

NURSING IMPERIALISM:
CLARA MAASS, YELLOW FEVER AND U.S. AMBITIONS IN CUBA,

1898-1901

by

MANUEL A. JUSINO

A thesis submitted to the

Graduate School-Newark

Rutgers, The State University of New Jersey

in partial fulfillment of the requirements

for the degree of

Master of Arts

Graduate Program in History

written under the direction of

Stephen G. Pemberton

and approved by

Newark, New Jersey

January 2012

© 2012

MANUEL A. JUSINO

ALL RIGHTS RESERVED

ABSTRACT OF THE DISSERTATION

Nursing Imperialism:

Clara Maass, Yellow Fever and U.S. Ambitions in Cuba,

1898-1901

By MANUEL A. JUSINO

Dissertation Director:

Stephen G. Pemberton

From 1900 to 1902 the U.S. Army conducted a series of yellow fever experiments in Cuba. While some of the medical physicians involved in these experiments have received recognition for the role they played in controlling yellow fever, the vast majority of volunteers utilized during experimentation have fallen into obscurity. One such volunteer is Clara Louise Maass, the only woman to die in association with the army's yellow fever experiments.

Clara Maass served as a U.S. Army contract nurse in Florida, Georgia, Cuba and the Philippines during the War of 1898. While Maass's activities are representative of contract nursing for the period, her uniqueness extends further than nursing during these years of nascent American Imperialism. In March 1901, Maass volunteered to be bitten by infected yellow fever mosquitoes at *Las Animas* Hospital in Havana. Three-out-of-eight volunteers utilized in this experiment died; with Maass being the third. Although these deaths were tragic, the publicity garnered by them – most notably the death of Maass as a woman

and nurse – aided Havana’s sanitation department in ridding the city of yellow fever. Prior to August 1901, the majority of Havana’s population did not believe the results of Walter Reed’s yellow fever experiments produced at Camp *Lazear* – most notably the role of *Aedes Aegypti* as transmitter of yellow fever. But following the death of Maass, doubting residents better understood that mosquitoes could indeed transmit yellow fever.

Maass’s death potentially serves as a significant event in the history of colonial medicine in Cuba when Havana’s population began to cooperate with the city’s sanitation officers to rid the region of *Aedes Aegypti*. With the success of controlling yellow fever in Havana, U.S. leaders acquired enough authority and prestige to continue forward in implementing yellow fever control efforts throughout much of Latin America. In this way, American leaders consciously utilized a war against yellow fever as an effective mechanism for making the Caribbean and Latin America viable territories for U.S. Imperialism.

CONTENTS

Introduction	1
1. Behind Cuban Annexation	5
2. Nursing American Imperialism in Cuba	17
3. Reflections on the Life of Clara Maass	38
Epilogue	43
Bibliography	46
CV	53

Introduction

During the War of 1898 Clara Louise Maass enlisted as a contract nurse in the U.S. Army. While typhoid and dysentery were leading causes behind military deaths at the time, yellow fever was the most feared.¹ To combat yellow fever, the U.S. Army conducted a series of experiments designed to explain and identify key factors involved in the etiology of the disease. The thinking behind these investigations were two-fold. First, the army needed to understand how yellow fever developed. Subsequently, military commanders wanted to identify activities that might control the disease. With these two objectives in mind Leonard Wood, Military Governor of Cuba between 1899 and 1902, supported attempts by U.S. and Cuban physicians to elucidate yellow fever.

In 1900 the first of several U.S. Army yellow fever experiments took place in Cuba at Camp *Lazear* under the direction of Walter Reed. With the support of Governor Wood, Reed investigated whether-or-not a mosquito named *Aedes Aegypti* could transmit yellow fever. While these experiments have proven pinnacle in U.S. histories of yellow fever, they were by no means the only investigations that occurred. In 1901 a second series of military experiments took place at *Las Animas* Hospital under the supervision of Cuban physician

¹ For some accounts which describe yellow fever as the most feared disease see Margaret Humphreys, *Yellow Fever and the South* (New Brunswick: Rutgers University Press, 1992); J.R. McNeill, *Mosquito Empires: Ecology And War In The Greater Caribbean, 1620-1914* (New York: Cambridge University Press, 2010) and J.H. Powell, *Bring Out Your Dead: The Great Plague of Yellow Fever in Philadelphia in 1793* (Philadelphia: University of Pennsylvania Press, 1993).

Juan Guitéras. With the support of Governor Wood, Guitéras investigated if mild cases of yellow fever might induce inoculation against the disease.

While the army's immunization experiments were well supported and thought-out, the results of Guitéras's experiments turned tragic when three-out-of-eight volunteers succumbed to yellow fever. On August 24, 1901, at the age of twenty-five, Clara Maass became the third and final volunteer to die in association with Guitéras's immunization experiments. Although these deaths appeared tragic to the public, the publicity garnered by them – most notably the death of Maass as a young woman and nurse – aided Havana's sanitation department in ridding the city of yellow fever. Prior to August 1901, the people of Havana believed that experimental yellow fever and wild-type yellow fever were two different things, unequal in virulence.² At this time medical professionals speculated that wild-type yellow fever killed between twenty and eighty percent of its victims. In contrast, the experimental yellow fever associated with Reed's Camp *Lazear* experiments in 1900 and 1901 appeared to be milder in form – maiming but never slaying its victims.³

² For accounts of Havana's disbelief in the mosquito theory see Assistant Surgeon General George's remarks in U.S. Congress. Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. (Washington, D.C.: Government Printing Office, 1904); and U.S. Congress, House. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 1865. (Washington, D.C.: Government Printing Office, 1904). Additionally, many southern U.S. sanitarians also did not believe in the mosquito theory; see, for example, Humphreys, *Yellow Fever and the South*: 156-157.

³ The incorrect idea that experimental yellow fever maimed but could not kill its victims was postulated by medical professionals antagonistic to the mosquito theory, and based in part on the evidence that none of the volunteers at Camp *Lazear* died when bitten by mosquitoes. For the details of these experiments see Walter Reed, James Carroll, and

With the death of Maass in 1901 Col. William C. Gorgas, Chief Sanitation Officer of Havana, promulgated the idea that wild-type yellow fever and experimental yellow fever were equal in virulence.⁴ As Havana's population evaluated the circumstances surrounding Maass's death, they soon began to conclude that mosquitoes could indeed transmit yellow fever.⁵ The death of Maass thus potentially serves as a key to understanding when – in the minds of Havana's citizens – yellow fever control became inextricably linked to mosquito control.

To illustrate the connection between Maass's death and yellow fever control in Cuba this essay is organized around three chapters. The first chapter looks at the background behind American involvement in Cuba, paying close attention to the role yellow fever played in forging a relationship between the two countries. "Behind Cuban Annexation" argues that American involvement in Cuba stemmed in large part from the premise of controlling yellow fever in Havana – thereby making Cuba a viable partner for U.S. economic growth. Chapter two moves into the activities surrounding the War of 1898 and

Aristides Agramonte. "The Etiology of Yellow Fever: An Additional Note." *Journal of the American Medical Association* 36 (1901): 431-40.

⁴ Some historians have even claimed that Gorgas embellished Maass's death. See, for example, Mary T. Sarnecky, *A History of the U.S. Army Nurse Corps* (Philadelphia, PA: University of Pennsylvania Press, 1999): 46.

⁵ For accounts of the transition that occurred among Havana's population in accepting the mosquito theory see Assistant Surgeon General George's remarks in U.S Congress. Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. (Washington, D.C.: Government Printing Office, 1904); and U.S. Congress, House. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 1865. (Washington, D.C.: Government Printing Office, 1904).

specifically follows Maass and her contribution to U.S. yellow fever control efforts. This chapter investigates how contract nurses, specifically Maass, were critical to U.S. success during America's imperialistic years. Finally, the third chapter looks at the legacy of Maass, yellow fever and American expansionism in Cuba. It argues that the circumstances surrounding the death of Maass is ripe for further historical investigation in order to better understand U.S. yellow fever activities in Cuba at the turn-of-the-century.

The focus on Maass is central to this essay. Not only is Maass's story representative of how nurses participated in the army to help gain newly acquired territorial possessions for the expansion of U.S. trade and commerce, but her death potentially serves as a significant event in the history of colonial medicine in Cuba when Havana's population began to cooperate with Gorgas's sanitation officers to rid the city of *Aedes Aegypti*. With the suppression of yellow fever in Havana, the U.S. proved that it could transform what was once believed to be a "diseased" city into a viable center for U.S. expansion. The U.S. Army acquired enough authority and prestige from their success in Havana to move forward in implementing yellow fever control efforts throughout much of Latin America. In doing so, American leaders consciously utilized a war against yellow fever as an effective mechanism for transforming the Caribbean and Latin American regions into viable territories for continued U.S. development and imperialism.

Ch. 1) Behind Cuban Annexation

In 1898, yellow fever was the most feared disease throughout the Western Hemisphere. Though tuberculosis, typhoid and dysentery annually took more lives, yellow fever was unequivocally feared because of the unique circumstances and characteristics associated with the disease. Yellow fever is known for its ability to produce fevers, muscle pains, backaches, headaches, shivers, loss of appetite, nausea, and vomiting. It can appear in a mild form and cause flu-like symptoms that may last about a week. While many victims of yellow fever never progress beyond mild symptoms, anywhere from ten to sixty percent – depending on the fever’s virulence – can enter a period of intoxication.⁶ If intoxication occurs liver failure normally follows causing jaundice to appear along with vomiting of digested blood – symptoms that compelled the Spanish to name the disease *El Vomito Negro*.

Fear of yellow fever arose not only from its physical effects, but its social consequences as well. The disease often came like a thief in the night. It attacked rich and poor, clean and unclean. Most importantly, yellow fever disrupted the total fabric of life by bring commerce and communication to a standstill; a characterization which was prominently revealed during the 1878 Mississippi Valley epidemic.⁷ Yellow fever’s destructive ability eventually enticed

⁶ Thomas P. Monath, “Yellow Fever Virus,” in Gerald L. Mandel, et al., eds., *Principles and Practice of Infectious Diseases*, 2nd ed. (New York: John Wiley & Sons, 1985): 923-926. While many ranges of death from yellow fever infection exist, this range encompasses a majority of them and is cited in well known monographs on the subject such as in Margaret Humphreys, *Yellow Fever and the South*: 6.

American leaders to involve the U.S. military in a defensive effort to stem the spread of the disease from Cuba to America's southern states.

Yellow fever's destructive ability across the eighteenth and nineteenth centuries convinced American leaders in the 1890s that U.S. interests at home and abroad hinged on controlling yellow fever. This assumption was particularly evident among military men. By illustrating yellow fever's destructive ability this chapter hopes to show why American involvement in Cuba and Latin America stemmed in large part on the premise of controlling yellow fever. The chapter therefore describes yellow fever's prominent role – in war and peace – of affecting national outcomes throughout the eighteenth and nineteenth centuries.

Stories of yellow fever's destructive abilities were already rampant in military life throughout the eighteenth century. In 1741, English Admiral Edward Vernon led 19,000 men in an attack on the Spanish colonial city of Cartagena in northwest Columbia during the War of Jenkins' Ear. The Battle of Cartagena de Indias ended badly for Vernon, however, when 9,500 of his men died from yellow fever.⁸ Vernon's defeat is one in a series of events that exhibits yellow fever's prominence in history.

Between 1895 and 1898, during Cuba's War of Independence, an estimated 16,000 Spanish troops succumbed to yellow fever forcing Spain to rethink her position and role in the New World.⁹ But nowhere was yellow fever's

⁷ For an excellent account of the 1878 epidemic see Margaret Humphreys, *Yellow Fever and the South*.

⁸ McNeill, *Mosquito Empires*: 153-164.

military impact more greatly felt than in St. Domingue, the western half of Hispaniola (now Haiti). In 1803, in an effort to re-exert control over St. Domingue, Napoleon Bonaparte's army lost upwards of 45,000 troops to disease – overwhelmingly to yellow fever.¹⁰ Napoleon had viewed Haiti as the key to France's power in the Americas. Once St. Domingue was lost, however, Napoleon decided to abandon his ambitions in North America. Shortly thereafter, Napoleon reached an agreement with U.S. President Thomas Jefferson to sell France's Louisiana Territory to the United States. That one treaty, signed as a direct result of the ravages of yellow fever in Haiti, doubled the size of the United States overnight.

Although yellow fever's significance stemmed in part from its ability to sway the outcome of wars, it also wreaked havoc on political and economic development. During the summer of 1793, a nascent U.S. government stopped functioning when a devastating yellow fever epidemic broke out in Philadelphia.¹¹ Doctor Benjamin Rush, dean of Philadelphia medicine and a notable signer of the Declaration of Independence, proclaimed in August that for the first time since 1763 yellow fever had returned to Philadelphia.

⁹ John R. Pierce and James V. Writer, *Yellow Jack: How Yellow Fever Ravaged America and Walter Reed Discovered Its Deadly Secrets* (Hoboken: John Wiley & Sons, Inc., 2005): 103.

¹⁰ McNeill, *Mosquito Empires*: 259.

¹¹ For excellent accounts of the 1793 yellow fever epidemic in Philadelphia see J.H. Powell, *Bring Out Your Dead: The Great Plague of Yellow Fever in Philadelphia in 1793* (Philadelphia: University of Pennsylvania Press, 1993) and Jim Murphy, *An American Plague: The True and Terrifying Story of the Yellow Fever Epidemic of 1793* (New York: Clarion Books, 2003).

Initial disbelief turned to panic in the 1763 yellow fever epidemic as 140 to 325 Philadelphians died by the end of the month. In November, an estimated ten to fifteen percent of Philadelphia's 45,000 population succumbed to yellow fever. By the end of the summer an estimated 20,000 Philadelphians fled the city. Paupers along with notable individuals such as George Washington, John Adams and Thomas Jefferson all tried to evacuate Philadelphia. Most of the poor had no choice but to stay. For the rich, however, salvation was to be found through travel. Washington, Jefferson and Adams all fled to nearby Maryland. Alexander Hamilton and his wife – both of whom contracted yellow fever in the 1763 Philadelphia epidemic – became refugees on their way to Albany for recuperation at Elizabeth's family's Schuylers Mansion.¹²

In the "City of Brotherly Love" politics, trade and commerce came to a standstill as people suspected each other of carrying yellow fever. Two political factions vehemently opposed each other's notions of how the disease originated. Hamilton's Federalists believed the disease was imported from the West Indies, while Jefferson's Democratic-Republicans, including Rush, believed it arose from filthy conditions within Philadelphia's harbor.¹³ The yellow fever outbreak of 1763 is one example of how yellow fever interacted and influenced American political and social history.

¹² Ron Chernow, *Alexander Hamilton* (New York: Penguin, 2005): 580-591.

¹³ For an account of the rise of the first U.S. party system in relation to yellow fever see Martin S. Pernick, "Politics, Parties, and Pestilence: Epidemic Yellow Fever in Philadelphia and the Rise of the First Party System," *The William and Mary Quarterly* 29, no. 4 (Oct., 1972): 559-86.

The concern over yellow fever's economic effects would reappear in the nineteenth century as Cuba began playing a more prominent role in U.S. trade. Cuba's location within the Caribbean, and its proximity to southern U.S. ports, meant that its harbors were some of the busiest in the world. Cuba's harbors exported sugar, rum, molasses, tobacco, cocoa and coffee beans as some of its largest commodities. The great majority of Cuba's commodities left for U.S. markets; paid for by ship captains with African slaves arriving by-way-of the Middle Passage.¹⁴ Prior to 1886 and the end of the *patronato*, or gradual-emancipation, Cuba was one of the major Caribbean importers of Africans via the transatlantic slave trade between West Africa, the Caribbean and North American or Europe.¹⁵ Cuban landowners regarded African slaves as more effective in plantation economies – particularly for Cuba's labor-intensive cash crop of sugar – than Asians, Yucatecans or Spanish immigrants.

In the nineteenth century Cuba's largest export crop was sugar.¹⁶ The island was home to some of the world's finest sugar fields. By 1868 Cuba

¹⁴ For accounts of the slave market in Cuba see Laird W. Bergad, Fe Iglesia García, and María del Carmen Barcia, *The Cuban Slave Market, 1790-1880* (New York: Cambridge University Press, 1995) and Eric Williams, *Capitalism and Slavery* (Chapel Hill: University of North Carolina Press, 1944).

¹⁵ For an account of the abolition of slavery in Cuba see Rebecca J. Scott, *Slave Emancipation in Cuba: The Transition to Free Labor, 1860-1899* (Princeton: Princeton University Press, 1985).

¹⁶ For recent accounts of the Cuban sugar industry see Cesar J. Ayala, *American Sugar Kingdom: The Plantation Economy of the Spanish Caribbean, 1898-1934* (Chapel Hill: University of North Carolina, 1999); Alan Dye, *Cuban Sugar in the Age of Mass Production: Technology and the Economics of the Sugar Central, 1899-1929* (Stanford: Stanford University Press, 1998); and Sidney W. Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Viking, 1985).

produced 720,250 metric tons of sugar, more than 40 percent of the cane sugar reaching world markets that year.¹⁷ Originally from Southeast Asia, sugar was one of several commodities that traveled with Columbus on his second trip to the New World in 1493.¹⁸ The crop readily took to Cuban soil. Dominated by rolling hills, rich soil and a proximity to U.S. capital, Cuba rose to become the largest Caribbean exporter of sugar in the nineteenth century. But this proximity and close relationship with the southern U.S. did not come without its problems.

In 1878, a virulent strain of yellow fever scourged its way up the Mississippi Valley and U.S. health officials believed that the origin of the infection was Havana, Cuba.¹⁹ The 1878 Mississippi Valley epidemic devastated the southern economy.²⁰ Ships ceased to transport goods to and from cities along the Mississippi, while trains stop servicing the contaminated region. Communities grew angry and afraid, while groups of men could be found tearing up train tracks, burning bridges and blocking roads leading into and out of their

¹⁷ Scott, *Slave Emancipation in Cuba*: 3.

¹⁸ Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport: Greenwood Publishing Company, 1972): 68. Other commodities also traveled from Old to New World such as citrus, bananas, mangos, wheat, grapes, onions, coffee, olives and rice; see *ibid.*, 64-113.

¹⁹ Some sanitarians believed the source of the epidemic came from a steamer that traveled between Havana and New Orleans without passing through quarantine: the *Emily B. Sounder*. See, "The Late Yellow Fever Epidemic," *New York Times*, November 30, 1878, 8; and John H. Ellis, *Yellow Fever and Public Health in the New South*: 38.

²⁰ For recent accounts of the 1878 epidemic see Kahled J. Bloom, *The Mississippi Valley's Great Yellow Fever Epidemic of 1878* (Baton Rouge: Louisiana State University Press, 1993); John H. Ellis, *Yellow Fever and Public Health in the New South* (Lexington: University of Kentucky Press, 1992); Margaret Humphreys, *Yellow Fever and the South* (Baltimore: Johns Hopkins University Press, 1992).

towns in an effort to keep the contagion at bay. Others formed armed bands and – in a type of “shotgun diplomacy” – kept passengers from disembarking trains.²¹ The entire ordeal is estimated to have cost the US economy at least \$100 million.²² For the South to prosper this could not continue. After the Civil War the South would spend the latter part of the nineteenth century in economic recovery. For the South to continue developing yellow fever epidemics could not be tolerated.

In an effort to combat yellow fever the U.S. established a National Board of Health, increased the use of quarantine and sanitation measures and contemplated annexing Cuba.²³ The reasoning behind these actions were threefold. First, to understand how yellow fever might be stopped from propagating in the South the National Board of Health organized the Havana Yellow Fever Commission to travel to Cuba and study the disease in what some suspected to be the disease’s natural habitat. While this research had the intention of increasing the knowledge of yellow fever, the U.S. bolstered its use of quarantine and sanitation measures in an effort to defend against maritime

²¹ For an account of the 1878 epidemic see J.M Keating, *A History of the Yellow Fever: The Yellow Fever Epidemic of 1878, in Memphis, Tenn.* (Memphis: Howard Association, 1879).

²² Stanford E. Chaillé, “Report to the United States National Board of Health on Yellow Fever in Havana and Cuba,” in *Annual Report of the National Board of Health, 1880*, ed. U.S. National Board of Health (Washington, D.C.: Government Printing Office, 1881): 72-73. Others have estimated the financial loss closer to \$200 million; see, for example, Crosby, *The American Plague*: 74.

²³ For an account of how the U.S. Public Health Service gained control over quarantine measures in the South see Humphreys, *Yellow Fever and the South*: 167-169.

vessels that might potentially bring the contagion to U.S. shores. In time, the Louisiana State Board of Health's Mississippi River Quarantine Station would become a model of "rational quarantine" not just for the U.S. but also for the world.²⁴

While the National Board of Health proposed research and quarantine to help contribute to the defense of U.S. borders against yellow fever, it also believed that a proper offensive was necessary. In 1878, U.S. sanitarians suspected that refugees from Cuba's Ten Years War for independence had transmitted yellow fever from Havana to the U.S; unintentionally starting the Mississippi Valley epidemic. If an offensive was to take place, it would be in Cuba. In the nineteenth century, medical authorities widely believed that yellow fever was a disease that lived in and could be transmitted by filth. The Cuban port of Havana was notorious among U.S. sanitarians for its refuse and disease. Most houses in Havana had simple privies that leaked into the harbor. When reporting to the National Board of Health, the Havana Yellow Fever Commission believed that,

The effluvia there-from 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.²⁵

²⁴ Ibid., 156.

²⁵ Quote from Dr. D. M. Burgess in Chaillé, "Report to the United States National Board of Health on Yellow Fever in Havana and Cuba," 102.

The simplest way to clean filth from Havana was to force the Spanish to administer and maintain sanitation reform. But there was little chance that the Spanish government could do this. At the time, Spain could not afford to pay interest on its debts. The estimated \$20 million sanitation infrastructure believed necessary – including clean water supplies, sewage systems and dredging of harbors – could not be supported by the Spanish crown.²⁶

Since Spain could not adequately prevent yellow fever in spreading from Cuba, some began to feel that the responsibility of countering the contagion should then fall to the United States.²⁷ On October 26, 1897, the *Atlanta Constitution* wrote that, “It is necessary, therefore, in the interests of all who are affected by an epidemic in the south that Cuba should be annexed, to the end that the plague, which has existed on the island for so many years, should be stamped out.”²⁸ By the autumn of 1897 the McKinley administration and many in the federal government agreed.²⁹ McKinley would soon send Steward L. Woodford to Europe with the ultimatum that if the Spanish government did not

²⁶ This estimate is taken from Chaillé, “Report to the United States National Board of Health on Yellow Fever in Havana and Cuba,” 107.

²⁷ For an impressive account of how yellow fever was used to justify U.S. involvement in Cuba see Mariola Espinosa, *Epidemic Invasions: Yellow Fever and the Limits of Cuban Independence, 1878-1930* (Chicago: University of Chicago Press, 2009).

²⁸ “Where to Fumigate-Havana,” *Atlanta Constitution*, October 26, 1897, 6.

²⁹ See, for example, Senator Wilkinson Call of Florida who argued that, “Just as long as [Cuba] is kept under Spanish domination just so long will it be a constant menace to the health of the people of the United States.” in “Will Ask Congress to Aid Cuba: Senator Call of Florida Will Push the Matter this Winter,” *Chicago Daily Tribune*, September 14, 1895, 5.

take actions to discontinue the spread of yellow fever from Havana the U.S. would have no choice but to intervene.³⁰

The opportunity for Cuban annexation began with the Grito de Baire (“Shout of Baire”) on February 24, 1895 in what were the beginnings of the Cuban War of Independence. As in previous independence movements – the Ten Years War (1868-78) and the “Little War” (1879-80) – Spain sent thousands of soldiers who were non-immune to yellow fever to counter the revolution.³¹ The influx of these troops led to an increase in yellow fever cases. On April 4, 1895, the *New York Times* reported that “Nearly one-third of all the soldiers imported from Spain in Cuba have been sick and many of them have died.”³² By the end of the year 7,085 Spanish soldiers contracted yellow fever, and 2,796 of them (roughly 40%) would die from the disease.³³

Sanitarians watched the Cuban War of Independence closely in order to see if yellow fever would make its way to U.S. southern borders. The *New York Times* reported that “The insurrection in Cuba causes a condition of affairs unpleasant for the health officials to consider. Marine hospital officials declare

³⁰ Stewart L. Woodford to Secretary of State John Sherman, September 13, 1897, October 4, 1897, and October 5, 1897 in United States Department of State, *Papers Relating to the Foreign Relations of the United States, with the Annual Message of the President Transmitted to Congress, December 5, 1898* (Washington: Government Printing Office, 1901): 562-65, 73-79.

³¹ For an account of these revolutions see Louis A. Pérez, *Cuba Between Empires 1878-1902* (Pittsburgh: University of Pittsburgh Press, 1998): 3-38.

³² “Spanish Troops in Cuba,” *New York Times*, April 4, 1895, 5.

³³ Espinosa, *Epidemic Invasions*: 19.

that the shipment of several thousand new Spanish troops into Cuba, at this season of the year, none acclimated, is bound to precipitate an epidemic of yellow fever, the ill effects of which must, in a degree more or less severe, be felt in this country.”³⁴

The effects of yellow fever began to be felt in 1897 as Cuban smugglers, insurgents and refugees evaded U.S. patrol boats and quarantine stations to land along the American gulf coast. It was one of these groups that U.S. sanitarians believed had propagated yellow fever in the resort town of Ocean Springs, Mississippi.³⁵ The result, reported Surgeon General Walter Wyman of the U.S. Marine Hospital Service, was a “well-defined epidemic of yellow fever in Ocean Springs, [which] spread to other states, with results which must still be fresh in the minds of all here present, of shotgun quarantines, disturbances of business, interruption of passenger traffic, hardships imposed on travelers, and all the other unhappy concomitants of a yellow fever epidemic.”³⁶

By the end of 1897, U.S. newspapers across the country blamed Cuba for spreading yellow fever to America’s borders. On September 8, 1897, the *New York Daily Tribune* mentioned that the disease “was carried over from Havana by

³⁴ “Safeguards against Yellow Fever,” *New York Times*, April 4, 1895, 16.

³⁵ Edmund Souchon, “True Origin of the Epidemic of Yellow Fever,” *Journal of the American Medical Association*, vol. 35 (1900): 308-10.

³⁶ Surgeon General Walter Wyman, “Our Sanitary Obligations,” March 22, 1900, cited in Souchon, “True Origin,” 308.

certain mysterious Cuban visitors.”³⁷ And on September 24, the *Atlanta Constitution* declared “The contamination [yellow fever] was brought by refugees from Cuba.”³⁸ Shortly thereafter the McKinley administration concluded that U.S. control of Cuba was slowly being seen as the best possible solution for the control of yellow fever in the South. Yellow fever thus became a direct premise behind the decision to invade Cuba.

American involvement in Cuba stemmed in large part from the desire by U.S. authorities to control yellow fever in Havana and the Greater Caribbean Antilles. But to control this territory, the U.S. would need the help of medical experts with experience in tropical diseases. To acquire this help, America’s military machinery began recruiting a cohort of medical professionals including physicians and contract nurses. When war with Spain finally commenced in April 1898, nurses found themselves imperative to U.S. success in Cuba.

³⁷ “The Yellow Fever Outbreak,” *New York Daily Tribune*, September 8, 1897, 6.

³⁸ “A National Board of Health,” *Atlanta Constitution*, September 24, 1897, 4.

CH. 2) Nursing American Imperialism in Cuba

In May 1898, Clara Louise Maass did something rather unusual for a young woman of twenty-one years. That spring she applied for a position within the U.S. Army. Ordinarily women were not permitted into military service, but circumstances were changing.³⁹ On April 25, 1898 the United States Congress declared war on Spain and a shortage of male nurses would soon provide the motivation behind military leaders hiring women to serve within the ranks of America's military.

Clara Maass was born on June 28, 1876 in East Orange, New Jersey, to Robert and Hedwig Maass. The Maass's were part of a large influx of German immigrants in the late nineteenth century. After the aborted Revolution of 1848, many German families fled their country.⁴⁰ Some German refugees left their homeland for Newark, New Jersey. By 1865 about one-third of Newark's 100,000 residents were either German-born or Newark-born children of Germans.⁴¹ These immigrants took up employment in fields they had left behind in Germany. Many began working in factories as laborers, jewelry makers and beer brewers. Maass's parents became two such laborers. With both parents working, Maass often became a surrogate parent to her eight younger siblings,

³⁹ Mary T. Sarnecky, *A History of the U.S. Army Nurse Corps*: 30.

⁴⁰ For accounts of the German Revolution of 1848 see Jonathan Sperber, *The European Revolutions, 1848-1851* (New York: Cambridge University Press, 2005); Mike Rapport, *1848: Year of Revolution* (New York: Basic Books, 2010) and Wolfram Siemann, *The German Revolution of 1848-49* (New York: Palgrave Macmillan, 1998)

⁴¹ John T. Cunningham, *Clara Maass: A Nurse, A Hospital, A Spirit* (Bellville, NJ: 1968), 4.

substituting as mother's helper, unpaid nurse and housekeeper.⁴² This experience helped Maass earn her first outside job where – at the age of fifteen – she worked for the Newark Orphan Asylum in New Jersey earning \$10 a month, half of which went back to her family.⁴³

Maass's career in nursing began as a result of Newark's continual influx of German immigrants. Throughout the 1860s Newark's German population grew and a hospital for this expanding community was desperately needed. On December 27, 1870 the Newark German Hospital opened its doors "for all the people" no matter one's race, ethnicity or religion.⁴⁴ In 1893, Maass answered the hospital's call for German speaking girls and enrolled in its nursing program. As a German hospital in the late nineteenth century Maass's training would have included discussions based on the work of Louis Pasteur, Robert Koch and other proponents of germ theory.⁴⁵ The influence of these conversations in Maass's life would be illustrated by how she performed throughout the typhoid outbreaks

⁴² For activities which Maass as a mother's helper and home nurse might have participated in see Karen Buhler-Wilkerson, *No Place Like Home: A History of Nursing and Home Care in the United States* (Baltimore: Johns Hopkins University Press, 2003); and Faye E. Dudden, *Serving Women: Household Service in Nineteenth-Century America* (Middletown: Wesleyan University Press, 1983).

⁴³ Lynn Wenzel and Carol J. Binkowski, *More Than Petticoats: Remarkable New Jersey Women* (Guilford, CT: Twodot, 2003), 88; and Cunningham, 37.

⁴⁴ Cunningham, *Clara Maass*: 24.

⁴⁵ For accounts of the influence of germ theory in medicine and culture see Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge: Harvard University Press, 1998); and Bert Hansen, *Picturing Medical Progress from Pasteur to Polio: A History of Mass Media Images and Popular Attitudes in America* (New Brunswick: Rutgers University Press, 2009).

of the late nineteenth and early twentieth centuries, as well as in her acceptance to become a contract nurse with the U.S. Army.⁴⁶

As war with Spain loomed imminent in the 1890s, the U.S. Army set up military camps that served as training, staging and mobilization areas for regular and volunteer soldiers. Seminal to military camps were the women, like Maas, who would serve as nurses. Contract nurses during the War of 1898 were imperative to the military. Nurses cared for diseased and wounded soldiers, which would soon become important as more troops died of disease and sickness during the War of 1898 than from bullets or cannon fire.⁴⁷ Just as important to the care of soldiers were the military experiments needed to understand and treat diseases. Nurses were important to caring for the volunteers of these military experiments, and some nurses – such as Maass – even served as volunteers themselves. More generally, nursing actions were

⁴⁶ For accounts of turn-of-the-century typhoid outbreaks see William Travis Howard, *The Natural History of Typhoid in Baltimore 1851-1919* (Baltimore: The Johns Hopkins University Press, 1920); Judith Walzer Leavitt, *Typhoid Mary: Captive to the Public's Health* (Boston: Beacon Press, 1996); John Staige Davis, *Fashions in Typhoid: A Review of 239 cases of Typhoid Fever in the University of Virginia Hospital* (1912) and Herman B. Allyn, *Statistics of Typhoid Fever at the Philadelphia Hospital from January 1, 1897 to December 31, 1899* (1901).

⁴⁷ For a few of the many accounts on disease and warfare see Andrew McIlwaine Bell, *Mosquito Soldiers: Malaria, Yellow Fever, and the Course of the American Civil War* (Baton Rouge: Louisiana State University Press, 2010); Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (New York: Cambridge University Press, 2004); William H. McNeill, *Plagues and Peoples* (Garden City: Anchor Press, 1976); J.R. McNeill, *Mosquito Empires: Ecology And War In The Greater Caribbean, 1620-1914*; and Sheldon Watts, *Epidemics and History: Disease, Power and Imperialism* (New Haven: Yale University Press, 1997).

imperative to the success of U.S. military and economic dominion over Cuba throughout the War of 1898.

The U.S. Army operated over a hundred and fifty camps across the contiguous forty-eight states in 1898. The vast majority of these camps served as mustering-in locations, where volunteer soldiers were initially recruited, mobilized and housed by regular soldiers. The separation between regular and volunteer soldiers was not uncommon for the period. From the time of the American Revolution until World War I, the small Regular Army of the United States bolstered its numbers by assimilating state militias and volunteer regiments that, in times of war, came under the command of federal authorities.⁴⁸ These “citizen-soldiers” came to be known as United States Volunteers (USV) in contrast to the Regular United States Army (USA).

After mobilization, volunteer soldiers began transferring to training and staging camps for the various army corps. At training and staging camps volunteer soldiers could prepare for war, receive arms and uniforms, and form into brigades, divisions and corps.⁴⁹ If sick or wounded throughout training, soldiers – both regular and volunteer – could visit field hospitals where nurses like Maass would care for them. At the beginning of America’s conflict with Spain

⁴⁸ For an account of the development of the U.S. Army see Edward M. Coffman, *The Old Army: A Portrait of the American Army in Peacetime, 1784-1898* (New York: Oxford University Press, 1988).

⁴⁹ Graham A. Cosmas, *An Army For Empire: The United States Army in the Spanish-American War* (Columbia: University of Missouri Press, 1971): 124.

there were over a dozen major staging and mobilization camps for the army corps across the continent.

The various army camps located themselves in different states based on political and military preferences. General William R. Shafter assembled his Cuban invasion Fifth Corps composed in small part of the First United States Volunteer Cavalry – popularly known as the “Rough Riders” and commanded by Leonard Wood and Theodore Roosevelt – in Tampa, Florida. In contrast, General Wesley Merritt assembled his Philippine Expeditionary Force – later known as the Eight Army Corps – in San Francisco, California. Other major camps existed for training, staging and mobilization, including those located in Savannah, GA; Chickamauga, GA; Charleston, SC; Jacksonville, FL; Fernandina, FL; Mobile, AL; Huntsville, AL; New Orleans, LA; and Miami, FL.⁵⁰ Military officials located these camps in the southeastern United States so the men would assemble and train in close proximity to their ultimate destination, while simultaneously adjusting to the tropical climates of Cuba and the Philippines.

The formation and maintenance of army camps quickly caused major health concerns and problems for military leaders. Observers were known for commenting on the pervasive filthiness of volunteer camps, often run by regular commanders who disregarded the well-established rules of army sanitation due to the undisciplined attitude of volunteers.⁵¹ Soldiers lacked adequate equipment

⁵⁰ For a map of these various camps see Cosmas, *An Army for Empire*: 138.

including shovels in which to dig latrines and refuse pits. In many regiments soldiers defecated in surrounding woods and threw garbage on the ground near their tents. Camps had no disinfectants to control germ-bearing insects, and they had no kettles in which to boil drinking water. When shovels were available, commanding officers often had their soldiers dig latrines and garbage pits within yards of their kitchens, hospitals and living quarters for convenient access. The results of these actions were rampant disease among troops.

By September 1898, typhoid, diarrheal diseases, malaria and yellow fever quickly reached epidemic proportions within camps.⁵² Typhoid became the single largest killer of American soldiers taking the lives of 2,774 Regulars and Volunteers by early 1899.⁵³ To compound the disaster, the limited numbers of medical officers in the U.S. Army Medical Corps quickly became overwhelmed by the task of controlling epidemic disease and caring for the ill. What military leaders would soon realize is that they needed more trained nurses.

In early summer 1898, Maass received orders to depart Newark, New Jersey, for the Field Hospital of the Seventh U.S. Army Corps at Camp *Cuba Libre* in Jacksonville, Florida. The general catastrophic conditions of the army camps set off public outrage against the Medical Corps. To pacify public opinion, Surgeon General George M. Sternberg requested U.S. Secretary of War Russell

⁵¹ Ibid., 268.

⁵² Report of the Surgeon General of the Army to the Secretary of War for the Fiscal Year Ending June 30, 1899 (Washington: GPO, 1899): 237.

⁵³ Ibid., 239.

Alger for permission to hire a cohort of contract nurses.⁵⁴ The army aggressively sought nuns, males and blacks to provide nursing during the war.⁵⁵ But not enough male nurses, nuns and blacks could be found and the army turned – as a measure of last resort – to female nurses. Originally deemed inappropriate for warfare, female nurses soon became such a military staple that by 1901 the U.S. Congress formed the U.S. Army Nurse Corp. In this way, it was thus out of necessity that women gained a foothold in American military medicine and not because of suffrage movements or political changes at the turn-of-the-century.

When Maass arrived at Camp *Cuba Libre* she could not have known to what extent her services would be needed. Originally established on May 26, 1898, the camp was an army staging and training area for the VII Corps headed for Cuba. Created mainly to house Major General Fitzhugh Lee's VII Corps of regulars, military commanders located Camp *Cuba Libre* near Tampa, Florida, to take advantage of the city's deep-water port. But overcrowding of soldiers and supplies near Tampa created a bottleneck effect where no one and no thing could move. Congestion in Tampa led to the army's decision to build a new camp in Jacksonville that would be run by Major General Lee. Lee was an ex-Confederate general, ex-governor of Virginia and nephew of Robert E. Lee. As a highly ranked southerner, Lee's participation in the war helped McKinley solidify North and South unity; something desired in a country still rift by the Civil War. Additionally, Lee's presence at the helm helped to pacify southern aggression

⁵⁴ Sarnecky, *A History of the U.S. Army Nurse Corps*: 30.

⁵⁵ *Ibid.*, 32.

against stationing federal troops in the South for embarkation to Cuba and Puerto Rico.

Typhoid, dysentery diseases and malaria were all common occurrences within Lee's *Cuba Libre*. The care of these soldiers soon fell to army contract nurses whom Surgeon General Sternberg intentionally hired for their medical training. Nurses who trained in anti- and a- septic techniques understood the relationship between germs and a patient's ability to recover from infections. This point was made imperative as the Medical Corps began looking for ways to reduce the transmission of contagions within army camps.

Maass's selection to *Cuba Libre* was the result of a meticulous selection process run out of Sternberg's office. To help select nurses for the war Sternberg utilized the services of Anita Newcomb McGee, a prominent Washington D.C. physician representing the Daughters of the American Revolution (DAR). McGee and Sternberg's goal was to hire only those nurses who met stringent qualifications. McGee's task force of DAR matrons selected trained female nurses based on three criteria.

In an effort to employ trained nurses, the Medical Corps primarily looked for individuals already working at nurse training schools and hospitals. The attention given to nurse training schools resulted from McGee and Sternberg considering professional ability – as demonstrated by letters of recommendation from a physician or from the superintendent of a nurse training school – to be of utmost importance. Fortunately, at the turn-of-the-century professional nurses were not uncommon. During the late nineteenth century, hospitals began

establishing schools that trained nurses in a type of nurse apprenticeship. The lure of obtaining cheap labor indoctrinated to a hospital's specification provided much of the incentive behind establishing nursing training schools.⁵⁶

Another quality McGee and Sternberg reviewed in a nurse's application was her character. For a nurse to validate her character she would need to obtain a letter from a Daughter of the American Revolution or any lady of "good standing" who would confirm a candidate's moral character and reputation. If a nurse's training and character could both be confirmed her application would move on to a final review committee. The third factor affecting selection to the Medical Corps was health. To substantiate good health, nurses forwarded a physician's certificate of health with their application.

While McGee's DAR matrons deemed all three factors important, it was the qualification of "nurse training" that Sternberg made critical to the selection of candidates. Nurses who trained in anti- and a- septic techniques understood the relationship between germs and a patient's ability to recover from infections. Training in bacteriology was made imperative by Sternberg as the Medical Corps began looking for ways to reduce the transmission of contagions in army camps. With Sternberg's authority, McGee's DAR matrons scrutinized approximately five

⁵⁶ For accounts of the ascent of nursing in American hospitals see Susan M. Reverby, *Ordered to Care: The Dilemma of American Nursing, 1850-1945* (New York: Cambridge University Press, 1987); and D'Antonio, Patricia. *American Nursing: A History of Knowledge, Authority and the Meaning of Work* (Baltimore: The Johns Hopkins University Press, 2010).

thousand applications submitted to the Medical Corps for professional nurses. In all, McGee accepted only one thousand trained nurses as eligible for service.⁵⁷

As a result of a nurse's medical training, duties were often issued to nurses that included dealing with bacterial and viral diseases. The treatment of diseased soldiers nearly always included organizing clean and aseptic wards for these patients. Often this would mean providing adequate ward ventilation, caring for utensils, cleaning furniture, making beds, disinfecting wards and moving patients as deemed appropriate. Much like the civilian nurses of the Civil War, contract nurses during the War of 1898 faced three primary tasks.⁵⁸ First, nurses regulated what a convalescent soldier could eat by administering special diets for patients. Second, nurses cared for soldiers' physical needs by bandaging wounds and assisting physicians in surgeries. Finally, nurses managed supplies provided from the U.S. Sanitary Commission distributing linen and clothing to patients.⁵⁹ Among the many patients Maass cared for at Camp *Cuba Libre* the vast majority of them suffered from typhoid.⁶⁰

Like many contract nurses in the war, Maass was well acquainted with typhoid that by 1899 had become the largest killer in the army. Between 1893

⁵⁷ Sarnecky, *A History of the U.S. Army Nurse Corps*: 31.

⁵⁸ For a recent account of Civil War nursing experiences see Jane E. Schultz, *Women at the Front: Hospital Workers in Civil War America* (Chapel Hill, NC: University of North Carolina Press, 2007); and Ann Douglas Wood, "The War Within a War: Women Nurses in the Union Army." *Civil War History* 18 (Sept., 1972): 197-212.

⁵⁹ Sarnecky, *A History of the U.S. Army Nurse Corps*: 34-41.

⁶⁰ Cunningham, *Clara Mass*: 39.

and 1898 Maass gained experience dealing with typhoid patients at the Newark German Hospital. The care of typhoid patients during the war would have included several different treatments. First, nurses would try to reduce soldiers' fevers by partially submerging convalescents into ice-baths for fifteen to twenty minutes. The cold temperature of the ice-baths would reduce a fever patient's temperature and local swelling. Second, nurses would manage a patient's diet, which often focused on forcing fluids – such as milk, broth, eggs, iced tea, and in certain cases, brandy or whiskey – while excluding solids from the patient during recovery. Medical doctors believed that the maintenance of a liquid diet helped patients recovery. Additionally, nurses used light moist coverings on fever patients in an effort to keep their skin as wet as possible and facilitate perspiration and cooling.⁶¹

In the fall of 1898, the Seventh U.S. Army Corps of Camp *Cuba Libre* transferred to Savannah, Georgia in preparation for their shipment to Cuba. By the time Lee was given permission to move his men to Georgia Maass had become well established with the Seventh Corps. That year the Medical Corps assigned Maass to travel with the Seventh to Cuba. On November 1, there were an estimated 13,000 men at Camp *Onward* in Savannah ready to embark for Cuba.⁶² By mid-December 1898, Camp *Onward* was all but abandoned; and for

⁶¹ For a list of nursing duties nursing duties at the time see Sarnecky, *A History of the U.S. Army Nurse Corps*: 36 and 55.

⁶² Spencer C. Tucker, ed. *The Encyclopedia of the Spanish-American and Philippine-American Wars* (Santa Barbara: ABC-CLIO, 2009): 91.

Christmas that year Maass found herself aboard an army transport ship in route to Santiago, Cuba.

In Santiago military officials were battling with a yellow fever epidemic that had taken hold of Shafter's Fifth Corps. Several direct outcomes occurred as a result of yellow fever striking the Fifth. First, nurses became desperately needed and immediately sailed for Cuba on the hospital ship *Relief*. The *Relief*, formerly known as the *John Englis*, was an army refitted vessel that functioned as a state-of-the-art hospital with operating rooms, sick wards and even an X-ray machine which located bullets in soldiers with gunshot wounds; sparing patients the painful probing that was the standard approach at the time.⁶³ During the War of 1898, the *Relief* served as a critical component to the army and navy; not only as a moveable hospital, but also as a transportation vessel carting the sick and wounded from the Caribbean theater to the United States.⁶⁴ A second consequence yellow fever had among the army in July was to put pressure on medical officers to end the reign of yellow fever in Cuba.

The experience with Shafter's Fifth reconfirmed the belief that to make Cuba viable for military and economic expansion yellow fever had to be controlled on the island. To restrain yellow fever in Cuba the army turned to a man who himself had suffered from the disease and now sought to understand its etiology: Surgeon General George M. Sternberg. George Sternberg was a

⁶³ Ibid., 35

⁶⁴ Ibid., 32.

U.S. Army physician considered by many to be the first U.S. bacteriologist.⁶⁵ Sternberg originally served with the Union Army after being appointed Assistant Surgeon in the Medical Corps on May 28, 1861. After the Civil War, Sternberg moved from post to post like many junior officers, serving for a time on the western frontier. From 1872-1875 Sternberg served at Fort Barrancase, Florida. It was at Barrancase that Sternberg contracted yellow fever. Sternberg survived the fever, but it launched a twenty-year grudge against the disease. In 1879, just after the Mississippi Valley yellow fever epidemic, the National Board of Health organized the Havana Yellow Fever Commission to gather information about the disease in Cuba. The National Board assigned Sternberg, who by this time had made a name for himself in the yellow fever field, to the commission. Joining Sternberg were doctors Carlos Finlay and Juan Guit eras; all three of them would spend the next two and a half decades studying yellow fever. By 1893, U.S. President Grover Cleveland promoted Sternberg to the position of Surgeon General.

In 1898 Sternberg was at the vanguard of U.S. military yellow fever research. After the U.S. entered war with Spain, Sternberg reassigned frontier physician Walter Reed from investigating typhoid epidemics among army camps to understanding the etiology of yellow fever in Cuba.⁶⁶ In 1900, Reed set sail

⁶⁵ See, "The Trials and Tribulations of George Miller Sternberg, 1838-1915 – America's First Bacteriologist," *Perspectives in Biology and Medicine*, vol. 36, iss. 4 (Summer 1993): 666. Sternberg also wrote the *A Manual of Bacteriology* (1892), which was the first exhaustive treatise on the subject produced in the United States.

⁶⁶ For the details of Reed's investigation of typhoid see Walter Reed, Victor C. Vaughan,

aboard a military transport ship for Cuba, and within a week's time found himself stationed at Camp *Columbia*, the army's largest base in Cuba. At Camp *Columbia* Reed met with army doctors Jesse W. Lazear, James Carroll and Aristides Agramonte formed the U.S. Army's Yellow Fever Board.

Between November 1900 and February 1901 the U.S. Army's Yellow Fever Board investigated two primary causes of yellow fever. At the request of Sternberg the Board first probed the findings of Dr. Sanarelli, an Italian bacteriologist who claimed to have found that microbes caused yellow fever. This idea turned up to be a dead end for the Board, which after several months decided to move on to a second theory regarding the etiology of yellow fever.

Thanks to the intuition of Carlos Finlay, Jesse Lazear and Henry Carter Reed's Yellow Fever Board examined if mosquitoes might be the vectors responsible for the transmission of yellow fever.⁶⁷ The idea that mosquitoes could spread disease originated three years earlier when Ronald Ross showed that mosquitoes were responsible for the transmission of malaria.⁶⁸ Reed and

and Edward O. Shakespear, *Report on the Origin and Spread of Typhoid Fever in U.S. Military Camps during the Spanish War of 1898* (Washington: Government Printing Office, 1904).

⁶⁷ Many accounts have been written of these events, however, for the original details surrounding the army's experiments see Reed, Walter, James Carroll, and Aristides Agramonte. "The Etiology of Yellow Fever: An Additional Note." *Journal of the American Medical Association* 36 (1901): 431-40.

⁶⁸ For accounts of the evolution in yellow fever theory see Carter, Henry R. "A Note on the Interval between Infecting and Secondary Cases of Yellow Fever from the Records of the Yellow Fever at Orwood and Taylor, Miss., in 1898." *New Orleans Medical and Surgical Journal* 52, no. 11 (1900): 618-36; and Francois Delaporte, *The History of Yellow Fever: An Essay on the Birth of Tropical Medicine* (Cambridge, MA: The MIT Press, 1991), 144. For a recent portrayal of the study of tropical medicine see Douglas

his fellow physicians most likely knew of Ross's findings, and used this information to bolster a theory that *Aedes Aegypti*, a household mosquito, transmitted yellow fever.

As a result of the Yellow Fever Board's findings at Camp Lazear General Leonard Wood, the U.S. Military Governor of Cuba, experimented with ways to eradicate mosquitoes from Havana. Eventually Governor Wood and Chief Sanitary Officer of Havana, Col. William C. Gorgas, decided on a four-prong approach to suppressing the intermediate host of yellow fever. First, under the supervision of Gorgas, the Department of Sanitation in Havana began screening yellow fever cases away from mosquitoes. Once fever victims were protected from mosquitoes, sanitation officers would set out on their second task of fumigating with sulfur, formaldehyde or other insecticides around the vicinity of the victim. Finally, mosquito breeding grounds had to be physically destroyed.

Mosquito breeding grounds soon became a major target for Gorgas's Department of Sanitation. Gorgas's sanitarians went door-to-door looking for any uncovered water sources that might potentially serve as breeding grounds for *Aedes Aegypti*. To prevent mosquitoes from breeding in barrels and cisterns Gorgas directed his sanitarians to cover these containers with a thin layer of kerosene. But the oiling of cisterns was a nuisance for many of Havana's wealthy landowners who complained that kerosene made their water undrinkable

and hazardous to their health. Furthermore, many of Havana's residents did not believe that mosquitoes were responsible for the transmission of yellow fever.⁶⁹

The idea that mosquitoes could transmit yellow fever was thought ridiculous even after the results of the Yellow Fever Board's experiments at Camp *Lazear*.⁷⁰ At a 1901 annual meeting of the Public Health Association, Eugene Wasdin, an attending physician for President William McKinley, announced on September 16 that the analyses of the Yellow Fever Board were questionable:

The fact that Dr. Reed states that the organism has not yet been discovered does not make that true. The organism has been discovered, and it is not inconsistent with Dr. Reed's demonstration of the transmission of the disease by the mosquito, to accept the organism of Sanarelli as the cause of yellow fever...although Dr. Reed has demonstrated to my mind that the disease may thus be transmitted, it is not the only way by which we can contract the disease, and when contracted from the mosquito I deem it but an artificial infection such as we produce in animals in our laboratories...⁷¹

⁶⁹ For accounts of Havana's resistance to the mosquito theory see Assistant Surgeon General George's remarks in U.S Congress. Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. (Washington, D.C.: Government Printing Office, 1904); and -----, House. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 1865. (Washington, D.C.: Government Printing Office, 1904).

⁷⁰ Many southern sanitarians did not believe in the mosquito theory. See, for example, Humphreys, *Yellow Fever and the South*: 156-157.

⁷¹ Proceedings from the 1901 American Public Health Association meeting are held in the Hench collection under the title *Public Health Papers and Reports, Volume XXVII, Presented at the Twenty-ninth Annual Meeting of the American Public Health Association, Buffalo, NY, September 16-20, 1901*; and Crosby 195.

Wasdin and others had a hard time believing that mosquitoes alone could spread yellow fever.⁷² Indeed, many in Havana speculated that wild-type yellow fever and experimental yellow fever were two separate things. For the mosquito theory to finally become accepted by medical professionals and the public something had to occur that would convince them of the legitimacy that *A. Aegypti* could indeed transmit yellow fever.

Immunization against yellow fever was the fourth means by which Wood and Gorgas hoped to control yellow fever in Cuba.⁷³ To run an inoculation program Wood and Gorgas turned to a Cuban physician, and well-known yellow fever expert, who had previously assisted in the U.S. Army's medical experiments at Camp *Lazear*: Juan Guitéras.

In 1901, doctor Juan Guitéras began directing a series of immunization experiments with the support of Governor Wood, Col. Gorgas and Capt. John W. Ross, the Medical Director of Las Animas Hospital, to try and immunize against yellow fever.⁷⁴ Guitéras believed that immunization was possible through the use of mosquitoes. He wanted to conduct immunization trials using *Aedes Aegypti* – the mosquito demonstrated to transmit yellow fever – on human volunteers. In a

⁷² Many southern sanitarians did not believe in the mosquito theory. See, for example, Humphreys, *Yellow Fever and the South*: 156-157.

⁷³ Pierce and Writer, *Yellow Jack*: 196-197.

⁷⁴ Juan Guitéras, "Experimental Yellow Fever at the Inoculation Station of the Sanitary Department of Havana with a View of Producing Immunization," *American Medicine*, vol. 2 (1901): 809-817; and U.S. Congress, House of Representatives, Committee on Pensions, *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 1865. (Washington, D.C.: Government Printing Office, 1904).

1901 paper in *American Medicine* Guitéras stated that he hoped to “propagate the disease in a controllable form... securing, among the recently arrived immigrants, immunization, with the minimum amount of danger to themselves and to the community.”⁷⁵ To carry out these experiments, however, Guitéras would need multiple non-immune volunteers. One such volunteer was a young army contract nurse named Clara Maass.

Between February and August 1901, Guitéras produced eight cases of yellow fever among his volunteers. Maass became the sixth confirmed case. Between March and June 1901 Maass volunteered to be bitten four separate times because, as Assistant Surgeon General Georges reported to the U.S. Congress, “She thought she would be more useful as a nurse after having had yellow fever, and requested to be bitten by infected mosquitoes in order to contract the disease and become immune.”⁷⁶ On August 14, 1901, at 9 A.M., Maass was bitten a final time. She became ill on the eighteenth, her temperature rising as she experienced chills and a headache.⁷⁷ On August 24, 1901, at the age of twenty-five, Clara Louise Maass died of yellow fever. She was the only American volunteer, and sole woman, to have died in any of the U.S. Army

⁷⁵ Guitéras, “Experimental Yellow Fever,” 809.

⁷⁶ This is a quote from John W. Ross, Medical Director of *Las Animas* Hospital at the time of Maass’s death, and reported by Assistant Surgeon General Georges to the U.S. Congress in U.S. Congress, Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. (Washington, D.C.: Government Printing Office, 1904): 2. The quote is used in a second report to the U.S. Congress in -----, House. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 1865. (Washington, D.C.: Government Printing Office, 1904).

⁷⁷ Guitéras, “Experimental Yellow Fever,” 814.

yellow fever experiments conducted between November 1900 and October 1901.⁷⁸

The result of Guitéras's experiment was not the immunization he had hoped for, but instead unforeseen publicity directed towards the U.S. Army Medical Corps. After Maass passed on August 24, 1901, news outlets began discussing the twenty-five year old German nurse who died volunteering for the army's yellow fever experiments.⁷⁹ Maass's death was also scrutinized by military commanders who were eager to utilize this newfound publicity in an effort to sway the minds of a local population antagonistic to their methods and control.⁸⁰ In 1901, William Gorgas utilized the headlines surrounding Maass's death by discussing how experimental and wild-type yellow fever were shown by the death of Maass to be analogous in virulence.⁸¹ By promulgating the similarity

⁷⁸ This 12 month span is assigned as the U.S. Army Yellow Fever Board experimental time period based on the establishment of Camp Lazear, in November 1900, and the end of Carroll's hematology experiments, in October 1901; respectively recorded in Walter Reed, James Carroll, and Aristides Agramonte, "The Etiology of Yellow Fever: An Additional Note." *Journal of the American Medical Association*, vol. 36, 1901: 431-440 and Walter Reed and James Carroll, "The Etiology of Yellow Fever: A Supplemental Note." *American Medicine*, vol. 3, 1902: 301-305.

⁷⁹ For accounts of the publicity garnered by Maass's death see U.S. Congress, Senate. *Hedwig A. Maass*. 58th Congress, 2nd Session, Report No. 2111 (Washington, D.C.: Government Printing Office, 1904): 1; -----, House. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 1865. (Washington, D.C.: Government Printing Office, 1904): 1; and Sarnecky, *A History of the U.S. Army Nurse Corps*: 46.

⁸⁰ For accounts of Havana's population antagonistic to U.S. military control see Perez, *Cuba Under the Platt Amendment*: 29-55. For an account of a military leader (William C. Gorgas, U.S. Army) utilizing Maass's death see Sarnecky, *A History of the U.S. Army Nurse Corps*: 46.

⁸¹ *Ibid.*, 46.

between experimental and wild-type yellow fever Gorgas hoped that Havana's citizens would understand the necessity behind his Department of Sanitation's efforts to rid Havana of mosquitoes.

In 1904, Assistant Surgeon-General Georges explained in a report to the U.S. Congress the significance of Maass's death in the army's campaign to eradicate yellow fever from Cuba.

While these [Guitéras's] cases were not directly connected with the experimentation of the [Yellow Fever] army board, they had much more effect in the city of Havana in convincing the physicians and people generally that yellow fever was conveyed by the mosquito than did the work of the [Yellow Fever] army board. In this way the assistance and cooperation of the people in our mosquito work was obtained. From this point of view the death of Miss Maass greatly contributed to establishing the fact that yellow fever was conveyed by the mosquito.⁸²

Though Reed's Yellow Fever Board had demonstrated that the mosquito was the vector of transmission behind the propagation of yellow fever, it was only after the death of Maass that a number of individuals from Havana's local population became convinced of the mosquito theory. In this way, Havana's population learned to accept the relationship between yellow fever and *A. Aegypti* based on the authority of Maass's death rather than the direct claims of American military leaders.⁸³ With Havana's cooperation Gorgas was able to carry out his goal of eliminating breeding grounds for *A. Aegypti* throughout the city.

⁸² U.S Congress. Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. (Washington, D.C.: Government Printing Office, 1904).

⁸³ *Ibid.*, 1.

Havana's newfound faith in Gorgas had stunning results. For nearly 150 years yellow fever had ravaged Havana, but from September 1901 to July 1902 there was not a single report of the disease in the entire city.⁸⁴ In less than 150 days Gorgas's Department of Sanitation had practically wiped out yellow fever in a territory believed to be endemic for the disease.

By participating and dying in the U.S. Army's immunization experiments Maass potentially serves as a pivotal figure in the history of yellow fever and Cuban-American relations. For over a century yellow fever ravaged Cuba and the U.S., but with the help of prominent physicians and volunteers a new understanding of yellow fever led to its control. Maass's significance is thus found in the role her death played in bolstering Gorgas's efforts to control yellow fever. In turn, Gorgas's work on behalf of the American military would effectively transformed Cuba into a viable and later thriving hub of American economic growth throughout the Caribbean.

⁸⁴ Pierce and Writer, *Yellow Jack*: 197.

CH. 3) Reflections on the Life of Clara Maass

While Maass's death led to the success of U.S. yellow fever control efforts in Havana, she is not remembered in association with any Cuban-American medical conquest. Indeed, even though Maass's sacrifice helped to legitimate the Yellow Fever Board's findings, she is not even thought about in conjunction with these experiments. Instead, journalists and historians have propagated a story of Maass as faithful and sacrificial nurse, while leaving out any hint of Maass as a significant historical figure in the U.S. campaign to control yellow fever.

In 1929, the 70th U.S. Congress passed Public Law No. 858, "To recognize the high public service rendered by Major Walter Reed and those associated with him in the discovery of the cause and means of transmission of yellow fever." It read:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in special recognition of the high public service rendered and disabilities contracted in the interest of humanity and science as voluntary subjects for the experimentations during the yellow-fever investigations in Cuba, the Secretary of War, be, and he is hereby, authorized and directed to publish annually in the Army Register a roll of honor on which shall be carried the following names: Walter Reed, James Carroll, Jesse W. Lazear, Aristides Agramonte, James H. Andrus, John R. Bullard, A.W. Covington, William H. Dean, Wallace W. Forbes, Levi E. Folk, Paul Hamann, James L. Hanberry, Warren G. Jernegan, John R. Kissinger, John J. Moran, William Olsen, Charles G. Sonntag, Clyde L. West, Doctor R.P. Cooke, Thomas M. England, James Hildebrand, and Edward Weatherwalks.⁸⁵

⁸⁵ U.S. Congress. Senate. *To Recognize the High Public Service Rendered By Maj. Walter Reed And Those Associated With Him in the Discovery of the Cause and Means of*

The men from Camp *Lazear* are listed, along with James Carroll's volunteer who had participated two months after the death of Maass.⁸⁶ A Special Act of Congress in June 1956 amended Public Law 858, 70th Congress to include the name of Gustaf E. Lambert, a male contract nurse from Camp *Lazear*.⁸⁷ Then in August 1958, the law was amended a second time to include the name of Dr. Roger P. Ames, Camp *Lazear*'s contract surgeon.⁸⁸ But the name of Maass has continued to be excluded.

On March 1, 1949, John J. Moran – a surviving volunteer of the U.S. Army's yellow fever experiments – wrote to longtime Maass advocate Reverend Arthur Herbert saying:

In drafting the Act of February 28, 1929, only those who volunteered for experimentation to Walter Reed and his Yellow Fever Board were considered. Manifestly, if the three "human guinea pigs" experimented upon by Dr. Carroll, in October 1901, were considered on a par with those of Walter Reed and his Board, omission of the name of Clara Maass from the ROLL OF HONOR did not do justice to her memory and her sacrifice to humanity and medical science.⁸⁹

Transmission of Yellow Fever, 70th Congress, 2nd Session, Report No. 1912, Ser. 8977. (Washington, D.C.: Government Printing Office, 1929); and Pierce and Writer, 242-243.

⁸⁶ For the details of these experiments see Walter Reed and James Carroll. "The Etiology of Yellow Fever: A Supplemental Note." *American Medicine* 3 (1902): 301-05.

⁸⁷ U.S. Congress. Senate. *Recognizing the Service of Gustaf E. Lambert in the Yellow Fever Experiments*, 84th Congress, 2nd Session, Report No. 2168. (Washington, D.C.: Government Printing Office, 1956).

⁸⁸ U.S. Congress. Senate. *Adding Name of Roger P. Ames to Roll of Honor in Discovery and Cause of Yellow Fever*, 85th Congress, 2nd Session, Report No. 2493. (Washington, D.C.: Government Printing Office, 1958).

Maass, the sole woman and only American to die in any of the military yellow fever experiments, had become by 1929 disassociated with the activities she gave her life for. Instead, a different legacy of Maass would emerge. In 1949, after reading a *TIME* magazine piece that omitted the contributions of Maass entirely, Reverend Herbert wrote a letter to the magazine's editors pleading with them to remember a young woman who "symbolized the sacrificial spirit, the best in young American womanhood."⁹⁰ *TIME* printed Herbert's letter, which prompted *American Weekly* to send a staff writer to Herbert inquiring about the role of Maass during the War of 1898 for its May 8th, 1949 issue. Over nine million copies of the *American Weekly* articles circulated narrating the young Maass who was willing to die for her country because she believed she would be more effective as a nurse after having become immune to yellow fever.⁹¹

Journalists and advocates chose to remember Maass more for her sacrificial spirit of caring for sick and wounded soldiers than her activities in legitimating the mosquito theory and furthering U.S. yellow fever control efforts in Havana. Promulgated by fans and admirers, Maass's nursing legacy would spread throughout the media and larger culture. On March 8th, 1949, Maass's publicity reached a crescendo when DuPont's *Cavalcade of America* – an anthology series transmitting novels like *Arrowsmith* via the radio from 1935 to

⁸⁹ Copy of letter located at Clara Maass Foundation.

⁹⁰ Ibid. and Cunningham, 78.

⁹¹ U.S Congress. Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. (Washington, D.C.: Government Printing Office, 1904): 2.

1953 and subsequently on television from 1952 to 1957— featured “No Greater Love” portraying Maass in her faithful service as nurse during the War of 1898. “No Greater Love” depicted Maass’s activities in military hospitals and reenacted her faithful decision to volunteer for Guitéras’s immunization experiments in the hopes of becoming a more versatile nurse. The promotion of Maass as sacrificial nurse would eventually lead the U.S. Postmaster General to endorse a commemorative stamp in 1976 etched with the subtitle “She gave her life,” celebrating the “sacrificial spirit” that Arthur Herbert and others had come to associate with Maass.⁹²

A narrative of nursing service and sacrifice has continued to overshadow Maass’s other contributions. Contemporary popular histories have chosen to remember Maass more for the activities she displayed as a female nurse rather than her unwitting role in helping to legitimate the mosquito theory.⁹³ This may have resulted from the repetitive nature of a false narrative originally begun at the turn-of-the-century. Historian Gail Bederman offers a general explanation of why such unbalanced accounts occurred in the early twentieth century with her categorization of journalists and their profession. During these years “white

⁹² “Clara Louise Maass,” *The American Journal Of Nursing* 50, no. 6 (1950): 343; D. Anthony Forrester and Pamela M. Grandinetti, “Nurses on Stamps,” *The American Journal of Nursing* 92, no. 5 (1992): 64; and Mildred Tengbom, *No Greater Love: The Gripping Story of Nurse Clara Maass* (St. Louise, MO: Concordia, 1978): 153.

⁹³ See, for example, Molly Caldwell Crosby, *The American Plague: The Untold Story of Yellow Fever, The Epidemic That Shaped Our History* (New York: Berkley Books, 2006): 196-197; and John R. Pierce and James V. Writer, *Yellow Jack: How Yellow Fever Ravaged American and Walter Reed Discovered Its Deadly Secrets* (Hoboken: John Wiley & Sons, Inc., 2005): 198-200.

middle-class men actively worked to reinforce male power... [to] develop new explanations of why they, as men, ought to wield power and authority."⁹⁴ As a woman Maass was thus characterized as allegedly subordinate to her male physicians, and instead epitomized on a Victorian pedestal of virtue and benevolence.⁹⁵ This image of Maass has continued to persist, overshadowing other possible presentations of her life and contributions that might help us to better understand how U.S. yellow fever control efforts came about in Cuba at the turn-of-the-century.

The circumstances surrounding the death of Maass is ripe for further historical investigation. When a fuller story of Maass's involvement in the U.S. Army's yellow fever experiments is finally revealed, it will likely become evident that her death helped further American medical influence throughout much of the Western Hemisphere. Such a history will likely have the possibility of placing Maass's death as a key event that legitimated the mosquito theory and bolstered the U.S. war against yellow fever. With America's success of controlling yellow fever in Havana, U.S. leaders would move forward in implementing anti-mosquito efforts throughout Caribbean and Latin America territories.

⁹⁴ Gail Bederman, *Manliness & Civilization: A Cultural History of Gender and Race in the United States, 1880-1917* (Chicago, IL: University of Chicago Press, 1996), 5. For an account of a change in attitude for the period see Karen Manners Smith, "New Paths to Power: 1890-1920." In *No Small Courage: A History of Women in the United States*, edited by Nancy F. Cott. (New York, NY: Oxford University Press, 2004.)

⁹⁵ For accounts on the expectations of Victorian women see Nancy F. Cott, *The Bonds of Womanhood: "Woman's Sphere" in New England, 1780-1835* (New Haven, CT: Yale University Press, 1997) and Carroll Smith-Rosenberg, *Disorderly Conduct: Visions of Gender in Victorian America* (New York, NY: Oxford University Press, 1986).

Epilogue

In April 1904, Colonel William Crawford Gorgas's superiors charged him with waging a critical war in America's Panama Canal Zone.⁹⁶ That war was not against man, but rather against the vectors of yellow fever and malaria. President Theodore Roosevelt, a veteran of the War of 1898, understood the devastating effects of yellow fever and malaria and endorsed Gorgas's appointment as chief sanitary officer for the Panama Canal project. Successful in his battle over *Aedes Aegypti* in Havana, Gorgas would take his experience in Cuba and tweak it for his sanitation efforts in Panama.⁹⁷ Gorgas's subsequent success in Panama was made evident in 1906 as the last case of reported yellow fever appeared in Colon. From 1905 until the canal opened in 1914 there was not a single case of yellow fever reported in all of the Canal Zone.⁹⁸

Gorgas's success in suppressing yellow fever at Havana and Panama led to other U.S. led public health ventures throughout Latin America. In 1916, the Rockefeller Foundation – through its subsidiary International Health Division – asked then Surgeon General Gorgas if he would be willing to travel to Brazil in

⁹⁶ For details of Gorgas's efforts in Panama see William C. Gorgas and John M. Gorgas, *Physician to the World: The Life of General William C. Gorgas* (Durham: Duke University Press, 1950); William C. Gorgas, *Sanitation in Panama* (New York: Appleton, 1918); and -----, "Health Problems of the Army." *The American Journal of Public Health* 7 (1917): 937-39.

⁹⁷ Paul S. Sutter, "Nature's Agents or Agents of Empire? Entomological Workers and Environmental Change during the Construction of the Panama Canal." *Isis*, vol. 98, 2007: 724-754.

⁹⁸ Pierce and Writer, *Yellow Jack*: 219.

order to investigate the possibility of establishing a national anti-yellow fever program.⁹⁹ American sanitarians worried about yellow fever transferring from Rio de Janeiro to American ports given that Brazil was then, like today, a major trading partner with the U.S.

Gorgas's focus on propagating U.S. control of yellow fever throughout Latin America would continue for much of the early twentieth century. Gorgas not only traveled with the Rockefeller Foundation to Brazil in 1916, but also visited Ecuador in an effort to see if eliminating yellow fever was possible in Guayaquil.¹⁰⁰ By 1918, the Foundation would once again call on Gorgas to investigate a yellow fever outbreak occurring in the Yucatan.¹⁰¹ With each new country Gorgas visited he facilitated U.S. trade and commerce. U.S. authorities consciously saw yellow fever control efforts as an effective mechanism for making much of Latin America and the Caribbean viable for U.S. economic growth.

Maass's historical contribution is open to further investigation. What would it mean to give Maass's life and death real agency in the Cuban-American

⁹⁹ For an account of Gorgas's activities in Brazil see Steven C. Williams, "Nationalism and Public Health: The Convergence of Rockefeller Foundation Technique and Brazilian Federal Authority during the Time of Yellow Fever, 1925-1930 in Marcos Cueto, ed., *Missionaries of Science: The Rockefeller Foundation and Latin America* (Bloomington: Indiana University Press, 1994): 27.

¹⁰⁰ For an account of this trip see John Farley, *To Cast Out Disease: A History of the International Health Division of the Rockefeller Foundation, 1913-1951* (New York: Oxford University Press, 2004): 89-90

¹⁰¹ Armando Solorzano, "The Rockefeller Foundation in Revolutionary Mexico: Yellow Fever in Yucatan and Veracruz," in Cueto, *Missionaries of Science*: 62.

yellow fever narrative? For example, the idea that Maass was needed to legitimate the mosquito theory draws attention to an outside authority beyond the standard jurisdiction of America's military. With their unwillingness to cooperate in Gorgas's sanitation campaign, Havana's citizens acted as an agency outside the limits of U.S. command. American leaders could not dictate what Cuba's population believed. Instead, military commanders relied on the circumstances surrounding the death of a twenty-four year old woman named Clara Maass to bring about yellow fever control in Havana. With the success of controlling yellow fever in Havana, American leaders like Gorgas utilized yellow fever control efforts as a mechanism for making much of the Caribbean and Latin America viable territories for continued U.S. economic growth.

Bibliography

ARCHIVES CONSULTED

Clara Maass Medical Center Foundation, Belleville, NJ.

Philip S. Hench Walter Reed Yellow Fever Collection, Claude Moore Health Sciences Library, University of Virginia, Charlottesville, Virginia (Online Collection)

Jefferson Randolph Kean Series

Jesse W. Lazear Series

Walter Reed Series

James Carroll Papers

NEWSPAPERS

Atlanta Constitution

Chicago Daily Tribune

New York Daily Tribune

New York Times

PUBLISHED SOURCES

Ayala, Cesar J. *American Sugar Kingdom: The Plantation Economy of the Spanish Caribbean, 1898-1934* (Chapel Hill: University of North Carolina, 1999).

Anderson, Warwick, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines* (Durham: Duke University Press, 2006).

Beard, Charles A., and Mary R. Beard. *The Rise of American Civilization* (New York: Macmillan, 1930).

Bederman, Gail. *Manliness & Civilization: A Cultural History of Gender and Race in the United States, 1880-1917* (Chicago: University of Chicago Press, 1996).

Bell, Andrew McIlwaine. *Mosquito Soldiers: Malaria, Yellow Fever, and the Course of the American Civil War* (Baton Rouge: Louisiana State University Press, 2010).

Bergad, Laird W., Fe Iglesia García, and María del Carmen Barcia. *The Cuban Slave Market, 1790-1880* (New York: Cambridge University Press, 1995).

- Bloom, Kahled J. *The Mississippi Valley's Great Yellow Fever Epidemic of 1878* (Baton Rouge: Louisiana State University Press, 1993).
- Briggs, Laura. *Reproducing Empire: Race, Sex, Science, and U.S. Imperialism in Puerto Rico* (Berkeley: University of California Press, 2002).
- Buhler-Wilkerson, Karen. *No Place Like Home: A History of Nursing and Home Care in the United States* (Baltimore: Johns Hopkins University Press, 2003).
- Carter, Henry R. "A Note on the Interval between Infecting and Secondary Cases of Yellow Fever from the Records of the Yellow Fever at Orwood and Taylor, Miss., in 1898." *New Orleans Medical and Surgical Journal* 52, no. 11 (1900): 618-36.
- Chaillé, Stanford E. "Report to the United States National Board of Health on Yellow Fever in Havana and Cuba." In *Annual Report of the National Board of Health, 1880*, edited by U.S. National Board of Health. Washington: Government Printing Office, 1881.
- Chernow, Ron. *Alexander Hamilton* (New York: Penguin, 2005).
- Coffman, Edward M. *The Old Army: A Portrait of the American Army in Peacetime, 1784-1898* (New York: Oxford University Press, 1988).
- Cosmas, Graham A. *An Army For Empire: The United States Army in the Spanish-American War* (Columbia: University of Missouri Press, 1971).
- Cott, Nancy F. *The Bonds of Womanhood: "Woman's Sphere" in New England, 1780-1835* (New Haven: Yale University Press, 1997).
- Crosby, Alfred W. *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport: Greenwood Publishing Company, 1972).
- . *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (New York: Cambridge University Press, 2004).
- Crosby, Molly Caldwell. *The American Plague: The Untold Story of Yellow Fever, The Epidemic That Shaped Our History* (New York: Berkley Books, 2006).
- Cueto, Marcos, ed. *Missionaries of Science: The Rockefeller Foundation and Latin America* (Bloomington: Indiana University Press, 1994).
- Cunningham, John T. *Clara Maass: A Nurse, A Hospital, A Spirit* (Bellville, NJ: 1968).
- D'Antonio, Patricia. *American Nursing: A History of Knowledge, Authority and the Meaning of Work* (Baltimore: The Johns Hopkins University Press, 2010).

- Delaporte, Francois. *The History of Yellow Fever: An Essay on the Birth of Tropical Medicine* (Cambridge, MA: The MIT Press, 1991).
- Dudden, Faye E. *Serving Women: Household Service in Nineteenth-Century America* (Middletown: Wesleyan University Press, 1983).
- Duffy, John. *The Sanitarians: A History of American Public Health* (Urbana: University of Illinois Press, 1990).
- Dye, Alan. *Cuban Sugar in the Age of Mass Production: Technology and the Economics of the Sugar Central, 1899-1929* (Stanford: Stanford University Press, 1998).
- Espinosa, Mariola. *Epidemic Invasions: Yellow Fever and the Limits of Cuban Independence, 1878-1930* (Chicago: University of Chicago Press, 2009).
- Ellis, John H. *Yellow Fever and Public Health in the New South* (Lexington: University of Kentucky Press, 1992).
- Farley, John. *To Cast Out Disease: A History of the International Health Division of the Rockefeller Foundation, 1913-1951* (New York: Oxford University Press, 2004).
- . *Bilharzia: A History of Imperial Tropical Medicine* (New York: Cambridge University Press, 2003).
- Forrester, D. Anthony, and Pamela M. Grandinetti. "Nurses on Stamps." *The American Journal of Nursing* 92, no. 5 (1992): 62-65.
- Guitéras, Juan. "Experimental Yellow Fever at the Inoculation Station of the Sanitary Department of Havana with a View of Producing Immunization." *American Medicine* 2 (1901): 809-17.
- . "The Suppression of Yellow Fever in Cuba." *Medical Record* 75 (June 26, 1909): 1108-09.
- Gorgas, William C. "Health Problems of the Army." *The American Journal of Public Health* 7 (1917): 937-39.
- . *Sanitation in Panama* (New York: Appleton, 1918).
- Gorgas, William C., and John M. Gorgas. *Physician to the World: The Life of General William C. Gorgas* (Durham: Duke University Press, 1950).
- Hansen, Bert. *Picturing Medical Progress from Pasteur to Polio: A History of Mass Media Images and Popular Attitudes in America* (New Brunswick: Rutgers University Press, 2009).

- Haynes, Douglas M. *Imperial Medicine: Patrick Manson and the Conquest of Tropical Disease* (Philadelphia: University of Pennsylvania Press, 2001).
- Howard, William Travis. *The Natural History of Typhoid in Baltimore 1851-1919* (Baltimore: The Johns Hopkins University Press, 1920).
- Humphreys, Margaret. "Hunting the Yellow Fever Germ: The Principle and Practice of Etiological Proof in Late Nineteenth-Century America." *Bulletin of the History of Medicine* 59 (1985): 361-82.
- . *Yellow Fever and the South* (Baltimore: Johns Hopkins University Press, 1992).
- . "No Safe Place: Disease and Panic in American History." *American Literary History* 14, no. 4 (2002): 845-57.
- Keating, J.M. *A History of the Yellow Fever: The Yellow Fever Epidemic of 1878, in Memphis, Tenn.* (Memphis: Howard Association, 1879).
- Leavitt, Judith Walzer. *Typhoid Mary: Captive to the Public's Health* (Boston: Beacon Press, 1996).
- Linn, Brian McAllister. *The Philippine War, 1899-1902* (Lawrence: University Press of Kansas, 2002).
- . *Guardians of Empire: The U.S. Army and the Pacific, 1902-1940* (Chapel Hill: University of North Carolina Press, 1999).
- Mandel, Gerald L., John E. Bennett, and Raphael Dolin, eds. *Principles and Practice of Infectious Diseases*, 2nd ed. (New York: John Wiley & Sons, 1985).
- Manning, William R., ed. *Diplomatic Correspondence of the United States: Inter-American Affairs*, 12 vols. (Washington: Government Printing Office, 1932-39).
- McNeill, J.R. *Mosquito Empires: Ecology And War In The Greater Caribbean, 1620-1914* (New York: Cambridge University Press, 2010).
- McNeill, William H. *Plagues and Peoples* (Garden City, NY: Anchor Press, 1976).
- Mintz, Sidney W. *Sweetness and Power: The Place of Sugar in Modern History* (New York: Viking, 1985).
- Mumford, Lewis. *Technics and Civilization* (New York: Harcourt, Brace, 1934).
- Murphy, Jim. *An American Plague: The True and Terrifying Story of the Yellow Fever Epidemic of 1793* (New York: Clarion Books, 2003).

- Pérez, Louis A. *Cuba Under the Platt Amendment, 1902-1934* (Pittsburgh: University of Pittsburgh Press, 1991).
- . *Cuba Between Empires 1878-1902* (Pittsburgh: University of Pittsburgh Press, 1998).
- . *The War of 1898: The United States and Cuba in History and Historiography* (Chapel Hill: University of North Carolina Press, 1998).
- . *Cuba and the United States: Ties of Singular Intimacy* (Athens, GA: University of Georgia Press, 2003).
- Pernick, Martin S. "Politics, Parties, and Pestilence: Epidemic Yellow Fever in Philadelphia and the Rise of the First Party System." *The William and Mary Quarterly* 29, no. 4 (Oct., 1972): 559-86.
- Pierce, John R., and James V. Writer, *Yellow Jack: How Yellow Fever Ravaged American and Walter Reed Discovered Its Deadly Secrets* (Hoboken: John Wiley & Sons, Inc., 2005).
- Powell, J.H. *Bring Out Your Dead: The Great Plague of Yellow Fever in Philadelphia in 1793* (Philadelphia: University of Pennsylvania Press, 1993).
- Rapport, Mike. *1848: Year of Revolution* (New York: Basic Books, 2010).
- Reed, Walter, Victor C. Vaughan, and Edward O. Shakespear, *Report on the Origin and Spread of Typhoid Fever in U.S. Military Camps during the Spanish War of 1898* (Washington: Government Printing Office, 1904).
- Reed, Walter, James Carroll, Aristides Agramonte, and Jesse W. Lazear. "The Etiology of Yellow Fever: A Preliminary Note." *Reviews of Infectious Disease* 5, no. 6 (Nov. – Dec., 1983): 1103-11.
- Reed, Walter, James Carroll, and Aristides Agramonte. "The Etiology of Yellow Fever: An Additional Note." *Journal of the American Medical Association* 36 (1901): 431-40.
- . "Experimental Yellow Fever." *American Medicine* 2 (1901): 15-23.
- Reed, Walter, and James Carroll. "The Etiology of Yellow Fever: A Supplemental Note." *American Medicine* 3 (1902): 301-05.
- Reverby, Susan M. *Ordered to Care: The Dilemma of American Nursing, 1850-1945* (New York: Cambridge University Press, 1987).

- Sarnecky, Mary T. *A History of the U.S. Army Nurse Corps* (Philadelphia: University of Pennsylvania Press, 1999).
- Schultz, Jane E. *Women at the Front: Hospital Workers in Civil War America* (Chapel Hill: University of North Carolina Press, 2007).
- Scott, Rebecca J. *Slave Emancipation in Cuba: The Transition to Free Labor, 1860-1899* (Princeton: Princeton University Press, 1985).
- Siemann, Wolfram. *The German Revolution of 1848-49* (New York: Palgrave Macmillan, 1998).
- Smith, Karen Manners. "New Paths to Power: 1890-1920." In *No Small Courage: A History of Women in the United States*, edited by Nancy F. Cott. (New York: Oxford University Press, 2004.)
- Smith-Rosenberg, Carroll. *Disorderly Conduct: Visions of Gender in Victorian America* (New York: Oxford University Press, 1986).
- Souchon, Edmund. "True Origin of the Epidemic of Yellow Fever." *Journal of the American Medical Association* 35 (1900): 308-10.
- Sperber, Jonathan. *The European Revolutions, 1848-1851* (New York: Cambridge University Press, 2005).
- Sutter, Paul S. "Nature's Agents or Agents of Empire? Entomological Workers and Environmental Change during the Construction of the Panama Canal." *Isis* 98, no. 4 (2007): 724-54.
- Tengbom, Mildred. *No Greater Love: The Gripping Story of Nurse Clara Maass* (St. Louise, MO: Concordia, 1978).
- Tomes, Nancy. *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge: Harvard University Press, 1998).
- Treasury Department, Marine Hospital Service. *Report of the Surgeon General of the Army to the Secretary of War for the Fiscal Year Ending June 30, 1899*. Washington: Government Printing Office, 1899.
- Tucker, Spencer C., ed. *The Encyclopedia of the Spanish-American and Philippine-American Wars* (Santa Barbara: ABC-CLIO, 2009): 91.
- Ulrich, Laurel Thatcher. *A Midwife's Tale: The Life of Martha Ballard, Based on Her Diary, 1785-1812* (New York: Knopf, 1990).
- United States Congress. House. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No.

1865. Washington: Government Printing Office, 1904.

United States Congress. Senate. *Hedwig A. Maass*, 58th Congress, 2nd Session, Report No. 2111. Washington, D.C.: Government Printing Office, 1904.

----- *To Recognize the High Public Service Rendered By Maj. Walter Reed And Those Associated With Him in the Discovery of the Cause and Means of Transmission of Yellow Fever*, 70th Congress, 2nd Session, Report No. 1912, Ser. 8977. Washington: Government Printing Office, 1929.

----- *Recognizing the Service of Gustaf E. Lambert in the Yellow Fever Experiments*, 84th Congress, 2nd Session, Report No. 2168. Washington: Government Printing Office, 1956.

----- *Adding Name of Roger P. Ames to Roll of Honor in Discovery and Cause of Yellow Fever*, 85th Congress, 2nd Session, Report No. 2493, Ser. 11888. Washington: Government Printing Office, 1958.

United States Department of State, *Papers Relating to the Foreign Relations of the United States, with the Annual Message of the President Transmitted to Congress, December 5, 1898*. Washington: Government Printing Office, 1901.

Watts, Sheldon. *Epidemics and History: Disease, Power and Imperialism* (New Haven: Yale University Press, 1997).

Wenzel, Lynn, and Carol J. Binkowski, *More Than Petticoats: Remarkable New Jersey Women* (Guilford: Twodot, 2003).

Williams, Eric. *Capitalism and Slavery* (Chapel Hill: University of North Carolina Press, 1944).

Wood, Ann Douglas. "The War Within a War: Women Nurses in the Union Army." *Civil War History* 18 (Sept., 1972): 197-212.

MANUEL JUSINO
manuel.jusino@gmail.com

RUTGERS UNIVERSITY

Biographical Information:

DOB: 12/2/1983
Location: Toms River, NJ

Education:

Rutgers University (Newark, NJ) Expected Completion: January 2012

Master of Arts; History

Thesis Title: "Nursing Imperialism: Clara Maass, Yellow Fever and U.S.

Ambitions in Cuba, 1898-1901"

Adviser: Stephen Pemberton (Rutgers and NJIT)

Gordon College (Wenham, MA) September 2005

Bachelor of Science; Biology & Chemistry

Griggs International Academy (Silver Springs, MD) June 2001

Selected Publications:

Craig W. Vander Kooi, Manuel A. Jusino, Benjamin Perman, David B. Neau, Henry D. Bellamy, and Daniel J. Leahy. "Structural basis for ligand and heparin binding to neuropilin B domains." *Proceedings of the National Academy of Sciences of the United States of America* 104, no. 15 (2007): 6152–6157.

Bryan Auday and Manuel Jusino. "Igniting the Mind: Introducing High School Students to Neuroscience." *Stillpoint Magazine of Gordon College* 21 (Spring 2006): 18-19.

Experiences:

09/11-present	Teacher Calvary Academy	Lakewood, NJ
09/08-present	Science Educator Liberty Science Center	Jersey City, NJ
09/05-05/07	Postbaccalaureate Research Education Program Department of Biophysics and Biophysical Chemistry Johns Hopkins University, School of Medicine	Baltimore, MD
09/03-05/05	Teaching Assistant Department of Psychology Gordon College	Wenham, MA
Summer 2003	Summer Medical & Dental Education Program (formerly, Minority Medical Education Program) Yale University, School of Medicine	New Haven, CT