

PART I

Colonial Entanglements

On November 15, 1932, representatives from several African colonial territories, British India, the League of Nations Health Organization, and the Rockefeller Foundation met in Cape Town, South Africa. The purpose of the meeting was to discuss questions relating to public-health administration and protection against epidemic diseases. Much of the conference focused on the problem of yellow fever. Growing concerns about the potential spread of yellow fever from its endemic locations in Latin America and west central Africa into other African colonial territories, and from there to South Asia, provided the background for these discussions.

A map labeled “African Air Routes, 1932” accompanied the conference report.¹ This map showed the routes of European airlines crisscrossing the continent and connecting Africa to the wider world. It was intended to illustrate that advances in air travel, which were bringing various parts of the world into closer contact with one another, were also creating pathways along which pathogens—specifically, yellow fever—could travel. The British, who had established colonies from Egypt to South Africa at the end of the nineteenth century, feared that yellow fever could be transported from West Africa to its colonies elsewhere in Africa, and from there to the jewel of its colonial empire in India, where the deadly disease had never been identified but the mosquitoes that transmitted it existed. The impact of this eastward spread of yellow fever would be devastating. The League of Nations Health Organization, which had been established after World War I as part of an effort to prevent future wars by ensuring the health and well-being of the world’s populations, viewed the conference as an opportunity to expand its influence into the colonial world. The Rockefeller Foundation, which had established an International Health Board in 1913 to advance the science of hygiene across the globe, had begun a campaign to eradicate yellow fever in Latin America and West Africa after the war. In 1932, it was exploring the limits of the disease in East Africa. The conference thus highlighted the shared concerns of newly established international-health organizations and colonial health officials. It revealed the extent to which the interests of the

two groups had become entangled.

Historians have tended to treat the histories of colonial medicine and early international-health organizations as separate topics. Yet recent studies by Warwick Anderson, Steven Palmer, Nancy Stepan, Deborah Neill, Sunil Amrith, and Helen Tilley have suggested that colonial medicine and international health shared a long and complex history, stretching from the end of the nineteenth century up through the 1950s.² Social networks linked colonial health authorities with international organizations. Colonial medical authorities and representatives of international-health organizations collaborated in efforts to control sleeping sickness, malaria, hookworm, and yellow fever. They traveled along the air routes represented in the 1932 map, engaging in international meetings like the 1932 Cape Town conference, and consulted with one another. They published articles in the same scientific journals and formed complex research networks that stretched across the globe. Colonial officials moved back and forth, serving at various times in colonial administrations and international-health organizations. Most importantly, the early interventions of international-health organizations were developed within colonial settings and, to a significant degree, were dependent on the coercive power of colonial rule. These interventions were also shaped by colonial ideas about “the pathology of native populations” and the inability of colonial peoples to improve their own health. All of these linkages contributed to the entanglement of colonial medicine and international health and shaped the subsequent development of international health. If we are to understand why disease-focused interventions were privileged over the development of basic health services and efforts to address the social determinants of health, we must start with these colonial beginnings.

Part I examines these interconnections, focusing primarily on the role played by America’s colonial possessions in the Caribbean, Panama, and the Philippines in the formation of a set of practices, attitudes, and personnel that would come to inhabit international-health institutions and interventions over the first half of the twentieth century. The linkage between colonial medicine and international health was not limited to the United States, which was, in fact, a latecomer to the colonial division of the globe. European colonial physicians had developed their own ideas and practices to deal with the

health of colonial populations. Moreover, similar connections tied European colonial physicians to emerging international organizations in Europe during the early twentieth century (part II). I have chosen to focus on early US involvement in overseas health because the United States, as the largest funder of international-health activities, came to play a dominant role in crafting international-health policies. US economic and political interests shaped many of the strategies that became part of global health, especially during its formative years.

In chapter 1, I describe US medical interventions within its colonial holdings in the Americas and the Philippines. I argue that it was in these colonial settings that a model of health interventions—the disease-elimination campaign—was perfected.³ While alternative approaches were implemented and had a significant impact on improving health in Panama and Cuba, it was the disease-eradication campaign that became a central element of early international-health efforts.

In chapter 2, I trace the movement of US colonial medical officers into the Rockefeller Foundation's International Health Board (IHB), which grew to become the most influential international-health organization in the first decades of the twentieth century. I focus particularly on the role these former colonial medical officers played in directing the IHB's campaigns against hookworm and yellow fever. I also describe how colonial medical knowledge was incorporated into the training of a generation of international-health workers through schools of tropical medicine and hygiene that the Rockefeller Foundation established in the United States, Europe, Latin America, and Asia. Through these educational activities, the knowledge produced in colonial settings was transferred into the world of international health. Over time, the intersection of colonial medicine and international health transformed colonial ideas and practices into a kind of international expertise about the health problems of the "tropical" or "developing" world and the strategies needed to deal with them. Freed from their colonial moorings, these ideas became available for use in post-and noncolonial settings by international-health experts across the globe. They became naturalized as global-health science.

CHAPTER ONE

Colonial Training Grounds

William Gorgas and Yellow Fever

Yellow fever, which drew the attention of those attending the Pan African Health Conference in Cape Town in 1932, is a good place to begin to understand both the nature of colonial medicine and its entanglement with the emerging field of international health.¹ Yellow fever was a ghastly disease that, in its final stages, resembled Ebola, causing patients to vomit and defecate blood. Epidemics of yellow fever occurred regularly in port cities in the Caribbean, Latin America, and the southern United States during the eighteenth and early nineteenth centuries, creating heavy losses of life and disrupting commerce. The disease also occasionally reached northern port cities in Europe and America.

The causes of yellow fever were debated. Some believed it was a contagious disease that spread from place to place, often on board ships. These authorities called for the establishment of quarantines restricting the movements of ships, to prevent the spread of the disease. Others viewed yellow fever as a product of local environments and poor sanitation. These sanitationists viewed cleaning up environments as the best way to prevent the spread of yellow fever. By the end of the nineteenth century, both approaches were being employed, and nations in Europe and the Americas sought to limit the spread of yellow fever through a combination of international trade regulations, urban sanitation, and various forms of quarantine. In addition, new institutions and international conferences explored ways to prevent the spread of yellow fever. The Pan American Sanitary Bureau, which later became the Pan American Health Organization, was founded in 1902 as an instrument for coordinating hemisphere-wide efforts to prevent the spread of contagious diseases, the most important of which, at the time, was yellow fever. These efforts had only a limited impact on the occurrence of yellow fever.

It was not until the US military occupation of Cuba at the end of the

nineteenth century and the discovery of the role of the *Aedes aegypti* mosquito in the transmission of yellow fever that health authorities were able to effectively prevent and eliminate the disease from the port cities around the Atlantic where it had become a recurring threat. Yellow fever–eradication efforts in Cuba (and later in Panama) involved direct intervention in the lives of local populations by US health authorities and created a model for subsequent international-health interventions, as well as a training ground for men who would become international-health leaders. US efforts to control cholera in the Philippines, America’s other colonial possession, reinforced this model and provided another colonial training ground.

Much of the history of yellow fever is familiar to historians and practitioners of public health. Carlos Finlay, Jesse Lazear, Walter Reed, and the US Yellow Fever Commission unraveled the mechanism by which yellow fever was transmitted by the female *Aedes aegypti* mosquito; William Gorgas successfully applied this new knowledge to rid Havana and Panama of the disease; and Frederick Soper expanded Gorgas’s methods to eradicate yellow fever from the Americas. All of these events are landmarks in a progressive narrative of international public health in which medical science overcomes age-old diseases and opens up tropical lands to economic development. The history of these events, however, is more complicated. Medical science played an important role. But multiple approaches to health were involved. In reexamining Gorgas’s work, we need to ask why medical discovery and the disease-eradication campaign became the center of this history and formed a model for future international-health efforts. Why were alternative approaches forgotten or ignored?

William Crawford Gorgas was born October 3, 1854, in Toulminville, Alabama, near Mobile. He received his medical training at Bellevue Hospital Medical College in New York City, graduating in 1879. He then entered the US Army as an assistant surgeon. After he contracted and survived a bout of yellow fever that left him immune to the disease, the army assigned him to locations where the disease was prevalent. He spent several years combating yellow fever epidemics in Texas and Florida.²

In 1898, the United States declared war on Spain and invaded Cuba and the Philippines. Following several months of sea and land battles, the Spanish

sued for peace and ceded control of Cuba, the Philippines, Puerto Rico, and Guam to the United States in the Treaty of Paris. The United States had overnight become an overseas colonial power. Its colonial possessions would become training grounds for a generation of US public-health workers who would later take up positions in emerging international-health organizations. While the 1898 invasion of Cuba was ostensibly intended to defend Cuban independence from Spain and stabilize trade relations in the region, Cuba had long been viewed by the United States as a hotbed of yellow fever and a source of the recurrent yellow fever epidemics that ravaged the American South. As Mariola Espinoza has convincingly argued, the invasion of Cuba was intended to put an end to this hemispheric threat of contagion.³ Responsibility for the elimination of yellow fever in Cuba quickly fell to Colonel William Gorgas. The army sent Gorgas to command a hospital for US yellow fever patients in Cuba in 1898. The following year, he was appointed chief sanitary officer of Havana. Over the next two years he dedicated himself to cleaning up Havana and eliminating yellow fever.

Gorgas's initial approach to yellow fever in Havana followed the traditional strategy that has been employed by military and civil authorities in the United States: quarantine, combined with efforts to sanitize the city.⁴ Havana, a major port city, was notorious for its lack of sanitation. In 1879, the US National Board of Health had sent a group of experts to examine sanitary conditions and the problem of yellow fever in Havana. Its report described unpaved, garbage-ridden streets; poor, overcrowded housing that lacked ventilation; and the absence of proper sanitation. Most households relied on privies to dispose of human waste, which contaminated the soil and the city's water supply. Referring to the pervasive use of privies, the report noted: "The effluvia therefrom pervades the houses, and the fluid contents saturate the soil and the soft porous coral rocks on which the city is built. Hence, all well water is ruined, and every ditch dug in the streets exhales an offensive odor. Thus Havana may be said to be built over a privy."⁵

Efforts were begun to sanitize Havana and the other large cities of the island as soon as US forces succeeded in pacifying Cuba. In Havana, Gorgas employed teams of sanitary officers to regularly scour the city, removing rubbish, dead animals, and untreated diseased persons from public places. Teams of street cleaners swept the streets and disposed of waste. Horse-

drawn sprinklers regularly sprayed the streets with electrozone, a disinfectant manufactured through the electrolysis of seawater. His teams also inspected private residences and businesses. These activities had a dramatic impact on the health of the city. The overall death rate dropped from 98 per 1000 individuals in 1898 to 24.4 in 1900. But yellow fever continued.⁶

Recognizing that sanitation efforts had failed to control yellow fever, Gorgas adopted a new approach, based on the work of the Yellow Fever Commission. In February 1901, he began targeting the *Aedes aegypti* mosquitoes. Gorgas directed his sanitation officers to attack the mosquitoes on two fronts: fumigating the houses of yellow fever patients and those of their neighbors, to kill any mosquitoes that may have been infected by the patient; and eliminating mosquito larvae by screening, covering, or oiling open water sources.⁷ This campaign required meticulous reporting and surveillance. It also required the cooperation of local residents, which was not readily obtained, as they objected to the intrusive measures introduced by Gorgas. Fumigation was a messy business that resulted in the staining of fixtures and fabrics. Gorgas's inspectors also emptied or destroyed water containers and sprayed oil on the surface of water kept in cisterns. None of these activities were popular. Most Cubans did not view yellow fever as a serious health problem, since years of repeated yellow fever epidemics had left large portions of the Cuban population immune to the disease. Yellow fever was much more of a threat to newcomers, especially to the invading American military troops, most of whom were susceptible to the disease.

To achieve cooperation, Gorgas employed legal sanctions to enforce compliance and punish householders who refused to eliminate breeding sites.⁸ The fact that the city was under US military occupation made the application of these sanctions possible. More-collaborative methods for developing community cooperation were never considered. The importance of military rule to Gorgas's success in eliminating yellow fever from Havana was emphasized by Gregorio M. Guitéras, who unsuccessfully tried to apply Gorgas's methods to eradicate yellow fever in the city of Laredo, Texas, in 1903. He concluded: "The Laredo epidemic has shown conclusively to my mind that results such as were obtained in Havana in the suppression of yellow fever during the American occupation cannot be obtained elsewhere, where the disease is widely spread, without the undisputed authority and the

means that were at the command of the Government of Intervention in Cuba. These powers in reality amounted to martial law.”⁹

Gorgas’s campaign against *Aedes aegypti* mosquitoes ended yellow fever transmission in Havana in less than a year. His victory was a major vindication of the mosquito theory of yellow fever, though not everyone was convinced. It was also a victory for the emerging specialty of tropical medicine. Moreover, it provided a strategy for attacking yellow fever in other parts of Latin America. In 1904, Gorgas was sent to direct sanitation efforts in Panama, where the United States had taken over the building of the Panama Canal from the French. The Isthmus Canal Convention granted the United States control over a strip of land, mostly covered by jungle vegetation, that ran from the Pacific Ocean to the Atlantic and extended five miles on either side of the canal route. Excluded from US control were two major cities on either end of the route: Colón (located on the Atlantic Ocean) and Panama City (on the Pacific). Construction of the canal involved some 60,000 workers, about half of whom came from the West Indies. Control of the Canal Zone was directed by the Isthmus Canal Commission, which exercised authority over nearly every aspect of the lives of its employees.

[image “image” file=../images/Packard_Figure_1_fmt.jpg]

Colonel William C. Gorgas overseeing work on the Panama Canal. National Library of Medicine.

Like Havana, the Canal Zone suffered greatly from yellow fever, as well as from malaria. The combined diseases had virtually halted French and American efforts to build the canal. Gorgas applied the lessons from Havana, launching a sanitation campaign aimed at eliminating *Aedes aegypti* and *Anopheles* mosquitoes. This involved massive drainage operations and the installation of screens on houses. Gorgas calculated that his men drained 100 square miles of territory, constructing roughly 6.5 million feet of drainage ditches. They also applied 50,000 gallons of kerosene oil a month to breeding sites.¹⁰ In the end, he succeeded in bringing both diseases under control, eradicating yellow fever.

In reviewing Gorgas’s successful campaigns, I want to stress four points. First, in many respects Gorgas’s methods resembled colonial medical

campaigns that were conducted against cholera, plague, sleeping sickness, and malaria in Africa and South Asia by European colonial authorities. Specifically, in parallel with colonial medical campaigns elsewhere, the decision to attack yellow fever was based on external interests—in this case, US military and public-health needs—as much as on the interests of the colonized populations. The campaigns were imposed from above, with little concern for the ideas or the cooperation of local residents. Compliance was achieved through compulsion. These campaigns focused narrowly on a single disease, rather than on the development of broad-based health services. Gorgas insisted that wider sanitation efforts were unimportant for controlling yellow fever, as long as there was an effective system for controlling mosquitoes.¹¹ Colonial health services in general were designed to protect the health of Europeans and American colonial personnel and workers, who were essential to the colonial economy. Health services were clustered in urban areas and sites of economic production. The general health of colonial populations was left to European and American missionaries, who built mission hospitals and concentrated on improving maternal and child health, and to the occasional military-style disease campaigns, like Gorgas's efforts against yellow fever.

Second, the success of the disease-campaign approach to public health was dependent on the colonial environments that existed in places like Havana, Panama, and the Philippines.¹² Colonial contexts empowered public-health officials to act unilaterally, applying health strategies that served the narrow interests of colonial authorities. This empowerment was made possible by the ability of colonial officials to enforce sanitation laws. But it was also achieved through the cultural construct of subject populations being dependent and incapable of taking responsibility for their own health. Such attitudes ignored the existence of local bodies of medical knowledge and, in the case of Latin American countries in the early twentieth century, existing public-health infrastructures, such as those described by historian Steven Palmer.¹³ Medical research into tropical diseases preceded the arrival of US colonial medical authorities.

Gorgas himself seldom used disparaging or racially charged language to describe the local populations of Panama and Havana. In fact, he paid little attention to the native populations at either location. His primary concern was

the health of white Americans. As long as he had the power to fine those who resisted his regulations, he did not need to enlist their cooperation and, thus, did not have to be concerned about their character. His concern was mosquitoes and their elimination. He occasionally complained about the ignorance of his workers and their need for supervision.¹⁴ But I found little evidence in his writings of the racialized discourse that characterized the language of many whites living in colonial settings at this time and was clearly articulated in the Philippines.¹⁵

Yet Gorgas shared a belief with many of his countrymen that the development of the tropics depended on the success of white settlement. Indigenous populations were incapable of developing these areas. He felt that the greatest significance of his sanitary work in Cuba and Panama was that it demonstrated that white men could live in the tropics.¹⁶ It is also true, as historians Alexandra Stern and Julie Greene have shown, that Panama was very much a colonial society in which racial ideas shaped social relations and economic opportunities. Segregation and racial discrimination were the rule.¹⁷

Third, the methods employed by Gorgas became a model for international-health efforts over the next century. They were a persistent feature of international, or global, health interventions up through the end of the twentieth century. Gorgas himself became an international celebrity within public-health circles. His successes and fame led him from the world of colonial medicine to that of international health, becoming one of a growing number of colonial medical authorities (including a number of physicians who had worked with Gorgas in Panama and Cuba) who traveled around the globe as technical advisors, working for foreign governments, attending international sanitary and medical conferences, and taking up positions in newly emerging international-health organizations. Gorgas became part of the community of authorities on tropical medicine, corresponding frequently with a number of prominent physicians and public-health experts in the United States and Europe and attending numerous medical and public-health conferences. Among his wide circle of correspondents was Sir Ronald Ross, whose work in India in the 1880s on the role of mosquitoes in transmitting malaria contributed to unraveling the source of yellow fever in Cuba. Ross visited Panama and forwarded Gorgas's annual reports on the situation in that

country to the government of India, in an effort to encourage Indian health officials to more aggressively adopt vector-control strategies to combat malaria.¹⁸ Gorgas also corresponded with the eminent American sanitationist Charles V. Chapin, with whom Gorgas exchanged ideas and debated the importance of various sanitation strategies. Malcolm Watson, who advanced knowledge of species sanitation through his work in Malaya and subsequently served as an advisor on malaria control in several British colonies in Africa, visited Panama and praised Gorgas's work as the "greatest sanitary achievement the world has seen."

Finally, despite the dominant roles of scientific discovery and the disease campaign in the history of efforts to improve health conditions in Cuba and Panama, these were not the only strategies deployed by Gorgas. It could be argued that other interventions played an equally important a role in the building of the Panama Canal. Yet they received little attention from health authorities at the time, or from later historians.

Alternative Approaches

Gorgas was primarily interested in yellow fever and malaria, which threatened the lives of American workers. Yet he was also concerned about pneumonia, which was taking the heaviest disease toll among the West Indian workers who made up the bulk of the canal labor force. Attacking mosquitoes would not prevent pneumonia deaths. Other methods had to be employed. Gorgas appointed a board to identify the conditions that were responsible for the pneumonia cases. The board studied a range of variables, including annual fluctuations in the incidence of the disease and differences in altitude, climate, months of employment, sleeping quarters, and clothing.¹⁹ It concluded that the overcrowding of workers, some 84 to a room in dilapidated barracks inherited from the French, had contributed to the spread of infection and was primarily responsible for the high rates of pneumonia mortality.

Gorgas's solution to this problem was to recommend that the West Indian workers be given land on which to construct their own huts. He also encouraged them to bring their families with them. To assist in this endeavor he recommended that their wages be doubled, from US\$0.11 to US\$0.20 an hour. While this was considerably less than the salaries of white workers in

the Canal Zone, Gorgas claimed that it was four times that of the salaries paid to workers in the countries surrounding the canal. By 1910, 30,000 of the total population of 37,000 West Indian workers lived in their own huts, many of whom settled there with their wives and children. Gorgas attributed the subsequent decline in pneumonia among this population to their resettlement and the elimination of overcrowding.²⁰ Had Gorgas not successfully addressed the pneumonia problem that plagued the West Indian workers, it is unlikely that the canal would have been completed.

Death rate from pneumonia among negroes

[image “image” file=../images/pg25.jpg]

While Gorgas is remembered as the father of the military-style disease campaign, which became a central weapon in later international-health efforts, he believed in the importance of addressing what we now call the social determinants of health. Commenting on the lessons learned from Panama, Gorgas noted in a 1915 lecture to the health officers of New York State:

It is a health officer’s duty to urge forward those measures in his community that will control individual diseases; but my long experience has taught me that it is still more his duty to take that broader view of life that goes to the root of bad hygiene, and do what he can to elevate the general social conditions of his community. This, my experience has taught me, can best be accomplished by increasing wages. Such measures tend at the same time to alleviate the poverty, misery, and suffering that are occurring among the poorest classes everywhere in modern communities.²¹

We should not be surprised by these remarks. Gorgas’s career spanned the transition from a sanitationist approach to public health that was dominant in America during most of the nineteenth century to the so-called new public health that was ushered in by the development of bacteriology, as well as by the emergence of parasitology and the discovery of the role of mosquitoes in the transmission of malaria and yellow fever at the end of the century. Nineteenth-century sanitary approaches to public health focused on eliminating a broad range of environmental conditions that were viewed as causing disease. Much of this work was aimed at improving water supplies,

housing, and nutrition. In the wake of the bacteriological discoveries of the 1880s, the new vision of public health aimed to improve health by identifying and attacking the germs and vectors that directly caused disease. In place of searching for the causes of disease in the environment, the new public-health professionals sought them out under the microscope.²² Powerful new methods of identifying disease overshadowed efforts to improve water supplies, clean the streets, and ameliorate the housing and living conditions of the poor.

It could be said that Gorgas came to Havana as a sanitationist, attempting to clean up the city, and left as an iconic representative of the new direction in public health, attacking mosquitoes. But his efforts to address pneumonia among West Indian workers showed that he retained a belief in the benefits of addressing the broader determinants of health. A closer look at the various public-health interventions he subsequently employed reveals his commitment to multiple approaches to public health.

Gorgas is often thought to have used the same type of campaign against yellow fever in Panama that he applied in Havana. Yet his work in Panama, while similar in many ways to that in Havana, was different in one fundamental respect. In Panama, Gorgas found that he was unable to enforce the covering and destruction of the open water sources that provided breeding grounds for *Aedes* mosquitoes in Panama City and Colón, which lay outside the Canal Zone. Panama itself was not under military rule, and local Panamanian authorities did not actively enforce sanitation regulations. He therefore decided to introduce a piped water supply, thereby making it easier to convince the populace to eliminate their dependence on cisterns, wells, and barrels. Gorgas's men introduced water and sewer lines, and paved the streets in Panama City and Colón. In short, in addition to attacking mosquitoes, he improved the overall sanitation and infrastructure of these cities.

Similarly, in 1913, the Transvaal Chamber of Mines in South Africa recruited Gorgas to review the gold industry's sanitary conditions and make recommendations aimed at reducing the extremely high rate of pneumonia cases and deaths among black mine workers. Gorgas's recommendations mirrored many of the measures he had put in place in Panama to reduce pneumonia among West Indian workers there. He proposed improvements in

housing, including the creation of family housing. He also recommended improvements in diet, the provision of piped water and sewage removal, and the establishment of a centralized medical system. He made no recommendations related to wages, however.²³ His South African recommendations were only partially accepted, as they came with significant financial costs.²⁴ Yet they reflected a broader approach to occupational health than was reflected in much of his yellow fever work.

In that same year, however, the surgeon general of the US Army ordered Gorgas to visit the port city of Guayaquil, on the Pacific coast of Ecuador. The city was experiencing repeated epidemics of yellow fever. The army was concerned that ships traveling through the soon-to-be-opened canal from that Ecuadorian city could reintroduce yellow fever into the Canal Zone, and from there it might spread across the Pacific. Gorgas visited the city and reported back to the surgeon general. He compared Guayaquil with Havana and described how yellow fever had been brought under control in the latter city. He recommended that the same methods be applied in Guayaquil. Yet he emphasized that the Havana campaign had been conducted under a military governor who was entirely in accord with Gorgas's measures. Gorgas therefore proposed that the president of Ecuador appoint a health officer for Guayaquil who would be empowered to levy fines on householders who refused to eliminate breeding sites, and that this individual would have the right to appeal to the president if ordinances were not enforced. In short, Gorgas recommended the imposition of a military-style regime similar to the one that had existed in Havana.²⁵

Gorgas was not alone in valuing multiple approaches to public health. It was quite common during the first half of the twentieth century for public-health authorities to engage in very technical, targeted approaches to health and, at the same time, espouse ideas about the social basis of disease and the need for economic improvements, or what nineteenth-century German physician and social-medicine advocate Rudolf Virchow termed "medical economic welfare." For example, Angelo Celli, who directed Italy's campaign to control malaria by distributing quinine, argued in his 1901 textbook on malaria control that malaria was a social disease and that the eventual control of the disease required social reform, better wages, and agrarian development. Similarly, Marshall A. Barber, who developed the use of the

larvicide Paris green (a highly toxic copper and arsenic compound) to attack mosquito larvae in the American South and helped develop mass-treatment methods for controlling hookworm in Malaya, claimed that “with only a moderate betterment of social conditions, malaria in the United States tends to disappear.”²⁶ Even the strongest advocates of the new public-health direction were aware of the underlying social determinants of health. Both approaches were always present and were often in tension with one another. The social-determinants approach, however, only occasionally took center stage in the organization of international-health activities. Why this approach failed to gain wider support is one of the central questions explored in the rest of this book.

The immediate question, however, is why medical science and the disease-eradication campaign came to dominate narratives of Gorgas’s success in improving health conditions in Cuba and Panama and be accepted as central to efforts to improve health conditions in other parts of the tropical world. Why were his other strategies ignored? Part of the reason was simply that malaria and yellow fever were diseases that plagued Americans in the tropics; pneumonia was not. Yet Gorgas’s antimosquito campaigns also dominated, because they converged with three emerging narratives related to the power of tropical medicine. The first was deployed by early specialists in tropical medicine in the United States and Europe, who struggled to distinguish themselves, and the value of their work, from that of general physicians at the turn of the century.²⁷ These specialists recounted Gorgas’s success in conquering yellow fever in order to confirm the power of tropical medicine. Second, the story of Gorgas’s victory over yellow fever became part of popular accounts that explained the United States’ ability to complete the Panama Canal in terms of America’s scientific and technical expertise. US know-how had permitted the Americans to do what the French could not. Finally, Gorgas’s success reinforced an emerging narrative of American imperialism in which colonial expansion was rationalized in terms of the benefits that America’s scientific knowledge brought to the peoples of its colonial possessions.²⁸ This was a narrative that would become an important part of US foreign policy after World War II.

Yet there is a more specific reason why Gorgas’s antimosquito campaigns became a central element in subsequent international-health activities

(chapter 2). They were attractive to the heads of the newly created International Health Board (IHB) of the Rockefeller Foundation. The IHB was committed to a public-health approach that emphasized biomedical science and found in Gorgas's mosquito work an exemplar of this model of public health. Conversely, the IHB was averse to approaches involving social and economic changes. The IHB adopted Gorgas and his disease campaign and, in so doing, reified their central role in the subsequent history of global health.²⁹ Before examining the work of the IHB, however, we need to briefly visit America's other colonial training ground for future international-health leaders, the Philippines.

The Philippines: Sanitizing Colonial Bodies

The US occupation of Cuba lasted only a few years, thanks to the Teller Amendment, which stipulated that the annexation of Cuba would be temporary. America's occupation of the Philippines, on the other hand, lasted for decades and involved a much more intensive exercise of colonial power and intervention into the health of the Filipino population. Though the Spanish relinquished control of the Philippines in 1898, Filipino insurgents launched a guerilla war against the US occupation, and it took three years to subjugate the islands. As in Cuba, tropical diseases took a heavy toll among US troops, and the conquest of the archipelago involved a campaign against microbes and insects as much as against enemy troops. Outbreaks of plague and cholera during the insurrection were met with sometimes brutal campaigns involving forced quarantines, the razing and burning of infected villages, and the mass burial of disease victims. Understandably, the local population viewed such actions as weapons of war rather than of public health.³⁰

Following the insurrection, military and sanitary operations continued to be linked. US authorities organized military-style health campaigns that were similar, in some respects, to those initiated by Gorgas in Havana and Panama. But the target of sanitation efforts in the Philippines during the early years of the American occupation was the Filipino population itself, rather than mosquitoes. Until the 1920s, relatively little was done to control malaria, other than initiate a segregation of American troops and issue quinine. Even less was done to control dengue fever, which was a persistent cause of

debility among US troops serving in the Philippines up through World War II. The Filipino population came to be viewed as the primary source of disease and a threat to the health of American troops and administrators, due to their supposedly poor sanitary habits. As Warwick Anderson has documented, US health officials were obsessed by what they saw as the Filipinos' "indiscriminant defecation." American authorities also shared the common colonial view that local populations were incapable of improving health conditions without white tutelage. Henry du Rest Phelan, a US Army doctor who was assigned to Suriago in the Philippines in 1902, captured these attitudes when he observed that the ground beneath native houses was covered with "filth of all kinds, human excrement included." He viewed the Filipinos as lacking the capacity to improve their sanitary conditions without assistance: "They appear to me like so many children who need a strong hand to lead them in the path they are to follow."³¹

US authorities were not the first to introduce bacteriology and sanitation to the Philippines. By the 1880s, young Filipino researchers, some of whom had trained in Spain and France, were undertaking new research on polluted water, malaria, and cells. Influenced by the revolutionary new discoveries being made in bacteriology, they focused on the nature of pathogens and microbial pathogenesis in disease development and transmission. These researchers sought to refute long-standing Spanish colonialist allegations that the Philippine environment was intrinsically unhealthy, and that Filipino bodies were markedly diseased and pathological, attitudes that dominated US views of the Filipino population.³² In addition, many communities had garbage-collection services. Yet US colonial health officials generally ignored or disparaged the work of these Filipino scientists and public-health authorities.

To improve the health of the islands, the US occupational forces launched a series of campaigns aimed at educating and sanitizing the Filipino population. By contrast, relatively little was done to develop basic health services until the commonwealth period, under Filipino administration, after 1935. Responsibility for the sanitation campaigns fell to Victor G. Heiser, who was placed in charge of health in the Philippines from 1905 to 1915. Heiser was a member of the Public Health and Marine Hospital Services, which later became the US Public Health Service. He was assigned as chief quarantine

officer in the Philippines in 1902, but before taking up his post, he was directed to attend the International Congress on Medicine in Cairo. There he met Gorgas, who had been dispatched to Egypt to attend the congress and learn about the sanitation measures the British had enacted in relation to the Suez Canal. Following the congress, Heiser made his way eastward through various British colonial possessions on his way to the Philippines: “All along the way I heard the same arguments: ‘Orientals could not be sanitized [sic]; he always lived in filth and squalor; to persuade him to live in any other way was hopeless; ... all efforts, therefore, should be concentrated on making living conditions safe for the European who was obliged to sojourn in his midst.’ ”³³

Heiser shared these racial attitudes with regard to the lack of sanitary habits among tropical populations. He also had little respect for the Filipino health workers and scientists who gradually took over public-health functions in the islands during the 1910s and 1920s. He rejected, however, the idea that “our little brown brothers” could not be taught the sanitary standards of civilized peoples. To this end, he launched campaigns to “discipline their bodies” and clean up environmental nuisances. He enforced vaccination, household hygiene, and improvements in housing, water supplies, nutrition, and—above all—sewage disposal. Heiser employed a small army of inspectors to oversee his colonial charges, including 200 physicians. Heiser possessed almost complete military power and did not hesitate to invade the domestic spaces and businesses of the Filipino population. By 1903, his team had inspected nearly 2 million homes; 241,000 homes and 162,000 yards were cleaned and 11,200 cesspools and similar sewage systems emptied.³⁴

A campaign directed by Allan McLaughlin, in response to a cholera outbreak in Manila in 1908, was an example of the military-style health campaigns launched to combat disease in the Philippines. McLaughlin organized 600 men into disinfecting squads that went about spraying carbolic over dwellings and “liming all closets and places where fecal matter existed or was likely to be deposited.” The effort to disinfect the dejecta of the entire population necessitated the disinfection of entire districts. More than 150,000 pounds of lime and 700 gallons of carbolic acid were used. Anyone who tried to obstruct the disinfection operations was arrested and fined.³⁵ US colonial health officials also employed educational campaigns, the imposition of

systems of pails for disposing of fecal waste, the cleansing of markets, and the application of building regulations requiring the construction of privies in all new buildings. Through these multiple strategies, they attempted to sanitize the Filipino body.

America's colonial possessions played an important role in fostering a set of public-health practices and attitudes regarding the control of diseases among dependent populations that would come to dominate international-health activities for much of the twentieth century. Following World War I, US medical personnel, who had served in Panama and the Philippines, were recruited by the Rockefeller Foundation's International Health Board to serve as country directors for hookworm-and yellow fever-elimination programs in various parts of the globe. They became part of a global network of international-health experts who shared a common vision of public health that shaped the early history of international-health activities. The incorporation of colonial physicians into the IHB led to the consolidation of medical science and the disease campaign as central elements of international health. The following chapter describes the building of this network and its impact on the early history of international health.

CHAPTER TWO

From Colonial to International Health

The International Health Commission and the British Empire

The Rockefeller Foundation created an International Health Commission in 1913, with the goal of extending the foundation's efforts to eradicate hookworm in the American South to other countries around the globe where hookworm was seen as incapacitating millions of people. The commission, which changed its name to the International Health Board (IHB) in 1916 and later to the International Health Division (IHD) in 1927, would become the most powerful and influential international-health organization during the first half of the twentieth century. By the time it wrapped up business in 1951, it had operated in 80 countries around the globe, fighting hookworm, bilharzia, malaria, and yellow fever. In addition, it had financed the construction of schools of tropical medicine and public health in 21 countries and funded the training of hundreds of health professionals from developing countries. International Health Board program officers, colonial health authorities, and public-health professionals from many countries passed through these schools, becoming part of a community of international-health experts who shared a common set of ideas about how to transform the health of peoples living in colonial and postcolonial settings.

A great deal has been written about the motives of the foundation and its creator, John D. Rockefeller, in creating the International Health Commission. Rockefeller amassed a fortune as founder and chief executive officer of Standard Oil, and some have argued that his philanthropic health work was designed to advance his far-reaching financial interests, focusing narrowly on increasing the efficiency of tropical labor. There is little doubt that Rockefeller was concerned about labor productivity. Yet the record of the IHB's activities hardly supports a narrow, materialist argument. Though many of the IHB's campaigns were targeted at plantation workers, many were not. Rockefeller was a visionary, who saw the promotion of health as part of a larger civilizing mission. His goal for the IHB was to sanitize the world and, in doing so, advance the cause of Western civilization. If this

contributed to his fortune, he would not object. Nor would he complain if it countered his image as someone who was solely interested in increasing his wealth. But increasing his personal wealth was not the purpose of his investments in international health.¹

Hookworm was chosen as the IHB's first vehicle for achieving its goals, because of the foundation's earlier experience in the American South and because the foundation viewed it as a disease of immense economic importance, as well as one for which "relief and control" could be readily achieved through medical intervention. Success in eliminating hookworm could demonstrate the benefits of a biomedical approach to public health and provide a means of advancing broader initiatives in health. The IHB's first director, Wickliffe Rose, described the purpose of its hookworm work in Latin America: "The work for relief and control of [hookworm] ... is to be regarded merely as an entering wedge toward a larger and more pervasive service in the medical field. It will lead inevitably to the consideration of the whole question of medical education, the organization of systems of public health, and the training of men for public health service."² At the same time, neither Rockefeller nor Rose were interested in efforts to address the underlying cause of hookworm or other diseases. Hookworm was a disease of poverty and was strongly associated with particular forms of agricultural and industrial production that brought together large numbers of workers in settings that fostered the transmission of parasites.³

From its inception, the hookworm campaign was deeply entangled in the world of colonial medicine. The IHB recruited many of the directors for its hookworm programs from Panama and the Philippines. Tracking the movement of these directors reveals the influence that ideas and practices developed in America's colonial possessions had on the IHB's early hookworm campaigns. The most prominent of the men recruited by the IHB from Panama and the Philippines was Victor Heiser, who was tapped to be the presumptuously titled "director of the East," responsible for the IHB's disease-control programs in 40 countries in East and Southeast Asia. In addition, Louis Schapiro and David Molloy, who worked under Heiser in the Philippines, became directors of the foundation's hookworm programs in Costa Rica and Nicaragua, respectively. Schapiro replaced Henry Carter Jr., who had been hired from the Marine Hospital in Colón, Panama, in 1914.

John D. Snodgrass, after working in Manila and the Ceylon leper colony, took over the Rockefeller hookworm campaign in Ceylon.

The International Health Board's decision to initially situate its campaign in the British colonial empire further strengthened colonial influences on its hookworm work. Rose traveled to London to obtain the Colonial Office's blessing for the campaign in 1913. He convinced the Colonial Office of the potential value of the IHB's work and won its support for initiating campaigns within British colonies. To facilitate this work, Rose agreed to set up a British Advisory Board, with headquarters in the Colonial Office. The Colonial Office agreed that the IHB's first work would be in the British West Indies. Rose followed his London meetings with a tour of the British West Indies and, subsequently, Britain's colonies in South and East Asia.

The IHB's hookworm work in the British Caribbean followed an organizational model that became known as the American, or intensive, method. First developed in the American South, the method was perfected in British Guiana by the IHB's country director, Howard H. Hector. The method involved mapping large populations, collecting and testing their stools for evidence of hookworm infection, and treating all those found to be infected with a highly toxic worming medicine, administered until the patients were worm free. The treatment was painful and, in a number of cases, fatal.⁴ The backing of British colonial authorities allowed the IHB to conduct their campaign without the need to develop strategies for gaining local cooperation. As the campaign expanded to other countries in the region where colonial forms of control did not exist, the campaign's ability to ensure the participation of local populations became more challenging, and the IHB was forced to develop communication strategies to overcome resistance and adapt to local conditions. Thus there was considerable variation in the ways the hookworm campaign was conducted in different locales. Yet the campaign retained the basic elements of the American method that had been established within colonial conditions.⁵

The IHB viewed the local hookworm campaigns as entry points into communities in which it hoped to introduce principles of scientific hygiene. The intent was to sanitize the world. Similar goals had driven the IHB's foray into tuberculosis control in France, where it attempted to apply hygienic

principles to eliminate this disease after World War I. To eliminate hookworm, it was necessary to get people to construct and use latrines, wear shoes, and generally improve their sanitation, as the IHB had attempted to do in the American South. These activities were also necessary to prevent reinfection. Yet sanitation activities often took a back seat to treatment in the IHB's international campaigns. In part this was because sanitation efforts required investments in time and money. But it also was because physicians who believed in the power of drugs to eliminate hookworm ran the campaigns.

[image "image" file=../images/Packard_Figure_2_fmt.jpg]

A poster from the International Health Board's anti-tuberculosis campaign in France, ca. 1918

In addition, sanitation efforts suffered because program officers failed to appreciate the perceptions of local populations and the conditions under which they lived. In Trinidad and British Guiana, sanitation efforts ran into local resistance to building latrines, both because they were expensive and, in some places, conflicted with local cultural attitudes regarding excreta. In Costa Rica, local populations complained that the latrines attracted mosquitoes and led to increases in malaria.⁶ In Mexico, IHB officers attempted to convince local residents to wear shoes to prevent reinfection. Yet there was a serious disconnect between the local villagers, who had little understanding of what the IHB was trying to do, and the Rockefeller health officers, who had little appreciation for the social and economic conditions of the people they were trying to treat. IHB officials employed educational posters showing enlarged images of hookworms. Villagers had never seen such monstrous creatures and were incredulous that they could enter the bodies of humans through the soles of their feet. Biological notions of infection were also alien to the locals' understanding of the causes of sickness and health. IHB officers additionally failed to understand that most villagers could not afford to purchase shoes. Instead, the health officers insisted that wearing shoes was a behavioral issue, a sign of individual enlightenment. As Andrew Warren, the director of the campaign, observed, "it is the culture and intelligence that causes people to wear shoes."⁷

The Rockefeller Foundation's political interests also undermined the IHB's

sanitation efforts in Mexico. In addition to curing and sanitizing local populations, the foundation viewed its hookworm program as a means of building support for the pro-US Mexican government and countering political opposition in the region.⁸ It thus focused on treating infected individuals, in order to have an immediate impact, and on rapidly expanding its eradication activities. This approach meant that prevention efforts, which required time and patience, were often not pursued with much enthusiasm. More importantly, the IHB did not conduct followup surveys to verify that their attempts to prevent reinfection had, in fact, worked. Mexican authorities took prevention more seriously than the Americans and, once they took over programs begun by the IHB in the late 1920s, pushed for the construction of latrines. The desire to have a rapid impact, a lack of understanding of local social and economic conditions, and the absence of followup surveys to measure outcomes would become enduring characteristics of international- and global-health campaigns.⁹

The IHB's hookworm-control efforts were further perfected in East Asia by another Panama alumnus working for the IHB, Samuel Taylor Darling. Darling studied medicine at the College of Physicians and Surgeons in Baltimore, graduating in 1903. In 1905, he accepted a position as an intern at Ancon Hospital in Panama and joined Gorgas's effort to eliminate yellow fever and malaria. Darling was in charge of laboratories and patient services at Ancon Hospital. He also conducted research on malaria and introduced species-specific control measures in Panama. In addition, Darling accompanied Gorgas to South Africa. Following the triumph of sanitation in Panama and the successful completion of the Panama Canal, Darling accepted an offer to join the International Health Board of the Rockefeller Foundation in 1915. He was soon appointed to head a commission to study hookworm disease in the Far East. Marshall A. Barber, who had begun his public-health work in the Philippines before being recruited by Rockefeller, joined Darling. For the next three years, Darling and Barber studied the incidence and consequences of hookworm and malaria in Malaya, Java, and Fiji. All three locations were British colonies, to which planters recruited large numbers of Tamils from southern India to work on sugar and rubber plantations. The laborers were poorly housed and worked on plantations that lacked basic forms of sanitation. They routinely defecated in areas outdoors, near where they were working. Not surprisingly, hookworm was a major

source of disability for them.

Barber and Darling's final report revolutionized the diagnosis and treatment of hookworm disease. They introduced the concept of mass treatment, in which a sample of the population was tested to estimate a hookworm index for an entire community. If the index revealed substantial infection, the whole community, infected and non-infected alike, would be treated. The goal was to treat everybody quickly, within a few days. If this was done, very few hookworm eggs would be passed onto the soil, making the disease less infective. The mass-treatment method eliminated the need for testing every individual to determine that person's level of infection. Barber and Darling argued that further sanitation efforts could also be eliminated. In this manner, the cost and effort of controlling hookworm would be reduced "advantageously."¹⁰

Darling's desire to develop a method that would eliminate the need for sanitation was driven by his negative view of the Tamil laborers among whom he worked. He saw them as incapable of observing sanitary practices and claimed that their superstitious ways and poor sanitary behaviors were a menace to the world. Describing his hookworm work in Malaya in 1920, Darling and his colleagues noted: "Most of the Tamil coolies in the Federated States come from the Madras Presidency in southern India, and are in the main ignorant, superstitious, and servile. Probably not more than 5 percent of them are able to write their names. While it is true that Tamils are hard workers, it is also true that they are almost entirely lacking in ambition. Docile, unstable, and apparently quite incapable of administering their own affairs, with either dispatch or intelligence, they constitute the white man's burden."¹¹ This view of Tamil workers as ignorant and incapable of caring for their own health echoed those of US colonial officials in the Philippines. It ignored the fact that plantation owners provided few, if any, facilities that the workers could have used. In addition, the report made no mention of plantation working conditions.

Darling and Barber also conducted clinical trials to test the effectiveness and cost of various purging agents, using subjects found in hospitals and jails. They noted that they had difficulty finding subjects for their trials and that "many patients absconded during the rather prolonged period [when] it was

necessary to keep them under observation and treatment.” This loss of subjects was not surprising, given the range of aftereffects observed in patients who took the test drugs. These included dizziness, unsteadiness of gait, an inability to rise, a semicomatose state, tingling in the hands and feet, deafness, burning in the stomach, and headache. All of these side effects, except the last two, were more commonly produced by oil of chenopodium than by any other vermicide.¹² Yet Darling and Barber found that oil of chenopodium was the most effective drug for removing worms, costing half as much as thymol, which was widely used by IHB hookworm campaigns at that time. Barber and Darling accordingly recommended the adoption of oil of chenopodium, though they emphasized the need for larger trials. The fact that it was the most toxic drug tested seems not to have dampened their enthusiasm.

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The International Health Board’s hookworm campaign in India. Courtesy of Rockefeller Archive Center.

The results of their hookworm studies were very influential in shaping the IHB’s subsequent reliance on the mass-treatment approach to hookworm control around the world.¹³ Darling would later become a member of the League of Nations Malaria Commission, extending the network of US colonial health officials who took up positions in international-health organizations. The emphasis on treatment over prevention ultimately undermined the IHB’s goal of eradicating hookworm. Even with the use of mass treatment, treating infections without implementing effective sanitary measures did not prevent reinfection. It was recognition of this failing that eventually led to the IHB’s disenchantment with hookworm control and their decision to wrap up their existing hookworm programs by the end of the 1920s. The IHB shifted its resources to its campaign against yellow fever, which had begun with the establishment of its Yellow Fever Commission in 1915 and had paralleled the IHB’s hookworm campaigns. By the time this occurred, hookworm campaigns had been extended over wide areas of Latin America, China, and South and Southeast Asia. Together, these efforts had established the colonial-disease campaign as a central part of international health.

The Colonial Roots of the Yellow Fever Commission

Like the hookworm campaign, the IHB's yellow fever campaign had strong colonial connections. The Rockefeller Foundation developed an early interest in eradicating yellow fever by eliminating it in the few places where it appeared to exist in the Americas and Africa. They invited William Gorgas to become director of the IHB's Yellow Fever Commission in 1915. Gorgas accepted the position but had to wait until after World War I to take up his new post. Following the war, Gorgas devoted three years to laying the groundwork in Peru, Mexico, and Ecuador for what he expected to be a successful campaign to eradicate yellow fever from the Americas. The campaigns employed methods Gorgas had developed in Panama and Havana and, like the IHB's hookworm campaigns, were directed by colonial old hands, recruited from Panama and the Philippines. In Ecuador, the Guayaquil campaign that Gorgas had recommended in 1913 began in 1918, under the leadership of Michael Connor, a graduate of Dartmouth medical school who had served in the US Army Medical Corps in the Philippines. He had also served as assistant sanitary inspector in the Panama Canal project. Within a year, he had replicated Gorgas's antimosquito methods, visiting 372,278 houses; inspecting 1,104,862 water containers; and dispersing 14,300,500 gallons of oil on water surfaces.¹⁴

[image "image" file=../images/Packard_Figure_4_fmt.jpg]

Yellow fever workers in Guayaquil, Ecuador. Courtesy of Rockefeller Archive Center.

In Peru, another Panama veteran, Henry Hanson, ran the campaign.¹⁵ In 1921, the Peruvian government solicited the financial support of the Rockefeller Foundation to eradicate yellow fever, and Hanson was hired to direct the campaign. The campaign was slow to develop, and yellow fever began spreading south. Hanson chose to focus on major towns and cities, rather than on smaller communities where, he claimed, the disease would burn itself out. While he employed a number of methods, including the unsuccessful application of a vaccine that Hideyo Noguchi had developed with Rockefeller Foundation support, Hanson came to depend on the use of small larvae-eating fish, placed in water tanks, to eliminate mosquito breeding. This method was applied with military precision, using 100

sanitation workers. Towns were divided into districts, each in the charge of an inspector and a squad. The workers covered their entire district in seven days, examining every water container to ensure that no mosquitoes were breeding. When mosquitoes were found, the receptacles were emptied, all adherent eggs were removed, and larvivores were placed in the newly resupplied water. On Sundays, Hanson and the inspectors made rapid surveys of the critical towns. Hanson kept a detailed daily record of funds expended, premises inspected, and water containers treated.¹⁶

Hanson conducted his campaign in a top-down manner, making no effort to educate the public or gain their cooperation through persuasion. His resistance to such undertakings was based on his assumptions about the scientific backwardness of the populations with whom he was working and their inability to understand the need for cooperation. In his personal account of his work in Peru, Hanson wrote, “Superstitious, ignorant, and seemingly satisfied, the rank and file of the natives of Lambayeque, as everywhere in Peru, were resentful of any effort to direct or change their mode of life.”¹⁷ Hanson’s views were hardly unique. They channeled those of his counterparts in the Rockefeller Foundation’s hookworm campaigns in the Caribbean and Latin America and by the US military in the Philippines, as well as by British and French colonial medical officers working in many settings across Africa and Asia. Despite these attitudes, Hanson succeeded in controlling yellow fever in all towns north of the department of Lima by the end of 1922, and no more cases of yellow fever were reported.

Passing the Torch

The disease-control strategies developed by Gorgas and American physicians, who learned their public-health skills in America’s colonial possessions in Panama and the Philippines, were passed on to later generations of US public-health workers, as well as to public-health workers from foreign nations, through training sites and schools of public health established by the Rockefeller Foundation. This educational process contributed further to the entanglement of colonial medicine and early international-health organizations. The Rockefeller Foundation invested heavily in the construction of schools of public health, both in the United States and abroad. These schools were intended to be centers for the

development and dissemination of the “new public health,” based on the application of scientific methods and principles informed by the new sciences of bacteriology and parasitology.

The first of these was the Johns Hopkins School of Hygiene and Public Health, founded in 1916, with William H. Welch, the noted physician and former dean of the Johns Hopkins School of Medicine, as its first director. The school attracted a wide range of students. While Welch sought to train young medical researchers, the foundation used the school to train its present and future staff members, award advanced degrees to experienced men in the field, and bring in field staff for specialized training courses. The school also served another purpose: it trained international students, who received an education in hygiene and then returned to head up health programs and become faculty at local schools of public health in their home countries.¹⁸ The foundation invested heavily in the training of such students. Between 1917 and 1951, it provided 473 scholarships for Latin Americans working in the medical sciences.¹⁹ Many of these students came to Johns Hopkins.

Just what foreign students believed they got out of these educational experiences is less clear. The curricula of Johns Hopkins’ and Harvard’s public-health schools were heavy on science and scientific methods for controlling disease, but contained little material on how to work with local populations. C. C. Chen, who graduated in 1929 from the Peking Union Medical College, which was also funded by the Rockefeller Foundation, went to Harvard to study public health in the early 1930s. He later played an important role in the International Health Division’s North China Rural Reconstruction Program (chapter 4). Chen claimed that he learned nothing of value at Harvard. Selskar Gunn, who also worked in China for the Rockefeller Foundation, was another critic of what he was taught at Harvard. Both Gunn and Chen built programs that were community based, something that was not part of the educational experience at Johns Hopkins and Harvard at this time.²⁰ It was not until the 1950s that the social sciences began to take hold in schools of public health in the United States.

Nonetheless, the schools of public health funded by the Rockefeller Foundation became places where models of disease control and public health, forged in colonial settings and replicated in disease-control projects across

the globe, intersected with the scientific practices, methods, and knowledge of the new scientific hygiene. This conjunction of colonial field experience with public-health education can be seen in the short course on parasitology that Frederick Soper took at the Johns Hopkins public-health school in 1923, after he joined the IHB. Soper, who would go on to lead hookworm and yellow fever campaigns for the IHB, became a major advocate for disease eradication and eventually was director of the Pan American Health Organization. As part of his parasitology course, he claimed to have taken a class on yellow fever control that described Gorgas's work in Havana. Years later, when Soper was sent to Brazil to combat yellow fever and malaria, he was met by Brazilian counterparts who had also been trained at Johns Hopkins.²¹

As Americans and foreign nationals who were trained in the new schools of public health took up academic and public-health positions around the world, they became part of an international community of public-health workers who shared a common set of ideals and practices. In this way, disease-control strategies forged originally in the crucible of colonial rule during the first decades of the twentieth century were fused with and became part of the science of hygiene. In this form, they were easily transferable to noncolonial settings and became central to the practices of international health. In addition to those at Johns Hopkins and Harvard, the Rockefeller Foundation eventually funded other schools of public health in 21 foreign countries, including the London School of Tropical Medicine and Hygiene.

The International Health Board created other sites where public-health knowledge was passed from one generation to the next. One such location was the IHB's malaria field site in Leesberg, Georgia. Samuel Taylor Darling, who had developed the mass-treatment approach to hookworm control, was appointed director of the Leesberg site in March 1923.²² Leesberg served as a training location for IHB physicians on their way to take up positions around the globe. It was there that Frederick Soper arrived in summer 1923, for two months of training with Darling before taking up a new post directing a hookworm campaign in Paraguay. Soper went on to apply Darling's methods to hookworm control in several Latin American countries.

Lewis W. Hackett, who would also become a major leader in the war on malaria, working for the International Health Division in Europe, joined Soper in Leesburg. Also at Leesburg that summer were John L. Hydrick, who would develop new methods for rural community-health education in Indonesia; and Alexander F. Mahaffey, who later discovered the virus that causes yellow fever and played a central role in mapping yellow fever in Africa. Mahaffey headed up the Rockefeller Foundation's Yellow Fever Institute in Entebbe, Uganda, and concluded his career in London, as director of colonial medical research at Britain's Colonial Office. He thus represented the movement of IHB personnel back into colonial medicine. Leesburg was one of many nodal points in an expanding network of tropical-disease experts that connected colonial medicine and international health across the first three decades of the twentieth century.²³

Philippines Redux

Before concluding this chapter on the colonial roots of global health, I want to return briefly to the Philippines, moving ahead a few years to the early 1930s, to examine the early career of Paul F. Russell, who would become an international expert in malaria control. Russell's career in the Philippines further demonstrates the importance of colonial settings for the development of international health.

The IHB had established a hookworm program in the Philippines in the early 1920s. Repeated surveys indicated that the Philippine programs had failed to reduce infection levels over a wide area of the islands. Heiser and his lieutenants routinely ascribed this failing to the indiscriminate defecation habits of the population in the Philippines, combined with the lack of initiative and general unsuitability of Filipino health workers for this kind of work. The hookworm programs in the Philippines were eventually abandoned, as they were elsewhere. In the 1920s, the IHB turned its attention to malaria. Malaria had menaced and sickened American soldiers and administrators from the beginning of the US occupation of the country. Yet efforts to control the disease had been perfunctory. The threats of cholera and plague and the American obsession with Philippine excrement drew attention away from malaria.

In 1914, Philippine health authorities attempted to control malaria in Manila

by eliminating breeding sites and fining householders who failed to keep their households free of mosquitoes. Yet they came to view malaria control as futile in the face of a Filipino population whom they continued to view as unable or unwilling to participate in control activities. Lack of confidence in their ability to change the habits of the Filipino population or to get them to participate in control programs, either through the use of netting or screens or by taking quinine tablets on a regular basis, led the IHB to focus its activities on the elimination of *Anopheles* mosquitoes, concentrating particularly on the elimination of breeding sites outside of homes through the use of larvae-eating fish and the chemical larvicide known as Paris green. These methods, it was hoped, would permit malaria to be brought under control without having to obtain the cooperation of the Filipino population.²⁴ The IHB established control units to apply these methods in various parts of the Philippines during the 1920s. The application of larvicides without the cooperation of local populations, however, failed to control malaria.

Paul F. Russell arrived in Manila in 1929. He has been appointed by the IHB to head laboratory work at the Bureau of Science. The bureau had been set up by American researchers but was largely under the control of Filipino nationals by the 1920s, much to the dismay of Heiser, who viewed these scientists as incompetent. Russell was also directed to take charge of malaria-control activities. Russell, a graduate of the Cornell Medical School, joined the IHB in 1923. Before coming to the Philippines, he had been assigned to hookworm work in the Malaysian Straits Settlements, Ceylon, and the American South. He had also received a Master of Public Health degree from the Harvard School of Public Health in 1929.

[image “image” file=../images/005_REDRAWPackard_Figu_fmt.jpg]

Colonial experience of directors of the International Health Board’s hookworm and yellow fever programs

Russell initially recommended a shift in control strategies away from centralized larval-control programs, which he viewed as a total failure, and toward programs that involved more community participation. He also recommended the use of quinine and netting, as well as educational efforts. In a letter to Heiser, he wrote, “I feel strongly that control work must be locally desired and locally carried out,” adding that “the work of a central

malaria control division should be advisory, experimental, and instructive.”²⁵ Russell’s ideas presaged a growing interest in community participation in international-health programs, an attitude that emerged in the 1930s (chapter 4). Yet his malaria-control work failed to sustain this commitment. Like Heiser and other American health officers working in the Philippines, Russell succumbed to the view that Filipinos were incapable of participating in the protection of their own health. In a 1932 *American Journal of Tropical Medicine* article on “Malaria in the Philippine Islands,” Russell wrote that “the difficulties of getting large groups of civilians to take antimalarial drugs systematically are as insurmountable in the Islands as elsewhere.” Filipinos could not be trusted with quinine. Larval control was the only way forward. Like Heiser, Russell also came to view his Filipino counterparts as incompetent: “The average [Filipino] physician, whether or not he is called a health officer, dislikes to get his hands, his feet, or his white collar muddy and is rarely qualified for antimosquito control.”²⁶ In the end, Russell’s campaign was better organized than previous efforts, but it remained a top-down exercise in applied technology.

Russell would continue his malaria work in India and become a leading figure in the international malaria-control efforts. He was centrally involved in the International Health Division’s malaria-eradication efforts in Sardinia after World War II and was one of the prime architects of the World Health Organization’s Malaria Eradication Programme in the 1950s and 1960s. A close reading of his later diaries and writings indicates that the attitudes and lessons he learned in the Philippines continued to shape his malaria work.²⁷

Russell’s career clearly illustrates how colonial contexts shaped the attitudes and practices of a generation of American public-health authorities who would go on to lead future international-health efforts. These authorities would continue the tradition of attacking diseases by applying biotechnologies, while largely ignoring the need to develop basic health services or addressing the underlying causes of ill health.