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Research Article

United States Army Casualties during the Puerto Rico Campaign of the Spanish-American War

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Abstract

The Puerto Rico campaign of 1898 was a brief but medically significant phase of the Spanish-American War. During nineteen days of operations, United States (U.S.) forces achieved rapid territorial gains with minimal combat losses. Of 49 documented battle casualties, only six were fatal, while disease caused 238 deaths, primarily from typhoid fever and malaria, yielding one of the highest disease mortality rates of the war. Military and medical reports show that antiseptic treatment, conservative surgery, and early use of X-ray technology helped reduce combat mortality. In contrast, typhoid fever, largely introduced from U.S. training camps, overwhelmed medical facilities despite reforms implemented by Surgeon General George M. Sternberg. Under the leadership of Colonel Charles R. Greenleaf, the campaign demonstrated advances in military medicine, including improved logistics, professional nursing integration, and more effective field triage. The campaign highlighted both the progress of modern military medicine and the persistent challenge of disease control in wartime.

Keywords: Combat Casualties, Military Medicine, Disease Mortality, Battlefield Surgery, Typhoid Fever, Spanish-American War, Puerto Rico Campaign.

Introduction

On July 25, 1898, an awesome United States (U.S.) Army, commanded by Civil War veteran and famed Indian fighter Nelson Appleton Miles, invaded Puerto Rico in one of the last salvos of the Spanish American War [1]. In his autobiography, *Serving the Republic*, Miles writes, "I started from Guantanamo [Cuba] on July 21 with 3,415 infantry and artillery, together with two companies of engineers and one company of the Signal Corps . . . Our effective force [was] about 3,300 men, and with that number we moved on the Island of Porto Rico [sic.] [2], at that time occupied by 8,233 Spanish regulars and 9,107 volunteers." This was later augmented by another 3,000 troops [3].

In his history of the war, Secretary of War Russell Alger described the Puerto Rico campaign as a swift operation with minimal casualties, stating, "Our total loss was four killed and forty wounded" [4]. In his official report General Miles stated, "The loss of the enemy in killed, wounded, and captured was nearly ten times our own, which was only 3 killed and 40 wounded" [5]. However, subsequent research reveals a higher human cost for American forces. Combat accounted for six deaths—three killed in action and three who later died of their wounds—and 43 wounded, but disease was far more lethal. The campaign claimed 137 additional lives, primarily from typhoid and malaria [6]. By comparison, Spanish forces suffered 34 killed, 91 wounded, and 324 captured [7].

Military Casualty Reporting and Identification in 1898

The term "combat casualty" applies to any person who is lost to a military unit having died of wounds or disease, having received wounds, or having been injured but not mortally [4]. Combat casualties are classified into two categories: hostile and non-hostile (disease and non-battle injuries). A hostile casualty is any person who is killed in action or wounded by any civilian, paramilitary, terrorist,

or military force that may or may not represent a nation or state. Also included in this definition are persons killed or wounded accidentally by friendly fire or by fratricide that occurs when troops are mistakenly thought to be an enemy force. Non-hostile casualties are those not attributable to combat action. These occur due to an injury or death from environmental elements, disease, self-inflicted wounds, or combat fatigue [5]. This study examines U.S. soldiers who were killed or wounded during combat engagements in Puerto Rico between 25 July and 12 August 1898.

In 1898, the responsibility for reporting combat deaths was strictly a command function rather than a medical one. Surgeons were "not called upon to report the killed in an engagement with an enemy. This is the duty of the commanding officer [6]." Consequently, casualty data followed two separate paths: company commanders reported deaths up the chain of command, while surgeons reported the number of wounded survivors to the Surgeon General.

Casualty reporting accuracy considering this systemic fragmentation was further confounded by a lack of individual identification. The U.S. military did not formally adopt standardized "dog tags" until December 1906, a reform sparked by an 1899 recommendation from Chaplain Charles C. Pierce, who had witnessed the identification crisis firsthand during the Philippine-American War [7].

Beyond the battlefield, the U.S. Department of War lacked a standardized protocol for notifying families, creating a significant administrative void. Without an official system, the heavy burden of informing next of kin fell inconsistently upon company officers, chaplains, fellow soldiers, or the Red Cross. As noted in historical records, "Some of the incidental work of the Red Cross was to answer letters of inquiry concerning missing soldiers [8]."

Families were frequently left in a state of agonizing uncertainty. Newspaper casualty lists were often vague, listing men simply as "missing" or "wounded" without further detail. This lack of reliable information forced the public to rely on external organizations and press rosters to confirm the status of their loved ones.

The vital role of the press in filling this information gap is evidenced by the *New-York Tribune's* August 20, 1898, coverage of the hospital ship *Relief*. The paper provided a full roster of names for the injured, ill, and dead, a crucial public record for families awaiting news. This list accounted for 248 soldiers being evacuated from Puerto Rico to New York. Most on the manifest suffered from typhoid (154) and malaria (30), demonstrating the severe toll of on the invading Army. The ship also transported 20 wounded soldiers, three of them officers injured in the "Battle of Mayagüez" [i.e., Hormigueros] to New York. Port of New York Health Officer Dr. Alvah Doty met the vessel which was quarantined to arrange patient transfers to various hospitals in New York and Brooklyn [9].

The War in Puerto Rico

The United States' interest in Puerto Rico dates to early nineteenth-century commercial pursuits in the Caribbean. These economic interests later intertwined with the broader conflict over Cuban independence and growing U.S. expansionist ambitions. Although the immediate catalyst for the war was Cuba's struggle against Spanish rule and the sinking of the USS *Maine* in Havana Harbor. Puerto Rico soon emerged as a strategic objective for the United States. American military and political leaders, influenced by the naval theories of Alfred Thayer Mahan, former U.S. Navy flag officer, historian, and influential American naval strategist saw the island as a vital coaling station and naval base, essential for controlling the Caribbean and protecting future trade routes, including a potential isthmian canal [10]. In November 1897, just months before the outbreak of the war, Spain had granted Puerto Rico an Autonomous Charter, allowing for a degree of local self-government. However, this short-lived self-rule ended when American forces invaded seeing the island as a strategic gain from a war that started over Cuba but redrew the region's geopolitical map [11].

The Puerto Rican campaign, lasting nineteen days, resulted in the U.S. capture of a significant portion of the island. American forces were victorious over six engagements against Spanish troops. The achievement of this operation can mostly be credited to skilled commanders, whose strategic experience from the Civil War and later Native American campaigns helped ensure a swift move across the island with relatively few combat casualties [12].

The July 25, 1898 Landing at Guánica

The U.S. invasion of Puerto Rico began at the small southern port of Guánica, following a crucial change in strategy by General Nelson A. Miles. He shifted the planned landing site from Fajardo on the northeast coast to Guánica on the south, a move that allowed American forces to bypass Spanish fortifications, encounter minimal resistance, and secure a faster occupation of the island.

Originally, the invasion force was to include veterans from the Cuban campaign, but widespread disease among the

Fifth Corps made their participation impossible. Yellow fever had decimated the corps, leaving most of these soldiers unfit for combat and posing a serious risk of contagion to the healthy troops bound for Puerto Rico. Medical inspections confirmed the extent of the outbreak; as Miles reported, "there was not a single regiment that had not been represented on the surgeons' reports as having some cases of this dread disease [yellow fever], ranging from the lowest number to as high as 33 cases to a regiment. … In addition to these, there were many reports of sickness, great weakness and prostration among the troops, which I then supposed were caused by exposure and climatic influences [13]."

This forced adjustment underscored the dual challenges of military planning and disease control during the campaign, shaping both the composition of the invading force and the pace of U.S. operations on the island. It also revealed a deeper structural vulnerability within the Army's operational system, where strategic intent was repeatedly constrained by the health status of the force. Command decisions could no longer rely solely on tactical considerations but had to account for disease prevalence, transmission risk, and the limited capacity of medical infrastructure to manage large-scale outbreaks. The exclusion of infected units from the campaign preserved combat effectiveness in the short term, yet it also demonstrated how disease could dictate force availability, delay mobilization timelines, and alter invasion planning at the highest levels. In this way, the Puerto Rico campaign illustrates that military success at the turn of the twentieth century depended as much on controlling infectious disease as on defeating an armed opponent.

Future poet and Lincoln biographer Carl Sandburg, then a 20-years-old volunteer, described the landing:

Soon after daylight on July twenty-fifth we sighted a harbor and moved into it. Ahead we saw gunfire from a ship and landing boats filled with bluejackets moving toward shore. We were ordered to put on our cartridge belts and with rifles get into full marching outfits. We heard shooting, glanced toward shore occasionally and saw white puffs of smoke … Holding rifles over our heads, we waded ashore. We were in Guánica, a one-street town with palm and coconut trees new to us [14].

The following day, in a letter home, Private George King, a young volunteer from Concord, Massachusetts, noted that Guánica appeared "neat and civilized-looking," though largely deserted. Resistance had been minimal, he wrote, as the Marines and the guns of the U.S.S. Gloucester quickly silenced enemy positions [15].

Some 35 miles due East of Guánica was the city of Ponce, the island's largest city. General Miles recognized Ponce's strategic value and promptly ordered Civil War veteran Brigadier General George A. Garretson to seize the city. At dawn on July 26, Garretson began the advance with units from the Sixth Massachusetts, Sixth Illinois, and several artillery detachments toward Ponce.

As American troops pressed inland from Guánica, they came under Spanish fire outside the town. The brief engagement left four Spaniards dead and four Americans wounded, all from the Sixth Massachusetts Regiment [16]. Captain Edward J. Gihon of Company A was hit in the thigh near the hip but refused evacuation, remaining at his post until the enemy withdrew [17]. Captain J. H. Prior of Company L was struck in the hand. Private James Drummond of Company K, already weakened by malaria, sustained two wounds to the neck, and Private Benjamin F. Bostick of Company L suffered a minor injury to his arm [18].

Medical officers, including Majors George W. Crile and Frank Anthony, responded quickly while under fire "with hospital attendants and rendered necessary aid to the wounded." Most injuries were minor and did not require evacuation to the hospital ship *Lampasas*; however, new typhoid cases from arriving transport ships from the states were sent there [19]. It was reported that overall health at this time remained good despite tropical conditions, though heavy rains later increased illness among the troops [20].

Lieutenant Colonel Nicolas Senn, a Swiss-born Chicago physician who founded the Association of Military Surgeons of the United States in 1891, reported that "most of the injuries were flesh wounds, which healed in a remarkably short time [21]." In an article published in the *Journal of the American Medical Association*, Senn reported "briefly the nature of the wounds and the results of those wounded" of 30 soldiers [22]. The skirmish, though minor, cleared the road to Ponce and demonstrated the Army Medical Corps' readiness to manage both battle injuries and disease among the troops.

During the Spanish retreat from Guánica to Yauco, a wounded and unidentified Spanish soldier was left behind. Although Captain Charles Vernon arranged to transfer him to an infirmary, the man died at the site of his fall. Under Vernon's direction, the soldier was interred on the spot. The captain secured the burial site with a fence featuring a definitive proclamation: "This tomb is protected by the American Government; whosoever profanes this tomb will be severely punished." To commemorate this act of military

respect, the Casa de España de Puerto Rico erected a concrete structure in 1924. This site is formally recognized today as the *Monument to the Unknown Soldier* [23].

The Army Regroups in Ponce and Plans the Campaign

On July 27, additional transport vessels arrived at Guánica, delivering reinforcements under the command of Major General James H. Wilson. Miles promptly ordered these units to continue onto Ponce, where landing commenced the following day. By the time of the fleet's arrival, General Garretson's forces had completely encircled the city. Faced with these odds, the Spanish garrison offered nominal resistance and retreated, thus, enabling American forces to secure Puerto Rico's largest city without any casualties.

In a telegram sent to Secretary of War Alger, Miles wrote, "This is a prosperous and beautiful country. The army will soon be in mountain region; weather delightful; troops in best of health and spirits; anticipate no insurmountable obstacle in future. Results thus far have been accomplished without the loss of a single life [24]."

The people of Ponce greeted the occupation with celebration, seeing in it the long-anticipated end of Spanish rule. Soldiers and citizens quickly established cordial relations. Shopkeepers, who initially feared that their businesses would be plundered, found instead that they enjoyed greater protection than before. With the city open to the troops, residents welcomed them warmly. As Dr. Senn observed, "The citizens received our soldiers with enthusiasm and expressions of joy. General Miles was hailed not as a conqueror, but as a long-expected friend [25]."

To assist with the war effort, several prominent Puerto Rican families responded with acts of support and generosity by opening a temporary Red Cross hospital and contributing money, medicine, cots, and physicians to care for the sick and wounded. As Senn noted, "the Red Cross people of Porto Rico, composed largely of Spaniards, have shown the greatest activity and interest in their humane work during the entire campaign [26]."

On July 28, General Miles issued his historic proclamation to the people of Puerto Rico. He declared that the immediate purpose of the campaign was to sever the island's political ties with Spain, promising liberation from colonial rule and assuring inhabitants of the United States' benevolent intentions. The proclamation pledged to "foster the cheerful acceptance of the Government of the United States," guaranteeing protection of life, property, and prosperity. It further promised that existing laws and customs would remain in place, provided they aligned with the requirements of military authority, order, and justice [27].

The capture of Ponce provided a decisive advantage for American forces. Its port could manage the heavy logistical ship traffic needed to sustain the campaign, and as the administrative and commercial hub of southern Puerto Rico, it provided a key link in the island's communications network. Most importantly, Ponce's transatlantic cable allowed General Miles to send and receive messages directly from Washington, tightening coordination and accelerating decision-making across the theater.

The significance of this communication advantage was quickly recognized. A San Juan newspaper observed the irony that while "telegraphic communication from Ponce allows the rest of the world to know the details of recent military events in southern Puerto Rico," residents remained uninformed. "Since there is a cable station on the beach at Ponce," the paper noted, "it is more than likely that by this date the smallest details of the events that have taken place in Guánica, Yauco, and Ponce are already known throughout the civilized world [28]."

The ensuing occupation of the island was directed by a cadre of seasoned war-tested veterans whose decades of service deeply informed their approach to the campaign (Figure 1) [29]. Central to this leadership was General John R. Brooke, who, as commander of the Department of the Platte during the 1890 Ghost Dance massacre, had developed a command style defined by rigid discipline and administrative oversight. Under Brooke's First Army Corps, the tactical leadership was split between two distinct profiles: the First Division was led by Brigadier General James H. Wilson, a distinguished Civil War veteran recalled from civilian life, while the Provisional Division was commanded by Brigadier General Guy V. Henry, who brought a storied history of gallantry from the Battle of the Rosebud, where he had survived a near-fatal gunshot wound to the face while fighting Native American forces.

Supporting these divisions were brigades composed of Regular Army and volunteer regiments, led by men whose reputations were forged on the American frontier. Second Brigade, First Division was commanded by Brigadier General Oswald H. Ernst, the serving superintendent of U.S. Military Academy at West Point. He was joined by Brigadier General Theodore Schwan, a veteran who had served alongside Nelson A. Miles during the Great Sioux War of 1876. To maximize operational reach and ensure local control across

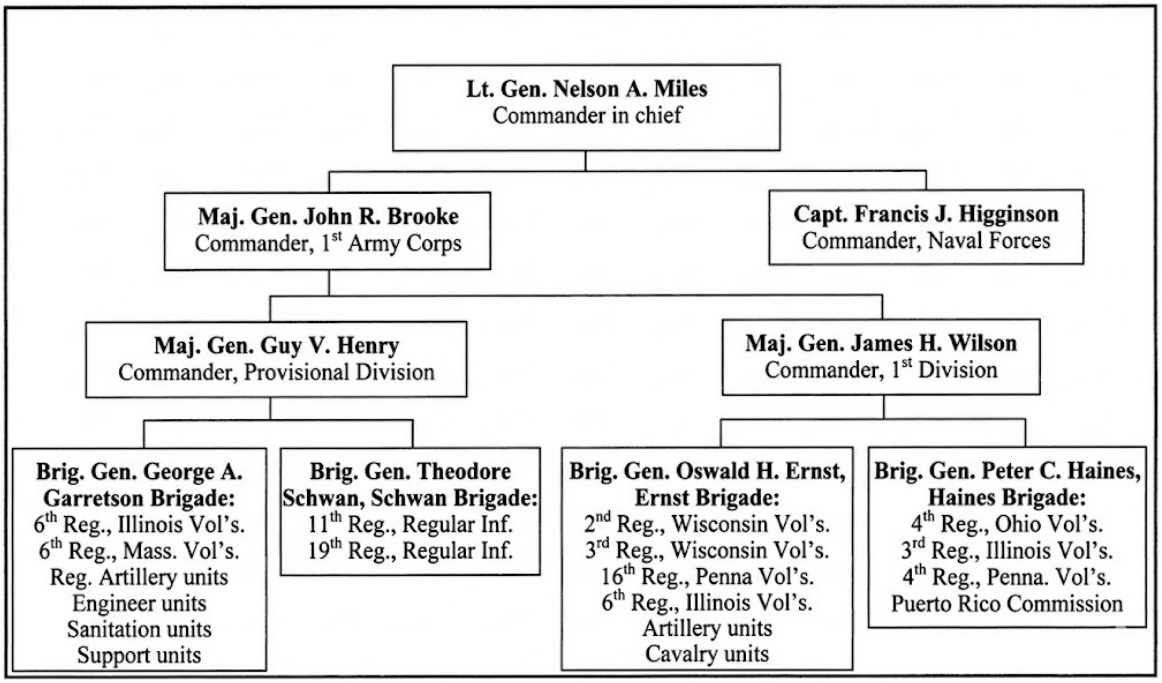


Figure 1: United States Forces in Puerto Rico, Chain of Command.

the island, Henry and Schwan operated semi-independently throughout the southern and western sectors.

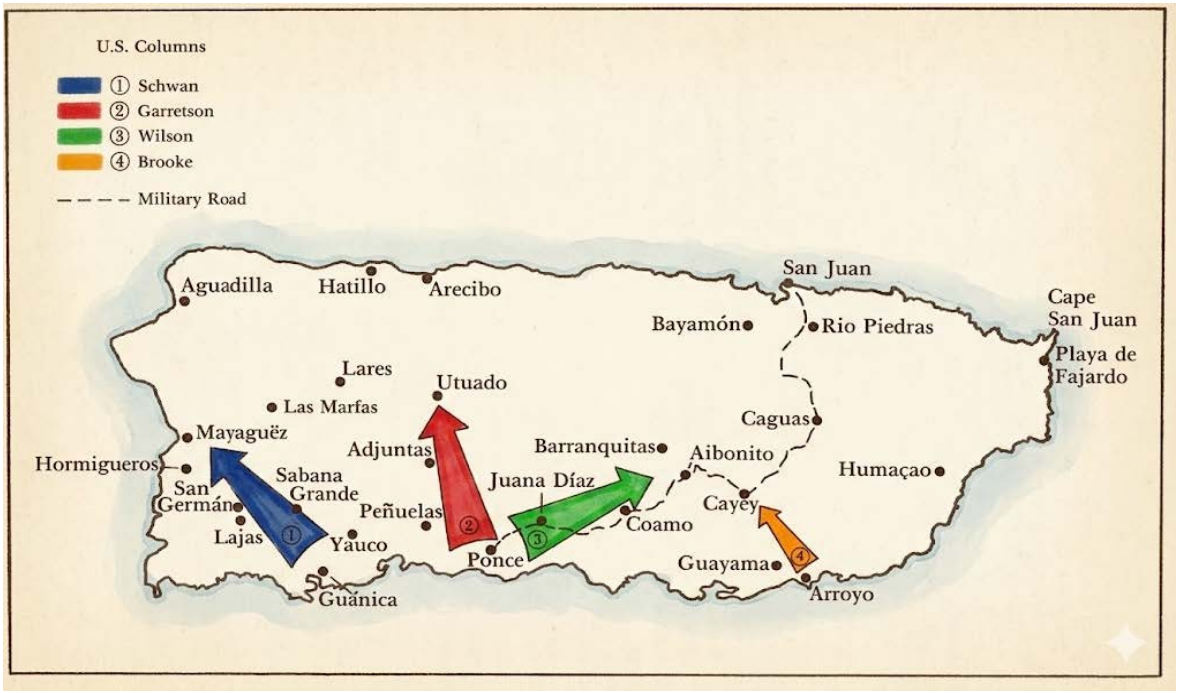
Ultimately, the strategy for the island's conquest reflected the expansive, sweeping maneuvers characteristic of General Miles's Civil War experiences, utilizing a plan that called for four distinct columns to converge in a synchronized, decisive movement on the island's capitol of San Juan (Figure 2). The primary advance was directed along the Military Road from Ponce toward San Juan under Major General John R. Brooke and Brigadier General Oswald H. Ernst, where resistance from Spanish regulars was anticipated near the mountain towns of Coamo and Aibonito. Simultaneously, a second force led by Brigadier General James H. Wilson who had landed at Arroyo, would move northwest to intercept retreating troops near Cayey, while a third column under Brigadier General Theodore Schwan and his 11th Infantry would strike out toward Mayagüez by way of Yauco, Sabana Grande, San Germán and Hormigueros. A fourth column, commanded by Brigadier General Guy V. Henry and comprising the 2nd and 11th Wisconsin Volunteers, would push north through the rugged interior from Ponce to capture Arecibo. By deploying these multi-directional maneuvers led by his veteran officer corps, Miles aimed to secure rapid control of the territory while minimizing combat casualties through overwhelming tactical positioning.

Ponce was the logistical heartbeat of the American campaign. While the first and second battalions scouted the nearby rugged hills, Miles focused on the massive undertaking of provisioning the troops. The Army transformed the port into a bustling supply depot, securing local warehouses to store everything from ammunition to fresh local harvests.

At last, General Miles was prepared to begin his offensive. Captain Augustus Peabody Gardner, Assistant Adjutant General on Major General Wilson's staff and son-in-law to Senator Henry Cabot Lodge, recorded the event in a letter to his wife dated August 2. "The rumors of peace are thick, and everyone is more disgusted than ever. I am not bloodthirsty; but I should like to see a little real fighting after all the farce [30]."

Caring for the Soldiers

Complementing Miles' Army command and plan of attack was a cadre of physicians and surgeons from the U.S. Army Medical Department. By 1898, the U.S. Army Medical Department had evolved into a centralized organization transitioning into the era of modern germ theory under the leadership of Surgeon General George M. Sternberg [31]. However, the department's structural limitations were stark; it entered the Spanish-American War with only 332 commissioned medical officers, a number suited for a



Source: Adapted from Trask, The War with Spain in 1898, 354.
Figure 2: Map Showing Puerto Rico Campaign, 1898.

small peacetime force but wholly inadequate for a global mobilization. This deficiency forced the Army to develop a hybrid establishment, rapidly integrating thousands of volunteer and contract surgeons to supplement the Regular Army medical staff. While this expansion provided the necessary personnel for field and hospital operations, it created a complex management environment where the success of medical care relied heavily on the cooperation between medical officers and line commanders [32].

The importance of this collaboration was underscored by the horrors witnessed during the Cuban campaign. Colonel Charles R. Greenleaf, Chief Surgeon of the Army in the field, observed firsthand how General William Shafter's disregard for medical advice led to a catastrophic yellow fever outbreak. Greenleaf had provided clear instruction regarding hygiene and preventative health measures before the Army had left its encampment in Tampa, yet these warnings went unheeded. The resulting epidemic served as a grim object lesson for the high command, highlighting that even the most advanced scientific hygiene of the era was powerless if medical officers were denied the authority to enforce sanitation and manage the distribution of medical supplies [33].

When planning the invasion of Puerto Rico, General Miles corrected these systemic failures by fully integrating Greenleaf into his staff and strategic planning. This partnership ensured that the expeditionary force was robustly equipped with medicines, hospital stores, and trained personnel from the outset. Greenleaf's approach to the care of the wounded was defined by personal oversight and logistical rigor. Upon arriving in Ponce, he eschewed the traditional distance of a high-ranking officer, personally inspecting camps and hospitals to ensure that medical equipment and supplies were properly distributed. He was notoriously impatient with "slow, hesitating subordinates," occasionally performing the menial tasks of a hospital steward to demonstrate the skills required to save lives at the front lines.

Under Greenleaf's direction, the medical system functioned as a tiered network of care designed to maximize survival. Regimental surgeons and ambulance detachments provided immediate first aid and rapid evacuation from the front lines, while field and base hospitals were organized to manage both trauma and the ongoing threat of infection. By prioritizing the "health and comfort" of the troops and maintaining a well-stocked supply chain, Greenleaf and Miles ensured that the Puerto Rican campaign remained singularly exempt from the rampant infectious diseases that decimated American forces in Cuba. Although typhoid and heat exhaustion remained persistent challenges, the

organized care of the wounded represented a significant advancement in the professionalization of military medicine.

The sheer scale of this medical mission required the utilization of contract surgeons, who were civilian physicians hired by the Medical Department to bridge the gap between the Army medical officers and the needs of a mass-mobilized force. Unlike the regular Army officers who held military rank, these contract surgeons were often specialists in private practice who brought immediate, high-level clinical expertise to the field. Their integration was a point of professional friction however, as they often lacked training in military bureaucracy and camp sanitation. Greenleaf's genius lay in his ability to harness their clinical skills for the care of the wounded while personally enforcing the military side of medicine, disciplining subordinates who failed to maintain the rigorous sanitary standards necessary to keep the hospitals from becoming breeding grounds for secondary infections.

In Ponce, Greenleaf transformed local buildings into sophisticated hospitals, utilizing the supplies he had fought to bring from the states. He was particularly attentive to the distribution of hospital stores that included surgical kits, as well as nutritional and restorative supplies vital for recovery, such as condensed milk, malted nuts, and clean linens. Through personal oversight, he ensured that these items were not bottled up in warehouses but reached the wards where wounded and fever-stricken soldiers lay. This level of detail, ensuring a surgeon had both a sterile probe for a wound and the proper stimulants for the patient's recovery, distinguished the Puerto Rican campaign as a hallmark of professional military medicine [34].

The low casualty rate of the Puerto Rican campaign is understood by examining the medical materiel and diverse personnel managed by Greenleaf. By the 1890s, battlefield medicine was transforming. The Medical Department standardized surgical kits, which. replaced the heavy wooden kits of the Civil War with compact, sterilizable metal trays. Greenleaf ensured these kits, equipped with the latest artery forceps, bone saws, and antiseptic dressings such as bichloride of mercury and carbolic acid, were deployed as close to the front as possible. His logistical coordination also maintained ample supplies of chloroform and ether, allowing surgeons in field hospitals to perform debridement and amputation necessitated by the severe wounds caused by Mauser rifle fire.

After the Civil War and Native American Campaigns, wound care advanced as weaponry changed [35]. The adoption by Spain of small-caliber, high-velocity Mauser cartridges in 1893 resulted in wounds from bullets which often passed cleanly through soft tissue but caused internal damage via hydrostatic shock [36]. Surgeons learned that despite less severe surface injuries, there was a greater risk of internal bleeding and contamination, requiring thorough cleaning and the diligent use of antiseptics.

Supporting this surgical effort was the emergence of a specialized nursing force [37]. Although the official Army Nurse Corps was not established until 1901, the Puerto Rican campaign relied heavily on contract nurses [38]. These were primarily women, many of whom were trained professionals or members of the Sisters of Charity, who were brought in to manage the postoperative care that surgeons could not provide. Under Greenleaf's supervision in Ponce, these nurses became the vanguard of clinical hygiene. They were responsible for maintaining the antiseptic chain, ensuring that bandages were changed under sterile conditions and that the hospital stores of specialized diets were administered correctly to prevent the secondary onset of infection.

The integration of nurses into the field hospital environment was initially met with resistance from the old-guard hospital stewards. However, Greenleaf's insistence on personal oversight helped bridge this institutional gap. He recognized that the care of the wounded did not end at the operating table; it required a continuous cycle of sanitation, nutrition, and professional monitoring. By utilizing contract nurses to oversee the wards in Ponce, Greenleaf freed his surgeons to focus on the wounded, creating a prototype for the modern multi-disciplinary military medical team [39].

As the American command sought to expand its foothold beyond the southern coast of Puerto Rico, the burden of care shifted from the surgeons in the rear to the regimental medical officers marching alongside the infantry. This transition from administrative preparation to tactical execution was best exemplified during the movement of Major General John R. Brooke's command, whose advance toward the strategic town of Guayama would provide the first real-world test for the newly standardized medical protocols in the heat of a tropical skirmish.

The Engagement at Guayama

"Arriving at Guanica, Porto Rico, July 31," Major General John R. Brooke wrote in his official report, "I was informed that General Miles was at Ponce, and directed my course to that point, where I was ordered by the Major-General

Commanding the Army to proceed to and make a landing at Arroyo, Porto Rico [40]." On August 3, Brooke landed a force of 5,000 men ashore at the southern coastal town of Arroyo, about forty-two miles east of Ponce. Two days later, as planned by Miles, General Brooke began his advance west toward San Juan.

At dawn on August 5, the column set out for the town of Guayama, five miles distant. Company A of the Fourth Ohio Volunteer Infantry acted as the advance guard, moving ahead of the main body. After marching for about a mile, they encountered a French national who alerted them that Spanish troops were entrenched roughly two thousand yards ahead, near a grove of blooming flamboyant trees [41]. The Spanish had fortified two hills along the Arroyo-Guayama Road. Company A maneuvered to the south, while Companies B, C, and I moved northwest to flank the Spanish positions.

At about 10:00 a.m., the Americans crossed a stream and came under rifle fire. Within half an hour, the Spanish withdrew, abandoning their defenses. The terrain slowed the American advance. As Sergeant Major Charles Creager recalled, progress was hampered by "sharp cacti, thick underbrush, swamps, barbed wire fences and [Spanish] defenses [42]." After four hours of cautious advance, the Fourth Ohio regiment reached the outskirts of Guayama and found the town deserted of Spanish troops.

General Miles reported the brief action to Secretary of War Alger the following day: "General Brooke reports Haine's Brigade, Fourth Ohio, Third Illinois, captured Guayamo [Guayama] yesterday. Slight skirmish with enemy in and about town. Enemy's strength estimated about 500. Resistance not strong [43]." The Spanish sustained minimal losses—"one Spaniard killed, two wounded as far as we know [44]."

Several soldiers of the Fourth Ohio were wounded during the brief exchange. Private John O. Cordner of Company C was struck in the right knee, the bullet passing cleanly through without fracturing bone. Though the injury was not considered severe, it remained unhealed when the regiment was mustered out [45]. His wounds, like Cordner's, healed slowly. Private Stewart Mercer of Company E received a superficial graze to the left knee. By day's end, resistance around Guayama had ended, and American forces held the town, securing a key position on the road to San Juan.

Sergeant Major Creager recounts the circumstances of another soldier's wound: "As soon as the Third Battalion returned to the city [Guayama], strong guards were posted all over the town. Private William Walcut [Wolcott], of D Company, was placed on guard at the principal corner, within a few yards of the Capitol building. At a house near him, several shots had been seen to be fired and several times a man with a long black beard was seen to appear on a veranda. The shots came very mysteriously, and as there was no smoke, it was not known to an absolute certainty that they came from the house mentioned except as could be judged from the report of the rifle. One of the shots was well aimed and Sentinel Walcut [sic.] was wounded in the foot." Excitement grew as the house was entered by Chief of Police Blanco, a Spanish sympathizer believed to have shot Wolcott. Colonel Alonzo B. Coit, along with several troopers, seized weapons, a Spanish flag, and took prisoners including Blanco, who were then secured in the provincial jail under heavy guard [46].

In San Juan, *La Correspondencia* described the battle, "At seven in the morning yesterday, numerous American forces advanced toward Guayama." Spanish guerrilla detachments resisted from morning until late afternoon but were gradually forced to retreat after being outflanked. The account notes that the defenders "maintained a lively exchange of fire" and continued fighting despite the odds. It acknowledged casualties among the Spanish forces, stating "we have had some casualties, without being able to specify the number", suggesting confusion and limited communication during the retreat [47].

Rivero writes that Spanish forces suffered 17 casualties: two killed and fifteen wounded, who remained in the city and in private homes under Red Cross care. One of the dead was Massot, a seventeen-year-old guerrilla from Guayama, whose body was taken in by several local women. All 17 casualties came from Captain Acha's 40-man flying guerrilla unit, for which the chief of staff later authorized a reward.

When General Brooke received his orders on August 8, he was tasked with advancing toward Cayey under a strategy that favored tactical finesse over raw power. His instructions were explicit: he was to avoid the dangers of a direct frontal assault against fortified Spanish lines by focusing on outflanking and enveloping maneuvers, all while keeping a sharp eye out for potential ambushes or booby-trapped roads. To make the most of his superior numbers, Brooke was directed to maintain a broad, extended front and deploy a specialized toolkit featuring light artillery, dynamite guns, and General Miles' preferred portable shields.

However, these carefully laid plans met an immediate obstacle when scout reports indicated that the enemy had already established defenses several miles to the north. While the goal was to seize Cayey and isolate the Spanish stronghold at Aibonito, the lack of reliable intelligence on the ground necessitated a pause. Brigadier General Peter C. Haines' troops remained encamped in Guayama for several days for this very reason; as Haines later noted, the accounts provided by local inhabitants were too contradictory to trust. Consequently, with Brooke's authorization, Haines spent August 8 conducting a thorough reconnaissance of the main Cayey Road, dedicating the following days to meticulously refining the American strategy before attempting to dislodge the entrenched Spanish forces [48].

That morning, two companies from the Fourth Ohio Volunteer Infantry moved north of Guayama, where they encountered Spanish troops hidden in the hills. After an exchange of fire, several men from Company C fell back to Brooke's headquarters with "alarming reports of disaster," prompting Brooke to send the remainder of the regiment forward in support. The reinforced force pressed the attack, forcing the Spaniards to withdraw [49].

During that skirmish north of Guayama, the Fourth Ohio Infantry faced a challenging day that left five soldiers wounded and two others sidelined by heat exhaustion. Despite the intensity of the fight, the medical reports of the era highlight a series of remarkably clean recoveries. Corporal Edward O. Thompson [50], the regiment's Spanish interpreter, was among the first hit. A bullet passed through the soft tissue of his right forearm just above the wrist. Thanks to the projectile missing the bone, his injury healed without complication after a single dressing [51].

Private Harry L. Haines, 20-years-old, experienced an even more harrowing ordeal when he was struck four times while taking cover in a ditch. The bullets traveled a complex path through his body, entering his upper arm and exiting near his collarbone and neck, while another shot caused a deep gash near his elbow. Incredibly, Haines reported very little pain and was on the road to recovery within days [52]. His resilience on the battlefield foreshadowed a successful future; he later became a prominent businessman and served five terms as a U.S. Congressman from Pennsylvania.

The medical staff also treated several lower-body injuries that could have been far more devastating. Private William J. Edington was struck in the lower back, with the bullet exiting through his thigh. Despite the dangerous trajectory, the shot miraculously missed his internal organs and his wounds healed cleanly. Private Noble W. Horlocker was shot through the right ankle bone, yet he reported minimal pain as long as he kept the joint still. Doctors were optimistic that he would regain full use of his foot [53]. Private Samuel F. Jones also survived a wound to his right knee, rounding out a list of casualties that, while significant, resulted in surprisingly few long-term disabilities for the men involved [54].

The low American casualty rate during the engagement at Guayama and the subsequent reconnaissance toward Cayey can be attributed to a combination of superior tactical positioning, cautious operational doctrine, and the physiological characteristics of modern ballistics. Strategically, General Brooke's adherence to General Miles' orders, prioritizing flanking maneuvers over costly frontal assaults and utilizing superior troop strength, forced Spanish withdrawals with minimal direct engagement. This tactical caution, combined with the use of light artillery and the psychological deterrent of portable shields, minimized the exposure of American infantry to sustained fire. Furthermore, the nature of the wounds sustained by the Fourth Ohio suggests that even when Spanish fire found its mark, the small-caliber, high-velocity Mauser rounds often produced clean, non-lethal penetrations that spared vital organs and bone. As noted in the clinical observations of Dr. Nicholas Senn, these "Mauser wounds" typically healed without the rampant infection common in previous conflicts, ensuring that even soldiers struck multiple times, such as Private Harry L. Haines, made rapid recoveries.

The Pincer Movement at Coamo and the Battle of the Gorge

On August 7, General Wilson's 1st Division, composed of approximately 2,700 soldiers, left Ponce and began the advance toward San Juan. After a half-day's advance they reached Juana Diaz, the next town on the Military Road (*Carretera Militar*), only to discover the town largely already under American influence. In a colorful episode of the campaign, Stephen Crane, famed author of *The Red Badge of Courage* and war correspondent, managed to "capture" the town single-handedly. Slipping away from rival journalist, Richard Harding Davis, Crane entered Juana Diaz alone and used sheer bluffing, including a ruse involving a mock "Governor of Puerto Rico" to secure a peaceful surrender of the town from the local officials. When General Wilson's forces arrived prepared for battle, they were met not by Spanish resistance, but by a nonchalant Crane who had been enjoying the townspeople's hospitality. While the military continued its strategic positioning across the island, Crane's exploit

stood out as a moment of theatrical bravado that left both the U.S. Army and his fellow journalists stunned [55].

Davis recounts, "Juana Diaz yielded to General Wilson's forces without resistance, resembling, in theatrical terms, a one-night engagement. However, the capture of Coamo, the subsequent target, proved to be one of the most graceful skirmishes of the campaign [56]." On August 9, the strategic focus shifted to Coamo, where Major General Henry and MG Wilson carried out a coordinated pincer movement against the Spanish forces under Major (*Comandante*) Rafael Martínez Illescas. The approach from Ponce followed the Military Road, which climbed steadily through the southern foothills, with the mountains rising continuously in the distance. Coamo offered little comfort to arriving troops; its oldest hotel was austere and uninviting. Despite this, the town retained significance as one of the island's earliest settlements, founded in 1640, and drew visitors to its well-known thermal baths [57].

While Wilson advanced along the main road, Henry maneuvered his troops over difficult mountain trails to reach the Spanish rear. The Spanish occupied a strong defensive position within a natural gorge, reinforced by a blockhouse and a system of deep trenches. At 7:00 a.m., American artillery destroyed the blockhouse, opening a sustained exchange of Mauser and Krag-Jørgensen fire that continued for forty-five minutes.

The lethality of high-velocity projectiles was immediately apparent. Major Martínez Illescas was struck in the chest and killed, and the Spanish defense collapsed under the weight of the two-pronged assault. Correspondent Davis described Matinez's death: "The Spanish comandante seemed to wish to die. He galloped out of the road and into the meadow, where he was conspicuous from the top of his head to the hoofs of his horse. At one time he stood motionless . . . holding his reins easily and looking up at the firing line above. After he was killed the men in the trench along the road raised a white handkerchief on a stick and ceased firing [58]."

This display of individual defiance, however, masked a broader collapse of the Spanish position described in more harrowing detail by a soldier on the ground. An anonymous Spanish soldier that participated in the battle wrote that approximately 300 Spanish soldiers found themselves outmatched when American forces appeared from the south with cavalry and artillery, initiating a "lively exchange of shots between both forces lasting about three-quarters of an hour." Despite the Spanish opening fire, the engagement quickly turned tragic for their leadership; Major Martínez Illesas was fatally struck in the chest, pleading with his troops, "'Pick me up, my sons!'" just moments before Captain Frutos López were also killed. Recognizing the "disadvantage of his men and the death of the senior officers," Captain Hita assumed command and ordered the ceasefire. The skirmish concluded with the surrender of the Spanish forces after Hita "had the white flag raised," leaving behind at least 11 confirmed dead, 71 wounded, and 167 prisoners captured in the wake of the American advance [59].

Wilson had taken Coamo at a cost of six American troopers wounded (two subsequently died of these wounds) [60]. Recently promoted from Cooperstown, Pennsylvania, Corporal Charles P. Barnes, Company E, tragically died in Ponce on September 23, 1898, due to abdominal wounds sustained during the action at Coamo.

Private Theodore Herbert Lubold, Company I, was shot while retreating during the skirmish. The bullet struck his right arm just above the elbow, breaking off the bony point of the elbow (the olecranon), and exited through the back of his forearm between the two main arm bones. An X-ray showed that a piece of the bullet's metal casing remained lodged inside the arm. Fortunately, the wound remained free of infection and healed cleanly [61]. Lubold subsequently died on October 1, 1898, at Cherry Grove, Pennsylvania, from wounds received at Coamo [62].

Private George Whitlock, Company C was wounded while in a kneeling position. The bullet entered his upper inner thigh, traveled outward and backward, and exited through the buttock. While there was very little bleeding, the wound caused paralysis in his foot and lower leg, suggesting the bullet damaged the sciatic nerve. Despite the nerve damage, the entry and exit wounds healed without further medical complications [63].

Private Clyde C. Frank, Company C, was injured near Guayama on August 9 when a bullet entered the middle of his right inner thigh. The bullet traveled upward and backward, grazing the thigh bone (femur) and leaving a groove in the bone without breaking it, before exiting through the back of the leg. Both wounds healed quickly and naturally. However, a later X-ray (then called a skiagraph) revealed a fragment of the bullet stuck in the groove of the bone. On August 17, Dr. Shultze, a contract surgeon, performed an operation to enlarge the original wounds and remove the lead fragment along with several small pieces of loose bone [64].

Other wounded included Private Logan of Company I and Private Errol V. Jolley of Company F, both with arm wounds,

and Corporal Claude E. Barnes of Company E, who was shot through the abdomen.

Several days after the smoke had cleared from the fighting at Coamo, on the afternoon of Thursday, August 11, Walter S. Elliott of the 1st Army Corps Reserve Hospital sat down to write to his former professor, John J. Halsey at Lake Forest College. He spoke with the adrenaline of a man who had finally "smelt gunpowder" and the pride of leading the first Red Cross detachment onto the firing line in Puerto Rico. "My dear Professor Halsey — I have smelt gunpowder. I have been in a battle. I have the honor of having led the first detachment of Red Cross men onto the firing line on Porto Rican soil." As the medical teams moved through the rugged terrain, the reality of the engagement became clear. Following a native guide up a mountain stream bed, Elliott's team discovered wounded American and Spanish soldiers scattered among the bushes and steep slopes. Each encounter required immediate, decisive action: "We took a native guide and followed him up the bed of a mountain stream and here and there was found a wounded American or Spaniard in the bushes or upon the side of the mountain. With each wounded man I left four men and a litter to dress the wounds and transport them to the Spanish hospital in the city, where our doctors had taken hold to help care for the wounds [65]."

The success of the Coamo campaign was not only a triumph of military strategy but also a milestone in organized medical support. While the flanking maneuver by the 16th Pennsylvania achieved a decisive tactical victory, the low American casualty rate was bolstered by a highly efficient medical response. For the first time on Puerto Rican soil, specialized Red Cross detachments and Reserve Hospital units followed the firing line, ensuring that wounded soldiers, both American and Spanish, were treated immediately where they fell and quickly transported to hospitals.

The precision of this care was further enhanced by cutting-edge technology; the use of early X-rays (then known as Röntgen ray) allowed surgeons to locate bullet fragments and nerve damage with a level of accuracy that was revolutionary for the time [66]. This seamless integration of rapid field triage, professional nursing, and advanced diagnostics meant that even "dreadful" injuries often healed without the deadly infections that had plagued previous wars. Ultimately, the careful medical planning at Coamo ensured that a "graceful skirmish" didn't turn into a medical tragedy, preserving the strength of General Wilson's forces as they continued their push across the island. The road to Aibonito was now open.

Maneuvers and Casualty Care in the Skirmish at Hormigueros

While American efforts had initially concentrated on the east, the strategic scope of the invasion widened in early August as operations commenced in the western sector. Leading a force of 2,896 soldiers, Brigadier General Theodore Schwan launched a lightning campaign with the explicit objective to "drive out or capture all Spanish troops [67]." The advance proceeded at a relentless pace; over the course of just eight days, the brigade marched roughly 90 miles, seizing nine towns and taking nearly 200 Spanish prisoners.

Surgeon Lieutenant Bailey K. Ashford, accompanied the column. He later became a central figure in tropical medicine and a pioneering physician in the treatment of anemia [68]. During the march he observed the effects of heat, fatigue, and disease on the soldiers. In response, he organized a Red Cross hospital in San Germán. The facility also treated "some cases of typhoid fever which had developed during the tiresome hot march [69]."

As Schwan's forces pressed toward the strategic city of Mayagüez, Colonel Julio Soto Villanueva prepared a formidable defense. He dispatched 1,500 Spanish Regulars from the 24th Rifle Battalion, alongside six companies of Alfonso XIII auxiliaries and various guerrilla units, to intercept the American troops. These Spanish forces entrenched themselves atop a high ridge known as Silva Heights, overlooking a road that led to the town of Hormigueros. On August 10, the march turned into a violent confrontation when the Spanish launched an ambush against the American column.

Amidst the sudden eruption of gunfire, Ashford was summoned to the front. He found General Schwan in a "pretty exposed position" as American cavalry and infantry maneuvered to flank the enemy lines. Ashford later recalled that while the firing was initially at a great range, the reality of combat soon struck home: "A man on horseback near me suddenly threw up one hand and toppled back [70]." Ashford rushed to a fallen soldier, discovering a life-threatening injury where a bullet had "snipped the facial artery," causing the man to bleed "like a fountain." With no standard surgical tools immediately available, Ashford resorted to a moment of desperate resourcefulness. He cut a metal grip from a pair of old-fashioned suspenders and applied it as a makeshift forceps to clamp the artery and stop the bleeding before sending the man to the rear [71].

As the battle continued, General Schwan's Chief-of-Staff, Lieutenant J. C. Byron, was toppled from his horse by a bullet to the ankle. In response to the growing casualties, the Chief Surgeon, Major P. R. Egan, ordered Ashford to establish a field hospital within a large sugar mill on the outskirts of Hormigueros. Before retreating to this post, Ashford caught a final glimpse of the unfolding battle as American infantry made disciplined rushes toward the Spanish crest just four hundred yards away, while the cavalry engaged a moving train packed with Spanish soldiers retreating toward Mayagüez.

As the field artillery began unlimbering their guns to join the fray, Ashford turned his focus back to the grim task of saving the wounded [72]. The Spanish forces retreated after the American reinforcements brought them under intense fire.

Private Karl S. Herrmann, Light Battery "D" 5th U.S. Artillery recalled:

Later in the afternoon I saw a wounded private propped up against a fence, and bleeding copiously from a bullet-hole that extended through both cheeks. His eyes were closed, and he was making queer noises in his throat. As I happened to be idle at the instant, I stepped to his side and inquired compassionately if I could do anything for him. He opened his eyes with a jerk, spat forth a couple of teeth, and replied: "If you'll tell me how the beginning of 'Sweet Marie' goes, I'll give you a piece of my face for a souvenir. I've been trying to get that blame tune straight for the last fifteen minutes but keep getting off my trolley." And he laughed a ghastly laugh. I stared at him in amazement, and then, seeing that he was not delirious, strode moodily away. What that man ought to have said was, "How goes the fight?" or "A drop of water, for God's sake"; but it is the painful truth that he didn't [73].

As fighting intensified, Dr. Ashford moved the wounded and dead to the sugar mill converted into a temporary field hospital, where he spent a grueling night "moving about from man to man" to stabilize the injured. By the time the convoy reached Mayagüez the following day, the situation was critical; Ashford noted that "the ambulances were filled to overflowing". These men were eventually moved into the city's Municipal Theater that the Red Cross had partitioned into wards for both American and Spanish soldiers. Official reports from the field underscored the confusion of the aftermath: Captain Frank Thorp of the Fifth Artillery and Captain A. L. Myer of the Eleventh Infantry submitted urgent lists of the wounded, including Corporal John Bruning and Privates George Curtis, Samuel Frye, and others struck by "balls". General Miles's initial cables to Secretary Alger were initially marred by a grim clerical error; while a press report suggested only one man was likely to survive, Miles later clarified that "Doctor thinks all but one of wounded likely to recover [74]".

The medical outcomes for these men were remarkably positive, often owing to the "clean" nature of high-velocity Mauser bullets. Head and neck injuries, while terrifying, proved non-fatal: Private William Rossiter survived a bullet through the lower jaw that miraculously missed the bone, and Private Samuel Copp escaped with a simple scalp wound while lying prone on a hill. Torso injuries presented higher risks, such as Sergeant William H. Wheeler's chest wound and Corporal Amos Wilkie's abdominal injury, both of which required bed rest but resulted in full recoveries. Most critical was Private George Curtis, who was shot through the chest while on horseback; despite coughing up blood, he was stabilized with sedatives and proper positioning. Lower body injuries were the most frequent, ranging from Lieutenant J. S. Byron's foot wound, that healed under its original bandage, to various through-and-through leg wounds suffered by Privates Errick, Sparks, Mitzkie, and Corporal Johnson. Even more complex cases, such as Corporal Joseph Ryan's, who was shot through the ankle joint, and Private Daniel J. Graves's whose fractured thigh bone was caused by a deflected bullet, saw successful outcomes following surgery and splinting [75].

The battle won, Schwan's men set up camp on Silva Heights for the night. The outcome of the Silva Heights Battle left three Spanish dead, six wounded, and 136 prisoners. Schwan's brigade suffered 15 wounded and two killed in action. The following day they continued the drive toward Mayagüez reaching it later that morning to find that the Spanish forces had abandoned the city retreating east towards the town of Lares. Schwan decided to send a force to follow their retreat.

In the rugged terrain of Las Marías, unaware that an Armistice had been signed and that the conflict had ended, Spanish forces found themselves trapped in a desperate retreat that quickly spiraled into a struggle for survival. What began as a strategic withdrawal soon devolved into a scene of total chaos near the Guacio River. In a staggering display of lopsided fortune, a proud military tradition met a humiliating collapse; while the Spanish ranks disintegrated under the pressure of the pursuit and the elements, their American pursuers remarkably failed to sustain a single casualty.

The Spanish retreat from Mayagüez was already a grueling ordeal, but it turned catastrophic when leadership failed at the most critical juncture. Under the oppressive heat

of the tropics, Commander Soto Villanueva suffered a fate more ignominious than a combat wound—he fell through a bridge, his leg fracturing as his ambitions for a coordinated withdrawal crumbled. With Villanueva incapacitated, command fell to Lieutenant Colonel Antonio Oses. Leading 1,500 demoralized men toward Lares, Oses soon found that the environment was as much an enemy as the Americans. The Rio Grande de Añasco had swollen into an impassable torrent, effectively pinning the Spanish forces against the water with nowhere left to run.

The end arrived on the morning of August 13. Though the Spanish attempted to hold their line with a frantic cannon barrage, their morale was already spent. The American response was swift and decisive, leaving the Spanish position in tatters. Major General Nelson Miles would later report to Washington with striking brevity that while the Spanish had opened fire, the American return fire was the only side to achieve its mark. He noted with pride that despite the engagement, "none of our men hurt."

Even in the final hours of the campaign, Ashford's medical curiosity remained sharp. Ashford examined the captured army's medical gear, noting with a touch of professional wit that he took "an antiquarian's pleasure in appropriating their doctor's operating set, which might have been used by Ambroise Paré" (a sixteenth century surgeon) [76]. The success of Schwan's march was as much a testament to Ashford's makeshift surgeries and the skill of the other medical personnel as it was to the soldiers' speed in catching up with the enemy. That night, along with their prisoners, the tired troops camped out on the field. The next day they learned that an armistice had been signed at the time of the action at Las Marias.

The Engagement at Asomante and the Armistice

The skirmish between American and Spanish forces on August 12, 1898, at Aibonito Pass, Puerto Rico, often called the Battle of Asomante, marked the final engagement of the war. On August 9, 1898, Spanish troops withdrew to a defensive position near Aibonito after their clash with American forces at Coamo earlier that day. Aibonito lies in the Cordillera Central mountain range in the east central region of Puerto Rico. The terrain between the two towns is rugged. Deep ravines and steep ridges limited movement and made conventional militaryoperations difficult. Travel between Coamo and Aibonito followed the paved military road. The route wound through narrow valleys, curved around sharp promontories, passed beneath overhanging cliffs, and clung to the sides of steep mountain slopes.

To prevent the Spanish from destroying key bridges along this road, Major General Wilson ordered a pursuit. He sent Troop C of the New York Volunteer Cavalry from Brooklyn under the command of Captain Bertram T. Clayton. About five miles beyond Coamo, Clayton's men came under fire from Spanish artillery positioned on two hills north of Aibonito — Asomante and El Peñón.

They faced a daunting defensive line orchestrated by Colonel Ricardo de Ortega, who had transformed the Aibonito Pass into a mountain fortress. Four companies of the Cazadores Patria Battalion occupied trenches, supported by seventy mounted guerrillas from the 6th Provision Battalion. Two provisional companies of civilian guards, police units, and the 9th Volunteers also joined the defense. In total, about 1,280 Spanish troops held positions below the artillery batteries. From these heights they controlled several miles of the roadway in both directions. The combined artillery and infantry fire forced Clayton to halt the pursuit under heavy fire.

After reconnoitering the Spanish positions at Aibonito on August 11 and 12, Wilson concluded that a frontal assault was impossible. Spanish forces controlled the steep military road and could fire down on advancing troops. Their position also prevented American artillery from deploying effectively. Wilson's scouts identified two routes that bypassed the Spanish line and could place American forces blocking the enemy's line of retreat. Both routes were concealed from Spanish observation and followed extremely steep mountain paths. The trail to the left offered the shorter distance. Wilson selected this route for a turning movement. On the morning of August 12, he ordered Brigadier General Oswald H. Ernst to take the mountain trail that branched west and north across the divide toward the town of Barranquitas. From Barranquitas, Ernst would descend the highway through the barrio of Honduras and move against the rear of the Spanish positions at Aibonito.

Wilson attempted one final diplomatic effort before launching the maneuver. He sent a message to the defenders of the town requesting their surrender. A Spanish officer agreed to forward the request to the island's Governor General. During the delay, Spanish forces strengthened their defensive works. The next morning the Spanish commander delivered a direct reply. He informed Wilson that "if any further flags of truce are sent by us upon any condition whatever they will not be received [78]."

Wilson then ordered Ernst to begin the flanking movement. To divert Spanish attention from Ernst's advance, he

directed Captain R. D. Potts's Battery F of the 3rd U.S. Artillery to occupy a low ridge about 2,150 yards from the Spanish batteries on Asomante and roughly 400 yards below them. The battery fielded six 90 millimeter field guns. At 1:25 p.m. the Americans opened fire. For thirty minutes both sides exchanged heavy artillery fire until the Spanish guns briefly ceased firing. American gunners used the moment to shift their fire toward Spanish infantry entrenched along the slopes. Spanish reinforcements soon arrived and answered with intense artillery and rifle fire. Wilson recognized that the exposed position could not be held and ordered his forces to withdraw while preparations continued for the flanking maneuver. Before the operation could proceed, a courier arrived with news that Spain had agreed to surrender, bringing the Campaign in Puerto Rico and the Spanish American War to an end.

The struggle on the steep terrain was costly for the exposed American batteries. The Americans suffered seven wounded and one killed, while the better-protected Spanish suffered five killed and two wounded. In his official report, General Wilson detailed the specific combat injuries sustained: "Lieutenant Haines, Third Artillery, was seriously wounded by a rifle bullet which passed through his body from side to side below the arms. Capt. F. T. Lee, Company F, Third Wisconsin, was slightly wounded in the right arm. Corp. Oscar Swanson, Company L, Third Wisconsin, was killed by a bursting shell. The same shell also wounded Private Fred Vought; Corp. August Yank, left arm; Private George J. Bunce, chest, all of the Third Wisconsin. Private Delos Sizer, also of the Third Wisconsin, received a bullet wound in the left leg." Another officer, Lieutenant T. H. Hunter, Battery B, Fifth Artillery, "was accidently shot by one of his own men by a Krag-Jorgensen bullet [79]." One officer reported,

The officers and men all behaved well… but I desire especially to call attention to the conduct during the engagement of August 12 of Sergt. [sic.] John Long, Light Battery F, Third Artillery, who, under heavy fire, carried Lieutenant Haines in his arms from the place where he was wounded to a point on the road where medical assistance was found [80].

Lieutenant Haines was likely the last American soldier wounded before the cessation of hostilities. While positioned on a prominent hill, he was struck by a bullet just as his battery completed its orders. The projectile entered his lower back and traveled upward, exiting through the ribs on the same side. Despite the terrifying trajectory of the bullet, Dr. Senn noted that it miraculously missed his bones and did not puncture the chest cavity. Because Haines was likely hunched over now of impact, the bullet took a shallow path through his side rather than striking vital organs. His wounds healed quickly, and he remarkably reported very little discomfort during the twenty-mile ambulance ride to the hospital ship Relief [81].

Lieutenant T. H. Hunter of the 5th Artillery survived a harrowing "friendly fire" incident when he was accidentally struck by a high-powered bullet from one of his own men's rifles. The bullet entered the right side of his upper hip bone and traveled downward and backward through his body, eventually exiting through his buttock. This fortunate trajectory allowed the long, tube-like wound to heal remarkably fast without infection or complications. Medical reports at the time were highly optimistic, noting that the Lieutenant was expected to make a full recovery with no lasting damage to his mobility or physical function [82].

The Battle of Asomante stands as a poignant "what if" of the Spanish-American War. It demonstrated the tactical difficulties of mountain warfare and the lethality of entrenched artillery. While the arrival of the peace protocol prevented a much bloodier frontal assault on the Aibonito Pass, the engagement left a lasting mark through the recorded sacrifices of the men of the 3rd Wisconsin and the 3rd Artillery. The survival of men like Lieutenant Haines, despite severe combat injuries, remains a testament to both the luck of the battlefield and the emerging efficiency of field medical care at the turn of the century.

An Epidemiological Profile of the Puerto Rican Campaign

The nineteen-day Puerto Rican campaign offers a clear inflection point in the evolution of U.S. military medicine. Command operations moved with what observers described as the "precision of a set of chessmen". Furthermore, the campaign's success was underpinned by a medical infrastructure that mirrored this rigorous coordination [83].

Care was organized, standardized, and closely integrated with campaign maneuvers. By the time the Armistice was signed on August 12, 1898, U.S. forces had secured the island with minimal battlefield loss and with a medical framework that emphasized logistical operations, documentation, and rapid intervention. Hospital wards no longer served only as sites of convalescence. They functioned as structured clinical environments where emerging protocols for trauma and tropical disease were applied with consistency and intent.

The statistical profile of the campaign underscores both its military efficiency and its clinical significance. Combat deaths remained limited with only 6 soldiers killed or mortally wounded, and 43 having sustained non-fatal injuries across six engagements. The combat mortality rate stood at 0.8 per thousand. In contrast, disease took a far greater toll. The mortality rate from disease reached 21.6 per thousand, more than twenty-seven times higher than combat losses. These figures forced a shift in medical focus from battlefield trauma alone to population level disease control.

Casualty patterns reveal the operational realities of the campaign. Of forty-four documented wounded, most injuries affected the lower extremities, followed by upper extremities and torso wounds. Head injuries were rare. Enlisted soldiers bore the overwhelming burden of exposure, with privates accounting for nearly 70 percent of casualties. Officers represented just over 12 percent. The average age was 25. Private Carl Sandburg was only 20 years old when he trekked across Puerto Rico and surgeon Lieutenant Bailey K. Ashford was 24. Casualties clustered within a small number of regiments. Over 75% of all combat casualties occurred within just four units: the Eleventh Infantry Regiment (15, 30.6%), the Fourth Ohio Volunteer Infantry (9, 18.4%), the Third Wisconsin (7, 14.3%), and the Sixteenth Pennsylvania Volunteer Infantry (12.2%).

Even in carefully managed campaigns, incidents of friendly fire — though infrequent — revealed shortcomings in coordination among rapidly assembled troops. Such occurrences, while not often publicly acknowledged, added to the casualty count during the Spanish-American War. Available records identify only two cases on Puerto Rico: Lieutenant T. H. Hunter of the Fifth Artillery was wounded in the pelvis by an accidental discharge from a Battery B member, and an unnamed private, struck by a bullet while on guard duty, lost his life to friendly fire.

The most consequential impacts to personnel were identified through disease surveillance and analysis. Typhoid fever proved the dominant threat, accounting for over two thirds of disease related deaths, with a mortality rate of 26.9 per thousand [84]. Medical officers responded to the high percentage of Typhoid deaths with systematic data collection and comparative analysis. Lieutenant Colonel Senn conducted a detailed review of 250 cases and traced the origin of infection to stateside camps such as Chickamauga, Georgia and Camp Alger near Falls Church, Virginia. This finding redirected responsibility away from the tropical environment and toward pre-deployment sanitation failures. The implication was direct. Disease prevention had to begin before embarkation. This marked a transition toward preventive medicine as a core military function [85].

Civilian casualties remained limited in scale but were not negligible. Fighting was brief and geographically contained, which reduced direct casualties. Indirect effects were more common. Food disruption, property loss, and disease followed troop movements through towns such as Ponce, Yauco, and Adjuntas. Contemporary claims of a bloodless campaign do not fully align with eyewitness accounts. Lieutenant Ashford, recorded that during the Hormigueros engagement:

one other casualty occurred in a native Porto Rican negro, an unfortunate whose curiosity proved to be his end. He had approached on foot well into the firing line when he was struck by a ball in the region of the umbilicus and died instantly, probably of hemorrhage. It was the source of greatest surprise to us all that more of these people were not hurt as even during the noise of the fight they kept getting into the most dangerous positions both from our fire and that of the enemy.

His observation underscores how even limited combat exposed civilians to lethal danger, challenging the notion that the Puerto Rico campaign was entirely free of human cost [86].

These operational and epidemiological realities set the stage for a series of clinical advances that defined the campaign's lasting significance. Three developments stand out. First, strict antiseptic protocol was enforced at all echelons of care. Antiseptic dressings were applied as soon as possible after injury, reducing infection and sepsis before patients reached field or base hospitals. This immediate intervention marked a decisive break from earlier wars, where contamination during evacuation often proved fatal. Second, surgical restraint became a guiding principle under Assistant Surgeon-General Greenleaf. He directed that initial dressings should remain undisturbed during transport. His order prioritized patient stabilization over hurried, high-risk operations at the front, preventing the complications that frequently followed premature surgery [87]. Finally, diagnostic radiology revolutionized trauma assessment. The introduction of X-rays, a pioneering achievement for 1898, enabled surgeons to locate bullets, assess bone damage, and plan precise interventions without resorting to blind exploration. This use of technology not only improved surgical accuracy but also

reduced secondary trauma and infection [88]. Lieutenant Colonel Nicholas Senn, writes, "Every movement in this [Puerto Rican] campaign was made with a due regard for the welfare and success of our troops. . . The expedition was well supplied with medicines, hospital stores and medical officers to meet all possible emergencies [89]."

Together, these measures produced survival rates unmatched in previous conflicts and signaled the modernization of U.S. military medicine.

The tragic case of Philip Reddington M. Hildreth serves as the definitive bookend to the campaign's human cost. Having survived the military operations, he died by suicide while delirious from a fever contracted in Puerto Rico [90]. His death, like the 2,000 other Americans who died of disease compared to only 385 killed in action during the wider Spanish American war, underscores the failure of logistics and sanitation. While the "splendid little war" proved that the U.S. could master modern surgical techniques and tactical maneuvers, it simultaneously exposed a critical inability to manage the microscopic threats of a tropical environment. Ultimately, the true "enemy" proved to be the invisible threat of disease rather than the Spanish Mauser. For every man like Corporal Barnes, who died after "weeks of dreadful suffering" from a gunshot wound, dozens more succumbed to typhoid and malaria, filling hospital ships with "disease casualties" who paid the ultimate price long after the chessmen had finished their moves.

After it was over, President Theodore Roosevelt summed up the war in a speech at the Stockyards Pavilion in Chicago that was covered by Carl Sandburg, now a reporter for a Chicago newspaper. "He happened to mention the Spanish-American War and added with a chuckle and a flash of his teeth, 'It wasn't much of a war but it was all the war there was [91].'"

Disclaimer

The views expressed are those of the author and do not necessarily represent the official policy or position of the U.S. Army, Defense Health Agency, U.S. Department of Defense, or any other U.S. government agency.

References

1. For an overview of the war see David F. Trask, *The War with Spain in 1898* (New York: Macmillian Publishing Co, 1981); and Albert A. Nofi, *The Spanish-American War, 1898* (Conshohocken, PA: Combined Books. 1996); although dated, Walter Millis, *The Martial Spirit* (Cambridge, MA: Literary Guild of America, 1931) provides an etertaining overview of the war; for the official report see U.S. War Department, *Annual Report of the Major-General Commanding the Army to the Secretary of War* (Washington, DC: U.S. War Department, 1898).
2. The official U.S. spelling for the island was established as *Puerto Rico* in 1891. However, it was changed to *Porto Rico* in 1898 with the installation of the U.S. military government. In 1932, an act of Congress formally restored the original spelling.
3. Nelson A. Miles, *Serving the Republic: Memoirs of the Civil and Military Life of Nelson A. Miles, Lieutenant-General, United States Army* (New York: Harper & Brothers. 1911), 296.
4. David A. Blum and Nese F. DeBruyne, *American War and Military Operations Casualties: Lists and Statistics* (Washington, DC: Congressional Research Service, 2020); see also Bernard D. Rostker, *Providing for the Casualties of War: The American Experience through World War II* (Santa Monica, CA: The RAND Corporation, 2013), 3.
5. Vincent J. Cirillo, "Two Faces of Death: Fatalities from Disease and Combat in America's Principal Wars, 1775 to Present," *Perspect Biol Med* 51, no. 1 (2008), 121–133; John B. Holcomb, Lynn G. Stansbury, Howard R. Champion, Charles Wade, and Ronald F. Bellamy. "Understanding Combat Casualty Care Statistics," *J Trauma Acute Care Surg*, 60, no. 2 (2006), 397–401.
6. U.S. War Department. *Report of the Secretary of War. Miscellaneous Reports* (Washington, DC: Government Printing Office,1899), 661.
7. Quartermaster Museum. "Short History of Identification Tags." 1988. Web page. https://qmmuseum.army.mil/research/history-heritage/mortuary-affairs/Short-History-of-Identification-Tags.html.
8. American National Red Cross Relief Committee, *Reports: May, 1898 - March, 1899* (New York, NY: The Knickerbocker Press, 1899), 273.
9. "The Relief Returns," *New-York Tribune,* August 20, 1898, 3.
10. Cristóbal S. Berry-Cabán, "Prelude to Imperialism: Puerto Rico and the United States, 1895-1898," *J Caribb Hist* 58, no. 2 (2024), 77–104.
11. William Appleman Williams, *The Tragedy of American Diplomacy* (New York, NY: Dell Pub. Co., 1962); Foner Philip Sheldon, *The Spanish-Cuban-American War and the Birth of American Imperialism, 1895-1902*. 2 vols. (New York, NY: Monthly Review Press, 1972).
12. Graham A. Cosmas, *An Army for Empire: The United States Army in the Spanish-American War* (College Station, TX: Texas A&M University Press, 1998).
13. Nelson Miles, "The War with Spain – III," *The North Atlantic Review* 169, no. 512 (July 1899), 126.
14. Carl Sandburg, *Always the Young Strangers* (New York: Harcourt, Brace and Company), 413.

15. George King, *Letters of a Volunteer in the Spanish-American War* (Chicago: Hawkins & Loomis, 1929), 53.
16. Rivero, *Crónica de la Guerra Hispanoamericana,* 203.
17. U.S. War Department *Annual Reports of the War Department for the Fiscal Year Ended June 30, 1898* (Washington, DC: Government Printing Office; 1898), 266.
18. U.S. War Department; Adjutant-General of the Army, *Correspondence Relating to the War with Spain and Conditions Growing out of the Same, Including the Insurrection in the Philippine Islands and the China Relief Expedition, between the Adjutant-General of the Army and Military Commanders in the United States, Cuba, Porto Rico, China, and the Philippine Islands, from April 15, 1898, to July 30, 1902*, Vol. 2. (Washington, DC: Government Printing Office. 1902), 330.
19. U.S. War Department *Annual Reports of the War Department for the Fiscal Year Ended June 30, 1898*, 266.
20. Charles R. Greenleaf, "Report of Operations of the Medical Department at Santiago, Cuba, and in Porto Rico." *Report of the Surgeon-General of the Army to the Secretary of War for the Fiscal Year Ended June 30, 1898* (Washington, DC: Government Printing Office, 1898), 146.
21. Nicholas Senn, *War Correspondence (Hispano-American War)* (Chicago, IL: American Medical Association, 1899), 84.
22. Senn, *War Correspondence,* 122-130.
23. Rivero, *Crónica de la Guerra Hispanoamericana*, 203-204.
24. U.S. War Department, *Correspondence Relating to the War with Spain,* Vol. 2, 330.
25. Senn, *War Correspondence,* 85.
26. Senn, *War Correspondence,* 84; *La Correspondencia de Puerto Rico*, July 27, 1898, 1.
27. U.S. War Department, *Annual Reports of the War Department for the Fiscal Year Ended June 30, 1898*, 31-32; Marco Ramírez Lavandero, *Documents on the Constitutional Relationship of Puerto Rico and the United States*, 3rd ed. (Washington, DC: Puerto Rico Federal Affairs Administration, 1988), 49-50.
28. *La Correspondencia de Puerto Rico*, July 29, 1898, 1.
29. Robert Marshall Utley, *Frontier Regulars: The United States Army and the Indian, 1866-1891*(Lincoln, NE: University of Nebraska Press, 1984).
30. Augustus Peabody Gardner, *Some Letters of Augustus Peabody Gardner,* edited by Constance Gardner (New York: Houghton Mifflin Company, 1920), 27-28.
31. John M. Gibson, *Soldier in White; the Life of General George Miller Sternberg* (Durham, NC: Duke University Press, 1958).
32. Mary C. Gillett, *The Army Medical Department, 1865-1917* (Washington, DC: Center of Military History, 1995); Vincent J. Cirillo, *Bullets and Bacilli: The Spanish-American War and Military Medicine* (New Brunswick, NJ: Rutgers University Press, 2004).
33. Greenleaf, "Report of Operations of the Medical Department," 146.
34. Greenleaf, "Report of Operations of the Medical Department," 152.
35. Carole Adrienne, *Healing a Divided Nation: How the American Civil War Revolutionized Western Medicine* (New York, NY: Pegasus Books, 2022).
36. Ludwig Elmer Olson, *Mauser Bolt Rifles*, 3d ed. (Montezuma, IA: F. Brownell, 1976).
37. David Krueger, "The Red Cross, the Daughters of the American Revolution, and the origins of the Army Nurse Corps in the Spanish-American War." *J Mil Hist* 83, no. 2 (2019): 409.
38. American National Red Cross Relief Committee, *Reports: May, 1898 - March, 1899* (New York, NY: The Knickerbocker Press, 1899), 268-278.
39. Ibid.
40. U.S. War Department, *Annual Reports of the War Department for the Fiscal Year Ended June 30, 1898*, 139.
41. Charles E. Creager, *The Fourteenth Ohio National Guard, the Fourth Ohio Volunteer Infantry, a Complete Record of this Organization from its Foundation to the Present Day* (Columbus, OH: The Landon Printing and Publishing Company, 1899), 146.
42. Ibid, 153.
43. U.S. War Department, *Correspondence Relating to the War with Spain,* 365.
44. Ibid.
45. Creager, *The Fourteenth Ohio National Guard,* 151; Senn, *War Correspondence,* 126.
46. Creager, *The Fourteenth Ohio National Guard,* 159.
47. *La Correspondencia de Puerto Rico*, August 5, 1898, 2.
48. U.S. War Department, *Annual Reports of the War Department for the Fiscal Year Ended June 30, 1898*, 142.
49. Ibid.
50. Miles erroneously lists him as Captain; U.S. War Department, *Correspondence Relating to the War with Spain,* Vol. 2, 378.
51. Creager, *The Fourteenth Ohio National Guard,* 139; Senn, *War Correspondence*, 125-126.
52. Senn, *War Correspondence*, 126.
53. Ibid., 125.
54. Ibid.

55. Richard Harding Davis, "Our War Correspondents in Cuba and Puerto Rico." *Harper's New Monthly Magazine* (May 1899), 942-943.
56. Richard Harding Davis, *The Cuban and Porto Rican Campaigns* (New York, NY: Charles Scribner's Sons, 1898), 334.
57. Albert Gardner Robinson, *The Porto Rico of to-Day: Pen Pictures of the People and the Country* (New York, NY: Charles Scribner's, 1899), 109-110.
58. Davis, *The Cuban and Porto Rican Campaigns*, 343.
59. *La Correspondencia de Puerto-Rico*, August 24, 1898, 1.
60. U.S. War Department. *Correspondence Relating to the War with Spain,* Vol. 2, 378.
61. Senn, *War Correspondence*, 128.
62. Thomas J. Stewart, *Record of Pennsylvania Volunteers in the Spanish American War, 1898* (Harrisburg, PA: Wm. Stanley Ray, 1900), 687.
63. Senn, *War Correspondence*, 127-128.
64. Senn, *War Correspondence*, p. 128
65. Letter from Walter Elliott to John Halsey, "I Have Smelt Gunpowder..." August 11, 1898, in the private collection of Cristóbal S. Berry-Cabán.
66. Cirillo, *Bullets and Bacilli*, 52-53.
67. U.S. War Department, *Annual Report of the Major-General Commanding the Army to the Secretary of War*, 249.
68. Nicole Trujillo-Pagán, *Modern Colonization by Medical Intervention: US Medicine in Puerto Rico* (Chicago, IL: Haymarket Books, 2013).
69. Bailey K. Ashford, *A Soldier in Science; the Autobiography of Bailey K. Ashford* (New York: W. Morrow and Company, 1934), 24.
70. Bailey K. Ashford, "Observations on the Campaign in Western Porto Rico during the Spanish-American War." *Journal of the Military Surgeons of the United States* 15 (1904), 161.
71. Ashford, *A Soldier in Science*, 25
72. Ibid.
73. Karl S. Herrmann, *From Yauco to Las Marias* (Boston: Richard G. Badger & Co., 1900), 64; "Sweet Marie" was a popular 1893 sentimental song with lyrics by Cy Warman and music by Raymond Moore.
74. U.S. War Department, *Correspondence Relating to the War with Spain,* Vol. 2, 380, 390.
75. Ashford, "Observations on the Campaign in Western Porto Rico," 163-166.
76. Ashford, *A Soldier in Science*, 27.
77. U.S. War Department. 1898. "Annual Report of the Major-General Commanding the Army to the Secretary of War." U.S. War Department.
78. U.S. War Department. 1898. "Annual Report of the Major-General Commanding the Army to the Secretary of War." U.S. War Department.
79. Senn, *War Correspondence*,
80. U.S. War Department. 1898. *Annual Report of the Major-General Commanding the Army to the Secretary of War*
81. Senn, *War Correspondence*, 124.
82. Senn, *War Correspondence*, 124-125.
83. Davis, *The Cuban and Porto Rican Campaigns*, 303-304.
84. U.S. War Department. *Report of the Secretary of War. Miscellaneous Reports*, 591.
85. U.S. War Department. *Report of the Secretary of War. Miscellaneous Reports*, 619.
86. Ashford, "Campaign in Western Porto Rico", 166-167.
87. Senn, *War Correspondence*
88. Cirillo, "The Spanish-American War and Military Radiology." *American Journal of Roentgenology* 2000, 174 (5):1233–39.
89. Senn, *War Correspondence*,
90. Cristóbal S. Berry-Cabán, "The Last Casualty: A Case Study of the Death by Suicide of an 1898 United States Soldier." *International Journal of Social Science Research* 2026 (3.3): 107–15.
91. Sandburg, *Always the Young Strangers*, 418.

