"Don't Strip Tease for Anophlese": A History of Malaria Protocols during World War II

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“DON’T STRIP TEASE FOR ANOPHELSE”¹:
A HISTORY OF MALARIA PROTOCOLS DURING WORLD WAR II

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Dedicated to my loving parents, who told me I could do anything
I wanted to in life, as long as I didn't make a mess in the house.

And for my grandfather, Benjamin Wacks, who served as a medical officer
in the Sixth Combat Engineers in the Philippines during World War II.
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ABSTRACT

This study focuses on the American anti-malaria campaign beginning in 1939. Despite the seemingly endless scholarship on World War II in the past seventy years, little has been written on the malaria epidemic on Guadalcanal. Through extensive archival research, the breadth of the anti-malaria campaign throughout the Pacific is explored as a positive side effect of the malaria epidemic on Guadalcanal in 1942-1943. While most scholars of the Pacific war mention the devastating effects of malaria during the battle for Guadalcanal, few have examined the malaria protocols. Through intensified atabrine discipline, bed nets, mosquito repellant, and an intense cultural war against malaria, the United States military won the war against the anopheles mosquito. Moreover, research and development in the years leading up to war fundamentally changed the way large-scale scientific and medical research is conducted in the United States, including the establishment of the Centers for Disease Control and Prevention.
INTRODUCTION

In Alfred Cowdrey’s *Fighting for Life*, a comprehensive monograph of World War II medicine, he views malaria as an enemy akin to the Japanese in the Pacific War.\(^2\) There were two enemies, both powerful, with the ability to launch crippling attacks against the Marines on Guadalcanal. During the battle for Guadalcanal, 7 August 1942 through 9 February 1943, the Marines fought a hard campaign in a tropical jungle, the likes of which few had seen before. Many were experiencing combat for the first time, and Guadalcanal introduced the men to the horrors of war. Ambush attacks from small groups of Japanese soldiers were frequent enough to instill fear into the minds of the young Marines. Supplies were unevenly distributed, reflecting the hurried storming of the island. Both sides suffered from disease and malnutrition. In the run up to war, the United States was acutely aware of the disease threat. Yet, there was a notable lack of malaria protocols in place to protect the Marines when they left their boats for the uncertainty of war on Guadalcanal.

Throughout the thesis, I argue that prior to the outbreak of war, the United States was aware of the threat of malaria throughout the Pacific. At the beginning of the Pacific war, medical corps members were taught how to treat tropical diseases. When the Marines landed on Guadalcanal, there was a clear need for preventive malaria protocols; however, there was a clash of wills between the line officers and medical personnel. While the line officers wanted to win the campaign, they were decidedly more concerned about the Marines’ ability to shoot straight than their proficiency in spraying repellant. There is no evidence to suggest that the commanding officers throughout the Pacific were unaware of the threat of malaria. When faced with an early opportunity to engage the enemy and gain the Solomon Islands as Allied territory, the overall war objectives trumped the basic safety precautions needed to avoid the malaria epidemic. The true problem lay with the bureaucratic setup of the malaria testing in the United States. The constant search for a miracle drug was favored over testing medications that could be massed

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1 Color Poster No. 44-PA-686; “Don’t Strip-Tease for Anopheles,” Records of the Office of Government Reports, 1932-1947, Record Group 44; National Archives at College Park, College Park, MD.
produced prior to the outbreak of war. More than any decision made by a commanding officer in-theater, this led to the malaria epidemic.

The victims of this decision were the Marines on the front lines: sick, malnourished, and forced to fight the Japanese and malaria at the same time. As malaria infection rates grew, its impact on the overall campaign became increasingly evident, leading to the implementation of anti-malaria protocols. Beginning in September 1942, a month into combat on Guadalcanal, anti-malaria protocols began to be enforced, albeit sporadically.\(^3\) However, the devastating effects of malaria were not truly evident until the battle for Guadalcanal came to an end. At this time, the protocols became widespread and enforced throughout the Pacific. I contend that the implementation of strict preventive malaria protocols were the result of high infection rates during the battle for Guadalcanal. This is illustrated by the overlap in implementation and the first spike in illness, the infection rate, and the visible toll malaria had on morale, troop effectiveness, and the hospitalization rate of the Marines. Until this time, governmental scientists and researchers were ambivalent towards atabrine and the idea of a new miracle drug that did not yet exist. Ultimately, the epidemic on Guadalcanal forced the military and the United States government to confront malaria within the context of active war, leading to the testing of atabrine within the military.

The battle for Guadalcanal occurred early in the war, exactly eight months after the attack on Pearl Harbor. Japan officially declared war on the United States as they began attacks on Guam, Wake Island, Hong Kong, Singapore, the Philippines, and Shanghai on December 7, 1941. The following day, President Franklin Delano Roosevelt went before a joint session of Congress and gave his famous Infamy speech. The President requested “that the Congress declare that since the unprovoked and dastardly attack by Japan on Sunday, December seventh, 1941, a state of war has existed between the United States and the Japanese Empire.”\(^4\) The United States was not alone in declaring war on Japan; the United Kingdom, the Netherlands, and New Zealand declared war on Japan the same day, China and Australia the next. As the Second World War gained momentum, so, too, did the American ideology of superiority and military might. President Roosevelt continued, “I believe I interpret the will of the Congress and of the people when I assert that we will not only defend ourselves to the uttermost but will make very certain that

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\(^3\) Ibid., 63.

this form of treachery shall never endanger us again.” Following the outbreak of war with Japan, the Americans were further pulled into war with Germany and Italy on December 11, 1941. Within days of Pearl Harbor, the world was at war. In the days and months following, diplomats, strategists, and military officials began preparations for war. Eight months later, the battle for Guadalcanal was the first major engagement in the Pacific since the attack on Pearl Harbor.

Although the meeting of American and Japanese forces on Guadalcanal was not their first engagement since Pearl Harbor, it was a major turning point in the war. Early engagement was necessary to stop any Japanese attempt to move southward. Fears were widespread, and included the possibility of a Japanese attack on Australia. Strategically, such a move would be disastrous for Allied forces. Therefore it was essential to contain the Japanese as far northward as possible. In the early stages of the war, supply chains were crucial. A Japanese attack on Australia would signal the loss of all safe American supply lines from Hawaii and San Francisco, virtually abandoning American troops in the Pacific to fight a war with diminishing rations of food, medical supplies, and weaponry. Aware that the Japanese were building a landing strip on the island of Guadalcanal, the short-lived opportunity to launch an assault was not to be given up.

In an attempt to stop Japanese forward assaults, capture the airfield, and take control of Guadalcanal as a forward base for Allied assaults, the First Marines were called to duty. The largest of the islands in the Solomon Island chain, Guadalcanal is strategically located approximately 1,000 miles from mainland Australia, 2,600 miles from Luzon, Philippines, and 3,500 miles from the island of Hawaii. Yet, the strategic importance of the island is often misunderstood. While its location for launching Allied attacks northward was clear, the island itself was “not a picturesque South Pacific island paradise.” Instead, it was a steaming jungle with mountains and swamps, and was “loathed by all who fought there.” A miserable place throughout much of the war, regardless of medical supplies, the island took more than it gave—and what it gave was malaria.

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5 Ibid.
6 American and Japanese engagements after Pearl Harbor and before Guadalcanal include: the Battle for Corregidor, part of the Japanese effort to gain control of the Philippines; Kokoda Track campaign on Papua New Guinea; and the Aleutian Islands campaign, a part of the Alaskan territory.
8 Ibid., 59.
Historians of the Pacific war never questioned the overall importance of Guadalcanal. Inspired by Samuel Eliot Morison’s epic multivolume account of the naval history of the Second World War, Richard Frank began his own journey to complete a monograph about the air, ground, and sea war surrounding the battle for Guadalcanal. The monograph is rooted in the strongly-held belief of American President Franklin D. Roosevelt and British Prime Minister Winston Churchill that defeating Germany must be the first priority of the war. By establishing this dichotomy, the rest of the Pacific War plays out in a different light.

Eric Hammel’s monograph, *Guadalcanal: Starvation Island* focuses on the raw inexperience of the soldiers on both sides. While Hammel is quick to explain that there was nothing of intrinsic value on Guadalcanal, it became valuable merely because both sides wanted it. In the first days, Hammel is clear that neither side knew exactly how to run their operations. As undertrained Marines forged their way through the pestilential jungles of Guadalcanal, their inexperience led to friendly fire injuries, death, and disease. Yet, Hammel systematically demonstrates that over the span of the six-month battle, the Americans truly found their rhythm, however unharmonious their beginning was.

Richard Lee’s *Victory at Guadalcanal* argues that the battle for Guadalcanal was parallel in importance to the Allied victory in Stalingrad. There is no doubt that both were crucial moments for the Allied Forces. Yet, most scholars point to the Battle at Midway as the true turning point in the Pacific War. Moreover, to view Guadalcanal as the turning point in the Pacific War is neither new, unique, nor correct. Lee’s comparison of Stalingrad and Guadalcanal goes further, to the point of painting an inaccurate picture. In Russia, two million died in the battle for Stalingrad. Guadalcanal was not as central to its theater as Stalingrad was. If the Allied Forces lost in Stalingrad, there would have been no way to stop Nazi Germany. Guadalcanal, on the other hand, was one of many dozen small islands within close proximity to one another, all with similar topography and strategic importance. Winning Guadalcanal early, even with losses at 37,000, was certainly important for the Pacific War, but it did not represent a turning point in the war. To take Lee’s argument that Stalingrad and Guadalcanal were equally important to the overall outcome of World War II, overstates the importance of Guadalcanal, while

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simultaneously conflating the war-turning outcome of Stalingrad. While this radical belief is not representative, the work is important in covering the span of ideas about Guadalcanal and what it symbolizes.

For each of the three abovementioned monographs on Guadalcanal there are dozens more. Yet, these are the most notable over the past sixty years. Understanding the battle for Guadalcanal is just one vital piece of this research. The heart lies in the complexities of wartime medicine, especially the treatment of malaria. To date there have been no monographs that look critically at the role malaria played during the Pacific war. Instead, malaria and wartime medicine are discussed in the larger context, placing this project at the forefront of those evaluating the impact of medicine on the war. The most comprehensive volume on World War II medicine is undoubtedly Alfred Cowdrey’s *Fighting for Life.*12 In just shy of four-hundred pages, Cowdrey analyzes the new medicines, techniques, and protocols utilized in all Second World War theaters. In the Pacific, tropical diseases and jungle rot were among the most treated ailments. Malaria, the biggest threat in the Pacific, was being prevented by medication, while mosquito breeding zones were being eradicated with the new miracle spray, DDT. Cowdrey is clear that malaria was an enemy as deadly as the Japanese, and had the ability to determine the outcome of both battles and the war.

World War II military medicine is well understood, as is the epidemic of malaria that occurred in the Pacific. Yet, the social history of the disease on Guadalcanal, the location of most malarial infections, is untold. To understand American attitudes toward malaria, Margaret Humphreys’ *Malaria: Poverty, Race, and Public Health in the United States* is a vital source.13 Humphreys examines the intricacies of malaria through the lens of physicians, people, and the parasite itself. The physician’s view focuses on extensive research on public health literature and anti-malarial programs. The impact of malaria on the average person was illuminated through diaries and letters. Humphreys also used the Federal Writers’ Project of the 1930s, which included local histories, oral histories, and ethnographies. The study of the malaria parasite included changes in the introduction of malaria to the original thirteen British Colonies, where it was called the intermittent fever. Humphreys also examined changes in ecology, trends in the infection rates, and disease severity through westward expansion. By the 1900s, the

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12 Cowdrey, *Fighting for Life.*
overwhelming majority of anopheles mosquitoes, and therefore cases of malaria, were contained to the South.

Humphreys’s explanation of the relationship between the Rockefeller Foundation’s International Health Board and the United States Public Health Service to test known and new malaria control methods throughout the Mississippi Delta region is thorough. The area in which she adds the most to the history of the disease is in her argument that the New Deal’s Works Progress Administration (WPA) efforts throughout the South caused many to contract malaria. She explains that by hiring unskilled workers to dig ditches and build dams, both of which held stagnant water, WPA project areas became breeding grounds for malaria. Humphreys tackles the location question head-on, accepting that climate is not the reason malaria plagued the South for generations after it had left the northern and western states. Humphreys argues that poverty, particularly surrounding the cotton industry, and to a lesser extent the sugarcane and rice industries, forced workers to live close to the fields, keeping themselves and their families in close proximity to anopheles breeding.\footnote{Ibid., 3-5, 55-57.}

In his groundbreaking work \textit{War and Disease: Biomedical Research on Malaria in the Twentieth Century}, Leo Slater examines the role of malaria and the wider war between the United States and Germany to create a synthetic medication to treat and prevent malaria. Slater makes a bold argument that what humankind has learned from the anti-malarial programs of the Second World War is akin to the progress made by the Manhattan Project.\footnote{Leo B. Slater, \textit{War and Disease: Biomedical Research on Malaria in the Twentieth Century} (New Brunswick, NJ: Rutgers University Press, 2009), 1.} The monograph emphasizes the importance of anti-malarials prior to the war and the bombing of Pearl Harbor, and sets the stage for what the United States understood would be a deadly war without adequate supplies of medication and preventive drugs. The wartime anti-malarial projects involved an amalgamation of government and private research firms employing thousands across the continent. With the American military’s dire need for a synthetic drug, the race to find one had far reaching implications for future epidemic studies.\footnote{Slater, \textit{War and Disease}.}
American War against Malaria

Among the standing water and shaded jungles of Guadalcanal were two predators: the Japanese and the anopheles mosquito. Both were ready to attack quickly and without warning, and had the potential to take a soldier from the frontlines for days, if not permanently. While much of the Pacific held a certain risk of malaria, Guadalcanal was different. The most malarial places in the world include Guadalcanal, New Georgia, Bougainville, and Papua New Guinea.17 Within weeks of the landing, an epidemic of malaria swept through the Marines. It was evident that any attempt to control malaria must be through medicine, and not rely solely on spraying and draining techniques.18 It was essential for the military to establish strict anti-malarial protocols to keep infection rates low. As the military soon discovered, the concept was easier than the reality. Troops were initially given basic advice to cover their skin, stay away from standing water, and use insect repellents as often as they could; however, this was not nearly enough to stop the anopheles from her need to bite unsuspecting soldiers.19 Once bitten by an infected mosquito, a soldier was forced to contend with the infection for a singular excruciating cycle that lasted over a week and recurred over several years. The cyclical nature of malaria necessarily means that an infected person experiences periods of health followed by a clinical infection; that is, active illness with periods of high fever followed by intense chills.

Malaria is a cyclical parasitic infection that can remain in an infected host for any period of time ranging from months to years. Once bitten by a female anopheles mosquito, the microscopic sporozoites (parasitic cells) enter the hepatocyte cells that are specific to the liver. They multiply and divide to form multinucleated schizonts.20 Soon after multiplying, the cells rupture and infection re-enters the red blood cells. At this point, a non-infected anopheles mosquito ingests blood of an infected host, the production cycle of malaria is completed, and she will then infect new hosts.21

20 Initially, the infected liver cells multiply and create new infected liver cells. Then the infected cells divide, causing the number of infected cells to further multiply, creating smaller cells.
While there are four known species of malaria, *Plasmodium vivax* and *Plasmodium falciparum* were by far the most common plaguing the military on the Solomon Islands. Of the two, the most common, and less deadly *Plasmodium vivax* often incapacitated its victims for days. Soldiers experiencing a clinical infection suffered with compromised immune systems, leaving them vulnerable to secondary infections. On the other hand, the few soldiers who became infected with *Plasmodium falciparum* risked death without immediate, proper medical care.  

Today, the cause of prolonged parasitic infection in the liver is well understood within the medical community, but is hard to treat because of its intracellular nature. It is still common, once infected, for victims to have multiple acute recurrences for years after they contract malaria. Once the first attack occurs, patients can be treated to ease symptoms and calm the episode, but nothing can be done to clean the liver of the infected cells.

Prior to World War II, quinine was used to treat the symptoms of an acute malarial infection. Quinine was extracted from the bark of the Cinchona tree, native to South America and the island of Java. However, quinine would not keep soldiers from contracting the parasitic infection. Akin to using aspirin for a headache, quinine only relieved the symptoms of an acute attack, including the shivering chills followed by profuse sweating. Many soldiers complained of blurred vision and hearing thunderstorm-like sounds while on quinine, side effects that would adversely affect the military mission in the Pacific. In such endemic areas, it was vital that the government and military work together to develop a new medication capable of preventing malaria infections and curing an existing infection.

First discovered in 1930 by Bayer scientists Hans Mauss and Fritz Mietzsh, atabrine is a medication able to cure and prevent malaria infections. In the search for a new synthetic formulation, scientists began with the quinine nucleus. All chemicals used to treat malaria at this time originated with the quinine nucleus, as did the chemical structure of new medications. Using this base structure, atabrine was developed. Soon after, the Winthrop Chemical Company, the American sister company of Bayer, began to produce atabrine domestically. Throughout the Second World War, Winthrop Chemical held the American patent for atabrine.

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20 Condon-Rall, “The Army’s War against Malaria,” 129.
21 That is, while physicians understand the disease and its epidemiology, it is hard to treat because it reproduces within the liver. While killing the infection before it multiplies and infects the bloodstream would be ideal, it is impossible without doing permanent damage to the liver.
became inevitable, American scientists began to gather across the country in 1939 to fuel the search for a drug they believed would serve the military better than atabrine. This new miracle drug would have fewer side effects and straightforward dosing guidelines. Ultimately, American scientists settled with chloroquine, a medication first formulated in 1934 by Bayer’s Hans Andersag. For over ten years, chloroquine was ignored by Germany scientists because they falsely considered its toxicity to be too risky.  

In 1940, the Medical Department of the Army began to get more involved with the process, as did the U.S. Surgeon General. Together, they jointly arranged meetings for vital members of the National Research Council’s Division of Chemistry and Chemical Technology, Division of Medical Sciences, the Office of Scientific Research and Development, Malaria Control in War Areas, and scientists from the Rockefeller Foundation and various research universities to meet and discuss their current projects and the overarching goals of current malaria research. These meetings became clearinghouses for medical information about atabrine chemical trials. As soon as Guadalcanal was secured and supply lines were safer, vital shipments of atabrine tablets made it to Pacific to combat the malaria epidemic.

“Don’t Strip-Tease for Anopheles”: A History of Malaria Protocols during World War II seeks to examine the role of malaria during World War II through the lens of Guadalcanal. Beginning with the lead up to war, the United States government knew the importance of anti-malarials should they enter war in the Pacific. To prepare for war, the United States and Germany fought to find a new medication that prevented malaria and could be mass produced in the United States during war. Though it could not be predicted, the decision to forgo quinine for atabrine won the war on disease for the United States. In January 1942, the island of Java, location of most of the Cinchona trees in the world, fell to the Japanese. The importance of the decision to become self-sufficient in the production of more effective anti-malaria drugs cannot be estimated. However, the never-ending fight for an American-made drug provides evidence that the United States government acknowledged malaria as a formidable enemy.

26 Slater, War and Disease, 60-80.  
27 James Stevens Simmons, “Wartime Importance of Tropical Diseases,” The Scientific Monthly 59, no. 6 (December 1944), 406; Medical Department, United States Army, Medical Supply in World War II, ed. Charles M. Wiltse (Washington, D.C.: Office of the Surgeon General, Department of the Army, 1968), 74. Slater, War and Disease, 84-95.  
28 Bergerud, Touched with Fire, 92
Yet, as the Marines landed on Guadalcanal they lacked an anti-malarial protocol. This eventually caused a malaria epidemic among more than eighty percent of the Marines by the end of the campaign. Many suggest that the American ability to control, on some level, the malaria epidemic among its troops won them Guadalcanal and later the war. There is much evidence to suggest that the United States made a dangerous mistake in not protecting troops from malaria during Guadalcanal. However ill-managed the campaign was, the thesis argues that after an initial failure to act during the battle for Guadalcanal, the Surgeon General of the Navy implemented an impressive anti-malarial campaign that was enforced for the remainder of the war.

To understand the military’s handling of malaria in the Pacific, I divide the thesis into three chapters and an epilogue. The first chapter, Failure from Indecision, spans the pre-war efforts to create atabrine through the end of the Guadalcanal Campaign. I argue that the United States government was acutely aware of the malaria threat, yet was unwilling to implement the strict requirements to stop an epidemic during its first major military battle. As such, the incidence rate was well over eighty percent by the end of the campaign. However, the military began to rectify its poor decision a month into the campaign by starting multifaceted anti-malarial campaigns.

The second chapter, Triage and Diagnosis, focuses on the period after the battle for Guadalcanal, as the military dealt with a malaria epidemic and sought to implement effective protocols to prevent further disease. This process was two-fold, as they needed to treat the Marines that contracted malaria while simultaneously implementing stricter standards. The objective of the chapter is to clearly link the failure to protect soldiers from malaria during the battle for Guadalcanal, with the push to establish a comprehensive prevention and treatment plan.

The third chapter, Prescription for Success? examines the details of the then-new malaria protocols. Using statistics, the first section will examine the protocol’s effectiveness through the use of monthly malaria reports. Moreover, this analysis will include the training materials used by the military to help implement their new protocols. Although the focus is on the medical prevention of disease, the chapter explores the efforts to rid camps of mosquito breeding grounds. The second section focuses on the malaria prevention propaganda presented to soldiers.

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during the war, and includes a video made by the Walt Disney Company and monthly pin-up calendars with tips on preventing malaria.

The epilogue considers the pressure placed on the medical and military establishments during the war and the medical breakthroughs that shaped the field of medicine forever. As a closing section to the thesis, the epilogue looks at the post-war years, placing some of the larger breakthroughs and accomplishments in the context of the war against malaria.

Newly recruited with their bags neatly packed, the Marines left their boats for the island of Guadalcanal in August of 1942. Unaware of what they would find, they stormed the beach ready to fight any enemy of the United States. Little did they know, they would face two elusive enemies. As they marched into the steamy jungles and up the merciless mountains of Guadalcanal, they encountered both the Japanese and anopheles mosquitoes. Their fight was ruthless. Ultimately, they won the war against Japan by fighting off malaria.
CHAPTER ONE
FAILURE FROM INDECISION

Historically, malaria has plagued societies across the globe. Though its name varied by location and period, the classic symptoms of cyclical sky high fevers followed by shaking chills allow historians to trace the first recorded treatment of malaria to 1600. Upon settling in the British North American Colonies, malaria played a significant role in the southern colonies from Maryland to Georgia. The amalgamation of humid, long summers with the focus on agricultural work kept many in the fields without protective drainage systems. This led to higher rates of infection among field workers, especially during the summer months. Militarily, malaria has played a similarly significant role, especially in the Revolution, the Mexican-America War, and Civil War. By the dawn of the nineteenth century, much of the malaria in the northern states was gone; however, mosquito populations thrived throughout the South and plagued many of those settling the American frontier.\(^\text{30}\) It has decimated entire units, determining the fate of battles. In the interwar period, the United States and Germany were acutely aware of malaria’s power. The 1930s saw an increase in laboratory experimentation, which led scientists to uncover a series of chemical compounds to treat and prevent malaria. Their eventual use in the United States Armed Forces is well chronicled in the war stories of veterans. Yet, the military did not officially accept atabrine until the battle for Guadalcanal was well underway. Field tests were still being conducted, and there was no official dosing guideline accepted by the United States. While researchers pushed for a better medication into the 1940s, they were unsure how to use atabrine, if at all. Although war became imminent, they did not readily accept atabrine because, in part, there had been no American trials. Moreover, a large-scale drug trial required careful considerations and organization the likes of which had not been conducted under wartime constraints and demands. Although scientists and researchers were vacillating between beginning atabrine trials and potential implementation, their drive to find a more effective drug, or to rely on environmental controls, their delay came at the cost of tens of thousands malaria infections in the first year of the war.

\(^{30}\)For more on malaria in America, see Humphreys, *Malaria.*
American Rush for Anti-Malarial Medications

From the Italian *mal’aria*, meaning bad air, malaria was believed to come from poisonous fumes emitted from swamps and lakes. By the turn of the twentieth century, it became clear that mosquitoes were the cause of malaria. Due to its global presence, many sought a lasting cure. Medical treatments were confined to quinine, which only treated current illness. Due to the cyclical nature of malaria infections, quinine was limited in its ability to bring long-term prophylaxis. Instead, it was only used upon the onset of symptoms. As the century progressed, scientists and public health officials began programs to rid endemic areas of mosquitoes. Other focuses included the use of bed nets, door and window screens, and drainage of standing water to eliminate breeding grounds. There was a deep intellectual and philosophical divide throughout the period, with scientists either advocating for medical or environmental malaria protocols.\(^\text{31}\)

In the interwar years, the United States modeled its anti-malarial program off of Bayer’s. One of the most extensive medical research programs on malaria, the scientists at Bayer tested thousands of compounds in canaries infected with an avian strain of malaria, *Plasmodium relictum*. With fears about the natural supply of quinine being controlled by a wartime foe, scientists looked at the chemical structure of quinine to begin the process of creating a synthetic medication. The first of these medications was the short-lived plasmochin. Human tests were run under Dr. Franz E. Sioli, the director of the asylum Provinzial-Heil und Pflegeanstalt, in Düsseldorf, Germany. There, among other places, syphilis patients were treated with malaria medications.\(^\text{32}\)

Upon completion of the trials against syphilis, patients were injected with blood with *vivax* malaria. After the patient had several cycles of fevers and chills, they were given different dosages of plasmochin, starting with the maximum tolerable dose (0.05 grams three times daily for several days). This treatment killed the parasites in the blood and ended the acute infection. Another round of testing was done to test different dosing, this time the minimum effective dose. Sioli found that 0.0125 grams one or two times daily for seven days was effective in stopping an acute infection and killing the parasites in the blood. While Sioli’s work was significant, it was

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\(^{32}\) Slater, *War and Disease*, 9, 60-68.
undermined by dangerous side effects that prevented plasmochin from being mass produced and marketed for malaria treatment. The most troubling side effect was cyanosis, which turned the skin and lips blue or purple from lack of oxygen.\textsuperscript{33}

Just like plasmochin, atabrine became the next wonder drug for the treatment of malaria in 1930. Bayer scientists Hans Mauss and Fritz Mietzsh found atabrine and sent it to Dr. Sioli, among others, to test against malaria and syphilis. Unlike plasmochin, atabrine had a rare but serious side effect. Some patients had hallucinations and woke in an induced psychosis. However, testing continued and it was marketed in the United States through Winthrop Chemical. Through American partnerships with the United Fruit Company, atabrine was further researched in highly malarial areas including the Panama Canal Zone, the Philippines, and Puerto Rico. Just like plasmochin, atabrine had its own problems. Reported side effects included nausea, vomiting, and diarrhea. Many complained of the skin turning yellow. By the end of 1937, the League of Nations Malaria Commission approved atabrine’s use at 0.20 grams, twice weekly. In 1938, the commission changed their dosing recommendation to 0.40 grams once a week. Still other protocols existed, causing confusion and varying degrees of side effects.\textsuperscript{34}

By the mid-to-late 1930s, many scientists and doctors knew atabrine was an effective treatment for the suppression of malaria. However, its cost was deciding factor by many, including the Rockefeller Foundation, not to have it mass produced and shipped for large scale anti-malarial projects. This was a big blow to the U.S. military, as much of the testing for new medications was, in some part, connected to the Foundation.\textsuperscript{35} As war in Europe became imminent, departments within the U.S. government began to crop up. The first was the National Research Council and their Division of Chemistry and Chemical Technology, who, in 1939, concluded that finding a synthetic anti-malarial was a vital priority. By the outbreak of war in Europe in September, 1939, American health organizations were coming to realize that quinine was no longer adequate, and were unsure of atabrine. Leo Slater argues that these initial meetings reflect the first war mobilization efforts on behalf of the United States in the lead up to World War II.\textsuperscript{36}

\textsuperscript{33} Slater, \textit{War and Disease}, 66-8.
\textsuperscript{34} Slater, \textit{War and Disease}, 69-71, 122
\textsuperscript{35} Slater, \textit{War and Disease}, 89-98.
\textsuperscript{36} Slater, \textit{War and Disease}, 80-4.
As the bureaucracy of war began, more departments, organizations, and committees were formed, each tasked with the insurmountable job of finding the silver bullet for the United States to win the war on malaria. In 1941 the short-lived Chemistry Division and the Division of Medical Services, under the National Research Council, merged under the new Office of Emergency Management. More specifically, they became the Office of Scientific Research and Development. While previous attempts at large-scale drug trials and investigations were done under the Rockefeller Foundation, the United States created its own internalized network of doctors and scientists, many in partnership with the Foundation, to win the war on malaria. Together, these committees and research groups were aware that quinine was in short supply and was not able to handle the medical needs of a military at war.37

They were correct that quinine could not be counted on. In the 1930s, the average yearly import of quinine from Java was approximately 700 tons. By 1940 it jumped to 2,700 tons. On 9 March 1942, Java fell to the Japanese, ending all hopes of quinine supplies. Moreover, this further instilled fear for the Allied nations, as Japan would now have an endless supply of quinine. If they were not fighting a simultaneous war on malaria, they could win this war. The need for a mass produced synthetic was at its height. It was not until this point that the military pushed for atabrine for the treatment and prevention of malaria. By the end of 1942, the Committee on Medical Research’s Board for the Coordination of Malaria Studies recommended that field tests begin in the military.38

Upon beginning large-scale military field testing of atabrine, false reports came back stating that atabrine was not able to end a acute infection or remove the falciparum or vivax parasites from the blood to remove the infection from the body. Complaints of toxicity and gastrointestinal side effects began to circle. What was most damning were rumors that atabrine would leave soldiers sterile and/or impotent. With time, however, fears about atabrine’s side effects diminished and led the way for its reputation as a first choice drug in the treatment and prophylaxis of malaria. By the end of 1943, domestic production of atabrine was set to reach 2.5 billion tablets.39 Throughout the war, research for a better drug continued. By war’s end, the complex network of doctors, chemists, malariologists, and pharmacologists paid off.

37 Slater, War and Disease, 82-6.
38 Slater, War and Disease, 109-121.
39 Slater, War and Disease, 120-124.
Meanwhile, on Guadalcanal

The United States was preparing for war in the Pacific long before the attack on Pearl Harbor, with United States Surgeon General Thomas Parran pushing for medical research programs in 1940. After the fall of Java to Japanese forces on 12 March 1942, most of the world’s quinine supply was held by Japan. Just prior, the Japanese occupied the American territory of Guam, leaving Allied forces no strategic island from which to gather supplies and launch assaults. Upon learning about the Japanese construction of an airfield on Guadalcanal, the American forces were given an opportunity to engage the enemy.  

Monthly malaria reports were not kept until 1943. However, we do know that the first four months on Guadalcanal were spent fighting malaria as often as it was fighting the Japanese. Both sides suffered tremendously from disease, lack of supplies, and poor nutrition. “General Vandegrift’s marines were suffering from malaria and dysentery, as well as from malnutrition and the lack of sleep and replacement clothing. Operation ‘Shoestring’ should have been the name for the Guadalcanal mission. Everything was in short supply, even writing paper.” Both sides suffered from similar problems. Guadalcanal was as much a fight for land as it was an intellectual struggle of resource management.

Every region poses specific problems. It is abundantly clear that the United States was aware of the malaria threat. Recalling the experience of French, German, and British forces in Macedonia during the World War I, there was a strong impetus to establish malaria protocols before any American boarded a ship and headed westward. For almost three years, the three armies were continuously plagued malaria. The British lost an estimated 2,000,000 man-days from malaria, while the French suffered with nearly eighty-percent of its troops spending time in the hospital for malaria. At one point, French Generals refused orders to attack because of the toll of malaria. Its threat was clear; without protection, estimates suggested malaria would infect at least half of all men by the end of the first rainy season. With most men having multiple attacks, and treatment requiring at least ten days, there was no feasible way to house the sick.

41 Stanley Coleman Jersey, *Hell’s Islands: The Untold Story of Guadalcanal* (College Station, TX: Texas A & M University Press, 2008), 275.
while also appropriately tending to the wounded. Without a basic plan in place to keep the troops from getting malaria, there would be no way to win the war in the Pacific.\textsuperscript{43}

Guadalcanal was the first true test of both the Americans and Japanese. Both sides faced hunger, malnourishment, disease, and lack of sleep. If any advantages existed on either side, malaria was the great equalizer. Similarly, neither side was willing to give up their fight. The Japanese had access to all the quinine in the world, but poor logistics allowed the Americans to tackle their malaria problem quickly and more effectively. This crucial mistake by the Japanese allowed the American forces to slowly regain its health and ultimately win the Solomon Islands. From February 1943 on, the American anti-malaria system dictated how many pills were needed per person for the duration of the war. “Malaria and filariasis, to name the most troublesome blights, were far from vanquished in 1944, although they were not the dire threats they had been in 1942 and 1943.”\textsuperscript{44} The Americans’ ability to simultaneously fight the Japanese and the war on malaria, they paved a path to win the wider war in the Pacific.\textsuperscript{45}

From the Rank and File: Soldiers Experiences with Atabrine and Malaria

The official military history of Guadalcanal leaves nothing to the imagination. “Into that fucking island,” the official record reads, young recruits endured erratic and severe weather, were exposed to the elements day and night, and became infected with disease by the constant mosquito bites.\textsuperscript{46} In the early months of the war, especially on Guadalcanal, many commanders were far from worried about malaria. Their job, after all, was to kill as many Japanese soldiers as they could. “One officer informed a malariologist in the Pacific that combat soldiers had come to ‘fight japs,’ not swat mosquitoes.”\textsuperscript{47} Such behavior was common in the earlier weeks and months, which created a dangerous medical and military situation for the United States. The time needed to drain swamps, cover standing water with oils, and spray temporary encampments was considered wasted time by many. From dusk to dawn, soldiers were required to wear long shirts and pants, though many complained because of the excessive heat.\textsuperscript{48} As more and more

\textsuperscript{43} Warshaw, \textit{Malaria: The Biography of a Killer}, 289.
\textsuperscript{45} Ibid.
\textsuperscript{47} Cowdrey, \textit{Fighting for Life}, 178.
\textsuperscript{48} Ibid.
American soldiers were being infected by the day, scientists back home were still searching for something better than atabrine. In the beginning months, many soldiers had no access to prophylactic drugs.

Within months, the consequences were clear. From November 1942 through February 1943, the rainy season on Guadalcanal, there were approximately four hundred malaria-related hospital admissions per thousand men.\(^{49}\) Official medical records are a bit more conservative, stating that at its height (late 1942, early 1943) some twenty-five percent of the American military were unable to join their unit at any time because of malaria.\(^{50}\) It must be noted that doctors were unable to excuse any soldier from duty whose temperature was below 104°. Initial military protocol called for ten days of hospitalization for a clinical infection; however, that plan was reworked because there were not enough beds, nor were there enough soldiers on the front lines. Moreover, it has been calculated that of the one hundred thousand cases of malaria in the Pacific, sixty thousand originated on Guadalcanal.\(^{51}\) The clinical infections gained from the initial attack on Guadalcanal did not become apparent for weeks in some, months in others. Regardless, once the soldier had the illness in his body, he was subject to multiple attacks per year and daily, proper use of atabrine was necessary to keep recurrences at bay. By the time atabrine supply lines were secured, the infection rate was already established.

Soldiers were engaged at all times in a fight with both the Japanese and malaria. When remembering their war experiences, the first thing many recalled was how they entered the service, followed by their first realization that they were in a real war zone. This came through in many ways, mostly regarding food, weather, and sleep. Boot camp was never bad compared to their first recollections of being in-theater. Wilmer West recalled that while he was on Guadalcanal soldiers feasted on “weevil and worm filled rice” but added some positive aspects, “The insects provided us with animal protein.”\(^{52}\) During his stay on Guadalcanal, he remembers losing approximately forty-five pounds.\(^{53}\) The two big food days were Thanksgiving and

\(^{49}\) Cowdrey, *Fighting for Life*, 64.

\(^{50}\) “Navy Medical Department at War,” p85, quoted in Cowdrey, *Fighting for Life*, 64.

\(^{51}\) Cowdrey, *Fighting for Life*, 64.

\(^{52}\) Wilmer F. West, *Some Highlights of My World War II Experiences*, pg 7. Archive collection number 98.0712. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

\(^{53}\) Ibid.
Christmas, when they were grateful to have turkey, but that indulgence left as quickly as it came.54

John Richter of the Navy remembers the first days on Guadalcanal. Even as a member of the medical staff, he was in danger. “In anticipation of our Guadalcanal landing, we Navy Corpsmen were instructed to wear armbands with large Red Crosses on white backgrounds in compliance with the Geneva Convention.”55 Eager to follow instructions, he did so, only to learn from the Marines who were now leaving Guadalcanal that Medical Corpsmen were targets of Japanese. Almost as quickly as they were given the armbands they were stripped of them and handed .45 caliber semi-automatic pistols to carry at all times.56

Other first recollections of war and the Solomon Islands were illustrated with malarial metaphors. Wilmer West’s recollection of his time travelling to the Solomons was turbulent to say the least. “We started towards Guadalcanal and ran into an awful typhoon. They thought we might sink, as the waves would go over the ship and the ship would stop and shake, as if they had a severe malarial chill.”57 Later in the war, he did have an acute clinical infection from malaria. His experience with the infection was violent enough to become a fitting metaphor more than fifty years after the typhoon and the illness. Although cases were different for everyone, his experience was enough to remember and compare to being thrown around a ship during a typhoon. This is an important lesson. While most soldiers experienced malaria at one time or another, the ways they remember it are different, as were their illnesses.

On Guadalcanal, Marine Robert Griggs had mixed recollections of his experience with malaria. His first memory was of punishment for missing a dose of atabrine. Like many soldiers, he reminisced about the line at meal time that was used to get food and your dose of atabrine. While he did not recall why he was absent from the food line that particular day, he does recall the agony of its repercussions. First, there was the military punishment for not getting his name checked off the list for that dose, for which he had to memorize and recite a five hundred word essay on the history and uses of atabrine. “I had the hardest time doing that. I wasn’t that well educated. When I went in [the] Marine Corps, I guess I’d already quit school. I think I had part

54 Ibid.
55 John Francis Richter, Handwritten War Recollection, “Farewell to Arms!” Archive collection number 98.0496. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.
56 Ibid.
57 West, Some Highlights of My World War II Experiences, pg 3. Archive collection number 98.0712.
8th grade and part 9th grade subjects.” Although he laughed about it now, it was a hard for him, though the memories soon became overshadowed with those of having an acute clinical infection. “I got malaria there. Oh, it was terrible. It was high fevers.” While the agony of the infection is clear, Griggs also played treatment down, perhaps because there was nothing he could do aside from accept the treatment offered and go back to the front lines. “Well, I had that malaria, and they just sent you over there and gave you that quinine until you got cured, until your temperature went down. They sent you back to duty. I had it one time… at least.” Conceivably taking responsibility for his role in missing a dose of atabrine, or just accepting his fate, Griggs did not complain about the illness. Rather, he stated it as par for the course. For him, malaria was a part of winning World War II in the Pacific theater.

Wilmer West also recalled the atabrine and food line. He was responsible for making sure soldiers got and swallowed their doses. Dr. West proudly recalled that he was “verbally commended, by Mr. Boaz, the division medical warrant officer, for having the healthiest company in the division.” Although he was a good physician, his record was partially left to the soldiers who ultimately decided if they would comply with the atabrine and clothing requirements or not. Luckily for his company and Dr. West, they were given a commendation by the Secretary for the Navy for having not one man on the sick list or in the hospital for one calendar month. This was a mix of good medicine and luck, and they were happy to have it.

Though not on Guadalcanal, Mr. Ziegler was a prisoner of war in Bataan. However, his oral history is important because he, like most Bataan prisoners of war, had malaria. His recollection really places the horrors of malaria at the fore. “I had a terrible problem with malaria. We didn’t have any medicine to take and I lost all my hair,” he recalls. “I didn’t think it’d grow back,” he remembers, but “I was fortunate enough that it did after a while.” Ziegler also suffered from side effects from malaria. He had “what they called beri-beri. You swell … all

58 Robert Griggs, interview by Lisa A. Craft, transcript August 10, 1999, Coll. # WWII-811, Reichelt Program for Oral History, Florida State University, Tallahassee, Fl. A Copy was provided by the Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.
59 Ibid.
60 Ibid.
61 West, Some Highlights of My World War II Experiences, pg 9. Archive collection number 98.0712
62 Ibid.
63 Hugh and Nonnie Zeigler, interview by David Gregory, transcript January 6, 2000, Coll. # WWII-935, Reichelt Program for Oral History, Florida State University, Tallahassee, Fl. A Copy was provided by the Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.
64 Ibid.
your organs.”65 The pain of having hands, feet, eyes swollen to the point of rupture, only to be followed by gangrene was excruciating beyond anything most soldiers on Guadalcanal knew from non-combat wounds and illness.

In preparation for landing on Guadalcanal, Lonnie Smith recalls that the brief period spent on New Caledonia, south of the Solomon Islands in the Coral Sea, where the air was thick with mosquitoes. “They didn’t have any bad diseases there, like malaria and like that [sic], but they had mosquitoes that were thick.”66 While the mosquitoes left a distinct impression, the fact that the island was generally free of disease meant that soldiers met the mosquitoes with annoyance and frustration, not fear. Weeks later, upon his arrival on Guadalcanal, that changed considerably. As his circumstances changed, Smith recalls that “The biggest thing to me was that there was absolutely no control of disease, so malaria was rampant there.”67 Upon getting malaria and jaundice, he and a friend thought that the best idea was to destroy the island to save it. “The whole place was … the fellow said you ought to just blast the whole part of Guadalcanal we were in – it wasn’t worth keeping.”68 The whole time on Guadalcanal was sad for Smith. They took the atabrine as required, but it wasn’t enough to keep them from getting sick. The experiences of malaria on Guadalcanal were bad enough that they changed men forever.

Going into the war, Lt. Henry Marsh was a self-proclaimed man’s man. If anything, battle made him more steadfast in his belief in perpetual bachelorhood. However, one bite from an anopheles mosquito during his time in the Pacific made him change his tune. After two clinical infections and hospital stays in Australia, a newspaper article reflected the change war and malaria brought about in this young man. According to the story in the unidentified newspaper clipping, he and a friend were sent to a local sheep farm in Australia for much needed rest and relaxation after their latest malaria infections. There he met the farmer’s daughter, to whom he was briefly engaged. For one Marine, the experience of taking Guadalcanal was not

65 Ibid.
66 Lonnie R Smith, Sr, interview by Jason Jewell, transcript May 27, 1999, Coll. # WWII-729, Reichelt Program for Oral History, Florida State University, Tallahassee, Fl. A Copy was provided by the Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.
67 Ibid.
68 Ibid.
enough to change his mind on having a family. Yet, after surviving two cycles of malaria, he was ready to settle down.\textsuperscript{69}

A young man, barely eighteen years old, wanted nothing more than to join the Marines after Pearl Harbor. Dana T. Hughes remembers his mother begging him to wait until after Christmas. On 26 December 1941, Hughes enlisted and was sent to the South Pacific. Hughes spent time on the Solomon Islands. When asked how long he spent there he quickly replied “Too damn long!”\textsuperscript{70} Upon leaving the demonic island chain, Hughes recalls his unspeakable circumstances on New Caledonia. As a member of a small unit, Hughes and his peers were “confined behind a barbed wire fence on New Caledonia. And we sat there for many weeks, it was totally ridiculous. We were supposed to go back to New Zealand.”\textsuperscript{71} Eventually their role behind that wire became clear: the entire unit was under quarantine and given experimental dosages of anti-malarial drugs. Hughes laments that while they all had malaria, they never in their wildest dreams thought they would find themselves subjects of medical experiments on New Caledonia, especially given their orders to set sail for New Zealand. Though their forced participation undoubtedly aided medical research in some way, Hughes recalls that instead of the thirty days of rest and relaxation they earned, like the rest of their division, he and his unit were forced to give that up for the sake of science.

Marine Warren P. Baker was sent to Guadalcanal where he, too, contracted malaria. His World War II experience is different than most. After many admissions to the hospital on Guadalcanal for malaria, where he spent upwards of a week per admission, his unit finally left the island. Most of his overseas experience was confined to Guadalcanal. Upon his division’s move to Australia, he was deemed too sick to remain on active duty. After returning to the United States, it took Baker nine years to get the malaria parasites out of his system.\textsuperscript{72} Even those with abbreviated tours were significantly affected by the lack of proper malaria protocols during the early months of the war. These young men sacrificed their young adulthood to fight for their nation, for her protection, but many were not protected by their own government.

\textsuperscript{69} “Saga of South Pacific War Narrated By Marine Lt. Marsh,” Newspaper clipping, no date. Archive collection number 00.0842. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.
\textsuperscript{70} Dana T. Hughes (AFC 2001/001/54112), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
\textsuperscript{71} Ibid.
\textsuperscript{72} Warren P. Baker (AFC 2001/001/18886), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
War changed all of the soldiers in one way or another, and so did malaria. Soldiers who took orders regularly suddenly found themselves simultaneously breaking direct orders from the brass to take their doses of anti-malarials. Many commanders thought the constant fear surrounding malaria was inappropriately redirecting the focus of the soldiers and their true goal to win the war. It was necessary that soldiers remain focused on the war aims. A 1st Marine Division final report stated that soldiers were “concerned with killing and being killed.”  

Malaria, according to this report was routine, and should be viewed in the same light as a combat wound. Before atabrine was available, soldiers complained bitterly about quinine. “[It] affected our eyesight and our hearing, it sounded like a thunderstorm.” Due to the quinine shortage, the soldiers were out of luck. Supplies dwindled very quickly, and for a time they had little or no malaria coverage. However, atabrine supplies eventually arrived in 1943, which was hated more than quinine. Now forced to take a new medication that was bitter and had legitimate side effects of its own, the rumors began to spread throughout entire units. “The rumor was out that [atabrine] made us sterile. That concerned a lot of the boys because they wanted to have families when they got back home.” The taste, real and rumored side effects together created quite different situation for the military. Soldiers were actively evading atabrine, which cost soldiers days in the hospital, and could potentially determine the outcome of battles.

As West and Griggs mentioned in their stories, the line for atabrine was integrated into the chow line, the only place you could get soldiers every day. Marshall Cheney recalled a similar situation on Guadalcanal. Once the men were handed their atabrine and water the ground was littered with the yellow pills. “The brass got on to that quick, and they had a commissioned officer see that everyone took it.” All branches of the military established programs for medics and Non-Commissioned Officers to stand at the end of the line, one placing atabrine on the back of the soldiers’ tongues, the other checking the mouth and throat for a hidden pill. It was imperative that the soldiers swallowed their pills. Even after mass numbers of men were sick with clinical infections, the taste of the atabrine was so foul that many wished to take the risk of

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74 Ibid.
75 Interview with Marshall Cheney, quoted in Bergerud, Touched with Fire, 93.
76 Ibid.
77 Ibid.
78 Cowdrey, Fighting for Life, 63.
not taking the medication. As the problem of noncompliance escalated, the military began referring to it as “quinacrine discipline.”

The Marines on Guadalcanal reached the point of no return early in the soldiers’ war against atabrine. The pill line had two officers, one who physically placed the pill in the mouth and another officer who used a tongue depressor to examine the soldier’s mouth to assure their compliance. Dr. Richter recalls that they found one of four things: first, the soldier followed orders and swallowed the pill; second, the atabrine was secured between the upper lip and gums; some were able to withstand the bitter taste long enough to secure the pill to the roof of their mouth; others placed it under their tongue. Additionally, soldiers “had to be persuaded or forced not to catch malaria deliberately in order to get out of further fighting.” Punishment, of course, would be two-fold: there would be official reprimand from their commanding officers, potential court martial, and the torment of having malaria for years.

Yet, men took these risks every day they could get away with it. Not only did men fear becoming impotent, a false rumor throughout all the military branches about atabrine, they hated the bitterness of the yellow pill and the jaundice which it caused. Other side effects included nausea, vomiting, and headaches. In rare cases, atabrine caused temporary psychosis. In one instance, a soldier abruptly announced that he was Jesus, after which he became restless, agitated, and violent, though others became catatonic. Upon missing a dose or two of atabrine, the soldier would return to his normal self as if nothing had happened. However, for the overwhelming majority atabrine was an effective treatment to prevent and treat malaria so long as it was taken as directed.

In the first months on Guadalcanal, losses due to malaria were high. The 1st Marine Division suffered a total of over ten thousand casualties. Of them, seven hundred seventy-four were killed in action, fewer than two thousand were wounded in action, and five thousand seven hundred forty-nine spent time behind the lines due to malaria. Regardless of what the soldiers

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79 Slater, War and Disease, 123; Quinacrine is the generic name for atabrine.
80 John Francis Richter, Handwritten War Recollection, “Fire Away!” Archive collection number 98.0496. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.
81 Ibid.
82 Cowdrey, Fighting for Life, 63.
84 Bergerud, Touched with Fire, 96.
witnessed or learned about malaria in their first months on Guadalcanal and other islands, the rank and file would never fully accept atabrine as the miracle drug it was. The pushback against atabrine was not a conspiracy to get out of combat, but rather men trying to avoid the side effects of the pill that saved their lives.

Conclusions

Of all the battlefields contested during the Second World War, the Solomon Islands, home to Guadalcanal, was the most malarial of them all. Upon reaching the Solomon Islands, and specifically Guadalcanal, the United States military was forced to deal with a malaria epidemic among the soldiers. A clear dichotomy existed in soldiers’ attitudes toward the disease. During the early war years on the Solomon Islands, soldiers suffered horribly with one or more clinical infections of malaria, while simultaneously trying to evade their prophylactic medications because of side effects, both rumored and experienced. The American soldiers who served on the Solomon Islands both suffered from malaria and learned of its horrors while defying orders by disregarding their doses of atabrine. This conflict endangered the health of soldiers and placed them in conflict with their commanding officers. Fighting a world war, the soldiers were not able to see the true ramifications of their actions until they suffered an acute attack from malaria, at which point their initial protests against atabrine ended.

The soldiers who fought in World War II share a unique experience. They saved the world from fascism, and when they returned they brought a new era focused on the family, suburbs, and a happy life. However, life was not all fun for the thousands of veterans who returned to the United States with malaria parasites in their bloodstream. Their main objective in the Pacific was always to keep the Japanese from advancing any further, while simultaneously taking more islands; the military also fought another war against the anopheles mosquito. She inhabited much of the Solomon Islands, especially Guadalcanal, where thousands of Marines contracted the disease within the first few months of fighting. Initially there were minimal anti-malarial supplies, some quinine pills and ineffective sprays. It was not until the assault on Guadalcanal was over that atabrine, the miracle drug for the military, arrived en masse. Yet many soldiers, knowing the consequences, chose not to take their medication and risk contracting malaria because of rumored side effects and the bitter taste of the pill. However, once they became infected soldiers began to understand the horrible cyclical nature of malaria and
complied with orders. Although they saw their brothers suffer day in and out, forced to fight so long as their fever was under 104° Fahrenheit, they chose to risk their lives. Ultimately, however, most soldiers ended up suffering through at least one clinical infection, with some units having over a ninety percent illness rate. Though the military could warn them of the troubles ahead, nothing could prepare them for the bitter taste of atabrine like a week in a field hospital.

While the malaria epidemic could not be wholly avoided, the early battle for Guadalcanal led to a perfect storm. The amalgamation of governmental stalling and the early battle forced the government scientists on the home front to accept atabrine an acceptable medication. While no studies suggested it was ineffective or dangerous at appropriate dosages, their drive for a more effective medication could not be stopped. At the same time, the Marines were sent to fight for the island Guadalcanal. It was a hastily planned battle to say the least. The Marines were, in some cases, ill-equipped for battle against the Japanese, and lacked adequate medical protection from malaria. The medical program under the Navy was spread too thin between wounds, injuries, and other infections. Malaria took the medical situation from dire to impossible. Forced to fight in unthinkable medical conditions, the Marines won the battle against the Japanese.

With the answer to their malaria problem available to them all along, one must question the reasons why atabrine was not tested sooner and comprehensive anti-malarial programs not established prior to the deployment of troops. It is clear that everyone involved at the National Research Council and its subcommittees and the Rockefeller Foundation that malaria was the medical disease that had the potential to stop the American forces in their tracks. However, it was not until 1943 that the military began to implement strict malaria protocols to safeguard the young men. Although the first months of the new malaria protocols did not see a rapid drop in infection and relapse rates, by the middle of 1943 the protocols were clearly working in favor of the United States Armed Forces and the Allied cause.
The road to finding a miracle anti-malarial drug in the lead up to World War II was paved with good intentions and lined with missed opportunities. Scientists insisted that they continue to search for a better medication. Although this goal was well intentioned, it required that they ignore the existing medications. Pushing for a new, better drug was ultimately for the good of the troops, but this came with a high price. By the time the Marines were readying themselves for the invasion of Guadalcanal, military field trials with atabrine had not started. It was not until the end of 1942 that the Committee on Medical Research’s Board for the Coordination of Malaria Studies called for such trials. By this time, entire Marine units were infected with malaria on Guadalcanal. There was a quickly dwindling supply of quinine, with no hope for replacement stock. After three years of planning for an anti-malaria program, the epidemic had already started. Now all they could hope for was to gain control. Not until the end of 1943 did domestic production of atabrine tablets hit adequate levels to sustain military needs. By this time, the battle for Guadalcanal was over, with American troops securing Henderson Airfield and establishing the island as a forward base for future offensive maneuvers. Militarily, this Allied victory represents the beginning of American dominance in the Pacific. Moreover, it is also symbolic of basic safety failures. The continued delayed release of an acceptable malaria medication and accompanying protocol was not done maliciously. Rather, the desire to continue to push for a better, safer, more effective drug was done so because the researchers understood the importance of winning the war against malaria.

It is easy to suggest that researchers should have insisted that protocols be adapted prior to the battle for Guadalcanal; however, it overlooks many important factors from the later war years. Had atabrine field trials been successfully completed prior to 1942, it is possible that a full, standardized preventive plan would have been implemented prior to any land engagements in the Pacific. However, there is plenty of evidence that clearly shows that the established protocols were not followed after their implementation. Ships leaving from and arriving at malarious ports were not sprayed, units stopped taking their atabrine, soldiers continued to evade
their required pills, and many questioned the dosing requirements. This suggests that while earlier adaptation of malaria protocols would have been beneficial, there was never a clear dedication to prevent malaria among the soldiers.

The War Against Malaria: Protocols, Diagnosis, and Treatment Plans

Beginning in January 1943 monthly malaria reports for Guadalcanal clearly indicate that after the establishment of malaria protocols, rates of infection decreased. Data for the first five months on 1943 are not broken down into primary and relapse infections. Beginning in June 1943, the infection numbers are separated into these categories. Although these numbers provide ample evidence that malaria rates were lowered once strict protocols were in place, they fail to tell the whole story. Once the battle for Guadalcanal ended, the Marines were largely brought to other islands, including various parts of Australia, for rest and recreation. This calls into question the validity of these numbers. As seen in Figure 1, there is a sharp drop between April and May, when most of the Marines were no longer on Guadalcanal. It should be assumed that this drop is directly related to the relocation of thousands of troops to other locations, therefore excluding them from the official malaria numbers.

At the same time that the Marines were relieved of their duties on Guadalcanal, most for the first time in six months, malaria protocols were slowly being implemented. A memorandum dated 14 March 1943 regarding atabrine dosing tried to clear up the first waves of confusion. The letter begins with clear instructions. “Troops in rear area or inactive combat conditions will receive atabrine 0.1 gram tablets (1½ grains) as follows – one-half tablet daily at meal time except Sundays when one whole tablet will be given. Troops in hyperendemic combat areas will take one whole 0.1 gram tablets except Sunday.” This seems like a straightforward dosing guideline based on the location of troops. Yet, as the memo continued, the authors questioned the effectiveness of the prescribed dose of atabrine per week, stating “It must be pointed out that it is not clear from published reports that 0.4 grams of atabrine a week is sufficient in highly

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malarious areas. Possibly the dose in such areas should be 0.6 gram a week.\textsuperscript{87} Although not all soldiers were in highly malarious areas, the rotation of troops on and off of severely malarious islands, including Guadalcanal, increased the overall risk for everyone. Moreover, the lack of certainty in official protocols did not provide soldiers with the confidence in atabrine they needed.

Such open questioning of the military’s protocols played into the fears held by many of the soldiers that atabrine was not safe. However, this misses the larger, more pressing point. During the battle for Guadalcanal, military accounts state that between 75 and 100% of the 1\textsuperscript{st}...


\textsuperscript{87} Memorandum to Dr. Sapero, 14 March 1943, A9-4(17) Monthly Malaria Report – Second Marine Division [2/1943-7/1945], Records Relating to Malaria and Epidemiological Disease Control, RG 313, National Archives at College Park, College Park, MD.
Marine Division, 2nd Marine Division, 147th Infantry Division, and 164th Infantry Division were infected with malaria. The Special Report on Malaria and Epidemic Control further stated that of those infected, as many as half would suffer from two or more relapses. This is because of the admittedly slow response to the malaria epidemic. “The malaria control organization during these early months, though constantly expanding as the problem became evident, was grossly inadequate for the task.”\textsuperscript{88} Later in the same report, the continued compliance issues are mentioned, acknowledging that over time more troops were adhering to the protocols, but as late as March of 1944 many were not. Therefore the Special Report on Malaria and Epidemic Control had no other choice but to warn everyone that “unless control and maintenance, requiring this large permanent malaria control force, is kept in effect on Guadalcanal an experience nearly as bad as that suffered in October 1942-May 1943 can again be experienced.”\textsuperscript{89} These warnings were not just true for Guadalcanal, but for all of the Pacific Theater.

In implementing required daily atabrine therapy to suppress malaria, the military sought to keep its fighting strength healthy. Although the military was not medically ready for the battle for Guadalcanal, the steps taken mid-battle forward to control the rampant malaria epidemic allowed the American troops to eventually win the war. Deescalating the malaria epidemic took time and effort, but the careful planning that eventually went into the malaria protocols allowed those who followed them to make Guadalcanal an important military base. Yet, the lessons from Guadalcanal’s malaria epidemic were not clearly ingrained throughout the Pacific forces.

The first Malaria Training Manual was published in 1944. Its purpose was to provide medical personnel with effective means to prevent, diagnosis, and treat malaria. Throughout the manual, the military’s trust in the effectiveness of atabrine was apparent. This was important for two reasons, first to lend some comfort to troops that questioned the medication, and more importantly to keep a new malaria epidemic from beginning:

Experience has shown that organized and properly directed preventive measures against malaria in military forces in the South Pacific Area, will check the disease to a degree which will permit the successful accomplishment of military operations. Failure to take steps, however, will result in an enormous degree of

\textsuperscript{88} Special Report on Malaria and Epidemic Control, 6 March 1944, A11 (3-1) Commander South Pacific Area – Headquarters, Malaira Control, South Pacific Area, Base Button [3/6/1944 – 7/23/1945], Records Relating to Malaria and Epidemiological Disease Control, RG 313, National Archives at College Park, College Park, MD.

\textsuperscript{89} Ibid.
sickness and loss of man days, as might as well be expected in the conduct of war on some of the most malarious islands in the world.\footnote{Malaria Training Manual No. 1, 1944, A11 (22-1) Entomology -- Disease Vectors, Pacific Island, Records Relating to Malaria and Epidemiological Disease Control, RG 313, National Archives at College Park, College Park, MD.}

This experience, of course, was the battle for Guadalcanal. The initial lack of malaria protocols clearly allowed the outbreak to occur. Yet, the consequences eventually led to strict guidelines. As they experienced firsthand, allowing soldiers to go to war in the Pacific without proper preventive measures was akin to fighting a war with half your fighting power. The victory on Guadalcanal was not to be taken for granted. Both the American and Japanese forces were ill prepared to fight the battle against one another and malaria. Ultimately the American victory for the Allied cause had to be acknowledged as part luck, for at any moment they could have lost their entire fighting force to malaria. This bleak reality allowed everyone to see the importance of malaria protocols.

The manual insists that malaria could be controlled through the use of prophylactics, and the key to success was compliance and education. For this reason, the manual specifically states that “All officers and enlisted men should be made familiar with the general nature of malaria, its military importance, and with their respective duties and responsibilities in preventing the disease.”\footnote{Malaria Training Manual No. 1, A11 (22-1) Entomology -- Disease Vectors, Pacific Island, RG 313, NACP.} That responsibility largely fell on the officers to make sure their men took their atabrine, washed appropriately, kept their skin covered, slept in bed nets, and did not wander off into unsafe areas. Yet, every man was responsible for rudimentary knowledge of malaria. This included the malaria transmission, signs and symptoms, and the important role malaria can play in the outcome of war.

As a part of their malaria education, soldiers were taught that atabrine was a safe and effective drug. Upon beginning their preventive regimen, upset stomach, nausea, vomiting, and diarrhea were not uncommon; however, it was stressed that these were not signs of toxicity. After several weeks, soldiers were taught to expect their skin to begin to turn a yellow hue, which again was explained as a side effect from the dyes in the medication, rather than a sign of illness from atabrine. The stomach upset would likely disappear within the first few days of use, and the yellowing skin would reverse itself after atabrine was stopped. In order to truly express the importance of atabrine discipline, it was noted that in endemic areas like Guadalcanal as
many as 95% of soldiers will become infected with malaria while taking atabrine. The only way to carry the parasite and not experience an acute infection is to maintain the required daily dosage of atabrine. To prevent an acute malaria infection, the soldiers knew to take their atabrine every day.92

Initially, weekly dosages of atabrine totaled 0.4 grams. By 1944, the Malaria Manual presented new dosing guidelines. Now, soldiers were to take one 0.1 gram tablet of atabrine daily with a meal. Military studies found that this higher dose was just as safe as 0.4 grams a week, but was more effective in combating malaria cases. Moreover, in serious combat conditions soldiers could double their atabrine dosage to two, 0.1 gram tablets daily with a meal, but only under the direct supervision and only after a soldier’s body has become healthy after the initial dosing at 0.1 grams daily. This double dose was reserved for severely malarious regions and only under extreme combat conditions. It is unlikely that such dosing was ever used on Guadalcanal. However, due to the rainy season and the military significance of the island it is possible. In extreme cases, where soldiers experienced acute attacks of malaria while on suppressive atabrine at 0.1 grams daily, doses could be doubled (one 0.1 gram tablet with a meal, twice daily) or tripled (one 0.1 gram tablet with a meal, three times daily) for three to seven days. This was done to shock the system, as atabrine is a drug of cumulative effect. After this three to seven day period, soldiers were to return to their normal once daily dosage. When malaria did strike, its victims could easily be out of the line of duty for days.93

After Guadalcanal, the shortage of medical supplies slowly improved. With the increased access to atabrine and other medical supplies, the number of infections on the island continued to drop in 1944 (See Figure 2). Moreover, the Malaria Manual gave doctors and nurses clear guidelines for the diagnosis and treatment of malaria. This helped insure adequate treatment for all patients, which was for the first time not based on the availability of medication. Now malaria patients were treated according to a set standard of care. This began with proper diagnosis. Military medical personnel were taught to always suspect malaria, if it is endemic to the region, upon hospital admission. No set of symptoms were necessary, including high fever. Therefore all hospital admissions underwent blood smears. This was the written rule regardless of how clear

92 Malaria Training Manual No. 1, A11 (22-1) Entomology -- Disease Vectors, Pacific Island, RG 313, NACP.
93 Malaria Training Manual No. 1, A11 (22-1) Entomology -- Disease Vectors, Pacific Island, RG 313, NACP.
the clinical infection was. By running blood smears, doctors could determine which type of malaria infection a patient had and appropriately alter treatment. Those with *P. falciparum* were watched carefully, but upon discharge had a low possibility of relapse. On the other hand, those with *P. vivax* would likely continue to experience relapses for years.

With the standardization of care for the treatment of malaria came a better understanding of how the body reacts to treatment in combat conditions. By the publishing of the Malaria Manual, it was clear that regardless of the patient’s reaction to treatment, he should receive between three and four liters of liquid a day. Salt should be given if one’s chloride levels became

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too low from sweating or vomiting. To help with chills, bags of hot water should be used to warm the patient. For sweating and fever, cold sponges will help reduce body temperature and patient discomfort. It is important to remind patients that although they are experiencing an acute malaria episode, they should not discontinue atabrine once they are well. Malaria parasites did not build any immunity to atabrine, allowing for the vital preventive and suppressive treatments to continue after acute illness.\textsuperscript{95}

Once admitted, a patient’s course of treatment rested on his ability to hold medication. Those who presented without vomiting were given 0.2 grams every six hours, for a total of five doses. Following this high dose therapy, patients continued with 0.1 gram tablets three times daily with meals for another six days. If a patient’s malaria was complicated by vomiting, their atabrine dose needed to be higher and injected intramuscularly at 0.2 grams into each hip/buttock, totaling 0.4 grams, every six to eight hours. When the vomiting subsides and the patient is able to take atabrine orally, he should receive an amount of atabrine that will total 1.3 grams within the forty-eight hour period. After this, the patient should continue with 0.1 gram tablets three times daily with meals for five days. The patient should total 2.8 grams of atabrine in seven days.\textsuperscript{96} Prior to this manual, treatment varied by hospital and clinician.

The 1944 Malaria Manual played an integral role in ending the epidemic rates of malaria. There was a clear downward trend on Guadalcanal in mid and late 1943. Although numbers rose slightly in January 1944, the overall downward trend continued into 1945. Significantly, for the periods of 1943, that are available, and 1944 the number of relapse infections generally outweighs the number of primary infection rates. This trend begins to reverse in 1945, as the number of primary infections outweighs the number of relapses for most of the time (See Figure 3). Documents suggest that much of this trend can be accounted for by examining memos questioning dosing, as well as compliance on all levels. Even as the official Malaria Manual was released, memos were crossing the Pacific, asking if atabrine was effective at doses no longer being used, or toxic at the standard preventive rates. Moreover, many became less vigilant with anti-malaria activities including the spraying of ships as they arrived and left malarious ports. In a January 1944 letter to the Force Medical Officer, South Pacific Area, the new regulations found in the Malaria Manuals are seen in a new light. While their support is preventing and

\textsuperscript{95} Malaria Training Manual No. 1, A11 (22-1) Entomology -- Disease Vectors, Pacific Island, RG 313, NACP.
\textsuperscript{96} Malaria Training Manual No. 1, A11 (22-1) Entomology -- Disease Vectors, Pacific Island, RG 313, NACP.
treating malaria is unquestioned, it is important to recognize that many found the new guideline adaptation to have “been handled in a rather roundabout manner and [therefore caused] some confusion among medical officers in the field.” The letter confirms that the idea was to have the dosage increase approved and then migrate through appropriate offices. Instead, the Army, Navy, and Marines on the Solomon Islands were taking different doses. The letter is closed with a statement of support for increasing weekly atabrine doses to 0.6 grams, which they found to be safe and effective for field use in highly malarious areas.

![Figure 3: Malaria Cases, All U.S. Troops, Guadalcanal, 1945](image)

Figure 3: Malaria Cases, All U.S. Troops, Guadalcanal, 1945

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97 Letter to Force Medical Officer, South Pacific Area, 20 January 1944, A11 (4-1) Force Medical Officer, SOPAC, [7/22/1942 – 3/27/1945], Records Relating to Malaria and Epidemiological Disease Control, RG 313, National Archives at College Park, College Park, MD.

98 Ibid.

Mere weeks before the dropping of the nuclear bombs on Hiroshima and Nagasaki, letters were being sent directly to the Senior Malaria Control Officer, raising concern about protocols being skipped or blatantly ignored. As late as June 1945 the S.S. Cape Cod left Guadalcanal without spraying for mosquitoes. Moreover, Guadalcanal port authorities never indicated to the S.S. Cape Cod that spraying was necessary upon departure as required under the malaria protocols. At this point malaria was under control, but only due to strict measures stemming from the epidemic on Guadalcanal early in the war. Even after the conclusion of the war, letters were written back and forth about malaria control issues on Guadalcanal. In August 1945, a memo was sent to all island commanders throughout the South Pacific imploring them to follow malaria control protocols. It cites reports of new malaria cases caused by lack of malaria discipline. This included lack of bed net usage, leaving controlled areas between dusk and dawn, and atabrine insubordination. Although it was clear that the war was over, the malaria threat continued until every American was out of the Pacific Theater. These late war records provide some context to understand the increase in primary infection rates over the last few months of war. As time passed from the primary epidemic in 1942 and 1943, more soldiers were willing to go around the rules. They incorrectly saw atabrine as a punishment.\(^{100}\)

**Everyday Experiences: Malaria Protocols from the Enlisted Men to the Medics**

In the early months without atabrine, nurses quickly learned how to deal with malaria. Written by two Army Nurse Corps veterans just after the war, “Nursing Care in Malaria” was an invaluable resource for nurses and historians alike. Nurses were aware of the early supply shortages, and knew that atabrine and quinine were only effective if they were taken daily and in full dosages. It was through these first few months that the ramifications of robust atabrine supply became truly understood.\(^{101}\) For many, atabrine was more important for the military than any other wartime drug, including penicillin.\(^{102}\) There were two rules Army Nurse Corps

\(^{100}\) Memorandum to the Senior Malaria Control Officer, 26 June 1945, A6-5 (3-1) General Correspondence – Guadalcanal, British Solomon Islands [1/1/1945 – 12/10/1945], Records Relating to Malaria and Epidemiological Disease Control, RG 313, National Archives at College Park, College Park, MD.

\(^{101}\) Bergerud, *Touched with Fire*, 94.

\(^{102}\) Ibid., 93.
veterans had when treating malaria patients. First, disturb the patient as little as possible. Second, remember that all you can do is bring the patient medicine and keep them as comfortable as possible. The physical toll of malaria was high, as it left patients weak and exhausted. The onset of acute infection included shaking chills, lasting for hours. As the chills came to an end, the patient's fever will reach its peak, usually between 104° to 106° Fahrenheit. With the fever came severe headaches, nausea, and sometimes vomiting. All of this would eventually lead to the drop in fever, over six or more hours, during which the patient will sweat profusely. The manuals state that the best nurse will know how to time the removal of excess blankets, while making sure the patient does not soak through their bedding. After the fever has broken and the patient awakens, he will be exhausted, hungry, and thirsty and nurses should be ready to provide nourishing foods, water, and to ensure him that rest will get him through the weakness.

Since the prescriptive literature was written immediately after the war, it includes tips on how to deal with veterans who experience acute infections once home. They warns that veterans will often know the initial signs before they are visible to medical personnel or before parasites are found in blood smears. Emphasis is placed on the importance of making sure patients take their atabrine, especially veterans who recall its bitter taste from the war and are more apt to hide it than swallow it.

Although the availability of preventative medications was of the utmost importance, soldiers were also required to take some personal responsibility when it came to preventing malaria and other diseases. E. R. Coffey wrote, “You can’t put a screen on a foxhole, but you can spray the place with insecticide.” There was only so much the soldiers could do on their own, but it was imperative that they did everything in their power. Cowdrey notes that, “If the Pacific saw a fundamentally logistical war, the small spaced allotted to anti-malaria supplies were surely among the best-used in the cargo holds.” Fighting on the Solomon Islands was akin to fighting in bayous of Louisiana, the swamps, low lands, and jungles coalesced to create the perfect storm for anopheles breeding. Ultimately, atabrine was as effective a tool for the United States

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103 Lucia G. Allyn and Josephine Steiner, “Nursing Care in Malaria,” *The American Journal of Nursing* 46, no. 10 (October 1946), 675.
104 Ibid.
105 Ibid.
106 Ibid., 676.
107 Coffey, “Malaria,” 996.
109 Bergerud, *Touched with Fire*, 91
military as the atomic bomb. Without it, entire units would have been pulled from the front lines, which was something the Allied Forces could ill afford. Atabrine positively impacted military strategy, as the Allied forces were able to stay and outfight Japanese forces who were equally sick.\textsuperscript{110} No matter how hard the military brass tried to spread ideas of prevention, it was not uncommon for unit commanders and similarly ranked officials to approach malaria prevention as a deterrent from true war aims. This was much to the chagrin of the medical officers who were responsible for the soldiers’ health, but lacked the authority to demand compliance.\textsuperscript{111} Though things changed with time, it was not in the military’s power to prevent all incidences of malaria.

Members of the Army Nurse Corps saw firsthand how much suffering soldiers endured with malaria. One nurse, LaVonne Telshaw Camp, treated malaria in many theaters during World War II. In her memoir, she recounts aiding many soldiers with their deadly fevers, violent chills, sweating, and headaches. Remembering the degree of illness that the soldiers experienced was all the motivation she needed to take her atabrine as prescribed by the Army. In addition, members of the Army Nurse Corps were quick to cover up their arms and legs before dusk. Although failing to swallow one’s atabrine was a court martial offense, the soldiers never brought it up; however, the women of the Army Nurse Corps cite it as another incentive to comply with the regulation. Though many did complain about their new yellowing skin tones, they knew that it was in their best interest.\textsuperscript{112}

Although nurses treated the majority of malaria related symptoms around the clock, one must not forget that it was a learning experience for many medics. Many medics and doctors were treating exotic diseases for the first time, including malaria, dengue fever, jungle rot, and elephantiasis. Learning how to diagnose, treat, and prevent these diseases was a new experience for most. The time spent learning about malaria was imperative. In the early months of the battle for Guadalcanal, malaria was responsible for more hospital admissions than Japanese bullets. By October 1942, malaria was the most cited cause for hospital admission on Guadalcanal.\textsuperscript{113}

The Second World War taught doctors and nurses firsthand what they could rarely learn in the United States. For many of the soldiers, becoming sick overseas was far from a learning

\textsuperscript{110} Medical Supply in World War II, Editor Charles M. Wiltse, 73.
\textsuperscript{111} Cowdrey, Fighting for Life, 62-63.
\textsuperscript{113} Jan K. Herman, Battle Station Sick Bay: Navy Medicine in World War II (Annapolis, MD: Naval Institute Press, 1997), 83-85.
experience. Leonard Bushem enlaced in the Army on 2 October 1940 and recalls his recurrent experiences with malaria. “We had a makeshift hospital on Guadalcanal with these, um, squat tents is what we used as a hospital, and [the doctor] told me I lost 58 pounds overnight.”

Looking back, Bushem recalls being so severely ill that he could not sit or stand. “‘Lenny,’ [the doctor] said ‘I don’t even know why you’re living.’” This is clearly not indicative of all malaria cases. However, Bushem’s recollection of the severe illness fits with the early epidemic on Guadalcanal. As more medication and supplies became available, sanitation improved as did the outcomes of malaria cases.

In an oral history interview, George Mahoney spent just a brief moment on malaria. Yet, his response to the simple question, “Were you injured at all during the war?” provides some context for the malaria protocol manual. Mahoney quickly answered, “No, but I did contract malaria. Malaria is a sickness, a fever. It’s spread by the anopheles mosquito.” Although it is unknown how much training in malaria prevention Mahoney received, it is clear that some of it will never leave him, including the realities of being sick. “It knocks you out. It builds up on you until you get about 102° fever and then [whistles] it just knocks you out.”

Remembering illness was a common theme among those on Guadalcanal, but for others recovery was more complex.

Samuel Anthony Logiudice found himself on the wrong side of malaria symptoms when he awoke in a malaria unit to find medical alter tag on his bed. “It said psychoneurosis, manifested by long, loud praying and crying.” At the same time, he was being held for an acute infection of malaria. Although few experienced neurologic symptoms from higher doses of atabrine, his behavior was officially determined to be shell shock. Logiudice was fearful not of the malaria, but rather the label of shell shock on his permanent record with the Army.

Similarly to Mahoney, Paul Dulik also knew a bit about malaria. He was quick to tell stories about taking atabrine, and the widespread nature of malaria throughout the Pacific region.

114 Leonard James Bushem (AFC/2001/001/37932), Video recording (MV01), Veterans History Project Collection, American Folklife Center, Library of Congress.
115 Ibid.
116 George Mahoney (AFC/2001/001/70043), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
117 Ibid.
118 Samuel Anthony Logiudice, (AFC/2001/001/49584), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
119 Ibid.
“The whole Pacific, we always had to take it … Most every day we had to take medication for malaria. Malaria was a big, big thing then.”\textsuperscript{120} Dulik suffered from several relapses, many while back home in the United States. “I must have outgrown it because I would be so darn sick I would almost die. I thought I was dying.”\textsuperscript{121} Fortunately for Dulik and many others, the malaria attacks did end with time.

John Edward Hunt joined the Army in 1942, and wrote a brief memoir titled \textit{My Mirror}. In it he recalled the devastating effects malaria had on the battle for Guadalcanal. As supplies became available, soldiers took atabrine to prevent malaria outbreaks. Hunt jokes “They were so bitter you didn’t have to be told to drink some water.”\textsuperscript{122} Atabrine was only part of the war against malaria, and Hunt wrote that the mosquitoes were under control due to spraying.

“Actually, there were more mosquitoes at our Kahuka 6 Camp on Oahu, than there were in this coconut plantation!”\textsuperscript{123} In an oral history interview, Hunt further explored his experience with malaria. Upon receiving orders to ship home, Hunt, like many others, stopped atabrine therapy only to become ill aboard ship. “So just when I got home, just before Christmas time, I was okay until Christmas. I think it was Christmas Eve or Christmas Day, when I got a malaria attack again.”\textsuperscript{124} His wife carefully nursed him back to health. “She put me to bed and covered me with everything there was cause I was ice cold, shivering and shaking. After a little while I was just soaking wet and pulled off the pajamas I had and dried me off with towels and gave me a fresh pair of pajamas which I put on. I crawled into bed again and she piled the covers high again and I shivered until I finally straightened out.”\textsuperscript{125} Due to the recurrent nature of malaria, Hunt was among many returning veterans that successfully applied for disability because of malaria. At the time of his interview Hunt was unsure of the duration of his disability, but believed it was between six and nine months.

Others with frequent attacks, like Gottfried Alois John Fischer, meant finding and keeping a job immediately after the war was a challenge. “Whatever I had, I’ll tell you, it was

\textsuperscript{120} Paul Dulik (AFC/2001/001/47872), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
\textsuperscript{121} Ibid.
\textsuperscript{122} John Edward Hunt (AFC/2001/001/2018), Memoirs (MS02) 25, Veterans History Project Collection, American Folklife Center, Library of Congress.
\textsuperscript{123} Ibid., 25.
\textsuperscript{124} John Edward Hunt (AFC/2001/001/2018), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
\textsuperscript{125} Ibid.
bad.” Fischer was admitted to hospitals from Brisbane and Sydney, Hawaii, San Francisco, and all along his train route back east to Georgia. Fischer personally recounted twenty seven malaria attacks. “Nobody wanted anything to do with me with malaria cause you couldn’t work very long. Cause you worked two weeks then you were off two weeks. And whatcha gonna do? Even though I was in the Navy, you have to be at the station and do your job.” Fischer made no mention of applying for, or receiving, disability. Yet, his experiences resonate with many who came home from war exhausted only to continue to be plagued with malaria. “I was never sick a day in my life when I went in, and I’ve never been well a day in my life since I been out. It’s always one thing or another.” For Marine Clarence Coleman, malaria was enough to completely reshape his medical history. He, like thousands of others, acquired the malaria parasite on Guadalcanal, but did not become sick until taken off of suppressive quinine on the way to Australia. There he was given atabrine for the first time. “I had it so many times I could tell when it was coming on.” Because of his recurrent malaria, Coleman, too, was granted 10% disability for a period of one year. During that time he went to a local Veterans Hospital, knowing a new malaria recurrence was beginning. However, he unknowingly signed himself out of the hospital against medical advice, losing the remainder of his disability.

Fred DiDomenico spent the better part of four months in a North Carolina hospital trying to get rid of malaria after serving on Guadalcanal. From September through December 1944, DiDomenico fought off the malaria parasites in his body as he slowly cycled from sickness to health and back again. Andrew Zenner also dealt with multiple acute infections after the war, resulting in ten percent disability for a year. Yet, others who suffered at the hands of malaria were denied any disability. Jonas Berkey applied for disability after being found unfit for duty in April 1945. While the official reasoning for his extended shore time was “operational fatigue,” it is clearly

126  Gottfried Alois John Fischer (AFC/2001/001/74090), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
127  Ibid.
128  Ibid.
129  Clarence E. Coleman (AFC/2001/001/34043), Audio recording (SR01), Veterans History Project Collection, American Folklife Center, Library of Congress.
130  Ibid.
131  Ibid.
132  Fred DiDomenico (AFC/2001/001/38444), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
133  Andrew G. Zenner (AFC/2001/001/14578), Transcript (MS04), Veterans History Project Collection, American Folklife Center, Library of Congress.
written on Berkey’s papers “Malaria – 5 times” next to the other diagnosis.\textsuperscript{133} At the bottom of the page “This account did not mention real problem which was 5 attacks of malaria” appears just below the official recommendation.\textsuperscript{134} The September 1946 letter from the Veterans Administration claims that Berkey did not meet the established minimum connection for ten percent disability.\textsuperscript{135} While most men serving on Guadalcanal became infected with malaria, only some were able to successfully untangle the bureaucratic knot required to claim malaria related disability.

Conclusions

The hasty decision to fight the Japanese on Guadalcanal so early in World War II was certainly not in the early plans. Instead, a golden opportunity presented itself. Striking the Japanese on Guadalcanal, and the subsequent fight for the Solomon Islands, forced the young armies on both sides to face realities they were not ready for. Military experience aside, both the American and Japanese forces fought at the will of the anophles mosquito. Although there was a clear lack of preventive protocols, the Americans were able to win the war against malaria by implementing strict rules within the first few months of the island landing. The numbers speak for themselves. The complete anti-malaria program in the Pacific Theater was not in effect until January 1944. However, the numbers of malaria illness, both primary and relapse infections, began to decline several months after the battle for Guadalcanal ended. By the end of 1943 the number of cases of malaria on Guadalcanal was below 200 a month.\textsuperscript{136} From the beginning months where some units experienced complete wipeouts due to malaria, the effort to prevent the disease came along way in the sixteen months since the beginning of the battle.

By the official release of the malaria manual, the illness rates on Guadalcanal were under control. Yet, if it had not been for the initial months of battle and consequent illness in 1942, the protocols may very likely never have been accepted and implemented with such care in early 1945. This was not without incident. Even as the protocols were sent throughout the Pacific, questions and concerns were preserved through memorandums sent back and forth. Questions were not confined to the officers, as many soldiers continued to fear atabrine. As time continued and malaria rates remained low, evidence surfaced of pivotal protocols being broken. Soldiers

\textsuperscript{133} Jonas Martin Berkey, (AFC/2001/001/2797), Artifact (AR01), Veterans History Project Collection, American Folklife Center, Library of Congress.
\textsuperscript{134} Ibid.
\textsuperscript{135} Ibid.
\textsuperscript{136} See figure 1
continued to evade their daily atabrine doses, and ships leaving the most malarious islands throughout the Pacific arrived and left ports without spraying for mosquitoes.

At war’s end, malaria had a profound effect on everyone that served in the Pacific. For most of the doctors and nurses, their time in the Pacific was the first opportunity to learn about and treat tropical diseases. The battle wounds from malaria lasted far longer than V-J Day. They went home with new knowledge that some used to write books for future clinicians, while others never looked back. Soldiers continued to fight relapses for years, earning disability for their medical troubles stemming from malaria. The military knew that if they were to win the war against Imperial Japan, they would simultaneously win the war against malaria. Medicine was the most important part of the anti-malaria program. However, the military had another avenue to help remind soldiers that they, too, had an important role in maintaining their health. The cultural war on malaria included training movies, pin-up style calendars, and traditional propaganda posters. Together, they provided a holistic approach to the prevention and treatment of malaria.
CHAPTER THREE

PRESCRIPTION FOR SUCCESS?

The war against malaria was effective in large part to modern medicine. Once the battle for Guadalcanal was underway, the malaria toll was clearly enough to force the United States government and the military to begin trials of atabrine. Upon the completion of the trials, the pills were available to the military in large quantities. As the number of acutely ill troops began to drop, other weapons in the war against malaria were unleashed. Propaganda posters and films were commonplace for public health concerns among the troops, most notably for the prevention of venereal disease. On the home front, posters and short films asked consumers to stop using certain goods so they could be used for the war effort, including gas and rubber. Women were asked to plant victory gardens, so more of the domestic food supply could be sent overseas. Everyone had a role in the overall success of the Allied forces during World War II. Families were asked to give up a lot of comforts, and many of their fathers, sons, and brothers were sent off to war. When they arrived overseas, their primary job was to engage and beat the enemy. However, in order to do that, they needed to fight for their health. The cultural war against malaria began in 1944. The goal was to remind the men that while medicine played a significant part in their health, they, too, needed to take responsibility. Through a campaign of posters and films, the military was able to increase the effectiveness of the anti-malarial program by constantly reminding the troops that their role was not limited to taking their atabrine.

Malaria Posters Go Viral

When Americans think of wartime propaganda, many conjure up images of home front conservation or the popular venereal disease focused ads. In 1941, the United States Surgeon General Thomas Parran said “In peacetime, [venereal disease] lurks like a spider in a dark corner. It rends like a tiger when war comes over the horizon.”137 In many ways, the research and wartime programs created for malaria prevention were similar to those for venereal diseases, including the identification of its own miracle drug, penicillin. For the majority of the soldiers

137 Thomas Parran quoted in Alexandra M. Lord, Condom Nation (Baltimore: Johns Hopkins University Press, 2010), 71.
that fought in the Pacific, malaria was very similar. Malaria was absent from much of the United States in the decades leading up to war; however, it lingered in the southern states into the late 1930s. For the thousands of doctors and nurses serving in World War II, diagnosing and treating malaria was considered a “tropical exotic.”\textsuperscript{138} In order to win the war against malaria, the military began an educational program based on posters and films. Initially, the posters were informative. However, there is a clear tonal shift in the message of these posters. Echoing the overall racist ideologies apparent throughout the Pacific theater, the posters quickly went from being solely informative to fueling the Western notion that the Japanese were barbaric, killing machines.\textsuperscript{139}

Medicine played an invaluable role in the war against malaria. However, education efforts throughout the military were equally important, especially in the early years when medical supplies were unsteady, if not wholly unreliable. As newly minted soldiers shipped off to war, many in the United States were fearful that malaria would return, coursing through the veins of a new generation of veterans. Throughout the American South, health officials feared that decades of their work would be overturned at war’s end. Much like the multifaceted approach to combating malaria in the Pacific, health officials used a similar approach. Malaria education was serious business, and taught to adults and young children:

\begin{quote}
Education … was the answer for such general ignorance and apathy, proclaimed the public health gospel underlying both the hookworm and the malaria efforts. For example, in 1920 North Carolina schoolchildren had the opportunity to compete for $25.00 prizes by writing winning essays on malaria and its control.\textsuperscript{140}
\end{quote}

Twenty years later, education was still paramount to the military’s plan. There were no essay contests, but there were seminars and manuals. No soldier was left behind, the enlisted men were taught how malaria was contracted, treated, and the essential signs of an acute infection. Propaganda posters were used to instill malaria-related hygiene habits, while simultaneously including an us versus them mentality. As the enlisted men were taught to keep their shirts on during the hot days and to sleep under bed nets, General Douglas MacArthur told head malariologist Paul Russell that, ”‘it would be a very long war indeed if for every division facing the Japanese he must count on a second division in hospital with acute malaria, and a third

\begin{flushright}
\textsuperscript{138} Humphreys, \textit{Malaria}, 2.
\textsuperscript{140} Humphreys, \textit{Malaria}, 133.
\end{flushright}
division in a convalescent depot with relapsing malaria.”

Everyone knew that malaria prevention was vital. Even though prevention got off to a slow start, maintaining the progress made in 1943 was vital.

Most of the malaria propaganda posters were released in 1944. Beginning with information-based posters, the military sought solely to educate (see Figures 4 and 5). Both figures are direct, and give meaningful ways of actively participating in maintaining their good health. The first two posters work hand in hand, providing soldiers means to actively work to keep healthy. Image 4 reminds soldiers that while the mosquito is small, she carries a huge risk. While it was not important that soldiers know the sex of any given mosquito biting them, it was important to the overall education effort. Only female anopheles mosquitoes transmitted malaria. However, there was no way for a soldier to know if he was being bit by an infected female anopheles mosquito or not. The message necessarily focused on mosquito repellant. Similarly, Figure 5 is about the importance of keeping covered. Guadalcanal and other Pacific islands were home to high temperatures and humidity and widespread malaria. The choice to uncover skin, even for mere seconds, put soldiers at unnecessary risk for malaria. Even in the brief moments coming out of the ocean, the anopheles was standing by, ready to attack.

In 1945, the military issued calendars, each month featuring a different anti-malaria cartoon in pin-up fashion. March 1945’s image, (Figure 6) depicts a pin-up style woman reminding soldiers to always spray for mosquitoes. In the bottom corner, two mosquitoes talk to one another, clearly wounded from the woman’s mosquito bomb. As one mosquito laments, standing on her crutches, she was about to get a meal from the woman. Looking on, the other mosquito reminds her friend “not to go messin round these dames [sic].” The overall message is that those who use their mosquito bombs help win the war against malaria. The clear message was like the exotic women near American military bases, the anopheles mosquito may look harmless but she isn’t. This is clearly a play on the popular anti-venereal disease posters, reminding the young soldiers of the dangers that come along with new women. She may look like a fun time, but you never know what those kinds of women have.

143 Color Poster No. 5755086; “March 1945 Calendar”, Records of Naval Operating Forces, 1849-1997, Record Group 313; National Archives at College Park, College Park, MD.
The May 1945 calendar provides soldiers with a reminder of the myriad ways to keep himself safe from malaria. Centered on a pin-up with a sheer negligee, soldiers are given one very sexy reason to follow the malaria protocols. In three independent scenes surrounding the pin-up, soldiers are reminded of the importance of not swimming after dusk, to spray their quarters every morning and night, and to use their mosquito repellants. “If you don’t give a darn about yourself, do it for her!” Like the months before, the message was about personal responsibility in the wider war against malaria. However, if you were not willing to save yourself, there are other reasons back home to make sure you return safe and healthy. The June 1945 calendar portrays a young man, sleeping soundly, rear-end in the air, dreaming of all the comforts of home: his girl, his dog, playing a round of golf. As he sleeps under the stars, forgetting about the horrors of war, an anopheles mosquito swarms down for a midnight snack. The caption reads, “Don’t spoil a good dream. Sleep under a bed net!!” The military understood that personal responsibility could only go so far. By using sexist images in the posters, soldiers were more willing to follow instructions that were otherwise bothersome.

144 Color Poster No. 428-NPC-1498; “The Mosquito is Little, But Has Bugs in her Spittle”, General Records of the Department of the Navy, 1941-2004, Record Group 428; National Archives at College Park, College Park, MD.
145 Color Poster No. 44-PA-686; “Don’t Strip Tease for Anopheles”, Records of the Office of Government Reports, 1932-1947, Record Group 44; National Archives at College Park, College Park, MD.
146 Ibid.
While the pin-up calendars provided a more light-hearted look at the use of propaganda for the military, not all posters were straight-forward and educational. Figure 7, *Malaria Don’ts*, may appear to be innocent, plainly listing four important ways to be malaria free. However, when put into the wider context of the anti-malaria poster campaign, the racial tones, although subdued in this poster, are apparent. The poster is about the key safety steps after sundown. The sun itself is the focal point, a big red circle in the middle of a white poster. With the sun setting on the malarial islands of the Pacific, the poster also tells soldiers that if they are careful and remain malaria free, they can watch the sun set on a defeated Japanese empire. By 1944, the publication date of all the posters, soldiers were acutely aware that winning the war against malaria meant they would win the war against Japan. This poster reinforces that idea by using the dual visual reminder of the Japanese flag and the sunset.

Quickly after the attack on Pearl Harbor racial ideologies about the Japanese formed. Historian John Dower is clear that, “To speak of the global conflict as a race war is to speak of only one of its many aspects. Nonetheless, it is a critical aspect which has rarely been examined systematically.”\(^{150}\) It was not until the propaganda posters were published that the anti-malaria

\(^{148}\) Ibid.
\(^{149}\) Color Poster No. 44-PA-360; “Malaria Don’ts After Sundown”, Records of the Office of Government Reports, 1932-1947, Record Group 44; National Archives at College Park, College Park, MD.
campaign became a part of the race war in the Pacific. Unlike the phenomena of the “good German,” there was no equivalent in the Pacific war, all Japanese people, soldier or civilian, was unified in the war against the Allied Forces and had to be stopped. The racism is readily apparent in Figures 8 and 9, two popular posters in the anti-malaria campaign. In order to further the Othering of the Japanese, they were often depicted in Western propaganda as animals and other non-human beings; in this case the anophelus mosquito carrying deadly malaria parasites.

Both posters depict the Japanese in the same way, but with different malaria related messages. In Figures 8 and 9, the anopheles mosquito has exaggerated facial features, suggesting animalistic eyes and teeth. Their wings clearly evoke images of the Japanese flag. In the case of Figure 8, Casualty List, the aim is remind soldiers that for every one person taken from the front lines by the Japanese, malaria has taken eight. It was imperative that soldiers remain malaria free to fight the real enemy. The goal was to have American soldiers see the war against the mosquito and the Japanese as a singular mission. By equating the Japanese and the anopheles

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151 Color Poster No. 44-PA-362; “Casualty List”, Records of the Office of Government Reports, 1932-1947, Record Group 44; National Archives at College Park, College Park, MD.
152 Color Poster No. 44-PA-1327; “Man-Made Malaria”, Records of the Office of Government Reports, 1932-1947, Record Group 44; National Archives at College Park, College Park, MD.
153 Dower, War Without Mercy, 8.
154 Ibid., 10-11.
155 Beaubien, “How the U.S. Stopped Malaria.”
mosquito as being linked and fighting against the Allied Forces together, the importance of following malaria protocols was intensified. Similarly, Figure 9 tells soldiers that six of every ten mosquitoes breed in areas that they should avoid, including ruts, fox holes, abandoned roads, and blocked ditches.\textsuperscript{156} The propaganda posters utilize the racialized mosquito imagery as a reminder that winning the war against malaria helps the United States win battles against the Japanese, and is an integral part of winning the war in the Pacific. Moreover, the mosquitoes in Figures 8 and 9 are female, reminding soldiers that while it is just the armies of the Allied nations fighting, the Japanese as a nation, including women and children, were fighting in the war against them.

For many young soldiers, being constantly told that the Japanese were fundamentally bad people made their task easier. As early as Guadalcanal, American troops fought a different war in the Pacific. Many war correspondents noted that there was a clear difference in the attitudes of the American soldiers towards their enemy in the Pacific and Europe. Moreover, the fighting itself was more gruesome. Stories from Guadalcanal became famous, and helped root American ideas of the Japanese. The story of the Goettge Patrol served as proof to new soldiers of the evil nature of the Japanese soldiers. The Goettge Patrol was famous because approximately twenty Marines were reacting to what they believed to be a surrender by a group of Japanese soldiers. Instead, they were ambushed, killed by gunfire or bayonet. This happened just six days after the Americans landed on Guadalcanal. After this, many began to see war with the Japanese as “kill or be killed.”\textsuperscript{157} It is important, however, to recognize that all sides actively sought to dehumanize the others throughout World War II. The Pacific theater allowed a growing racial hatred to mix with necessary wartime killing. This allowed for some of the most racist propaganda posters to be created and viewed as a normal part of war.\textsuperscript{158}

Figures 10 and 11 provide the best examples of racism in the anti-malaria program. Figure 10 provides no new information to soldiers. Instead, it reinforces the notion that for every one person injured by a Japanese soldier, another eight will become sick from malaria. The idea of “fighting both enemies” became increasingly popular among malaria educational materials. In Figure 11, the message is similar. Both the Japanese and the anopheles mosquito are enemies, and both must be destroyed. Uncle Sam proudly holds both the Japanese soldier and the

\textsuperscript{156} Ibid.
\textsuperscript{157} Dower, \textit{War Without Mercy}, 64.
\textsuperscript{158} Ibid., 11, 64
anopheles mosquito as if he won the war over both enemies. For the first time, the Japanese soldiers are shown as humans with non-human features. The Japanese soldiers have animalistic facial features and wear Nazi swastika patches to emphasize their role in the Axis. This is just one of the myriad ways that racism reared its head during the Pacific war. “To scores of millions of participants, the war was also a race war. It exposed raw prejudices and was fueled by racial pride, arrogance, and rage on many sides.” ¹⁶¹ As a part of the wider war against malaria, there is clear evidence of all three. At the outset, the anti-malaria program was geared towards better health outcomes. With time, it provided an additional outlet to spread sexist images and racial hatred towards the Japanese through the guise of malaria education. These posters provide a unique look at broader societal beliefs during the war. The sexist and racist ideas that are presented were not new to the young soldiers. Instead, they echoed what many Americans felt during the war. The representation of loose women and villainous Japanese soldiers in the poster series allowed young recruits to internally justify their actions while simultaneously indentifying their own complex feelings.

¹⁵⁹ Color Poster No. 44-PA-1109; “Is Your Organization Prepared to Fight Both Enemies”, Records of the Office of Government Reports, 1932-1947, Record Group 44; National Archives at College Park, College Park, MD.
¹⁶¹ Dower, War Without Mercy, 4.
Film and the War against Malaria

At the outbreak of World War II, there were hundreds of thousands of new soldiers to indoctrinate. Lectures were resource friendly, as they could be given to thousands at a time, and only required one person at a time to speak. However, by the outbreak of World War II there were new technologies that educated soldiers faster than ever before, and in entertaining ways. Upon viewing Leni Riefenstahl’s *Triumph of the Will*, released in 1934, the United States Military began looking at film in a new manner. By 1942, the seven film series commissioned by the United States government was completed. *Why We Fight* by Frank Capra was made mandatory for all soldiers. Generally, World War II propaganda, regardless of medium, focused on the extremism of the enemy. As was clear in many of the anti-malaria posters, the goal was always to equate the enemy, both malaria and the Japanese, with winning or losing World War II. Although it was used successfully against the Germans, exceptions were made in American culture to allow for “good Germans,” whereas no such exemption existed for the Japanese. The focus of the anti-malaria films was different. Rather than reiterate the evils of the Japanese, the films focus on combating malaria through the most effective means possible. This was done through short films, mostly cartoons, and therefore served as both entertainment and education.

The first film was a documentary made by the War Department, titled *Medical Service in the Jungle*. This film was made for new medical personnel, and over the course of twenty minutes takes you through a complete mission through the experience of the medical team. Beginning with a beach landing and island invasion, the young medics go with the first wave of soldiers and treat the first wounds of the battle. Through the documentary, the medics move with the wounded soldiers through a field evacuation from the front lines. The lack of medical supplies and adequate shelter for procedures are stressed. The job of a medic is never over, and it is not safe from the injuries of the front lines. As the wounded are moved back towards the beaches, then on to boats to get better medical attention in safer surroundings, the medic goes back into the jungle island to help more soldiers.

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164 Marianne Fedunkiw, “Malaria Films: Motion Pictures as a Public Health Tool,” *American Journal of Public Health* 93, no. 7 (July 2003), 1046.
165 Video Recording No. 111-FB-147; “Medical Service in the Jungle,” 1944, Records of the Office of the Chief Signal Officer, 1860-1985, Record Group 111; National Records at College Park, College Park, MD.
Back at an American base, the medics fight other enemies, including jungle rot, naga sores, typhus, typhoid, cholera, yellow fever, and malaria. As they show brief footage of treatment for skin rashes, including jungle rot and naga sores, the focus of the medical life in the Pacific quickly shifts to malaria. Emphasizing the essential rules of malaria prevention, the narrator says, “Sleep off the damp ground, improvise hammocks if you can’t get [a bed net and hammock]. You catch on quickly to the tricks the jungle teaches you.” More importantly, this documentary demonstrates that while the medical service is there to triage and treat illness and wounds, it is also there to conduct life-saving research. “The most vicious of all: malaria,” is researched daily, on islands throughout the Pacific. Researchers are shown collecting randomized blood samples, draining standing water, spraying and oiling water, and collecting larva from different locations to test of malaria activity. In addition to rigorous research, a man is shown nailing up the poster *Malaria Don’ts*, mentioned in the previous sections.

The importance of the medical teams in the Pacific cannot be overstated. The aim of the documentary is to demonstrate the full range of tasks fulfilled by the medical community in the Pacific. Moreover, the film clearly demonstrates that the job of the doctors, nurses, and researchers are never over. In the Pacific, someone is always sick, and a new disease is always lurking.

The growing popularity of Walt Disney films began in the 1930s with its adaptation of the Brothers Grimm classic *Snow White and the Seven Dwarfs*. Prior to the outbreak of World War II, Disney films released several now-classic films, including *Pinocchio*, *Fantasia*, and *Dumbo*. Over the course of the war, Disney produced dozens of short films, including *The Winged Scourge*, about malaria. Walt Disney began the non-profit venture to “help the morale of our armed forces.” Initially, Disney created hundreds of insignias for various units in the Army, Navy, and Marines. With time, this began to include film. Although many include roles for their famous characters, there was a fear that the use of Mickey, Minnie, and Donald Duck would seem like product placement. Lead artist Henry Porter stated in the interview, “We have been informed that up to now no commercial characters could be used in the designs. That is why, to date [April 1942], Mickey Mouse, Minnie, Donald Duck and a few others in the Disney

166 Ibid.
167 Ibid.
169 Ibid., 40.
family haven’t appeared. Naturally, it might look as if the various branches of Government were advertising the Disney product.”170 With time, Disney artists began creating short films used for educational purposes by various military branches. “They have produced more than 400,000 feet of educational war films for every branch of the service – enough to make a continuous movie 68 hours in length.”171 Normal, pre-war film production averaged approximately 27,000 feet a year.172 Topics ranged from how to spot and identify planes and how to assemble various aircraft, to public health related topics.

With malaria prevention being a key component to the Allied strategy in the Pacific, the Walt Disney Company, in association with the Coordinator for Inter-American Affairs, Army Service Forces Signal Corps, and the Medical Department of the United States Army, produced *The Winged Scourge.*173 Beginning with a shot of a western-style wanted poster for the anopheles mosquito, the narrator focuses on the impact of malaria in the global context. A killer of millions, malaria is a global problem endemic in many of the areas that American soldiers were fighting in. Similar to other films, the focus is on education and begins with the lifecycle of malaria. In this film, the codependence of both healthy and sick people, and the living anopheles mosquito, is key. Without a sick human, a healthy human, and an anopheles mosquito, this “blood-thirsty vampire” could not continue to spread malaria.174 The film reminds viewers that, “Like all thieves and killers, [the anopheles mosquito] works best under cover of darkness.”175 As the film continues, the infected man loses his farm and his home. Luckily for the soldiers viewing this film, the famous Seven Dwarfs are there to demonstrate how to effectively protect their quarters, be it in a war zone or at the family farm.

Ready for active duty, to the tune of “Whistle While You Work,” Bashful, Doc, Dopey, Grumpy, Happy, Sleepy, and Sneezy demonstrate the myriad ways that you can protect yourself and your property from malaria and the anopheles. The focus was on environmental controls, like draining standing water, oiling lakes and rivers, dusting small, hard to reach places, and covering your doors and windows with netting. As the film nears its end, the Seven Dwarfs tuck themselves into bed, all lined up next to one another, under newly hanged bed nets. In closing,

170 Ibid., 41.
172 Ibid.
174 Ibid.
175 Ibid.
the narrator asks viewers to think of the poor farmer who lost everything because he failed to take precautions against malaria. This film’s focus on the environmental steps to prevent malaria is important. Like taking your atabrine and not swimming after dark, the Seven Dwarfs portray the role of the malaria control units that actively sought to eradicate the anopheles mosquito throughout the Pacific. Once an area was secured, they were able to tackle land issues like draining stagnant water, filling in holes, oiling lakes, and otherwise working with the land to ensure an inhospitable atmosphere for the anopheles. While atabrine could suppress infection, which was vital when arriving in a new location, environmental control could eradicate the mosquito population forever.

_Criminal at Large_ was an animated short film made in conjunction with the Office of Malaria Control in War Areas. It begins with a young boy given the seemingly impossible task to prove his journalistic talent. In order to get a job, he must track down Anne the Awful, and “get the story I want on a female who has the reputation of being the most dangerous criminal in the world. Her business is robbery and murder.”\(^{176}\) Over the next thirteen minutes, viewers watch this young reporter search for the woman known as Anne the Awful. Thanks to a health department poster, he determines that she is the mosquito that transmits malaria. As the young reporter enters the health department building, he is offered a trip into the country to learn, hands on, about Anne the Awful. First, he gets a lesson in the basic principles of malaria transmission. His guide emphasizes that in the country, when farmers get malaria their crop suffers, which in turn affects their family, their livelihood, and the wider country.

As malaria transfers from the sick person to a healthy person, the disease is able to spread much farther than the original mosquito’s flying radius of about one mile. This leads to an in-depth discussion of the lifecycle of mosquitoes, and tricks to identify the anopheles over other, non-malaria-spreading mosquitoes. Here again there is an emphasis on the sex of the mosquito. While there is no scientific doubt that only the female anopheles mosquito both bites humans and carries malaria, the male is viewed not as a nuisance, but rather a victim. In fact, the film uses visual cues to embed this idea. The female anopheles mosquito is views with human features, including large, protruding breasts. Because of the female, males are unfairly viewed as killers, ignoring their importance in the breeding process. To close the video, the lifecycle of malaria is

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\(^{176}\) Video Recording No. 90.28, “Criminal at Large,” 1945, Records of the Public Health Service, 1794-1990, Record Group 90; National Records at College Park, College Park, MD.
viewed again. This film does not mention atabrine or other medication. Instead, the focus is solely on window and bed nets and altering one's surroundings.

*Criminal at Large* is able to explain the lifecycle of malaria and the anopheles mosquito to the general public, while making it accessible to all levels of scientific knowledge. For many, this is neither an entertaining topic, nor one that many choose to study. Its purpose, in 1945, was to make sure that Americans remembered what led to the eradication of malaria, while soldiers began to return from highly malarious areas.

A popular series by the United States Army chronicled Private Snafu through his World War II experience. Through twenty-six short films, Private Snafu demonstrated to thousands of men the ways to get into a lot of trouble. Unlike the popular Walt Disney films, Private Snafu was produced by Warner Brothers for the Army Signal Corps, and provided racier clips with more explosive situations. The writer of Snafu, Theodor Geisel, came to international fame shortly after World War II under the penname Dr. Seuss. The more adult oriented content, beginning with his name (SNAFU standing for Situation Normal, All Fucked Up) allowed the troops to connect. Although the themes of the short films were important, and ultimately educational, the use of semi-nude female bodies and constant poor decision making on Private Snafu’s part allowed the films to be viewed as entertainment. Troops could emotionally connect with the daily situations Private Snafu found himself in because they faced the same thing. From fear of booby traps, spies, the importance of your camouflage uniforms and censoring your letters home, Private Snafu did everything a soldier would be reprimanded for. In these very serious situations, Private Snafu provided nervous young troops some comic relief.  

In the twelfth episode, *Private SNAFU V. Malaria Mike*, the short film begins in a swampy jungle, where a wanted poster hangs on a tree. "Wanted Dead or Alive Malaria Mike Alia Amos Quito," the sign reads, as Malaria Mike looks on. Just then, Malaria Mike gets splashed by Private Snafu who is swimming naked at sundown, a surefire way to get malaria. As Malaria Mike looks at a diagram of a human to pick the best cut of meat to bite into, Snafu gets out of the water and covers up. Miffed, Malaria Mike knows Snafu will give him another opportunity if he

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178 Video Recording No. 111-M-1035; “Private SNAFU V. Malaria Mike,” 1944, Records of the Office of the Chief Signal Officer, Record Group 111; National Records at College Park, College Park, MD.
waits. After filling up his nose with malaria parasite, Mike misses Snafu only to hit a tree that suffers through chills and fever only to die.

Malaria Mike's next attempt is at bed time, when Snafu smells his repellant and decides not to use it. However, he does tuck himself tightly into his bed net. This causes Malaria Mike to fly full speed ahead, only to get knocked on the ground. Fed up, Malaria Mike changes out his nose and sees Snafu peaking out of his bed net to kiss his pictures good night. Taking his final shot, Malaria Mike is able to infect Private Snafu. As the five minute film comes to an end, Malaria Mike sits at home with his child who asks, “What did you do in the big war, daddy?” as the camera pans up to Private Snafu’s head on a plaque. “Oh, I did my share,” Malaria Mike responds. As the cartoon ends, Snafu’s head appears to provide some last thoughts, as he usually does. “Just a moment, please. This program has come to you through the courtesy of my sponsors, the United States Army, distributors of GI repellant, mosquito nets, atabrine tablets, and good old fashioned horse sense. Gee, I wish to hell I’d used ‘em.”

The most important things to remember are covered in this five minute short film. While Private Snafu does everything wrong, and in an entertaining manner, soldiers were given the opportunity to laugh while the importance of malaria protocols were acted out in front of them. While on the surface Snafu films were entertainment to troops who could easily identify with situations Snafu found himself in, they served as an invaluable source of military propaganda. “First and foremost, the Snafu series was about military discipline and the consequences of not following it. But conspicuously absent from the films was the military disciplinary system itself. Snafu paid for his mistakes not by punishment but by risking, or more often losing, his life and the lives of his comrades at arms.” The lessons learned by Snafu were second nature to the men watching the films. The scientific oversights in the Malaria Mike film did not matter, the goal was to remind soldiers what the best preventive measures against malaria were. The fact that Malaria Mike was a male and not a female was irrelevant. Although the initial push was to give biologically accurate information on malaria and its transmission, later prevention focused on entertainment. While other propaganda made similar mistakes, the messages were clear and to the point: malaria is preventable and you can stop it.

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179 Ibid.
180 Alpers, “This is the Army,” 148.
The malaria films used throughout World War II varied by their locations, techniques, scripts, but their purpose was the same. Of the hundreds of propaganda films created on all topics, they were ultimately used to not just as an educational tool, but as entertainment. Yet, they are not used as often as other propaganda mediums. The malaria propaganda films demonstrate the power of film as an educational tool, even in a war zone. British medical officer Allen Daley and nurse Hester Viney argued that, “The film has the great advantage of showing cause and effect, often powerfully emphasized, within the space of a pleasantly occupied half-hour.” Unlike a poster, calendar, or manual, a film need not be reproduced thousands of time. Rather, it can be viewed by thousands with one reel. Even short films about public health proved entertaining, and therefore lent itself to becoming more effective than any other medium. The abovementioned examples demonstrate a mix of life saving information with humor. Through the power of storytelling, soldiers were able to relax while simultaneously having malaria protocols reinforced.

Conclusions

By the time the cultural war against malaria began, overall infection and relapse rates on Guadalcanal had plummeted. However, the medical nightmare malaria caused for American troops was not forgotten. The multifaceted approach to malaria awareness brought humor, public health, and pin-ups together in a way that welcomed soldiers’ attention. Introduced the same year as the comprehensive anti-malaria plan discussed at length in chapter two, the popular faces of malaria protocols allowed a serious, sometimes life threatening subject, to be presented in a welcoming format.

The print materials, done primarily through posters, were rife with racist images equating the Japanese as savage animals. Yet, the numbers, in large print, reminded soldiers that the anopheles mosquito was responsible for more wounded and sick troops than a single Japanese soldier. Artists went to great lengths to layer links between the Japanese and Nazis, including swastika arm patches on Japanese soldiers. Mosquitoes were given racialized features, often appearing with the Japanese flag in her wings. The war against malaria was, for the most part, focused in the Pacific, but losing to the Japanese meant losing to Hitler in Europe.

\[\text{Footnotes:}\]
\[\text{181 Fedunkiw, “Malaria Films,” 1047.}\]
\[\text{182 Ibid. 1046-1053.}\]
Far from home, the young soldiers missed many creature comforts, including their wives and girlfriends. Although malaria is not a sexually transmitted disease, in many propaganda pieces women, including the female anopheles mosquito, was portrayed in a similar light as women in the myriad venereal disease posters. Although the sentiment was not used for any malaria posters, the sentiment is similar to the popular adage about women soldiers meet overseas, “She may look clean, but – pick-ups, good-time girls and prostitutes spread syphilis and gonorrhea. You can’t beat the Axis if you get VD.” Similarly, the anopheles mosquito may look harmless, but she packs a deadly, malarial punch. If an entire unit is clinically infected, there is no way to win the war against Japan.

Although posters and calendars were popular, they were costly to produce. Film, on the other hand, could be made once and shown to untold numbers of soldiers in unlimited viewings. With companies like Walt Disney Company and Warner Brothers providing short, educational films at cost, they truly became the best way to teach new soldiers the lay of the land. Once in-theater, films provided entertainment while reminding everyone of the importance of anti-malaria protocols. Whether it was the Seven Dwarfs, Private Snafu, or a young guy looking to become a reporter, these educational shorts were welcomed deviations from the horrors of war. Yet, they could connect to messages because it was their daily reality. Moreover, the films and posters highlight the ongoing tension in the public health community between the use of medicine or environmental controls for disease. While the posters called for personal responsibility, they did so through acts of environmental control. These included spraying yourself with repellant, the use of bed nets, and spraying sleeping quarters twice a day. The films generally focused on the importance of wider environmental challenges, like oiling lakes, filling in holes that allowed for standing water, and spraying large areas with DDT. Together they cover the full range of environmental action against malaria. These actions reinforce the fundamentally important notion that medication and the augmentation of infrastructure work best to eradicate disease.

The use of propaganda was everywhere throughout World War II. In the case of malaria, the cultural images produced brought humor to a very serious situation. Regardless of the format, malaria protocols needed to remain in the forefront of every soldiers mind. Through posters,

\[\text{\textsuperscript{183}} \text{Color Poster No. 44-PA-172; “She May Look Clean, But 1941-1945,” Records of the Office of Government Reports, 1932-1947, Record Group 44; National Records at College Park, College Park, MD.}\]
calendars, and film, the military was able to constantly reinforce each soldier’s responsibilities in the war against malaria. This, along with atabrine discipline, kept American soldiers in top fighting shape, giving them the strength needed to fight and beat the Japanese.
In the course of six years, American malaria researchers established protocols that helped end an epidemic in the military. Not all of the decisions made directly helped fight malaria infections throughout the Pacific. However, the scientists and government officials that came together unknowingly shaped the future direction of medicine and science. When government and military officials considered the likelihood of war in the Pacific, prevention of a malaria epidemic was a chief concern. Many argued that the best way to combat malaria was to focus on the mosquito. Others believed that in combat situations, the military needed a two-pronged approach of medication to prevent and suppress treatment, while also treating mosquitoes through environmental measures. Four years later malaria research began, at the end of the battle for Guadalcanal, a comprehensive anti-malaria program was enacted throughout the Pacific, calling for daily medication for all soldiers and environmental precautions. It was too late for the thousands of soldiers that were infected during the six month battle for Guadalcanal, the overwhelming majority of whom suffered multiple relapses. Well intentioned in 1939, the researchers and government officials were unable to prevent the malaria epidemic on Guadalcanal because they were focused on finding a miracle anti-malaria medication. However, at the outset of the epidemic, researchers in Washington were forced to look at malaria prevention in a new light. For this reason, Guadalcanal was the intellectual turning point for scientists and researchers working on protocols.

Although the battle for Guadalcanal ended in a military victory for the Allied cause, the role of malaria cannot be forgotten. Throughout the entire battle, the monthly rates held between 900 and over 1000 cases per 1000 soldiers (ranging from 90 – 100%+ infection rates). It was not until June 1943, four months after combat on Guadalcanal ceased, that infection rates finally dropped below 1000 cases per 1000 soldiers (See Figure 12). At any moment, the malaria rate could easily have increased, crippling the fighting capabilities of the Marines. For this reason, the Allied victory at Guadalcanal has more than military significance. It is symbolic not only of crushing safety and health failures, but also of the rise of American dominance in the Pacific.
Once the war against malaria was fully underway, malaria rates fell sharply. As atabrine was ending acute infection throughout military hospitals, it was also being used as a daily preventive measure throughout the Pacific. By 1944, the monthly infection rate fell to two hundred for the first time during the war. At the same time, the military began the cultural portion of the war against malaria. Through propaganda posters, calendars, and film, the military was able to reinforce educational information about malaria prevention while gaining the attention of the soldiers. Every man had a valuable role to play during World War II, on and off the battle field, and in the Pacific everyone was responsible for malaria discipline. Initially, the posters reflected the medical necessity of following malaria protocols. Over time, the posters

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185 Ibid.
morphed into racially focused propaganda against the Japanese. As the malaria rates were finally under control, the military found it necessary to compare the evil of the savage Japanese soldier with the disease spreading mosquito, both of whom killed at will without any provocation.

These three distinct stages of the war against malaria began before the United States formally entered World War II and although it ended with the war, its influence was far reaching. Malaria’s role during World War II was the starting point for even bigger scientific achievements in the United States. Malaria Control in War Areas, headquartered in Atlanta, became the Centers for Disease Control and Prevention in 1946. Their focus was on public health and safety.¹⁸⁶ Today, the CDC is one of the “largest institutional legacy from the Second World War.”¹⁸⁷ Today they research everything from child safety seats, influenza, and Ebola. The need to have dedicated facilities that focused on public health and safety stemmed from the malaria epidemic in the Pacific. By recognizing the nation’s lack of national preparedness to conduct grand research, and organize and prevent disease threats, the malaria epidemic led to the establishment of one of the nation’s most important scientific research institutions.

The accomplishments of the malaria researchers cannot be overlooked. Today, malaria claims the life of one person every sixty seconds in Africa, despite the significant research devoted to the disease.¹⁸⁸ Although it is both preventable and treatable, the World Health Organization’s World Malaria Report 2012 reports that in 2010 there were approximately 219 million malaria deaths globally.¹⁸⁹ Despite these unacceptably high numbers, malaria rates are dropping. Of the 104 countries where malaria transmission is still endemic, 75% are considered to be under control.¹⁹⁰ In many countries, the mortality rate of malaria is intensified in those with HIV/AIDS and other immunosuppressed persons.¹⁹¹ Moreover, children and pregnant women are at an increased risk for death from malaria.¹⁹² Although it has not plagued the United States outside of war since the 1930s, millions remain affected.

¹⁸⁷ Ibid., 549.
¹⁹⁰ Ibid.
¹⁹² Ibid.
World War II led to scientific and military breakthroughs previously unthinkable. The consequences of not treating the malaria epidemic would have cost the Allied forces the war in the Pacific. In just four years, scientists went from a moderate quinine supply to none, forcing them adapt to new medications and preventive measures that were fit for a combat zone. The use of atabrine alone helped to suppress the malaria epidemic on Guadalcanal just months after it began. Malaria rates continued to plummet throughout the remainder of the war as large-scale environmental protocols were implemented. The additional use of propaganda materials, from print to film, provided constant reminders of vital malaria precautions. Without the tireless work of the malaria program researchers, the outcome of World War II may very well have been different. As the propaganda reminds us, a Japanese soldier will take out one man for every eight the mosquito claims. The anopheles truly was Anne the Awful, but the focus on prevention and treatment in the lead up to war allowed the United States to win the war against malaria.
REFERENCES

ARCHIVAL SOURCES

INSTITUTE ON WORLD WAR II AND THE HUMAN EXPERIENCE, FLORIDA STATE UNIVERSITY

Henry Marsh. Archive collection number 00.0842. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

Hugh Zeigler. Coll. # WWII-935, Reichelt Program for Oral History, Florida State University, Tallahassee, Fl. A Copy was provided by the Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

John Francis Richter. Archive collection number 98.0496. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

Lonnie R Smith, Sr. Coll. # WWII-729, Reichelt Program for Oral History, Florida State University, Tallahassee, Fl. A Copy was provided by the Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

Robert Griggs. Coll. # WWII-811, Reichelt Program for Oral History, Florida State University, Tallahassee, Fl. A Copy was provided by the Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

Wilmer F. West. Archive collection number 98.0712. The Institute on World War II and the Human Experience, Florida State University, Tallahassee, Fl.

LIBRARY OF CONGRESS, VETERANS HISTORY PROJECT

Andrew G. Zenner (AFC/2001/001/14578), Veterans History Project Collection, American Folklife Center, Library of Congress.

Clarence E. Coleman (AFC/2001/001/34043), Veterans History Project Collection, American Folklife Center, Library of Congress.

Dana T. Hughes (AFC 2001/001/54112), Veterans History Project Collection, American Folklife Center, Library of Congress.

Fred DiDomenico (AFC/2001/001/38444), Veterans History Project Collection, American Folklife Center, Library of Congress.

George Mahoney (AFC/2001/001/70043), Veterans History Project Collection, American Folklife Center, Library of Congress.

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Gottfried Alois John Fischer (AFC/2001/001/74090), Veterans History Project Collection, American Folklife Center, Library of Congress.


Jonas Martin Berkey, (AFC/2001/001/2797), Veterans History Project Collection, American Folklife Center, Library of Congress.

Leonard James Bushem (AFC/2001/001/37932), Veterans History Project Collection, American Folklife Center, Library of Congress.

Paul Dulik (AFC/2001/001/47872), Veterans History Project Collection, American Folklife Center, Library of Congress.


**NATIONAL ARCHIVES AND RECORDS ADMINISTRATION II**

College Park, MD., National Archives and Records Administration, Records of the Office of Government Reports, 1932-1947, Record Group 44.

College Park, MD., National Archives and Records Administration, Records of the Public Health Service, 1794-1990, Record Group 90.

College Park, MD., National Archives and Records Administration, Records of the Office of the Chief Signal Officer, Record Group 111.

College Park, MD., National Archives and Records Administration, Records of the United States Information Agency, 1900-2003, Record Group 306.

College Park, MD., National Archives and Records Administration, Records of Naval Operating Forces, 1849-1997, Record Group 313.

College Park, MD., National Archives and Records Administration, General Records of the Department of the Navy, 1941-2004, Record Group 428.
PRIMARY SOURCES, NON-ARCHIVAL


Coffey, E.R. “Malaria.” *The American Journal of Nursing* 43, no. 11 (November 1943), 996-998.


Simmons, James Stevens. “Wartime Importance of Tropical Diseases.” *The Scientific Monthly* 59, no. 6, (December 1944): 405-413.


**SECONDARY SOURCES**

Alpers, Benjamin L. “This is the Army: Imagining a Democratic Military in World War II.” *The Journal of American History* 85, no. 1 (June 1988), 129-163.


Fedunkiw, Marianne. “Malaria Films: Motion Pictures as a Public Health Tool.” *American Journal of Public Health* 93, no. 7 (July 2003), 1046-1057.


Jersey, Stanley Coleman. *Hell’s Islands: The Untold Story of Guadalcanal* (College Station, TX: Texas A & M University Press, 2008), 275.


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