, had married the daughter of Nicaragua’s discoverer of hookworm disease, Luis Debayle, and in the 1920s, prior to his meteoric rise in the officer ranks of the National Guard, he worked as a sanitary inspector on the mosquito control units of the Nicaraguan IHC
Later, as head of the US-created National Guard, he oversaw the assassination of Augusto Sandino and quickly moved to consolidate power. Under the rule of the Somoza family, which lasted until the triumph of the Sandinista revolution in 1979, Nicaragua would develop an abysmal healthcare system, with a skewed concentration of medical and health institutions in the city, and the near abandonment of rural health initiatives by the state. If the IHC briefly served to provide the US-sponsored Nicaraguan public power a state social policy presence in the rural areas between 1915 and 1928, the gains did not take root and ultimately disappeared when a new state—still sponsored by the US—concentrated resources in a praetorian program for consolidating dictatorial power in the rural districts.

NOTES

1 Steven Palmer’s research for this article was funded by a Rockefeller Archive Center Grant in the History of Basic Medical Research. Ligia Peña’s research was supported by Instituto de Historia de Nicaragua y Centro América. Managua, Nicaragua.

2 The name of the agency was changed to International Health Board in 1916, and then to International Health Division in 1927; for simplicity sake, and to avoid endless acronyms, we use “International Health” and IHC interchangeably in this article.


6 For studies of this period, see Andrés Pérez-Baltodano, Entre el estado conquistador y el estado nación. Providencialismo, pensamiento político y estructuras de poder en el desarrollo histórico de Nicaragua (Managua: Instituto de Historia de Nicaragua y Centroamérica-UCU, 2003), 373; Carlos Quijano, Nicaragua: Ensayos sobre el imperialismo de los Estados Unidos: 1909-1927 (Managua: Vanguardia, 1987); Francis Kinloch Tijerino, Historia de Nicaragua (Managua: Instituto de Historia de Nicaragua IHNCA-UCU, 2005); and Knut Walter, El Régimen de Anastasio Somoza García:1936-1956 (Managua: Instituto de Historia de Nicaragua y Centroamérica IHNCA-UCU, 2004).


8 Walter, El régimen de Anastasio Somoza, p. 35; Gobat, Confronting the American Dream, p. 300.

9 M. E. Connor, Report to Wyckliffe Rose, 1 February 1917, p. 8; folder 201, box 34, series 2, Record Group 5, Rockefeller Foundation Archives—Rockefeller Archive Center, Sleepy Hollow, New York (hereafter RFA-RAC).
10 In Latin America the disease was usually referred to formally as ancylostomiasis, according to the name given by their Milanese discoverer, Angelo Dubini in the late 1830s: *Achylostoma* (hooked-mouth) *duodenale* (the worms hook into the duodenum); or uncinariasis, the name given to the disease in Nicaragua and adopted for the name of the IHC mission.


15 “Report for the Relief and Control of Uncinariasis in Nicaragua for the Year 1915,” box 150, Record Group 5, RFA-RAC.


17 “White to Alvarado [Minister of Interior, Costa Rica],” 7 April 1914, folder 87, box 6, series 1.2, Record Group 5; “White to Rose,” 7 April 1914, p. 2; folder 87, box 6, series 1.2, Record Group 5; both RFA-RAC.

18 Ettling, *Germ of Laziness*, p. 25.


20 Diario El Cronista (León), no. 887, 12/08/1921, p. 5.

21 “Draft Memorandum for Dr. White”, 21 February 1914, folder 86, box 6, series 1.2, Record Group 5, RFA-RAC.

22 Malloy to Ferrell, 7 December 1914, folder 89, box 6, series 1.2, Record Group 5, RFA-RAC.

23 Malloy to Ferrell, 7 December 1914, folder 89, box 6, series 1.2, Record Group 5, RFA-RAC.


26 M. E. Connors, “Report on Conditions in Nicaragua,” p. 7; folder 201, box 34, series 2, Record Group 5, RFA-RAC.


28 “Report for the Relief and Control of Uncinariasis in Nicaragua from 1 January to 31 December 1916,” Box 15, Record Group 5, RFA-RAC.


31 The following sequence is distilled from Daniel Malloy, “Third Annual Report on work for the Relief and Control of Uncinariasis in Nicaragua for the period 1 January 1917 to 31 December 1917,” folder 1788, box 150, series 3, Record Group 5, RFA-RAC, and Idem., “Report on Work for the Relief and Control of Hookworm
Disease in Nicaragua from 22 September 1915 to 31 December 1920, folder 202, box 34, series 2, Record Group 5, RFA-RAC.

32 M. E. Connor, Report to Wyckliffe Rose, 1 February 1917, folder 201, box 34, series 2, Record Group 5, RFA-RAC, p. 11.

33 Connor, Report to Wyckliffe Rose, 1917, p. 11.

34 “Malloy to White”, 1917, folder 201, box 34, series 2, Record Group 5, RFA-RAC.


38 “Report on Work for the Relief and Control of Uncinariosis in Nicaragua, first quarter, 1916,” p. 8, folder 1787, box 150, series 3, Record Group 5, RFA-RAC.

39 “Report for the Relief and Control of Uncinariosis in Nicaragua, for the Year 1915,” p. 1-2, folder 1787, box 150, series 3, Record Group 5, RFA-RAC.

40 For a complaint of this kind on Nicaragua, see: “Report on Work for Relief and Control of Uncinariosis in Nicaragua in the 1st Quarter, 1916,” p. 8, folder 1787, box 150, series 3, Record Group 5, RFA-RAC.

41 “Report on Work for Relief and Control of Uncinariosis in Nicaragua in the 2nd Quarter, 1916,” p. 13, folder 1787, box 150, series 3, Record Group 5, RFA-RAC.

42 “Third Annual Report on work for the Relief and Control of Uncinariosis in Nicaragua for the period 1 January 1917 to 31 December 1917,” pp. 15, 17; folder 1788, box 150, series 3, Record Group 5, RFA-RAC.


49 “Report on Work for the Relief and Control of Hookworm Disease in Nicaragua, September 22, 1915 to December 31, 1920,” p. 35; folder 202, box 34, series 2, Record Group 5, RFA-RAC.


51 “Report on Work for Relief and Control of Uncinariosis in Nicaragua for the Quarter ending June 30th, 1916,” p. 12-13, folder 1787, box 150, series 3, Record Group 5, RFA-RAC.


53 Informe Anual de los Trabajos realizados desde el 1º de octubre de 1919 hasta el 30 de septiembre de 1920, elevado al Ministerio de Policía por el Departamento de Uncinariosis (Managua: Tipografía Nacional, 1920), p. 19.

54 Marcos Ortega, Lecciones de higiene (Granada: Tipografía El Centroamericano, 1918).


60 “Informe Anual de los Trabajos realizados desde el 1º de octubre de 1918 hasta el 30 de septiembre de 1919,” in República de Nicaragua, Memoria de la Gobernación, Policía y Cultos presentada al Congreso Nacional por el Ministro del ramo Dr. Venancio Montalván, 1919 (Managua: Tipografía Nacional, 1920), p. 284.
