

The Origins of International Public Health in the Americas

The concept of international public health goes back to the establishment of local, national, and international cordon sanitaires and maritime quarantines, used in Europe since the Middle Ages. This occurred predominantly in the ports of Italy that were engaged in heavy commercial traffic with Asia, where it was suspected, in the West, that many of the epidemics of the time, such as bubonic plague, originated. Despite these controls, Europe could not prevent being devastated, in the fourteenth century, by an epidemic of the dreaded plague, the so-called “Black Death.” A board of health was established in Venice. It ordered that the victims from suspicious ships be confined to a lazaretto (quarantine station) located on an island, and imposed *quaranta* days of isolation (it was assumed that after forty days, the most seriously ill individual would no longer be contagious).

The model was imitated in other European cities, such as Genoa and Marseilles. When, in the early eighteenth century, two ships from Cyprus, loaded with cotton and suspected of carrying the dreaded fomites of bubonic plague, reached London, the British authorities chose a radical solution: they burned the ships to ashes. But these methods were not consistent, and even England relaxed its maritime public health measures during much of the nineteenth century in the belief that this would encourage trade. Only starting in the mid-nineteenth century did the activities related to what is now known as international health become systematic and result in agreements aimed at universal implementation. Also, as we will see later on, only starting then did the measures that were taken become somewhat more effective.⁷

MARITIME PUBLIC HEALTH IN THE OLD AND NEW WORLDS

One of the most memorable meetings on health was the First International Sanitary Conference, held in Paris from 23 June 1851 to 19 January 1852, at which no country of the Americas was represented. Many of these meetings were responding to what were considered factors that increased the threat of cholera. For example, the third of these meetings, held in Constantinople in 1866, was organized because of fear of the arrival of cholera via the Muslim pilgrims to

Mecca (the previous year, the disease had attacked Egypt and Europe with a vengeance). Similarly, the fourth meeting, held in Vienna in 1874, was in response to the opening of the Suez Canal five years earlier, since it was feared that the Canal would become a means of spreading the epidemic from the East to the West.⁸ At the seventh meeting, this one held in Venice, in 1892, measures to prevent the spread of cholera would be standardized.⁹

One of the crucial international meetings was held in 1893 in Dresden, where the importance of international epidemiological surveillance activities was first recognized. This meant that the countries had to establish a worldwide information system and be attentive to the outbreak of epidemics anywhere in the world. A new threat, bubonic plague, was the main item on the agenda of the tenth meeting, held in Venice in 1897. The disease had broken out in Hong Kong in 1894 and had spread to various parts of the world. Another international accord of special importance, which went beyond and replaced the former, was the one signed at the Eleventh International Sanitary Conference held in Paris in 1903. This agreement, known as the “Paris Convention,” was subsequently revised and expanded in 1912, 1926, and 1938, and was directed specifically at regulating maritime traffic.

The Paris Conference brought together 21 countries, including the until-then reluctant Great Britain, which held that quarantines generally worked against trade. The treaty systematized measures against cholera and bubonic plague. Cholera had existed in the Americas during the nineteenth century, and fears were renewed in 1893, when an epidemic broke out in Europe, and again in 1905, when the disease appeared in Hamburg, whose port saw heavy commercial traffic with Rio de Janeiro and other Latin American cities.

The Paris Sanitary Conference recommended implementation of John Snow’s discovery about cholera. Around the middle of the nineteenth century, Snow had demonstrated, in London, that cholera could be prevented by avoiding the contamination of water for human consumption with

wastewater. That resulted in attention being paid to the hygiene of vessels and ports, as well as the surveillance of travelers and sailors from regions affected by the disease. By the early twentieth century it was known that the plague, a scourge that spread throughout the world from Asia, could be combated by eliminating rats from the ports and ships. The rodents were hosts for fleas, whose bite transmitted the microorganism that caused the disease. Also, since the late nineteenth century, relatively effective remedies for the plague were available, such as the Yersin serum and the Haffkine vaccine, named for Alexander Yersin and Waldemar Haffkine, who had, independently of each other, discovered the microorganism that causes plague.

Thanks to a 1907 Conference that included representatives of Belgium, Brazil, Egypt, England, France, Italy, the Low Countries, Portugal, Russia, Spain, Switzerland, and the United States, the International Office of Public Hygiene was established. This was the first more or less stable European international health organization. It was known as the “Paris Office” because it was first headquartered there. The Office was administered by a permanent committee that met once or twice a year and published a monthly bulletin. Its members were health authorities of the 55 states that belonged to this Office or diplomatic personnel from the embassies accredited in Paris. Its main functions were to provide information and address consultations on epidemiological matters and quarantines, and to disseminate this information in a bulletin. Its goal was to be speedier and more effective in these tasks than the diplomatic channels which had traditionally borne this responsibility. It approved important health measures in 1912 and 1926, improving these taken in 1903. The Office would be one of the two European international health organizations that remained in existence until the Second World War.¹⁰

The other organization, established at the end of World War I within the framework of the League of Nations, was the Hygiene Section. Fear of the spread of a typhus epidemic that broke out in Europe at the end of the War¹¹ precipitated a meeting to set up the Hygiene Section in London

in 1920. This organization, which sought to be more dynamic than the Paris Office, conducted weekly reporting on epidemiological events, created specialized committees on the most feared diseases, offered study and exchange grants with European universities, attempted (albeit unsuccessfully) to control the trading in and consumption of opium, and promoted new ideas such as industrial hygiene, social medicine, and nutrition. Its main office was in Geneva, as was the League's headquarters. The Hygiene Section was more international in its orientation than the Paris Office.

In fact, the Section promoted the first attempt to decentralize international public health in 1925, when it established the Eastern Bureau in Singapore—a city considered to be the crossroads for many epidemics—to cover the region of east Africa, Asia, and Australasia.¹² Between 1921 and 1939 the Section's medical director was Ludwik Rajchman of Poland (1881–1965), a leader in European and world health during the two World Wars who traveled widely, including to China and Japan, and drew attention to new concerns on the public health agenda, such as nutrition.¹³

But neither of these two organizations—the Paris Office and the League of Nations' Hygiene Section—won the unanimous or sustained support of the countries of the Americas. The United States, for example, did not become a member of the League initially, although it later sent representatives to the Hygiene Section because, during one of its isolationist periods, the U.S. Congress rejected President Wilson's proposal to join the new international organization. There was little or nothing Wilson, who left office in early 1921, could do. For its part, the French Government wanted to keep the Paris Office and ignored requests from Geneva that it merge with the Hygiene Section. Both the United States and France maintained—and encouraged others to maintain—their affiliation with the Paris Office.

Many Latin American countries were ambivalent toward both organizations. Cuba, for example, which kept its affiliation with both, organized meetings with members of the Hygiene Section

and received its representatives.¹⁴ Likewise, noted Brazilian scientist Carlos Chagas was appointed to and performed executive duties in the Section. Gregorio Aráos Flórez of Argentina, a member of the Pan American Sanitary Bureau, was also a delegate to the Paris Office and the League's Hygiene Section (where he eventually became Vice President). For its part, the League organized some activities in Latin America, such as visits of European doctors, a project to reform the health system in Bolivia, and joint actions for the protection of child health. However, starting in the 1930s, the influence, prestige, personnel, and resources of the League of Nations—including its Hygiene Section—began to decline, in large measure as a result of the social and political upheaval in Europe. During the difficult years of World War II, both organizations languished.

In the Americas, the perception that an international health organization was needed emerged in the late nineteenth century. The meeting that marks the beginning of interest in an institution of this kind was the Fifth International Sanitary Conference held in Washington, D.C., in 1881 (it was called the Fifth because it was considered to be associated with the meetings that had been organized in Europe).¹⁵ Delegates from Brazil, Haiti, Mexico, Spain, Venezuela, and other countries attended. One of the most prominent delegates was Cuban physician Carlos Finlay, who described his studies of the *Aedes aegypti* mosquito, which transmits yellow fever. Unfortunately, the scientific value of the discovery was undervalued, and this knowledge was not applied for approximately 20 years.

Events were also organized in Latin America during this period, generally by agreement of two, three, and even four countries. Noteworthy among these is a series of meetings on health in which Argentina, Brazil, and Uruguay participated. At the first of these meetings, held in Montevideo in 1873, an attempt was made to standardize the regulations for quarantines and disinfections of the ships coming from ports where cholera, yellow fever, and bubonic plague were spreading.¹⁶ The first agreement among these countries dates

back to 1887; others were signed in 1904 and 1914, with the participation of Paraguay.¹⁷ The first article of the 1904 agreement summarized the intent of many agreements of the time: “Each of the contracting governments agrees to immediately notify the others of the appearance of the first cases of oriental plague [bubonic plague], yellow fever, or Asiatic cholera in its respective territories.”¹⁸

The American Sanitary Congress held in Lima in 1888 with the participation of some Pacific South American countries (Bolivia, Chile, Ecuador, and Peru), included recommendations relative to reciprocal notification of diseases and a draft international agreement. This established general rules for prophylaxis against cholera and yellow fever, as well as for the organization and attributes of lazarettos, quarantines, and disinfections, and the types of questions passengers should be asked. It was also deemed necessary that each country have a central office of health information and that it share its epidemiological information with the other countries.¹⁹

All these meetings pointed to the limitations of traditional international public health, which was generally fragmented, considered an obstacle to trade, and thus, oftentimes ineffective. Up until the late nineteenth century, with certain noteworthy exceptions, the majority of the ports and cities of the United States, Latin America, and the Caribbean had boards of health whose scope was city- or province-wide rather than national, and whose nature was ad hoc; i.e., they were active only when an epidemic was anticipated or present. These boards had few economic resources, and the majority of their officials (political and ecclesiastical authorities and physicians) worked in the health field on a part-time basis.²⁰ Another important characteristic was that they established heterogeneous, inconsistent, and counterproductive quarantine measures and cordon sanitaires, which worked to the detriment of the shipping industry and commerce. In the general population, speculation on the origin of epidemics involved everything from the movement of heavenly bodies to earthquakes and, of course, divine retribution imposed on those who had committed moral or

ethical crimes against society. Accordingly, it was believed that the most effective measures were prayer, processions, and even self-flagellation.

Some ports in the southern United States observed a “quarantine season” starting in April of every year, before the summer began. Bursts of gunpowder were fired off to purify the air, and steaming pots of sulfur were lit in the belief that something in the air had become corrupted. A mercury derivative was also used to fumigate and disinfect, indiscriminately, both merchandise and passengers’ personal belongings. In other instances, ships arriving from ports marked by the stigma of epidemics were held for several days, the cargo was kept in the holds, and the passengers were isolated. These measures were generally annoying, useless, and even harmful.²¹

The measures failed to prevent the outbreak of epidemics, seriously affected trade, and led to shortages of supplies and higher prices for basic necessities. On several occasions, the announcement of a quarantine was considered more economically harmful than the epidemic itself. Especially sensitive were cities such as New Orleans (which received merchandise and temporary workers from different regions of Mexico), Veracruz (associated with Havana through heavy maritime traffic), towns along the banks of the Mississippi River, and U.S. ports such as Mobile, Pensacola, and Savannah.²² In the United States, the yellow fever epidemic of 1878 was remembered with bitterness: the suspension of traffic and trade was almost total, the death rate was high, and the suffering was vast. The disease affected 132 localities, the death toll was estimated to be more than 15,000, and the economic losses came to approximately US\$ 100 million.²³ During those years, in the southern part of the Americas, specifically in Rio de Janeiro and Buenos Aires, yellow fever caused disastrous experiences that created panic and led to drastic, albeit poorly coordinated, decisions and restrictions with respect to maritime commerce.²⁴

Despite its quarantines, New Orleans was ravaged several times by yellow fever, which was thought to have come from the Caribbean or Mexico. The

antepenultimate epidemic, in 1897 (the last occurred in 1905) left 298 dead and 1,900 ill. These were alarming numbers for a city with a population of 285,000. Equally or more serious was the panic generated in the rest of a country that had suffered severe epidemics of yellow fever in cities as far north as Pennsylvania and New York. The epidemic of 1897, not necessarily one of the most serious of the second half of the nineteenth century, extended to nine states and 42 localities. Similar epidemic outbreaks hit other parts of Louisiana and Mississippi in 1898 and, a year later, these two states, as well as Florida, would join the ranks of those ravaged by yellow fever.²⁵

Fear of the arrival of epidemics from abroad went hand in hand with fear of immigration. In the Americas, the number of immigrants from Europe and Asia increased dramatically in the late nineteenth and early twentieth centuries. In the 10 years between 1882 and 1891, five million immigrants entered the United States, a significant number for a nation with a population of slightly more than 60 million. In 1891 alone, a half million people arrived in that country,²⁶ and the fear that foreigners would bring unknown diseases was particularly strong. That was reflected in the declarations of the U.S. Commissioner General of Immigration, who said, a few years after the 1897 yellow fever epidemic that devastated New Orleans, that he should not have allowed the country to become the “hospital . . . of all the nations of the world.”²⁷

Fear, often baseless, led to doctors playing a prominent role in the ports where immigrants arrived, physically examining them, as on Ellis Island, just off Manhattan in New York. But, while in the United States the fear of contagion was probably greater than anywhere else, other countries of the Americas—such as Argentina, Brazil, Chile, Cuba, and Peru—also feared that foreigners would bring disease. So these nations, too, established medical posts in the ports to examine immigrants who arrived by ship,²⁸ and those on whom the most suspicion fell were the third-class passengers. Argentina received more immigrants than any other Latin American country. Two indicators were that, between 1881 and 1935, almost three-and-a-half

million immigrants reached its shores, and that, in 1914, half of the residents of Buenos Aires had been born outside Argentina.²⁹

There was fear that the poor immigrants would introduce or exacerbate disease outbreaks such as smallpox, syphilis, tuberculosis, leprosy, and “idiocy” or other “mental illnesses.”³⁰ Trachoma (an eye condition) was especially feared because it was endemic in Italy, from where many of the immigrants came. The racist and social connotations of the medical examination—which did not stop an astonishing number of immigrants from all parts of the world from coming to the Americas—were manifested, in some cases, by attempts to prohibit or restrict the entry of Asian immigrants.³¹

The fear of epidemics and diseases the immigrants might bring contributed to doubts about traditional maritime public health, which began to be perceived as a set of arbitrary, disordered, authoritarian measures, and as the source of mutual recrimination and rancor among states and nations. These doubts were not limited to officialdom. The perception that maritime public health was irrational led to a common outcome in the face of every authoritarian regulation: the sharpening of the public’s ability to circumvent it. Unauthorized voyages, ship captains who denied having ill passengers on board, the creation of hiding places for merchandise and travelers in train cars and all types of vessels, and local authorities and merchants who tried to conceal the first signs of epidemic outbreaks and to issue the regulations that best served their own interests, were, in and of themselves, an epidemic.

As a result of the foregoing, maritime public health was inconsistent. For example, during the summer, the state of Florida would admit only passengers who were “immune” to yellow fever. This was proven with some document attesting to the person’s having survived the fever, since at the time this measure was believed to be sufficient. New Orleans authorities, on the other hand, required nothing from incoming passengers. However, during epidemics, “miniature armies” sprang up around that city and imposed “shotgun quarantines,” so called because of the self-appointed

impromptu guards, armed to the teeth with old carbines and Winchester rifles.³² An article in *The New York Times* described the situation and bemoaned all of the above:

At no time has the yellow fever been one-tenth as disastrous as the quarantines. . . . Near Jackson, Missouri, the natives burned a bridge because the railroad was reluctant to obey the demands of the shotgun quarantine officials. Near Lake Charles [Louisiana], a railroad bridge on the Southern Pacific line was destroyed for a similar reason. . . . One town refused to receive a shipment of bar iron [from New Orleans], fearing that germs were hidden between the molecules of iron.³³

The erosion of traditional maritime public health was accompanied by a feeling that, thanks to the speed of transportation, the distance between the major ports and cities of the Americas had decreased. Havana, just a three-day voyage from New Orleans, and Rio de Janeiro, which was a little farther away but not too distant, suffered from the stigma of being considered two of the surest hotbeds of yellow fever, which periodically lashed the southern United States. The U.S. Surgeon General (the highest-ranking national public health official) told the Secretary of State that, between 1800 and 1894, there had been just seven years in which yellow fever, mainly from Cuba, had not occurred in that country. Based on that information, the Secretary sent a letter to the Ambassador of the Spanish Empire (Cuba was still a colony) notifying him that, sooner or later, Spain or other nations would have to do something about the situation.³⁴ The chairman of the Board of Health of New Orleans had his own concerns about the fever; a letter he wrote in the late nineteenth century revealed this fear: “We are surrounded by yellow fever. Every vessel leaving Veracruz, Havana, or Rio de Janeiro is more or less infected.”³⁵ Veracruz was also feared, since, in the 1890s, serious yellow fever epidemics left many dead: 259 in 1892, 209 in 1894, and 670 in 1899.³⁶

Spanish maritime public health, in force in Cuba at the end of the nineteenth century, was an example of inefficiency, contradiction, and archaic scientific assumptions. If there were yellow fever victims on board, the ships had to fly a yellow

flag on the main mast—a measure which was not strictly complied with. Port routine included a request that the crews lean over the side so the health inspector could look at their faces. The inspector’s weapons included ventilating cargo decks on the assumption that the closed air of the holds contained miasmas—defined as effluvia from decomposing organic matter—that produced disease. Also, the port medical officer used stigmatizing terms such as “lazarettos” (isolation hospitals) and “dirty” for the suspicious ships.³⁷ The Mariel lazaretto, near Havana, and many others in Latin America, became a symbol feared by the population due to the arbitrary measures employed and the segregation with which they were managed.

Irrational measures for quarantining and isolating passengers, crews, and merchandise affected land and maritime commerce. In the opinion of one Mexican official, the absurd and humiliating measures imposed by the U.S. state of Texas against the merchandise and passengers arriving on Mexican trains ended up “nullifying the traffic;” in other words, they stopped it.³⁸ This caused Mexico to call attention to a terrible injustice: local health provisions were taking precedence over those of the larger governments and could paralyze an entire nation’s trade.

THE RISE OF EXPORT ECONOMIES AND THE INSTITUTIONALIZATION OF PAN AMERICANISM

One of the principal triggers for the demise of conventional maritime public health was the fact that it was out of sync with new and growing economic interests. A fundamental ingredient of the old public health’s loss of prestige—and of the context in which new organizations such as PAHO emerged—was the extraordinary growth of maritime commerce, traffic, immigration, and international business in the late nineteenth century. This growth was due, in part, to steamships and railroads becoming widespread. The need to protect the ports, investments, plantations, mines, and travelers participating in this commerce, as well

as the fear of reintroduction into the United States, from Latin America and the Caribbean, of diseases that were barely under control in that country, were strong motives for redesigning international public health in the Americas.

In the late nineteenth century the United States exported cotton and grains, as well as machinery, refined petroleum, and manufactured products. Although the moment of greatest U.S. economic dominance varied in each Latin American country, it was particularly visible starting in the late nineteenth century in Central America, the Caribbean, and along much of South America's Pacific Coast. The fruit trade between the United States, the Caribbean, and Central America provided the basis for a significant growth in inter-American commerce during the late nineteenth and early twentieth centuries. It was so important that documents of the time called localities such as Puerto Limón in Costa Rica and Bocas del Toro in Colombia (now in Panama) "fruit ports."

A symbol of this growth was the formation of one of the first large corporations to conduct business in the region: the United Fruit Company of Boston. The company had plantations and railroads in Cuba, Jamaica, Puerto Rico, Central America, and Colombia, and a virtual monopoly on the trade in bananas entering the United States.³⁹ Indicative of the importance of this trade was a fundamental innovation in the diet of the North American working classes: the introduction of fruit, especially the banana. What is now an everyday dessert or snack was then a flavorful, affordable novelty, so widely available it began to be called "the poor man's bread."

It is easy to imagine how traditional quarantines could ruin this trade, and to understand the antipathy toward them: ships' holds filled with rotten, mashed fruit. Repulsion, fear, and suspicion that the stench of decomposing organic material was the origin of infectious disease were encouraged by the medical ideas of the time.

The economic interests that linked the countries of the Americas and the Caribbean in the early twentieth century were also manifested in the

extraordinary development of maritime transport. The ships of the Pacific Coast Steamship Company crossed the Gulf of California and arrived at Mazatlán in Mexico. They brought machinery and took on minerals, furs, coffee, vegetables, and live turtles. For their part, the ships of the American-Hawaiian Steamship Company left New York, sailed around Cape Horn, and, after a few stopovers, including San Francisco, dropped anchor in Honolulu. The vessels of the Pacific Mail Steamship Company called at 14 ports in both Mexico and Central America en route to Panama, carrying more passengers than any other company. It was inconvenient for these companies to have to comply with disparate and incongruous maritime public health requirements, which could include the presentation of as many as 25 different health documents, depending on the country visited.⁴⁰

In South America, the growth of maritime commerce was no less spectacular. From the port of Valparaíso, Chile's South American Steamship Company managed eight ships that traveled abroad with a total of 23,509 tons of merchandise and 90 crew members each. Of concern to some was the growing European presence in this commerce, as in the case of Kosmos, a German company with 46 steamships active in South America.⁴¹ This concern was due not just to the commercial competition, but also to the fact that this and other foreign companies had their own maritime public health rules.

Another major component of maritime commerce and the reformulation of inter-American public health came from the south. In the early twentieth century, the Latin American and Caribbean countries experienced an extraordinary upsurge in their economies emanating from the export of raw materials, especially agricultural and animal products, although minerals were also in demand. Argentine meat, Brazilian coffee, Cuban sugar, Mexican henequen, Bolivian silver, and Chilean copper, just to mention a few examples, became merchandise that was valued almost everywhere in the world. This economic process had some precedents during the nineteenth century, at least for a good part of South America. But, according to some historians, it was with the growth of exports

during the late nineteenth century that the need emerged to overhaul economic structures remaining from the colonial period.⁴²

This transformation was accompanied by the consolidation of commercial elites, big landowners, and exporters. These oligarchies, with their aristocratic lifestyles and a moderate liberal ideology, sought to modernize their countries in accordance with European patterns, while at the same time preserving their hierarchical privileges and the social order. Often supported by conservative militaries, they sought to impose their political authority, which in some cases was nearly synonymous with that of the State, and ensure the dominance of the capital cities over other regions where local power had disintegrated, was fragmented, or was disputed by caudillos. Improving maritime commerce and health was part of this process of modernization and centralization of political life.

The development of export economies, the consolidation of a ruling commercial elite class, and the emergence of Latin American nation-states meant not only that these countries had more opportunities to buy manufactured products from abroad and receive foreign investors, but also the emergence of more consistent regional foreign policies. During the first decades of the twentieth century, these policies were marked by a change: Latin America and the Caribbean passed from British economic dominance and fell under the powerful sphere of economic and political influence of the United States, which, on more than one occasion, translated into a U.S. military presence as well.⁴³ Starting with the First World War (1914–1918), U.S. economic investment and political influence prevailed.

There was an important difference between industrialized Europe, which held colonies well into the twentieth century, and the early twentieth century United States. The latter could not, because of its tradition and political system, call itself an empire, despite the fact that, in economic terms, that is what, in essence, it was. The United States' imperialist expansion took a different approach from that of the European powers, which gener-

ally displayed pride in owning colonies and naming viceroys in various parts of the world. In the case of the United States, imperialism entailed a geopolitical expansion marked by periodic military interventions, the persuasion of local politicians through use of the so-called “dollar diplomacy,” and the achievement of lasting economic influence rather than direct political control. This influence was based on a world economic order in which the Latin American countries were perceived as producers of raw materials. At the same time, it was distinguished by an ambivalence between the dissemination and restriction of a democratic political model. This meant support for concessions to and coexistence and agreements with dictators and military regimes.

This political process was highly influential in the redefinition of inter-American relations. A response to the tensions and the imperatives resulting from the economic dominance of the late nineteenth century was the institutionalization of Pan Americanism. At that time, this was, above all, part of the foreign policy promulgated by the United States Government, although its remote antecedents can be traced to the postulates of Simón Bolívar and the independence of the majority of the American republics in the early nineteenth century. In 1825, Bolívar organized an inter-American meeting in Panama attended by a select group of representatives; similar gatherings took place in 1847 and 1864. At almost the same time, the ideas of U.S. President James Monroe (1758–1831), which would be incorporated into the Monroe Doctrine (1823), served as a kind of warning to the European powers to avoid direct or indirect intervention in the Americas and inter-American affairs.

In the late 1880s, the dynamic U.S. Secretary of State, James G. Blaine (who held the office from 1889 to 1892 under President Benjamin Harrison), promoted the establishment of an entity to ensure the political and commercial stability of the Americas through regional solidarity and cooperation. Pan Americanism was then defined in terms of opposition to isolationism, which had marked U.S. foreign policy, and “Latin Americanism,” which prevailed in the countries south of the Rio Grande.

To Blaine, peaceful relations among the countries, diplomatic mediation of disputes, the reduction of European influence in the Americas, and increased U.S. exportation should be a single common objective.⁴⁴ Subsequent U.S. administrations, especially those of Presidents William McKinley (1897–1901) and Theodore Roosevelt (1901–1909), promoted Pan Americanism, despite the fact that there were instances of direct U.S. involvement in the internal affairs of several Latin American and Caribbean countries.

During this time, criticisms of Pan Americanism also emerged. According to its detractors, the concept assumed the fiction of a community of interests among countries of unequal economic and political strength. Furthermore, to some, it was a way of disguising an imperialism more aggressive than that of the nineteenth century European powers. The Roosevelt Corollary (1904) to the Monroe Doctrine and caricatures from the period of President Roosevelt carrying a big stick to beat or frighten the governments of various Latin American and Caribbean countries into submission served to solidify this argument. Cuban writer José Martí was one of the most forthright critics of the concealment of U.S. ambitions which the institutionalization of Pan Americanism could represent. There was also criticism of Pan Americanism because, according to several influential men of literature of the day—such as Rubén Darío and José Enrique Rodó—there were essential differences between Latin American and Anglo-Saxon culture, sensitivities, and spirituality, the Anglo-Saxon ones being marked by materialism and Puritanism.⁴⁵ While this debate has not been fully resolved to this day, it was noteworthy that, despite the real or perceived differences, an attempt was made to establish a common inter-American system in the late nineteenth century.

A decisive step in the institutionalization of Pan Americanism took place during the First International Conference of American States, held in Washington, D.C., from 2 October 1889 to 19 April 1890. The meeting was attended by representatives from Mexico, Central and South America, Haiti, the Dominican Republic, and the “Empire of Brazil.” (Despite the importance of

the event, Cuban representatives did not attend because that country was still part of the Spanish Empire.) In this meeting, 18 nations resolved to found the International Union of American Republics, whose permanent secretariat would be called the Commercial Bureau of the American Republics. This entity—whose Bureau would be renamed the Pan American Union at the Fourth International Conference of American States held in Buenos Aires, Argentina, in 1910—set up headquarters in Washington, D.C., with the diplomatic representatives from the Americas who lived in that city, acquired a small but stable bureaucracy, and was closely linked to public health in the Americas. In its early days it compiled, validated, and distributed information of commercial value. Over the years, its responsibilities and functions grew significantly.⁴⁶

There was, at least on paper and in the thinking of some leaders of Pan Americanism, the reasonable hope that countries united by geography and history could respect one another’s sovereignty, share the benefits of trade and technology, and cooperate through stable, legitimate political institutions. However, there was a gap in the proposals for both Pan Americanism and “Latin Americanism,” a concept prevalent mainly in South America. To a certain extent, neither included the Caribbean as an autonomous participant. Some countries of that region, such as Haiti, had no direct historical ties to the Iberian Peninsula, or were colonial possessions of non-Iberian European empires, such as Jamaica or the Guianas. The role of the Caribbean in Pan American or Latin American projects would remain unresolved, despite the fact that countries such as Haiti participated actively in international organizations, including those related to health. Thus, making Pan Americanism a reality in the Caribbean or Central America was a lengthier process than in other parts of the continent.

Of special importance to the history of public health was the confrontation, lasting approximately six months, known as the Spanish-American War of 1898, which took place in Cuba and was a dispute over the liberation of the Spanish Empire’s last colonial possessions.⁴⁷ After the war, by means

of the Treaty of Paris, the United States gained direct control over Cuba, Guam, Puerto Rico, and the Philippines. It was then that the United States began permanently stationing troops in areas that were considered tropical and were devastated by a group of feared diseases.

Drawing medical lessons from the military campaign in Cuba, General George M. Sternberg would say that public health was fundamental, because more U.S. soldiers had died from diseases caused by the inadequate sanitary conditions than from the enemy's bullets. Consequently, the Spanish-American War was the beginning of United States medical, sanitary, and scientific involvement in territories that were not its own, in connection with especially devastating diseases which were then known as tropical.⁴⁸ Later on in this chapter we will return to the importance of the medical work of U.S. military personnel in Cuba and Cuban physicians and scientists in controlling yellow fever.

THE ERA OF WALTER WYMAN

An essential player in the overhaul of international public health was the first Director of the Pan American Sanitary Bureau, Walter Wyman (1848–1911). He studied medicine in his native city of Saint Louis, Missouri, and, starting in 1876, was an official of an institution which, partly due to its military nature, had the power to intervene directly in the public health issues of all of the country's 50 states: the U.S. Marine Hospital Service. He gradually earned prestige for his painstaking attention to detail and devotion to duty, and he made his work not just an occupation but a passion. According to one historian, his strength of conviction could be summed up in one word: "persuasion."⁴⁹

His meticulousness even led him to develop manuals on how to respond to correspondence and on the Service employees' uniforms, the latter being considered necessary to promote discipline and create an esprit de corps among the staff of an important national entity. He progressed in his career and performed various duties, such as di-

recting the medical examination of immigrants arriving at Ellis Island, New York, and serving at the U.S. public health stations in Cuba, Puerto Rico, and the Philippines. Wyman was promoted to Chief of the Quarantine Division with an office in Washington, D.C. A unique personal quality worth mentioning is that he was not a racist (at least not outwardly), at a time when racism was accepted and practiced by the majority of those in power. In a letter to Marine Hospital Service employees, Wyman said that quarantines should not discriminate against people who came from areas where there were infectious diseases because of the color of their skin: "special restrictions should be applied to all persons . . . and should not discriminate for or against any particular race or people."⁵⁰

In 1891, Wyman was appointed Supervising Surgeon General (in 1902 this title would become simply Surgeon General) of the Marine Hospital Service, the highest-ranking office of its kind at that time. In that role he contributed decisively to the reorientation of international public health. One of the most important measures he promoted was the National Quarantine Act of 1893, which entrusted his office with the authority to intervene in the maritime public health affairs of any state, especially to standardize quarantine regulations. He assumed more power in 1902, when he persuaded the U.S. Congress to approve a law to "increase the efficiency of and change the name of the Marine Hospital Service" to the Public Health and Marine-Hospital Service.⁵¹

Along with the new name came a stable bureaucracy. A pay scale considered decent for the time was established (Wyman started out earning US\$ 5,000 a year and the officials under him a little less). Likewise, the term "Supervising" which in Wyman's title served to restrict the Service's jurisdiction over state public health authorities, was formally eliminated (and, beginning in 1912, this office was called simply the U.S. Public Health Service). When Wyman took charge of this organization in 1891, there were 54 inspectors and a budget of US\$ 600,000. Twenty years later, in 1911, he had overseen the expansion to a staff of 135 inspectors and a budget of US\$ 1.75 million.⁵²

Wyman's first contact with Latin America was in 1896, when he attended the Second Pan American Scientific Congress in Mexico City. At that meeting he presented a paper on yellow fever and "the international measures that should be adopted for its eradication."⁵³ In the years that followed, his role in U.S. organizations would grow, as witnessed by the fact that, in 1902, he was elected President of the American Public Health Association and, two years later, President of the Association of Military Surgeons.

The lives of U.S. civil servants were sometimes filled with sacrifice: some lived in cities far from the United States, such as El Callao in Peru, or on islands in the Gulf of Mexico, in relative isolation, as described in the following late-nineteenth century excerpt. With a humorous twist at the end, it speaks of the solitary work of an official at the Ship Island public health station, eight miles from Biloxi, Mississippi, responsible for surveillance of the entire Gulf of Mexico. During times of quarantine, mail came just once a month to Ship Island:

Insects were a terrific pest, heat was oppressive at times . . . no ice was available, water was obtained from rain collected at cisterns. . . . The Supervising Surgeon General's Office [wrote] that it was possible to supply the station with a typewriter to facilitate and expedite reports and correspondence and requested information as to the kind of typewriter desired. In those days a typewriter meant either a machine with which to do typing or the operator of the machine. [The officer] is said to have replied in due formality "If by typewriter is meant the machine, I do not know; I am not familiar with them. If the operator of the machine is meant, then I would prefer a blonde."⁵⁴

It is interesting to note that the Service Wyman directed was part of the U.S. Department of the Treasury, since its activities were considered to be closely linked to commerce. Thanks to that, he was able to discourage uncoordinated state health regulations and ensure Federal regulation and intervention with the states, which often sought to evade the national public health regulations that were considered inappropriate to their commercial interests.⁵⁵ This process took longer than

Wyman had expected. For example, it was only in 1921 that the U.S. Federal Government bought the last local quarantine stations operated by the urban authorities of New York City and Baltimore.⁵⁶

Wyman was part of a generation of intellectuals, politicians, and other public officials who lived during the so-called "Progressive Era," marked by the spectacular expansion of industry and the development of science, technology, and administrative methods, and by unflagging efforts to apply these innovations to business and society.⁵⁷ The political, financial, and scientific leaders of the period were convinced that human ability and knowledge could dominate nature, rationally direct commerce, and improve public health. It was believed that progressively applied reforms were the best solution to the abuses of big business and the extremes of anarchist and socialist agendas. Everything seemed to depend upon a painstaking study of the challenges at hand and upon the energy and rationality applied to solving them. International public health was not alien to this process.

Wyman consolidated two ideas that were starting to become widespread in some health and commercial institutions: first, the idea that it was possible to combine the protection of public health interests with minimal negative impact on commercial interests; and second, that the best quarantine was the one that began in the ports of shipment. In other words, the problem of maritime public health was not a lack of strictness, but the need for clear, consistent reform, integrated with the gamut of other port activities. In 1898 he gave a speech at a meeting of business representatives at which he explained the urgent need to rebuild relations between trade and quarantines on the basis of science, the common good, and solidarity with the patients.⁵⁸ Wyman was aware that a country's public health could not be reduced to what happened on the ships, in the ports, or in the big cities. But he thought it was more practical to limit international public health work to these locations, since they were the points of contact among countries, and because they could become an example for other cities.⁵⁹

The ports' problems included not just the sanitary conditions in the warehouses, but also the difficult living situations of the sailors, port workers, and fishermen. The sailors and fishermen lived in poor conditions, their work was unsteady, and during off-season, they needed to find other sources of income. The port workers had to load hazardous merchandise such as coal, which gave off asphyxiating gases; petroleum, which could trigger a fire; fertilizers such as guano, which damaged the skin; and agricultural products, which decayed easily. There was also the stereotypical notion that when the crews spent a few days in a Latin American port they would return to the ship with some venereal disease.

In the late nineteenth century, the Service Wyman directed had employees living in five localities in Cuba, two in Puerto Rico, two in Mexico, six in Central America, one in Colombia, and two in Brazil, as well as U.S. medical inspectors located in other parts of the world, such as Calcutta and Naples.⁶⁰ It was the employees' job to report on the sanitary conditions of the vessels, individuals, and merchandise departing for the United States. In addition, they used launches to disinfect the largest ships, carefully examined passengers and crews, and issued them health certificates. They also signed the health documents for the ships' captains. In this way they avoided the detention and imposition of heavy fines in the U.S. ports—fines that could reach US\$ 5,000 for ships that failed to present the requisite documents.⁶¹ In 1907, the U.S. Public Health and Marine Hospital Service had medical personnel in 10 of the principal Central and South American fruit-shipping ports.⁶²

It is important to point out that, despite the progressive spread of these measures, U.S. maritime public health was not standardized. It was not just the Federal authorities who were involved in disinfection in the ports of shipment. This activity was sometimes engaged in by the states, which wanted as much autonomy as possible from the central government to set down their own commercial regulations. For example, beginning in 1890, the New Orleans Board of Health posted medical inspectors in eight Central American ports during the fruit-exporting season.

In a parallel process, several Latin American countries modernized their maritime public health regulations and installations and aspired to have control over what crossed or could cross their borders. Cuba, for example, to ensure the sanitary condition of ports of shipment and fearing the introduction of yellow fever, stationed doctors in Tampa, Florida, and in Veracruz and Tampico, Mexico, where they supervised disinfections and issued health documents. In the early nineteenth century, Mexico even had health representatives in Hong Kong to keep an eye on the Chinese and Japanese immigrants headed for Mexico and to cable reports of any danger. In this instance, the fear was bubonic plague.⁶³

These measures were supplemented by the effort to establish a regular and frank exchange of health information among the countries. This meant reporting immediately to neighboring countries any epidemic outbreak—in other words, preventing any concealment of the seriousness of a situation, a practice to which the local political authorities had traditionally resorted. The initiative came from many directions. For example, the noted Mexican public health leader Eduardo Licéaga (1839–1920), who was, for many years, President of his country's *Consejo Superior de Salubridad* (Superior Council of Health), reported annually to U.S. specialists on the yellow fever situation in Mexico and on the control measures taken. His mechanism for accomplishing this was the publication of annual reports in the journal of the American Public Health Association, whose meetings he had been attending since 1895.⁶⁴

The scientific, economic, and political changes were fueled by the increase in the number, authority, functions, and diversity of health professionals in Latin America. They were influenced by the vestiges of positivist ideology that prevailed among the Latin American intellectual and political elite in the second half of the nineteenth century. According to this ideology, while it was true that the challenges of nature in the Region of the Americas were formidable, science could conquer them and start the countries down the road to prosperity and well-being. That meant studying the autochthonous diseases, controlling the major

epidemics, and exploiting the existing natural wealth, especially in the countries' interior regions. Public health measures and medicine were considered essential tools for strengthening national populations. At a time when fertility was high, it was thought that population growth would occur through the prevention of mortality, especially infant mortality, from preventable infectious diseases. These efforts were also part of an ideology of political modernization, which assumed that the social changes would be progressive and controlled by an educated elite consisting of politicians, engineers, and physicians. For some countries that embraced this ideology, such as Brazil, which incorporated the positivist slogan "order and progress" into its flag, the social changes would be supported by the mass arrival of European immigrants who would bring with them a superior culture and "race."

The medical changes in Latin American were closely linked to the growing importance of the cities, especially the capital cities. These were not only the centers of commerce, finance, and policy decisions; they were also becoming the locus of a significant portion of the national population. The growth of the Latin American cities generated public health needs which were often met by a new municipal and state bureaucracy, almost always recruited from among physicians. In some capitals, the urban growth was spectacular and much more marked than that of the population of the country as a whole. The population of Buenos Aires, for example, grew from 663,854 in 1895 to one and a half million in 1914, and that of Rio de Janeiro grew from 274,910 in 1872 to 650,000 in 1895. In other cities, the population increase was smaller, but no less significant. Lima, which had slightly more than 100,000 residents in 1876, had 143,000 in 1908. This growth was often disorderly; slums and makeshift housing multiplied, and the sanitary infrastructure was deficient or nonexistent.⁶⁵

One example of urban renewal that stemmed from this population growth and was partly justified by medical arguments was promoted by the prefect of Rio de Janeiro, Francisco Pereira Passos, inspired

by the work of his Parisian counterpart, George Eugene Haussmann (who governed the City of Light during the reign of Napoleon III). In the early twentieth century, Pereira Passos initiated a series of urban reforms known as *bota-abaixo*, consisting of the demolition of colonial buildings and narrow streets in order to decontaminate the atmosphere, prevent overcrowding, and open up gardens and wide avenues.⁶⁶

Some health officials of the Americas, such as Emilio Coni of Argentina (1855–1928), were convinced that they could make significant contributions to the cities.⁶⁷ Coni's achievements in Buenos Aires suggest the range of solutions, more complex than the reorganization of maritime public health, tested out by the hygienists of the era. They included the collection and disposal of garbage, the cleaning of sewers, the paving of streets, the ventilation of homes, the creation of a municipal health service, the establishment of school medical examinations, mandatory smallpox vaccination and reporting of infectious diseases, and the publication of a monthly demographic bulletin.

In addition to the above, there were initiatives to order the construction of parks and gardens, oversee the markets and slaughterhouses where animals were killed for human consumption, build new hospitals with spacious interiors, monitor the milk supply, control purity in the manufacture of soaps, conduct vital records collection and population censuses, and even require that barbers wear impeccable white long-sleeved shirts to prevent infections of their clients' scalps.⁶⁸ Another important change in the medical practices of countries such as Argentina and Chile was the emergence of a series of services targeted toward immigrant groups, who themselves organized mutual insurance societies, clinics, and hospitals in order to be able to respond with solidarity to their members' health problems.⁶⁹

These innovations enabled the establishment of the first national public health organizations, intended to be permanent and not merely ad hoc, as in the past. Small offices known as "assistant secretariats," "boards," or "health" or "hygiene departments," generally under the control of the

Minister of the Interior, appeared in most Latin American countries. While some countries, such as Argentina, Brazil, and Mexico, had had these types of institutions since the second half of the nineteenth century, in many others they were established in tandem with the emergence of inter-American public health. Moreover, in the early twentieth century the first bacteriology laboratories were established. Their responsibilities included scientifically certifying the presence of certain infectious diseases. In addition, the cleanup of the cities was systematized; health statistics and vital records collection and population censuses were regularized; and efforts to make smallpox vaccination mandatory were intensified. And the first steps were taken toward a crucial measure that had been considered intermittently during the nineteenth century: the education and participation of urban communities in health care issues.

Thus, urban life became medicalized or, to use the term employed by many, “hygienic.” As Michel Foucault said with respect to European history, many health-related activities, traditionally the responsibility of families—such as childbirth, illness, and death, in addition to nutrition, the disposal of bodies, and even requirements for marriage—began to be regulated by physicians with support from the State.⁷⁰

Many of these physicians were the first to hold positions in the incipient national health organizations that were established in most of the countries. They were not without strong competition from folk doctors, shamans, charlatans, herbalists, spiritualists, midwives, and bonesetters, often of indigenous or foreign descent. The university-trained professionals projected an image of authority, power, and above all, dominance among the health practitioners, at least in the cities and among the middle and upper classes. These professionals participated actively in urban hygienic renewal, setting up systems to supply drinking water, implementing or expanding sewer systems, and organizing systems for hosing, sweeping, and paving streets.⁷¹

Many of the young Latin American physicians—who were, in turn, part of the fully emerging ur-

ban middle classes—supported the changes in public health practices. Also, they saw, in science and in becoming part of the state machinery through public office, an opportunity to prove their talent, gain prestige, and develop their careers on the basis of academic and professional merit. That was especially important in a setting which, during much of the nineteenth century, had been dominated by clinics principally catering to the needs of the aristocratic classes, in a closed circle with few opportunities for social advancement. The clinics were characterized, moreover, by the belief that work in the hospital, as opposed to laboratory work, was what was important. The young health professionals became militants of maritime and urban public health, bacteriology, and laboratory medicine.

This new scientific discipline and type of medicine were offshoots of the discoveries of European researchers such as Louis Pasteur of France and Robert Koch of Germany, who identified the microscopic origins of certain infectious diseases, such as cholera and tuberculosis, and developed methods to control them. An important feature of this late nineteenth century scientific development is that it established an institutional and theoretical paradigm for its own replication. Pasteur established, in 1880, an organizational model—the Institute which bears his name—where the development of biological products was combined with research and teaching, which was emulated in various parts of the world, including several Latin American cities.⁷² Koch, for his part, developed a reliable method, known as the “Koch cycle,” for confirming the causality and effect of microorganisms. Around the same time, French military doctor Alphonse Laveran discovered the etiology of malaria, *Plasmodium*, while Ronald Ross of England and Italian researchers studied the role of the *Anopheles* mosquito in this disease’s transmission.

These scientific discoveries made more effective control of some of the major infectious diseases possible. They also made bacteriology and laboratory medicine fashionable specialties. The promise of bacteriology was that every microorganism that produced an infectious disease could be weakened or killed with the new and wonderful

biological products coming out of the laboratory: serums and vaccines. Later, the study of tropical medicine, another professional discipline that emerged strongly in England, extended Ross's discoveries and explained that several diseases were transmitted by the bites of insects such as fleas and mosquitoes, and that those diseases could be controlled by breaking the chain of transmission; in other words, eliminating the vectors.

The United States and the intellectual, professional, and political elites of other countries of the Americas joined the scientific movement that shook up the teaching and health intervention systems of the time. Not just the universities, but also municipalities and health stations in the ports, installed modern microscopes and bacteriology laboratories and hired European experts, certain that they would be essential to the control of major epidemics.⁷³ Their mission was to determine if the germs that caused the disease were hidden in the blood or sputum of patients, whether or not they were manifesting clinical symptoms, and to produce biological products (such as the smallpox vaccine) and control the quality of medicinal, biological, and even food products.⁷⁴

In the population at large and in the urban populations, the new disciplines produced what one Nicaraguan physician called "microphobia;" i.e., a fear of or repulsion toward the invisible biological enemies that could only be made vulnerable with the help of a medical expert.⁷⁵ All this helped to discredit the "miasmatic" explanations of epidemics, which attributed them to decomposing organic matter, and the erroneous ideas with respect to the famous fomites (the term that summarized the ideas about contagion held by the sixteenth century Italian physician, Fracastoro). The change was described succinctly in the words of Mexican public health leader Eduardo Licéaga: "fear as a health advisor begins to be replaced by reason."⁷⁶ The first major testing ground for many of the ideas just discussed was the control of an ancient disease that was present in many cities of the Americas.

THE CONTROL OF URBAN YELLOW FEVER

Of the many scientific studies conducted in the early twentieth century, one of the most influential in the Americas looked at the transmission of yellow fever. Despite the fact that Cuban physician Carlos Finlay had identified the mosquito that transmitted the fever (*Aedes aegypti*, then known as *Stegomyia*) in the 1880s, this discovery was not applied until after the confirmatory work done in Havana by the Fourth American Commission (so called because on three prior occasions, U.S. military personnel had tried unsuccessfully to solve the puzzle of yellow fever's origin). The Commission, chaired by military physician Walter Reed, also included Jesse Lazear of the United States (who died of yellow fever in Havana while research was being conducted) and Aristides Agramonte of Cuba, among others, and concern over the rapid transmission of tropical diseases led, in part, to the U.S. military participation in the Spanish-American War.⁷⁷

Reed's work was based on the tiny eggs of the *Aedes* mosquito provided to him by Finlay. Also instrumental in his study was the previous work by Ross, who had shown how the malaria parasite developed in a specific type of mosquito whose bite transmitted the disease. The results of this experiment were first presented at a session of the annual meeting of the American Public Health Association, held in October 1900 in Indianapolis, Indiana.⁷⁸ One of Reed's conclusions, extremely important at that time, was that the fever could not be transmitted by fomites; that is, by a patient's personal belongings, clothing, or hair.⁷⁹ To prove it, the Commission shut seven people who were not immune in an unventilated room, through which no mosquitoes or sunlight could enter, in Havana's Las Ánimas Hospital for 21 days, along with clothing and bedclothes stained with the bloody vomit, urine, and feces of yellow fever patients; filthy garments that they were asked to then place on their bodies. At the conclusion of the experiment, no one had fallen ill. And so it was that stories such as the one told at the beginning of this book gradually disappeared: doctors

succeeded in convincing people that yellow fever could not be transmitted through a patient's personal belongings or a dead person's hair. Rather, the generalized belief emerged that something effective could be done to counteract the true causes of the disease: mosquitoes and microorganisms.

An essential piece of information about the life of the *Aedes* mosquito was its close proximity to human beings. It was an insect that did not fly very far, avoided pools and wells with cloudy water, and bred in domestic water containers such as barrels, cans, jars, flowerpots, and even baptismal fonts. The female mosquitoes arrived at these after collecting the human blood they needed to raise their offspring. By the final decade of the nineteenth century, Henry Rose Carter (1852–1925) had determined that the incubation period of yellow fever was just seven days. In other words, after the seventh day an asymptomatic carrier could not develop the fever and, therefore, detention at the stations should not be for more than that amount of time.⁸⁰ This was a basic change, because up until then, many health authorities believed that the incubation period could be up to 14 days and that the safest approach was to detain ships and passengers for 40 (*quaranta*) days, or, literally, a quarantine. These findings also discredited a whole series of “miracle” remedies and cures that had been tested in different parts of the Americas and which, in general, had little or no effect against the fever.

These methods included those tried by Domingo Freire in Rio de Janeiro in the late nineteenth century, targeting *Cryptococcus xanthogenicus* as the causative agent and recommending injections of what turned out to be aspirin. Also, in 1885 in Mexico, Manuel Carmona y Valle found a microorganism in the urine of patients in Veracruz, another discovery that, in the end, turned out to be an erroneous. George Sternberg of the United States isolated “Bacillus X” during autopsies of some 50 individuals who had died of the fever, another action which in time was added to the list of failures. Another spectacular error was committed by Italian bacteriologist Giuseppe Sanarelli who, working in Montevideo in 1897, isolated the

Bacillus icteroides bacterium, which was thought for several years to be the cause of yellow fever. The errors continued until the 1950s, when Max Theiler of the United States identified the virus that caused the disease.⁸¹

The discovery of the natural transmission of yellow fever, made by Reed thanks to Finley's prior work, made it possible to develop simpler and less costly ways to fight the disease. The major change was that the work came to be directed toward one clear objective: elimination of urban mosquitoes. Health officials devoted themselves to destroying the adult mosquitoes by fumigation, protecting domestic water containers such as barrels and large earthenware jars to which the insects were drawn, and covering the surface of any pool of water where the larvae might breed with a thin layer of oil.

The first campaign of this type was carried out in Havana in 1901 under the command of William C. Gorgas of the United States (1854–1920), who enjoyed the valuable cooperation of Cuban doctors, including Finlay. Thanks to this work, the 1,300 cases and 322 deaths from yellow fever recorded in 1900 (prior to implementation of the campaign), dropped to 18 cases the first year and zero in 1902.⁸² Havana, which had not had a summer without yellow fever in the past 100 years, was free of the disease, at least for a time.

A decisive factor in the control of yellow fever in Havana was the training and prestige enjoyed by physicians, researchers, and local officials. Since the nineteenth century, several Cuban doctors had studied medicine in the best schools of the United States and Europe. These included Carlos Finlay (1833–1915), Juan B. Guiteras (1852–1925), and Aristides Agramonte (1868–1931). Finlay, trained in Europe and at Jefferson Medical College in Philadelphia (where he earned his doctorate in medicine in 1855), was Cuba's national director of public health from 1902 to 1907 and encouraged the establishment of a professional group that set up the first Secretariat of Health in any Latin American country. This Secretariat was a national service whose director did not report to any other ministry. In 1909, the continuity of this professional

group was reaffirmed when Guiteras became the director of his country's public health services, a position he held for the next 11 years.⁸³

Guiteras earned his medical degree at the University of Pennsylvania in 1873, worked at Philadelphia Hospital, and was an official with the uniformed services component of the U.S. Marine Hospital Service from 1879 to 1889. In that position he was responsible for medical services during several yellow fever epidemics. He was also a professor of pathology at the Medical University of South Carolina in Charleston, and at the University of Pennsylvania. Like many Cuban patriots, encouraged by the promise of his country's independence from Spanish control, Guiteras returned to Cuba for good around 1900. There he held prestigious positions such as Professor of Intertropical Pathology at the University of Havana. In taking responsibility for Cuban public health, both Finlay and Guiteras oversaw an honorable service, governed by technical, not political, criteria.

One example of the achievements of Cuban public health is the printing, in 1905, of 3,000 copies of the encyclopedic *Manual de práctica sanitaria* (Manual of Health Practices), a compendium of more than 1,000 pages on which 33 authors collaborated and which was aimed at directors of public health, physicians, and government officials. One of its chapters was devoted to maritime public health, an official department directed for years by Hugo Roberts, who applied methods of disinfection, fumigation, and isolation of patients at the Mariel lazaretto with energy, stringency, and insight. At an international meeting held in San Francisco, California, he received an award for his device that trapped rats on ships. Equally important were the 1906 *Ordenanzas sanitarias y la organización de juntas locales de salud* (Sanitary Ordinances and the Organization of Local Boards of Health), which led to the first Cuban law of this type and to more efficient and centralized public health coordination. The Cuban health organizations also emphasized public relations. By 1905, 38 popular brochures had been published and distributed, in some cases with as many as 50,000 copies. The titles included: *Fiebre*

amarilla: instrucciones populares para evitar su contagio y propagación (Yellow Fever: Everyman's Instructions for Preventing Its Contagion and Spread) and *Higiene de la primera infancia, instrucciones populares, sobre la manera de cuidar a los niños* (Early Childhood Hygiene, Everyman's Child Care Instructions).

Similar works, focusing on eliminating the *Aedes* mosquito and protecting patients from the bite of this vector, were developed a short time later in Rio de Janeiro and São Paulo (Brazil) and Veracruz (Mexico), which were the most important commercial ports in their respective countries.⁸⁴ One of the best-known battles against yellow fever, which adapted the model used in Havana, was that directed by Dr. Oswaldo Cruz in Rio de Janeiro.⁸⁵ After doing postgraduate work at the Pasteur Institute in Paris, he returned to his native city, Rio de Janeiro, to engage in the fashionable discipline of bacteriology. In 1900 he founded the *Instituto Soroterápico Federal* (an institute which would later bear his name) at Manguinhos, a city-owned farm outside Rio, to make anti-plague serum for the *Diretoria Geral de Saúde Pública*, or federal department of public health. Cruz became Director of this organization, committed to undertaking campaigns against yellow fever, bubonic plague, and smallpox.

In just a few years, using the methods employed by Reed, Gorgas, and the Cubans, Cruz freed Rio de Janeiro from yellow fever—at least temporarily—an achievement for which he would be recognized in his own country and in the world's research centers. According to Cruz, his work had been based on the theory of transmission by the mosquito, “disregarding” ideas about the fever being contracted through objects “contaminated” by a patient. Cruz did not limit himself to imitating the measures used elsewhere, but instead adapted them to a geographical setting that presented complications for public health work, being home to slightly more than 800,000 inhabitants who lived alongside gorges and on mountaintops covered with thick vegetation. Cruz organized a special service, independent of the *Diretoria Geral*, with 10 assistant medical inspectors, 75 medical students, and approximately 1,000

public health officers. The officers worked on isolating patients, fumigating the houses in which they lived, maintaining surveillance of those without immunity who lived near these homes, and especially, “systematically and continuously” destroying the mosquitoes. This meant not just fumigation to eliminate the adult mosquitoes, the principal method used by Gorgas in Havana, but combining fumigation with the battle against the larvae that bred in domestic water containers.

Cruz was also known because the opposition to his 1904 project, under which smallpox vaccination would be mandatory, coincided with the uprising at the *Praia Vermelha* Military School, which paralyzed the city for more than a week. The government put down the insurrection, called the “vaccine revolt”⁸⁶ because the participants were opposed to mandatory smallpox vaccination and an authoritarian regime. The following year, the outbreak of a nationwide smallpox epidemic served to vindicate Cruz’s efforts and discredit his critics.

In 1906, when Oswaldo Cruz was named his country’s Director of Public Health, the *Instituto de Manguinhos* was consolidated, and it began to manufacture biological products such as tetanus and diphtheria serums. Cruz also innovatively combined training activities with basic and applied research, a mix inspired by his own experience at the Pasteur Institute. Recognition came in 1907 at the International Congress of Hygiene and Demography in Berlin, where Cruz received a gold medal. Two years later, another member of the Institute, Carlos Chagas, discovered tripanosomiasis americana, a disease which now bears his name (Chagas’ disease), identifying the vector responsible for its transmission (*Triatoma infestans*) and the protozoan parasite that causes it (*Trypanosoma cruzi*).⁸⁷

As the control of yellow fever in Brazil suggests, several public health activities were linked together in practice. Often the public health interventions against mosquitoes were accompanied by the systematic collection of garbage, the provision of drinking water systems, the paving of streets, and general urban cleanup measures. In

Mexico, for example, in 1907, a vigorous campaign reduced the number of yellow fever cases that year to four. That was the first year in which the city of Veracruz, founded in the colonial era, passed a summer without the fever’s scourge.⁸⁸

Some years later, the Rockefeller Foundation organized campaigns to fight yellow fever in Brazil; Mexico; Central America; Guayaquil, Ecuador; and on the northern coast of Peru. The campaigns were designed by veterans of the war against this disease, such as Gorgas, Carter, and Guiteras, who traveled the region with the goal of total elimination of the disease. This U.S. foundation, based on the philanthropy of John D. Rockefeller—who had accumulated a considerable fortune in the oil industry—was established in 1913, and one of its main areas of interest was the struggle against certain diseases that humankind had the knowledge to control, such as hookworm, or that were considered a worldwide threat, such as yellow fever. Later, the Foundation helped organize the first health services and educational institutions for the training of doctors and health officials.⁸⁹ In fact, during the first half of the twentieth century, the Rockefeller Foundation and its powerful International Health Division were practically the only—and highly influential—philanthropic institution targeting international health issues.

New technologies came out of the various studies and activities with respect to yellow fever. The fumigation of houses required special care. It was necessary to seal all the cracks in the doors, windows, and ceilings of the houses where victims or mosquitoes had been found in order to then fumigate the interior. Later, fumigators began covering the terrace roofs and courtyards of the houses near the infected home with canvas to keep mosquitoes from escaping during preparation for fumigation. Finally, control activities came to focus on the river fish that ate mosquito larvae. With this latter system, in the 1920s, it became possible to eliminate coastal urban yellow fever from the Americas. But the disease retained a natural reservoir in Amazonia and rural areas, and would only manifest its ferocity years later.

The scientific discoveries and public health activities against mosquitoes resulted in yellow fever no longer being considered an erratic, unpredictable, and terrifying disease. A 1901 circular sent by Walter Wyman to the medical inspectors of the Marine Hospital Service Wyman directed noted: “Your attention is directed to the importance of insects in the conveyance of disease,” in reference to not just yellow fever but also to malaria and bubonic plague.⁹⁰ The conviction and simplicity of this scientific and public health event can be seen in the subtitle of a 1905 pamphlet written by Wyman: *No Mosquitoes, No Yellow Fever*.⁹¹ At the same time, health organizations in various other countries began to distribute popular booklets on mosquito control.⁹²

The shipping companies were not left behind. In Chile, the South American Steamship Company installed brass screens on the windows and doors of its ships’ cabins to discourage mosquitoes and other insects, and placed a notice inside the cabins recommending that passengers “remove” them because they were thought to carry “many infectious germs.”⁹³ No less important was the decision of various commercial vessels to change procedures for the protection of passengers’ drinking water. Previously, water had been distributed all over the deck in barrels and tanks. However, following the discovery of water’s role in the preservation of mosquito larvae, more rigorous measures were adopted to prevent these types of receptacles from becoming mosquito breeding grounds.

It is worth asking if so much attention to yellow fever in the Americas produced a certain reductionism in those who were fighting it. In other words, did they give short shrift to other diseases that were as, or more, important in terms of morbidity and mortality? One sentence uttered by a president of the Rockefeller Foundation, while referring to another disease, sums up the overspecialization of the time: to fight malaria effectively you have to think like a mosquito.⁹⁴ Despite the absence of definitive data, all indications are that other diseases caused more devastation. For example, in the Mexican state of Tamaulipas, with cities, such as Tampico, that were vulnerable to

yellow fever, statistics were developed on the deaths caused among its inhabitants by the major diseases between 1892 and 1901. They showed 461 deaths from yellow fever, 1,244 from smallpox, 2,588 from tuberculosis, and 3,048 from malaria.⁹⁵

While the above is not a national estimate—which, moreover, would have been difficult to produce in those days—these figures suggest that there was a selection of priorities in the relationship between public health and commerce. The diseases whose effects on the normal course of commercial trade were more noticeable, such as yellow fever, simply received more attention. There were also emotional factors associated with yellow fever: since it tended to appear and disappear suddenly, the seeds of panic were permanently sown among the population. The Sanitary Bureau’s third Director, Hugh S. Cumming, who had first-hand experience with the disease, would remember in the 1920s that “those of you who have not been in a community where yellow fever was epidemic cannot but faintly imagine the terror inspired by the mystery of its origin and the suddenness of its attack.”⁹⁶ What happened in Mexico in 1903, when 3,848 cases and 1,583 deaths were recorded nationwide, exemplifies this assertion.⁹⁷ These figures seem to indicate that yellow fever epidemics—despite the fact that, over time, they did not cause the most deaths—almost always led to important public health changes. Also, health officials of the time were of the opinion that only with diseases transmitted by insects, and to some extent with the diarrheal diseases caused by water contamination, could they achieve conclusive success; they were much less optimistic regarding respiratory diseases (with the exception of diphtheria, for which there was a vaccine).

It is also important to point out that public health campaigns sometimes yielded additional and unanticipated benefits. The fight against the *Aedes* mosquito led to the control of another disease transmitted by this same mosquito: dengue, and to the elimination of the *Anopheles* mosquito, which lived in the gardens and farms of the peri-urban areas and transmitted malaria. Some health officials of the time, including Gorgas, thought

that filth itself was connected with yellow fever's persistence, so the campaigns included improvement of the system for collecting garbage and dead animals, better provision of water and sewage removal, and modernization of building construction. In some cases—and perhaps going a bit overboard—measures were adopted to prohibit spitting in public.⁹⁸ The public health authorities of El Salvador joined the anti-mosquito crusade, writing, in 1904, the *Instrucciones para precaverse de la fiebre amarilla y de las fiebres intermitentes o paludismo* (Instructions for Taking Precautions against Yellow Fever and Intermittent Fevers or Malaria).⁹⁹ Thus, other diseases with more complex social and biological causes, such as tuberculosis, malaria, and typhoid fever, were controlled in the major cities.

As we have already noted, in addition to methods for the diagnosis, treatment, and control of yellow fever, there also existed effective measures for combating bubonic plague, cholera, and smallpox. In some cases the origin, the length of the incubation period, and the vectors responsible for transmission were known. It was already established that cholera was the result of the contamination of water with victims' feces. The defense measures consisted of safeguarding water for human consumption, disinfecting latrines, and properly disposing of patients' stools. Also, cholera had a characteristic that made it feared and, perhaps inadvertently, explained its origin: the nauseating odor of the patients' clothing. This stench, in and of itself, was thought to be contagious by those who were ignorant of scientific advances, and this belief was an additional reason to practice hygienic habits. It was these ideas, combined with medical discoveries, which the early twentieth century Latin American health officials capitalized on to instruct the population regarding the

dangers of cholera through a series of public health pamphlets and booklets.

A smallpox vaccine was originally conceived in the eighteenth century by Edward Jenner of England (1749–1823), although an appropriate technology for general administration was not available until the late nineteenth century. A serum and a vaccine were available for bubonic plague. There was also Clayton's fumigation device, which was driven by a small steam engine and released a sulfur substance. Widely used to disinfect ships and buildings in the ports, it did not damage fabrics, furniture, or merchandise, it could be easily transported to wherever it was needed in a small cart, and it was considered ideal for destroying rats, mosquitoes, bedbugs, fleas “and other kinds of bugs.”¹⁰⁰ The fumigation device was generally used early in the morning, to be able to club the rodents that tried to escape. At the same time, other measures were developed to control rats, such as regularizing systems for garbage collection and disposal in the cities, disinfecting warehouses with sulfur oxide, washing ships down with a strong solution of mercuric chloride, and mooring ships with barbed chains.

A quote from Eduardo Licéaga shows that, despite the fascination with science and technology, public health endeavors maintained a comprehensive, holistic, unified perspective. Licéaga's observation suggests that this perspective could fully complement the most practical and utilitarian of commercial interests:

The first condition that human groups need in order to prosper is the preservation of the health and life of their members, and one of the resources with which life and health are preserved is preventing diseases from being spread by the same agents that make communication among people easy and safe.¹⁰¹