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Investigations Into Civil War Medicine Through Some Artifacts Recovered From The U.S. Army Transport Maple Leaf

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THE FLORIDA STATE UNIVERSITY
COLLEGE OF ARTS AND SCIENCES

INVESTIGATIONS INTO CIVIL WAR MEDICINE THROUGH SOME
ARTIFACTS RECOVERED FROM THE U.S. ARMY TRANSPORT
MAPLE LEAF

By

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A Thesis submitted to the
Department of Anthropology
in partial fulfillment of the
requirements for the degree of
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ABSTRACT

This thesis examines an assemblage of artifacts recovered from the U.S. Army Transport *Maple Leaf*. This assemblage was part of a cargo of baggage from three regiments of Union Army troops sent to Florida in 1864. The U.S. Sanitary Commission, a civilian aid organization, likely distributed the assemblage studied to one or all of these regiments. It consists of non-military equipment likely used for medical practices. The assemblage is examined in context of the emergence of sanitary medical practices and the emergence of sanitation in the medical community during the Civil War. This thesis argues that newly introduced, more effective sanitary practices of the Civil War were not adopted after the war because the underlying cause of infection and disease was not understood. It was only after the advent of germ theory in the 1890's that the medical community adopted sanitation practices first recommended in the early 1860's.

CHAPTER 1

INTRODUCTION

The United States Civil War saw a marked change in the practices of medicine in the area of sanitation. Many of these practices were recommended to the Army by a civilian agency, the United States Sanitary Commission. The Army then ordered its surgeons to follow the sanitary practices recommended by the Sanitary Commission. Physical evidence for the introduction of these sanitary practices can be seen in an example from the U.S. Army Transport *Maple Leaf*. Discovered within its hold was a Sanitary Commission box with an assemblage of medical gear, likely of a non-surgical nature. To my knowledge no similar archaeological finds exist.

Medical Science Before Germ Theory

During the Civil War, disease was thought to originate from particles in the air that were always present. These were sometimes known as malarial miasm, nephritic effluvia, or simply crowd poisoning (Kramer 1948:456). These miasms, as they were commonly known, were diagnosed by the symptoms of the sick patient (Bynum 1994:29). The cause of the symptoms was not relevant to the treatment proscribed (Gibson and Farrar 1974:248). Medical personnel of the time treated the symptoms and judged the effectiveness of treatments by immediate results.

Destroying or preventing the cause was not part of the intellectual framework in 19th-century medicine. Pus and odor resulting from infected wounds were considered normal actions of the healing process (Gibson and Farrar 1974:248).

Germ Theory

Germ theory and its practical application to medicine can be attributed to the work of two men, Louis Pasteur and Joseph Lister (Bynum 1994:132). Pasteur's experiments discovered that microscopic bacteria caused putrefaction in liquids (Fisher 1977:156). His experiments and publications led to the wide acceptance of the existence of bacteria and formed the basis of Lister's work.

Joseph Lister, a doctor by trade, utilized Pasteur's work with liquids and bacteria to develop germ theory as it is applied to medicine (Fisher 1977:157). Germ theory examines not only the symptoms of a disease, but their bacteriological cause. This bacteriological cause, not the symptoms produced, is the basis for treatment of disease (Kramer 1948). Previously, similar symptoms were treated with the same procedures, regardless of the cause.

Germ theory stated that infection of wounds was unhealthy and preventable (Fisher 1997:302). These discoveries brought about antiseptic practices of modern medicine, where cleanliness is considered standard. Antiseptic cleanliness is not simply washing; it kills bacteria which might potentially infect patients.

Paradigm Shifts

Thomas Kuhn, a philosopher of science, introduced many theories in his publications concerning the nature of scientific thought (Buchwald and Smith 1997). *The Structure of Scientific Revolutions* (Kuhn 1964) explains how scientific paradigms often shift dramatically. He spent the next three decades publishing, lecturing, refining, and defending his theory about scientific revolutions (Kuhn 2000). The theory of scientific revolutions provides a framework for interpreting the significance of the assemblage as an artifact of an incipient paradigm shift in 19th-century medicine.

Kuhn's theory states that true innovation which forces a new paradigm onto a scientific community originates outside the mainstream of that community. Many scholars believe that science is a slow progression of discovery toward more correct and deeper understanding of phenomena. According to Kuhn, this theory is correct, but only to a certain point. Slow progression does occur, but only within a single, accepted,

intellectual framework, or paradigm. Slow progression by its very nature is limited to what can be understood within the established paradigm; phenomena outside the paradigm cannot be understood.

True revolutionary change that alters this underlying framework cannot come from within the current paradigm. New paradigms begin when scientists in the field abandon the accepted paradigm and create a new one to answer questions the old paradigm could not. Kuhn's theory states that these innovators are generally on the periphery of the existing system and the majority only later accept their ideas. Only when a new paradigm answers more questions than the old one is it accepted. Acceptance of a new paradigm then shapes future research, both in its practices and its materials.

The advent and incorporation of germ theory can accurately be described as a scientific revolution within Kuhn's definition. Conventional medical paradigms and practices were eventually replaced by the acceptance of bacteriology as the cause of disease. Lister himself was on the periphery of the medical community and his theories about bacteria and disease were only accepted after years of debate and even personal attacks.

The concept of scientific revolutions is important for this thesis because it requires a definite order of change. The underlying paradigm must first shift, and then the practices and materials will be adapted to fit this new paradigm. The assemblage of medical supplies from the Sanitary Commission may represent an altered order in such a revolution. Sanitary practices were forced on a scientific community without the underlying paradigm shift. These innovative practices usually were not accepted until the medical paradigm was changed with the acceptance of germ theory in the early 20th-century.

Conclusion

The assemblage from *Maple Leaf* used in this thesis can be placed in the theoretical framework of Thomas Kuhn's scientific revolutions only after thorough examination. The context of the site as well as the background history of the Sanitary

Commission must be established. The artifacts themselves must be examined to determine their condition and what function they may have performed. The artifacts may be interpreted according to their functions within the context of likely ownership. Only after this has been done can the assemblage as a whole be used to illustrate any larger hypotheses concerning human behavior.

Chapter 2 provides historical background for the assemblage and its context and explains the practices of the sanitary commission particularly in regards to sanitation within hospitals. The site, its history, and a brief general history of the U.S. Sanitary Commission including its function and powers during the Civil War will be explained. Chapter 3 introduces the assemblage, its provenience, and its condition. A brief section on conservation will be used to interpret the disparity in the condition of the assemblage between excavation and 2003. Chapter 4 presents an analysis of this assemblage as well as hypotheses concerning its use and function. Chapter 5 examines the way objects in the assemblage may have been used. Analysis of the assemblage shows that more effective sanitary practices of the Civil War were not adopted after the war because the underlying cause of infection and disease was not understood. It was only after the advent of germ theory in the 1890's that the medical community adopted sanitation practices first recommended in the early 1860's.

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CHAPTER 2

HISTORICAL BACKGROUND

This chapter provides historical context to the assemblage of medical objects studied in this thesis. A general history of the United States Sanitary Commission gives an overall sense of what the organization was and how it functioned in the Civil War. An overview of the interaction between the military and the Sanitary Commission is given to demonstrate the dynamic between these two organizations. How a Canadian steamer, *Maple Leaf*, ended up at the bottom of the St. Johns River, Florida, containing a cargo of U.S. military baggage is also described. A listing of the regiments that had baggage aboard *Maple Leaf* is also discussed to demonstrate who would have been using the equipment if the cargo had arrived.

U.S. Sanitary Commission

The United States Sanitary Commission was an organization of civilians that sought to aid in the health and morale of the Union Army during the American Civil War. This Commission was mandated by President Abraham Lincoln to advise and give aid to the Army during the war. The Sanitary Commission was patterned, both in form and in practice, on the British Sanitary Commission, which was instrumental in the Crimean War (1854-1856) (Maxwell 1956:5, Greenbie 1944:38).

The impetus to create a Sanitary Commission in the United States began with letters from volunteer troops in the Army. These letters to loved ones back home, usually women, told of deplorable living conditions in the Army (Maxwell 1956:35). From these letters detailing sickness and hunger sprang many Women's Aid Societies which helped to deliver aid to the men of their hometowns (Greenbie 1944:35). These societies

established themselves in almost every town in the north but lacked a central leadership or distribution center. This lack of central leadership meant that individual societies were limited in both resources and ability to aid.

In early 1861, several representatives from these societies traveled to Washington D.C. to attempt to form a Sanitary Commission based on the British model (Maxwell 1956:5). On June 18, 1861, President Lincoln signed an Executive Order creating the United States Sanitary Commission (Cameron 1866:6). The Sanitary Commission was to “Oversee the health and welfare of the volunteer army, and to serve as a channel for communication between the people and the government” (Cameron 1866:6). The Commission was to be supported solely by public contributions, receiving only a building in Washington from the Federal government (Bellows et al. 1866a:3). Lincoln saw the Commission as unnecessary because the army already had a Medical Corps, and was reported to have described the Sanitary Commission as “useful as a fifth wheel on a coach” (Maxwell 1956:8).

Many in the Army hierarchy believed the Commission to be a useless group of meddling women and gave them little help or support (Adams 1985:29). Without the power to enforce its recommendations the Sanitary Commission was forced to see many of its early recommendations ignored (Adams 1985:29). It was only later in the war, when Sanitary Commissions predictions about impending problems with troop readiness due to low morale were fulfilled at Bull Run, that military leaders began to respect the suggestions of the Sanitary Commission (Brooks 1966:13).

One of the first things the Sanitary Commission did was to send out inspectors into various army camps to assess the state of health and sanitation in the Army (Maxwell 1956:55). These civilian inspectors were sent throughout the term of the war and only much later received any respect from Army officers (Adams 1985:196). The inspectors made clear what many in the civilian medical community already knew: the Union Army was not medically prepared for a major war (Maxwell 1956:4). In the mid 19th century men were not expected to take care of themselves. Relying on their wives and mothers, volunteer soldiers would simply neglect hygiene, diet, or sanitation when in the army (Brooks 1966:8). Inspectors were a neutral third party whose only goal was to insure that as many volunteer soldiers remained healthy and active as possible. Sanitary

Commission inspectors continued their duties throughout the war and were even exempted from the Conscription Act of 1863, because of the great need for civilian inspectors (Adams 1985:196).

Another action the Sanitary Commission took to improve health and morale of the Army was to publish and distribute pamphlets on different aspects of sanitation (Adams 1985:18). Many Army doctors ignored these pamphlets because they often contradicted established medical techniques and practices and because the pamphlets were published by a civilian, not medical organization (Freemon 1988:144). Many pamphlets were ahead of their time in addressing methods of cleanliness and were often too radical for established medical professionals to accept wholesale (Freemon 1988:146). Hammond was a progressive doctor who was picked by the Sanitary Commission to be the Surgeon General. Hammond wanted to limit the use of purgatives such as calomel when treating patients, especially those with dysentery (Brooks 1966:64). This change in the established practices angered the medical community, both civilian and military. Surgeon General Hammond was court marshaled and dismissed from the Army for going against established medical practices (Freemon 1988:144).

The Sanitary Commission also instituted a policy revolutionary to the Civil War: tests for medical professionals (Adams 1985:49). At the dawn of the Civil War, medical thought lacked an objective scientific basis for understanding disease (Freemon 1988:24). There was no standard core of knowledge that every doctor was expected to know (Freemon 1988:24). Few educational opportunities for doctors existed and these consisted primarily of a few classes and short apprenticeships with experienced doctors (Freemon 1988:24). The only real difficulty in becoming a doctor was paying for two six-month terms of classes, often the same few classes repeated (Freemon 1988:24). Potential surgeons were required to take both written tests and oral examinations before they could be commissioned as surgeons in the Army (Adams 1985:49). The Sanitary Commission requested standardized tests for all surgeons in the army instead of the irregularity of state tests that were the standard of the time (Maxwell 1956:61). Testing doctors before allowing them to fill a post as surgeon or assistant surgeon became a useful tool for the Army to test the qualifications of doctors.

The Sanitary Commission strove to gain higher rank within the military for surgeons (Maxwell 1956:122). Preceding, and during the early years of the Civil War, an army surgeon was given the rank of major, from which he was never able to rise while in the Army (Steiner 1968:42). This lack of promotion meant that any rank over major could counter any order by a surgeon, regardless of cause. This policy also ensured that most doctors who wanted to stay in the army would avoid becoming army surgeons for lack of promotion prospects (Steiner 1968:42). This policy simultaneously limited qualified doctors from wanting to join the Army and removed existing authority for surgeons within the Army.

With the aid of Surgeon General Hammond, the Sanitary Commission changed this practice and allowed surgeons to rise in rank like any other Army officer (Maxwell 1956:122). Due to these efforts, a medical officer in the modern military can counteract an order, or even remove a commanding officer from command for a medical reason. This gives tremendous power and responsibility to the medical branch of modern militaries, something unknown in pre-Civil War times.

The original purpose of the Sanitary Commission was collecting and distributing goods and money directly to troops in the field. Regardless of the affiliation of the recipient, the Sanitary Commission would supply and give mercy wherever there was need (Maxwell 1956:303). Shipments of vegetables, clothing, medicine, and recreation equipment were all things a soldier could expect from the Sanitary Commission (Maxwell 1956:36). Hospitals could also expect shipments of medical and sanitary supplies directly from the Sanitary Commission (Maxwell 1956: 36). As a civilian organization, not affiliated with the Army Medical Corps, the Sanitary Commission could cut through “red tape” and concentrate on getting aid and supplies to troops that needed them most.

Shortly after helping veterans to readjust back to civilian life at the end of the Civil War, the United States Sanitary Commission shrank and eventually disbanded (Maxwell 1956:287). Practices and ideals of the Sanitary Commission did not end with the disbanding of the commission (Greenbie 1944). Even before the end of the war, European countries were realizing the benefits of a civilian-based sanitary and relief agency (Greenbie 1944:207). In 1863 an international committee was formed in Geneva

to establish a neutral aid society, the Red Cross, on the model of the United States Sanitary Commission (Maxwell 1956:274). A Sanitary Commission officer, Charles Bowles, was sent from America to aid in the formation of standards and practices of the Red Cross during the initial planning stages (Greenbie 1944:207). A neutral international agency of civilians to administer aid and advice during conflict, regardless of countries involved, was established (Greenbie 1944:207). Neutrality and willingness to help either side in a conflict are aspects taken directly from the Sanitary Commission (Brooks 1966:124).

Although instrumental in creating the Red Cross, the United States did not sign a treaty formally accepting it until March 1, 1882, in an attempt to keep itself out of world affairs (Greenbie 1944:208). Clara Barton, a former Sanitary Commission worker who had spent time working with the Red Cross in the Franco-Prussian war was the first president of the American chapter of the Red Cross (Greenbie 1944:208). The Red Cross today is seen as an international aid society that crosses all boundaries and borders giving aid solely on the basis of need. Neutrality has been an enduring aspect of the Red Cross and is recognized the world over.

Accelerated Technological Advancement in War

Technological advancement often occurs at an accelerated rate in war because of the interconnected relationship between opposing forces (Ferguson 1994:53). As a group develops a new technology or practice, the opposing group must develop technology and practices to counter this development. These advancements occur more rapidly in wartime because the price of stagnation is loss of sovereignty or even life (Richards 1994:1).

In World War II, for example, American forces created an Operational Research (OR) department with the sole purpose of creating new technologies and countering technologies of the enemy (Hartcup 2000:121). The OR produced more accurate sonar and depth charges to counter quieter U-Boats made by Germany (Hartcup 2000:100). Without the quieter U-Boats, these other developments would not have taken place so

quickly. The interrelationship between opposing forces generally causes a greater need for technological advancement in time of war.

Medical practices also advance at an accelerated rate in wartime because of similar factors. Reduction in overall fighting force caused by trauma injuries and epidemic disease cause can lead to defeat. The desire for victory provides a push for governments to develop treatments that will minimize the inevitable effects of battlefield injuries. Doctors are exposed to a greater number of trauma injuries in wartime than in civilian life, giving them a set of data from real events to study, not just hypotheses tested in a lab (Hartcup 2000:100). Shock on the battlefield has long been a problem in keeping troops alive; in the Spanish Civil War (1936-1939) the introduction of portable plasma on the battlefield greatly increased the survival rates of wounded soldiers. Portable plasma has become commonplace in civilian trauma injuries as an outgrowth of its wartime application.

In wartime generals have the ability to order their subordinates to accept change, in technology and practice, to keep men alive. These subordinates may be professionals who have biases concerning non-standard practices and technology. Military rank structure provides a framework for non-professionals to order professionals to adopt non-standard practices. The effects of a new technique can then be seen by these subordinate professionals, who might not otherwise attempt them. Sanitation practices of the Civil War represent an advancement of sanitation practices that did not remain in use after the Civil War by the medical community.

Practices of the Sanitary Commission

One of the primary functions of the U.S. Sanitary Commission was the collection and redistribution of donated goods to soldiers. These donations took the form of food and clothing to supplement what the Army supplied (Appendix A and Table 4.1). As manufacturing and distribution channels of the Army Quartermaster Corps developed, the Sanitary Commission needed to redistribute fewer articles of clothing and food.

The Sanitary Commission offered advice concerning sanitary issues to the Army. This practice began by sending out inspectors to discover the sanitation and health status

of soldiers in Army camps (Adams 1985:196). Sanitary Commission officers made recommendations on how to improve health and morale of troops based on these earlier inspections (U.S. Sanitary Commission 1866a).

Sanitary Commission recommendations included digging latrines away from water sources to avoid contamination, and urging soldiers to bathe themselves and wash their clothing on a regular basis (U.S. Sanitary Commission 1866a). Troop rationing was also seen as inadequate and lacking in diversification, including few or no vegetables (U.S. Sanitary Commission 1866b:11). Overall camp arrangement as well as repositioning camps every ten days were other recommendations the Sanitary Commission made to the Army, which were later strictly adhered to (U.S. Sanitary Commission 1866b:5).

Sanitary Commission recommendations for management and standard practices included Army hospitals. Surgeons were required to have a supply of fresh air circulating throughout their hospitals to help remove the odors (Adams 1985:158-159). Overcrowding of Army hospitals was also addressed with recommendations for fewer beds per hospital and larger, more centralized hospitals on a brigade basis (Freemon 1988:75). Bed linens were required to be changed and washed regularly, as well as between patients (U.S. Sanitary Commission 1866b:196).

The Sanitary Commission addressed medical staff issues by recommending the introduction of a greater number of dedicated nurses (Maher 1989:51). Prior to the Civil War, Army nurses were convalescent soldiers who would assist surgeons in menial non-medical tasks (Greenbie 1944:105). The Sanitary Commission recommended the incorporation of full-time, trained nurses into Army hospitals (Greenbie 1944:105). The full-time nurses proposed by the Sanitary Commission were primarily civilian women wanting to receive medical training and assist in the war. These women were provided a way into the medical profession, one usually denied them by civilian medicine because of their gender. This was also the first time in America that women attained rank and authority within the U.S. military (Greenbie 1944:105).

The Sanitary Commission published and distributed pamphlets on proper sanitary procedures within hospital and camp settings (Kramer 1948: 453). They stressed using disinfectants for the regular cleaning of wounds and hospital wards (Adams 1985:126-

127). These sanitary procedures mandated cleaning each hospital ward daily regardless of use (U.S. Sanitary Commission 1866b:196). Many of the disinfectants such as sodium hypochlorite and bromide were chemicals known to reduce and remove odors. The term disinfectant can be more accurately defined as a deodorant by modern standards, because its primary purpose was to reduce or eliminate odors, not kill bacteria.

Odors in Army hospitals were primarily caused by the infection of almost every wound (Adams 1985:146). A large caliber, slow moving, lead bullet, the minie ball, inflicted the majority of battle wounds in the Civil War (Adams 1985:114). The minie ball shattered bones and often lodged in the body of the target. It traveled at such a slow speed that air friction did not heat the bullet enough to kill off bacteria on its surface, introducing them to the wound (Adams 1985:114). A modern bullet has a greater velocity that usually burns off bacteria before reaching its target, limiting the occurrence of infection (Adams 1985:114). The large caliber of minie balls also pushed clothing and dirt into a wound, increasing incidents of infection (Adams 1985:115).

The Sanitary Commission recommended cleaning wounds and associated areas with water and chemicals to remove what was considered an unpleasant odor (Steiner 1968:11). Contemporary medical practices did not mandate more than the most superficial cleaning of wounds or equipment (Adams 1985:124). Standard cleaning in a surgical environment consisted of wiping blood from an instrument on an apron before moving to another patient. Repeatedly cleaning wounds, as suggested by the Sanitary Commission, led to increased survival rates (Kramer 1948:458-459). Army surgeons recognized the effectiveness of cleaning wounds and supported the practice.

Many of the effective chemical treatments were exceptionally harsh. For example a patient might have chlorine bromine applied directly to the wound (Fisher 1977:163).

Topical application of Bromine.

A piece of *dry* lint is to be placed over the diseased part; over this is to be placed another piece of lint, *moistened with the solution of bromine*; over this, a *third* piece *spread with simple cerate*; the whole to be covered with oiled silk and bandage, so arranged as to retain the vapor in contact with the diseased surface as long as possible. The solution is to be removed as often as it becomes exhausted by evaporation. [U.S. Sanitary Commission 1866b:62; emphasis in original]

These chemicals did eliminate infection-causing bacteria, reducing the rate of infection in wounds. Reduction of infectious wounds was the cause for increasing survival rates from

battle wounds. Surgical instruments or a doctor's hands were not cleaned regularly, even with water, between patients because disease transmission and the causes of infection were not well understood (Davis 1981:9).

By late 1862, the Sanitary Commission began sending medical supplies and personnel directly to regiments in the battlefield (Olmsted 1866). This represents a marked change in the redistributive and advisory role established at the inception of the Sanitary Commission. It began distributing medical and sanitary supplies along with the personnel to use them instead of sending food and clothing only. Civilians began donating money to procure medical supplies instead of directly donating food and clothing (Olmstead 1866). The Sanitary Commission distributed equipment as well as personnel to hospitals to facilitate the practices they recommended concerning sanitation and diet.

Effects of War on Medical Practices

On several occasions Union advances were slowed or even stopped because there were insufficient troops to press an advantage (Steiner 1986:27). Many troop absences were due to preventable sickness caused by unsanitary living conditions (Steiner 1986:18). The generals, being military officials and not medical professionals, did not share the biases of the medical community. Union Generals simply wanted to win a military campaign, and for that they needed greater numbers of soldiers ready and willing to fight (Koonce 2000:22). The number of men healthy for marching and subsequent battle could determine the difference between victory and defeat. After Sanitary Commission success in keeping men in fighting condition, Army generals were more receptive to its suggestions, often more so than the Army surgeons.

Medical professionals in the Army were resistant to new practices (Greenbie 1944:58). The fact that these new practices originated from civilians and laypersons, especially women, did not ease their acceptance. Surgeons adopted new techniques when ordered to by their superiors, or when the benefits were noticeable.

Military leaders had nothing at stake by following the advice of the Sanitary Commission. Their reputations were based only on their successful record in battle, not

if they knew the best and newest medical treatments or not. Concern for the continued health of their soldiers stemmed from a practical concern with victory in battle. Practices and techniques that kept their troops healthy were only a peripheral concern to most Union generals. They did not care about the scientific reasoning behind continued health, only what had to be done to achieve it. Union generals ordered the Army Medical Corps to adopt Sanitary Commission recommendations because they worked. Surgeons were required to follow orders and were exposed to the benefits of these new treatments and practices as a result. The rank structure in the U.S. Army provided the necessary framework for surgeons to try new techniques that were not based in current medical practices.

Maple Leaf

Examination of probable Sanitary Commission artifacts recovered from *Maple Leaf* necessitates a history of the ship prior to sinking. *Maple Leaf* was originally built for the passenger and packet trade on Lake Ontario, Canada (Girvin 1993:67). Donald Bethune commissioned the ship in 1850 to help support his failing steamboat enterprises along the lake (Baskerville 1976:49). Built by George Thurston of the Marine Railway yard, *Maple Leaf* was one of the fastest and most reliable steamboats that worked the regular packet and passenger lines across the lake (Girvin 1993:67). Completed on June 18, 1851, *Maple Leaf* had two side paddle wheels, a shallow-draft hull, and rebuilt engines and boilers from one of Bethune's older ships, *Sovrine* (Girvin 1993:67).

Bethune hoped that the addition of a new and faster ship could help him keep the post-office-determined deadlines required for the packet trade (Girvin 1993:68). *Maple Leaf* was a success in itself, but it was not enough to keep Bethune out of bankruptcy (Baskerville 1976:49). The Public Records of Canada specify that *Maple Leaf* was mortgaged to John Counter to counteract Bethune's failing finances as soon as it was licensed (Girvin 1993:70). Bethune could not afford to pay to furnish the ship and was forced to use part of the money from the mortgage to purchase furnishings so the ship could go on its first voyage (Girvin 1993:70).

With capital to complete the furnishing and outfitting of *Maple Leaf*, Bethune established *Maple Leaf* on its own route across Lake Ontario instead of replacing one of his older and failing steamboats (Girvin 1993:71). *Maple Leaf* completed many voyages and was highly regarded across Lake Ontario as one of its fastest and most reliable steamboats (Girvin 1993:73). The whistle of the steam locomotive signaled the inevitable decline in practicality of steamboat traffic. By 1857 the railroad had supplanted steamboat trade in and around Lake Ontario because of its cost, speed, and greater reliability (Girvin 1993:86). In 1857 only one steamboat company was still solvent and operating on Lake Ontario (Girvin 1993:88).

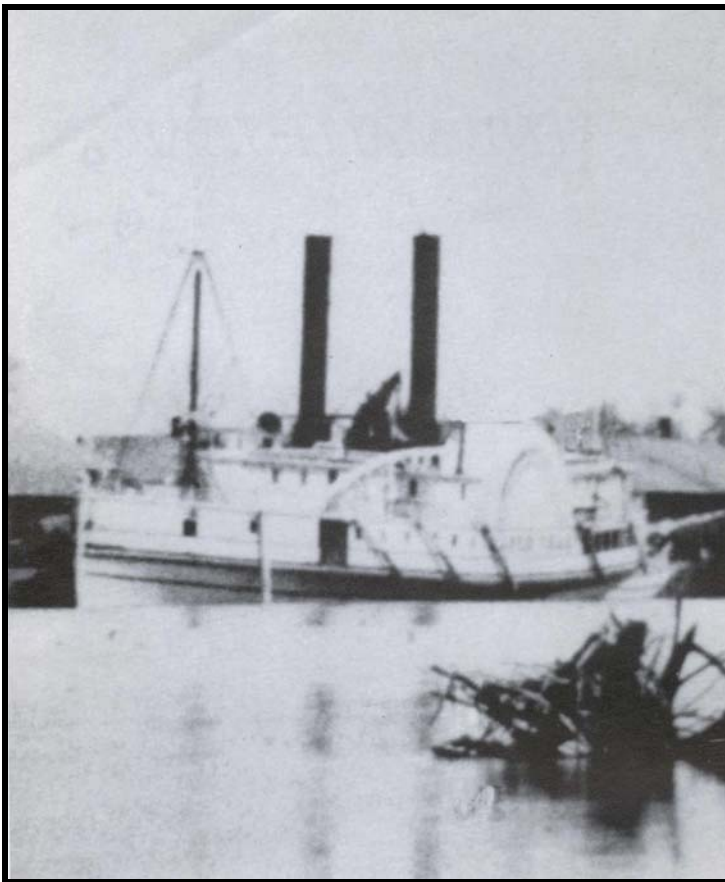


Figure 2.1. Photograph of *Maple Leaf* 1856. (Holland 1993: iv).

On December 4, 1859, *Maple Leaf* received its first major overhaul of equipment and hull since its construction (Girvin 1993:97). Throughout the decline of the lake

steamers in Canada, *Maple Leaf* had remained a solid and reliable asset for its owners (Girvin 1993). The ship made biweekly and triweekly crossings of the lake for over eight years, and its machinery and hull were in need of repair. In dry-dock the ship had its hull repaired, machinery overhauled and adjusted, and a thorough inspection of the hull (Girvin 1993:97).

Maple Leaf was sold on September 2, 1862, to J.H.B. Lang and Josiah P. Dewey of Boston for \$25,000 (Towart and Witt 1993:7). Lang and Dewey bought her with the express purpose of leasing her to the United States Government for use as a transport in the Civil War (Towart and Witt 1993:8). *Maple Leaf* was chartered to the U.S. Army in Boston on September 3, 1862, for use as an Army transport, less than one day after Lang and Dewey purchased her (Towart and Witt 1993:8). Contract stipulations indicated that *Maple Leaf* would be chartered for one month at \$550 dollars per day with an option to renew as needed indefinitely (Towart and Witt 1993:8). The U.S. Army chartered ships at this rate because it was in desperate need of ships to transport Union troops and goods for the war effort.

During its career as an Army Transport, *Maple Leaf* was a fast and reliable asset to the U.S. Army along the Atlantic coast, supplying troops and goods (New York Times [NYT], 13 April 1864). In the final days before its sinking, *Maple Leaf* was transporting goods for the U.S. Army in the St. Johns River in Northeast Florida (Dale 1864).

The captain at the time, Henry Dale, later testified at the board of inquiry that on March 26, 1864, *Maple Leaf* was loaded with baggage and equipment for Foster's Brigade of Vogdes' Division on Folly Island, consisting of the 112th Regiment of New York Volunteers, 169th Regiment of New York volunteers, and the 13th Indiana regiment (Dale 1864:55). These regiments arrived at Jacksonville earlier and expected to receive their baggage once *Maple Leaf* arrived (NYT, 13 April 1864). Personal goods, including items too large or too heavy to carry on their way to Jacksonville, as well as the brigade equipment were cargo on *Maple Leaf* (NYT, 13 April 1864). According to Captain Dale, all military equipment was stored in the aft cargo hold (Dale 1864). In the forward cargo hold were goods from a sutler's store, intended to service the brigade with the reported value of \$20,000 (NYT, 13 April 1864). Sutler stores were civilian businesses that sold goods not provided by the military to soldiers.

Passengers and mail were loaded at Folly Island, South Carolina, for transport and dropped off at Hilton Head on the way to Jacksonville (Dale 1864:55-57). Cargo from the upper decks was offloaded upon arrival at Jacksonville (Dale 1864:57). Neither the aft cargo hold, containing personal and camp equipment, nor the forward cargo hold containing the sutler's goods, was unloaded because *Maple Leaf* needed to make a hasty roundtrip journey to Palatka, Florida (Towart and Witt 1993:14). Union troops at Palatka were experiencing frequent raids by Confederate soldiers and needed reinforcements to offset recent losses (NYT, 13 April 1864). Eighty-seven cavalry officers, their equipment, and horses needed transportation to Palatka, and *Maple Leaf* was to return and then offload the cargo still in its hold at Jacksonville (Towart and Witt 1993:14).

On March 31, 1864, *Maple Leaf* began the return journey to Jacksonville to offload cargo and receive its next assignment (NYT, 13 April 1864). At four o'clock a.m. April 1, 1864, *Maple Leaf* struck a torpedo (mine) in the St. Johns River on the way to Jacksonville, killing four (NYT, 13 April 1864). The ship settled into the riverbed with only its upper decks exposed. Confederate soldiers burned the hull, and the ship, never salvaged, was left to sink further into the riverbed of the St. Johns River (Towart and Witt 1993:15).

Regiments Represented on *Maple Leaf*

The 112th New York volunteer regiment was organized on the outskirts of Jamestown, New York, and trained at Camp Brown in September 1862 (Phisterer 1890:464). This regiment, known as the Chautauqua regiment, consisted of men from the Chautauqua region of New York and Cattaraugus county (Phisterer 1890:464). Colonel Jeremiah C. Drake commanded the regiment and promptly sent it into service with only a few weeks of training.

It is important to note that this regiment consisted of men from rural counties who suffered particularly harshly from diseases that they had no resistance to. Many volunteer soldiers in the Army had never been exposed to diseases that they would encounter in the close living conditions and poor health of other soldiers (Ryberg

1993:33). Diseases that affected the 112th the most severely were typhoid fever, measles, dysentery, and diarrhea (Ryberg 1993:33).

After several campaigns, the 112th was assigned to Foster's brigade in January of 1864 to aid Brigadier General Truman Seymour in his advances into Florida (Ryberg 1993: 34). The troops disembarked in Jacksonville on February 25, 1864, while their baggage was being transported separately on an Army Transport, *Maple Leaf* (Ryberg 1993:35).

The 13th Indiana infantry regiment was formed in Indianapolis on June 19, 1861, for a term of three years (Ryberg 1993:39). The end of its original term of service coincided closely with the sinking of the *Maple Leaf*. After its first term was completed, the 13th was reformed as a regiment of veterans who continued to fight in the Civil War (Ryberg 1993:39). They were sent to Jacksonville to support the Florida advance and lost their baggage when *Maple Leaf* sank (Ryberg 1993:39).

The 169th New York volunteers was formed in Troy and New York City in 1862, and remained together until June 19, 1865, when their three-year term was completed (Phisterer 1890:503). The 169th is the third regiment of Foster's brigade with its baggage on board *Maple Leaf* when it sank (Ryberg 1993:39).

Summary

This chapter has given the broad background necessary to understanding and interpreting the artifact assemblage utilized for this thesis. The Sanitary Commission, a civilian agency, likely distributed this box and assemblage to these Army regiments. The origins, function, and actions of the Sanitary Commission as a civilian aid society are discussed. *Maple Leaf's* history and role in the U.S. Civil War at sinking, as well as information about regiments that lost baggage in the sinking have been described. Listing the regiments of Foster's brigade is used to demonstrate which regiments would have had access to the box, even if the specific owner is unknowable.

CHAPTER 3

ARTIFACT ASSEMBLAGE

This chapter provides essential data about the assemblage from *Maple Leaf's* hold as well as its association to other artifacts. The recovery and conservation of the box and its contents, including the condition of the assemblage when examined in 2003, are discussed.

Recovery

The aft cargo hold of the U.S.A.T. *Maple Leaf* held personal baggage and brigade equipment of Foster's Brigade when it sank. *Maple Leaf* lies in a brackish tidal river (Figure 3.1) that has a varying current and salinity (Holland 1993:129). It settled quickly into the muddy river bottom establishing anaerobic conditions immediately after sinking. Anaerobic environments protect organic materials from degradation by biological organisms (Cronyn 1990:24). The mud made visibility for excavators very limited, often limited to inches or none at all (Manley 1993:147). Due to low visibility, excavators relied on touch as much as sight for excavations conducted on site (Anuskiewicz and Garrison 1992).

The St. Johns Archaeological Expeditions Inc. (SJA EI) was a private, for-profit company formed by Keith Holland of Jacksonville to locate and excavate the wreck of *Maple Leaf* (Holland 1993:132). Recovery of the box took place during summer, 1988, in the first excavation season (Manley 1993:150). SJA EI excavated the wreck from 1988 to 1992, and was later assisted by East Carolina University in 1991 to 1992 by summer field schools in maritime archaeology (Manley 1993:156).

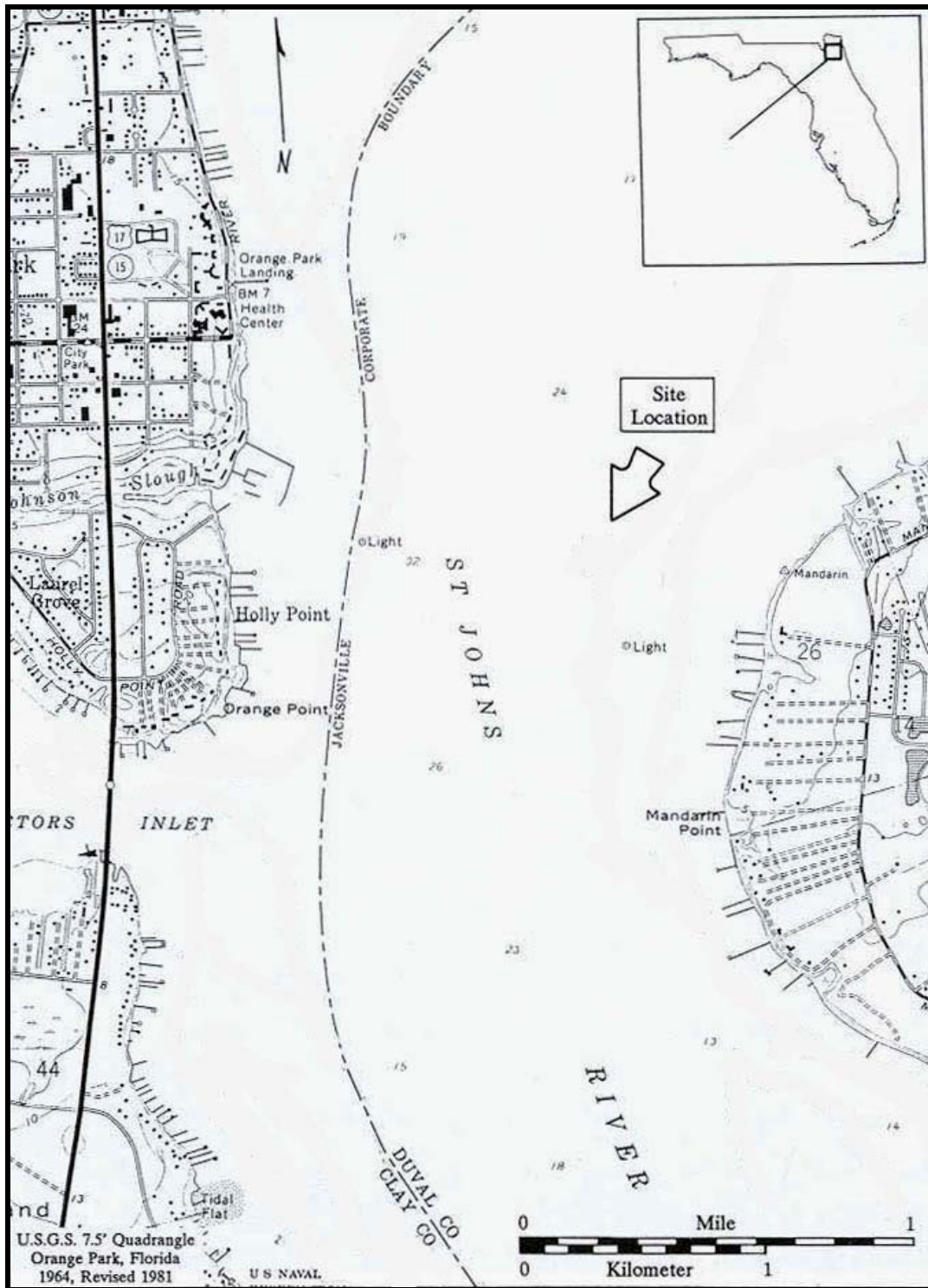


Figure 3.1. *Maple Leaf* wreck site. Altered from a Florida Site File document.

Maple Leaf settled in approximately 21 feet of water under 3 to 7 feet of mud (Manley 1993: 145). After several feet of mud overburden was mechanically removed with induction dredges, a 3'x4' section of deck planking was removed to gain access to the aft cargo hold (Manley 1993:149). The first excavation season did not utilize a baseline to record provenience (Manley 1993:150). Instead the hole's location was determined by counting the boards from the port side of *Maple Leaf*. The excavation hole for the 1988 season was located 22 boards to port.

Within the hole a crate containing a pair of leather shoes, a spigot, a rubber-coated sheet with grommets, seven nails and a straight edge as well as the box studied in this thesis were found. The box was removed from the crate in which it was found and taken to the surface to be opened under more controlled conditions (Keith Holland, personal communication 2004). The box containing the assemblage was intact with its lid tightly in place when it was excavated (Keith Holland, personal communication 2004).

After completion of that year's excavations, a large sheet of plywood was placed over the excavated area and covered with mud to maintain site integrity (Manley 1993: 150).

Artifact Assemblage

The SJA EI was composed of individuals with an interest in archaeology who later sought aid and assistance of professional archaeologists to assist in the excavation of *Maple Leaf*. The artifact collection was transferred to the State of Florida in its entirety for curation, and some artifacts have been loaned to individuals and institutions.

Table 3.1. Artifacts in studied assemblage

Artifact	SJAEI catalogue number	State of Florida catalogue number	Count
Box with lid	00177	95NS003.000177.0001	1
Ceramic jar with lid	00178	95NS003.000178.0001	1
Glass bottle with cork	00181	95NS003.000181.0001	1
Glass vessel	00179	95NS003.000179.0001	1
Marine sponge	00183	95NS003.000183.0001	1
Match block	00189	95A.047.000189.0001	78 total, 3 loose
Piece of rubber	00180	95NS003.000180.0001	1
Ceramic bowl	00182	95NS003.000182.0001	1
Tin dish	00184	none	1
Flat metal pieces	00185	none	3

I examined the assemblage in the fall of 2003. The box, sponge, and loose matches are curated by the State of Florida in the R.A. Gray Building, Tallahassee, Florida. The match block is located in the offices of Mosley, Warren, Prichard, and Parrish in Jacksonville, Florida. The remaining items are displayed in the Museum of Science and History in Jacksonville, Florida. Each artifact, when possible, was photographed, measured, and weighed by the author. Records from the State collections supplied by SJAEI concerning the assemblage have been reproduced as Appendix B.

The limited number of artifacts in the box assemblage allows each artifact to be presented individually. Measurements are presented in metric and English standard units. Each recovered artifact was stabilized for study and storage, and treatment procedures are included with the artifact description and picture later in this chapter.



Figure 3.2. Box with lid

Wooden Box with Lid (95NS003.000177.0001)

Dimensions:

Length: 14 in (35.56 cm)

Width: 8-5/8 in (21.9 cm)

Height: 5 in (12.7 cm)

Weight on examination in 2003: not available

Description:

The box has a removable lid and is beveled on three edges to fit into grooves on three sides of the box. The top was originally stamped "U.S. Sanitation Dept/Washington D.C." which was not visible upon examination in 2003. Iron nails which have since degraded originally held the box together. It could not be properly weighed in 2003 without threat of damage. The box was impregnated with various molecular weights of polyethylene glycol (PEG).



Figure 3.3. Ceramic Jar



Figure 3.4. Lid to ceramic jar

Ceramic Jar with Lid (95NS003.000178.0001)

Dimensions:

Body

Body Length: 4.9 in (12.5 cm)

Body Diameter: 3.62 in (9.2 cm)

Body Inner Diameter: 3.228 in (8.2 cm)

Body Weight on examination in 2003: 18.75 oz (532 g)

Lid

Lid diameter: 3.74 in (9.5 cm)

Lid thickness: .7 in (1.8cm)

Weight on examination in 2003: 4.4 oz (125 g)

Description

A white, refined earthenware jar with a crackled glaze and matching lid. There is no documentation concerning contents. The lid was repaired with methylcyanoacrylate after it had broken into three pieces. The artifact was washed with deionized water.



Figure 3.5. Glass bottle with cork.

Glass Bottle and Cork (95NS003.000181.0001)

Dimensions

Length: 5 in (12.8 cm)

Diameter at rim: 2.2 in (5.5 cm)

Diameter at base: 2.2 in (5.5 cm)

Weight on examination in 2003: 4.1 oz (116 g)

Description:

A glass bottle made from two molded pieces of clear glass joined along the sides. Its cork shrank, fell inside, and cannot be removed without damage. There is no documentation of bottle contents. The artifact was washed with deionized water.



Figure 3.6. Glass vessel

Glass Vessel (95NS003.000179.0001)

Dimensions

Length: 3.27 in (8.3 cm)

Diameter at rim: 7.28 in (18.5 cm)

Diameter at base: 2.17 in (5.5 cm)

Weight on examination in 2003: 3.95 oz (112 g)

Description:

A round, opaque, glass container without a lid. It has an overturned lip, no seam, and a small pontil on the bottom of the vessel. The artifact was washed with deionized water.



Figure 3.7. Marine sponge.

Marine Sponge (95NS003.000183.0001)

Dimensions:

Length: 2.6 in (6.7cm)

Width: 1.65 in (4.2 cm)

Height: 1.7 in (4.3 cm)

Weight after treatment: 4.4 g

Weight on examination in 2003: 3 g

Description:

A marine sponge, mottled brown in appearance. The sponge is extremely light and brittle. The artifact was washed with deionized water.



Figure 3.8. Block of matches, top view.



Figure 3.9. Block of matches, side view.

Matches, Block and Loose (95A.047.000189.0001)

Dimensions:

Length of block: 1.6 in (4 cm)

Width of block: .98 in (2.5 cm)

Height of block: 2.6 in (5.5 cm)

Weight on examination in 2003: 1.35 oz (38 g)

Description:

A match block made of a single piece of wood from an undetermined species. The block has been cross-cut to produce 98 matchsticks. The remaining matches have an unknown chemical residue on their tips, and the whole block is warped along its longitudinal sides. The artifact was treated with various molecular weights of PEG.



Figure 3.10. Piece of rubber.

Piece of rubber (95NS003.000180.0001)

Dimensions

Length: 8.8 in overall (22.5 cm)

Thickness: 1/4x3/8 in (.6x.95 cm)

Weight on examination in 2003: 0.85 oz (24 g)

Description:

A rubber strip made of a single piece of rubber with a 1/4x3/8-inch cross-section, tied with a single overhand knot. It was reportedly still pliable with good elasticity upon excavation, but in 2003 it was extremely brittle and hard. The artifact was washed with deionized water.



Figure 3.11. Ceramic bowl, top view.



Figure 3.12. Ceramic bowl, side view.

Bowl (95NS003.000182.0001)

Dimensions

Height: 2.3 in (6 cm)

Diameter at rim: 6.4 in (16.3 cm)

Diameter at base: 4.6 in (11.6 cm)

Weight on examination in 2003: 11.75 oz (333 g)

Description:

A small bowl of refined earthenware with a white glaze that has developed large cracks. The base is chipped. It is separated into two levels, upper and lower. The upper level has six $\frac{3}{16}$ inch holes surrounding one $\frac{3}{4}$ -inch hole in the center. The lower level is 1 inch deep and has a single small, rounded opening below the lip of the upper level. The two levels were joined together during firing. The artifact was washed with deionized water.

Small Tin Dish (00184) SJA EI Number

Description:

A small tin dish approximately 3 inches (7.62 cm) in diameter, which disintegrated in electrolytic reduction. There are no photographs or sketches of this artifact.

Flat Metal Pieces (00185) SJA EI Number

Description:

Some small, flat pieces of metal were recovered but disintegrated in electrolytic reduction treatment. There are no photographs or sketches of these artifacts.

Conservation Treatments

The conservation of the assemblage by SJA EI is important to understanding discrepancies between field documentation and examination in 2003. The assemblage was complete in 1988, but when examined in 2003, several artifacts were deteriorated or destroyed. It is important to note that the arguments presented in Chapter 4 utilize the previously intact collection, not necessarily the artifacts as they currently appear. A discussion of the various conservation treatments can be found in Appendix C.

Washing, bulking, electrolytic reduction, and adhesives characterize conservation treatments on this assemblage. The treatment most often utilized was washing the artifact with deionized water (Manley 1993:150). Brackish environments caused soluble salts to be dissolved within the matrix of the artifacts (Florian 1987:2). These salts, if not removed, form into crystals that can damage or destroy the integrity of an artifact (Florian 1987:22). To remove all salts from an artifact, a bath of water with little or no salts will, by diffusion, remove soluble salts from the matrix of an artifact (Jenssen 1987:122).

A bulking agent was used to treat wooden objects, such as the box and block of matches in this assemblage (Manley 1993:151). In an aqueous environment the insoluble cell walls of lignin fill with water when the soluble cellulose inside dissolves over time (Grattan and Clarke 1987). This makes wood look and feel as if it is in better condition than it actually is (Sease 1994:102). If untreated wood is allowed to dry out it can warp and crumble because its structure only consists of empty lignin cells (Sease 1994:102).

To prevent this, a bulking agent needs to be added to replace the missing cellulose and water (Grattan and Clarke 1987:165).

For wood artifacts SJA EI utilized polyethylene glycol (PEG) in various molecular weights as a bulking agent (Manley 1993:152). A freeze-drying process was also later employed over 60 days to dry artifacts at a slow, regulated pace to reduce chances of warping or splitting (Manley 1993:152). Composite artifacts were treated according to the dominant or most fragile material.

Electrolytic reduction was utilized for the tin dish and metal fragments to remove dissolved salts. This process utilizes electrical current in a solution of NaOH in water to force dissolved salts from a metal object (North 1987: 223-227). This process can damage or destroy the metal structure of an artifact if most of the metal has deteriorated, leaving only corrosion product holding the artifact together (North 1987: 223-227). All three metal pieces and the tin dish disintegrated in electrolytic reduction process making them unavailable for study in this thesis.

An adhesive, methylcyanoacrylate, was used to repair the broken lid of the ceramic jar. The cracking of the lid seems to have occurred after the jar was removed from the box.

Conclusion

This chapter has described the recovery of the Sanitary Commission box from the aft cargo hold of the U.S. Army Transport *Maple Leaf*. The assemblage studied came from a single provenience. The artifacts were in excellent condition, although the organic materials needed treatment and the metals were destroyed in conservation.

CHAPTER 4

ANALYSIS OF THE ASSEMBLAGE AND ITS POSSIBLE ASSOCIATIONS WITH THE SANITARY COMMISSION

In evaluating the composition and possible functions of the assemblage, the relationship between the box and the artifacts inside it is important. Three possibilities exist:

- 1). Neither the box nor its contents can be linked to the Sanitary Commission.
- 2). The box, but not its contents, originated in a Sanitary Commission distribution.
- 3). The Sanitary Commission sent the box and its contents to the brigade.

Because the box contains the rest of the assemblage, the origin of the box will be examined first. The excavators of SJAEI recorded “U.S. Sanitation Dept./Washington D.C.” marked on the lid of the box when it was recovered. Labeling was a common practice of the Sanitary Commission to help prevent theft (Livermore 1891:136). The original writing was eradicated by conservation treatment and was not visible in 2003. The U.S. Sanitary Commission was not a cabinet level department within the U.S. Government, and it did not use the title Department. All available historical documentation refers to a commission rather than a department, and it is reasonable to assume that it is the Sanitary Commission represented by the markings on the box lid.

There was another Sanitary Commission in the Civil War, the Western Sanitary Commission (Maxwell 1956). It was an unofficial organization based in St. Louis, Missouri, to service the western Union Armies (Maxwell 1956:182). The *Maple Leaf* box was stamped “Washington D.C.,” indicating that it came from the official Sanitary Commission located in Washington rather than the Western Sanitary Commission located in St. Louis. It is therefore reasonable to discard the first hypothesis and assume that the Sanitary Commission sent the box.

How the components of the assemblage came to be packed in the box and became cargo in *Maple Leaf* is related to the remaining hypotheses. One hypothesis states that the box

itself had been sent by the Sanitary Commission but was being used to transport other materials, possibly medical supplies from a field hospital, a soldier's personal items, or miscellaneous camp equipment. The second hypothesis states that the box and its contents were sent by the Sanitary Commission. In order to test these hypotheses, I analyzed the function of the artifacts. I separated this assemblage into two categories: containers for shipping and other items. The box, the ceramic jar and its lid, the glass bottle with cork were classified as containers for shipment. The jar with its lid fits into the box only if turned on its side, suggesting that its contents would not spill or be harmed by this position. The glass bottle could store a small amount of a substance kept sealed against leakage by its cork. The other items include an open glass vessel, a marine sponge, a block of matches, a rubber strip, and a ceramic bowl. The tin tray and three metal pieces destroyed in the conservation process will not be discussed in this thesis because no data is available about them. The box was filled close to its capacity by the artifact assemblage; it occupied approximately 70% of the available space in the box.

I have demonstrated why I believe the box came from the Sanitary Commission, but the artifacts discovered in the box lack comparable markings so a comparison of its contents with known medical kits is worthwhile. This assemblage probably does not represent a kit of materials specifically used for surgery. Surgeons usually had their own personal kit of surgical instruments that they owned themselves or were provided by the Army (Lord 1995:281). These kits contained knives, saws, surgical tourniquets, and other tools (Figure 4.1). The *Maple Leaf* assemblage does not contain any surgical tools, nor is it configured like a standard surgical kit. In addition few of the artifacts resemble personal belongings consistent with other *Maple Leaf* examples (Lord 1993).

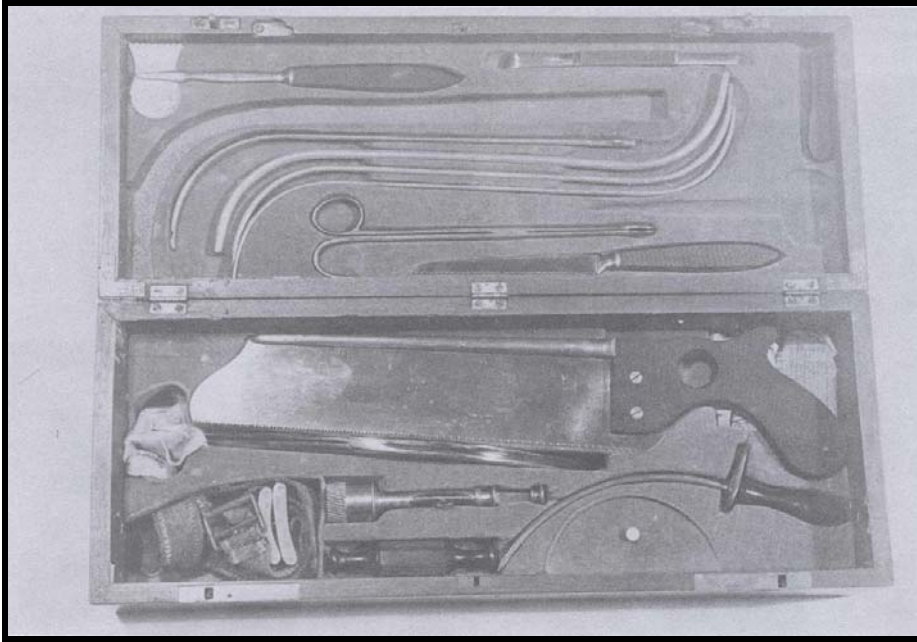


Figure 4.1. Surgeon's kit of equipment (from Lord 1995:186)

The artifacts are, however, consistent with the types of materials distributed by the Sanitary Commission (Table 4.1 and Appendix A). Table 4.1 provides a list of equipment that was sent back to Sanitary Commission offices from Jacksonville in February 1864 and documents the type of equipment that the Sanitary Commission was distributing. The third column indicates items present in the *Maple Leaf* assemblage with an X and artifact number or a question mark to indicate the item might be represented in the assemblage. The available evidence suggests that the second hypothesis is unlikely and that the Sanitary Commission probably sent the box and its contents to the brigade.

Table 4.1. Sanitary Commission supplies, Jacksonville, Florida, February 1864 (U.S. Sanitary Commission 1866b:325)

Items	In Stock	Items present in box
Bed sacks	582	
Pillow sacks	275	
Pillows	148	
Sheets	199	
Shirts	346	
Socks, pairs	306	

Table 4.1. (Continued)

Items	In Stock	Items present in box
Lint, bbls	2 ¼	
Bandages, bbls	6 ½	
Cloth pieces, bbls	6 ½	
Pillow cases	106	
Handkerchiefs	162	
Towels	648	
Slippers, pair	336	
Slings for wounded arms	39	
Cushions for wounded limbs, bbls	2	
Crackers, bbls	34 ¼	
Dried apples, bbls	6 ½	
Draweres, pairs	357	
Milk, cans	345	
Chocolat, lbs	30	
Corn starch, papers	262	
Farina, papers	141	
Stimulus, bottles	89	
Pickles, gallons	48	
Vegetables, bbls	25	
Tea, lbs	65	
Beef stock, lbs	297	
Tamarinds, quarts	24	
Tin cups	9	?, 00184
Tin basins	4	?, 00184
Sul. Morph., bottles	3	
Chloroform, 1 lb. Bottles	2	
Castile soap, lbs	33	
Quinine, bottles	2	
Ext. ginger, bottles	12	
Jellies, can	1	
Tomatoes, can	3	
Red pepper, ozs	4	
Blankets	267	
Sugar, lbs	20	
Coffee, cans	67	
Sponges	12	X, 95NS003.000183.0001
Peaches, cans	8	
Tourniquets	12	?, 95NS003.000180.0001

In evaluating the composition of the assemblage, its integrity is most important. The integrity of the assemblage is indicated by the condition of the box, found closed, with its lid in place, and buried under several feet of mud deposited since the wreck of *Maple Leaf*. Because the box was intact with a tight-fitting lid, it is unlikely that any objects were introduced or lost from the box (Figure 4.2 and 4.3). The lid did not prevent water or mud from entering the box, but it prevented larger objects from intruding. Because of this closed context, the contents may be examined to attempt to determine prior use.

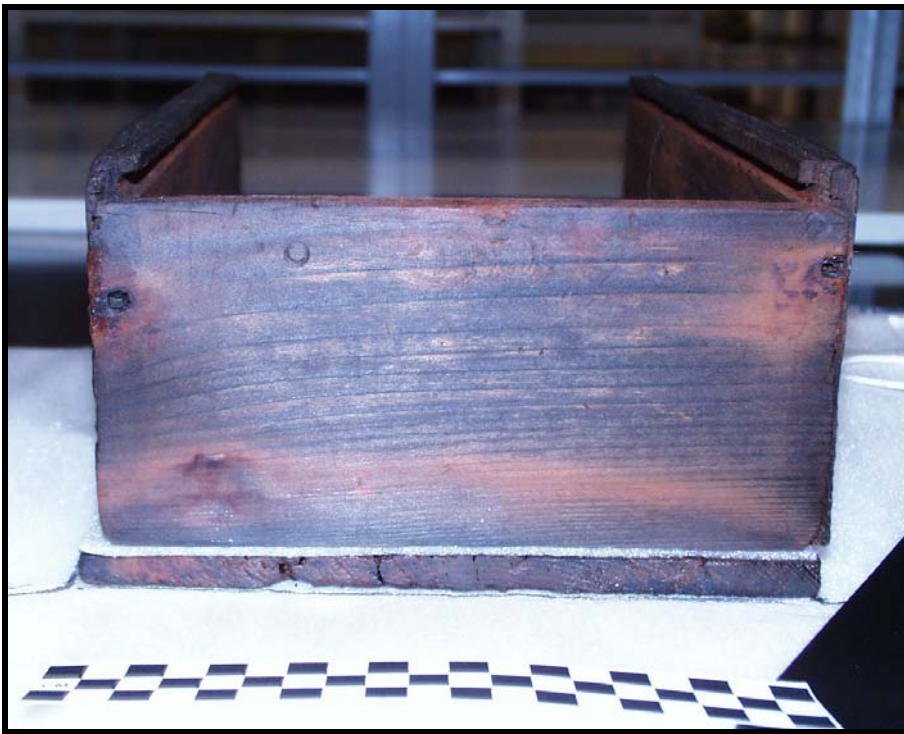


Figure 4.2. U.S. Sanitary Commission box, end view.



Figure 4.3. Lid of the U.S. Sanitary Commission box.

Three loose matches were found in the excavation of the box, indicating that the lid prevented even small artifacts from escaping. The block has 20 spaces for matches no longer present, only three of which are accounted for by the recovered matches (Figure 3.9). Because three loose matches remained in the box, I believe it is likely that the other 17 were used before the box was stored as otherwise they would have been found in the box upon excavation. It is therefore reasonable to conclude that the missing matches were removed prior to loading on *Maple Leaf*. Because the only evidence for use is that some of the matches were removed from the block, the available data make no further contribution to determining whether the contents of the box were used.

Conclusions

The hypotheses presented in this chapter concern the origin and possible use of this assemblage. The stamp on the lid of the box indicates that it probably came from the Sanitary Commission. The origin of other artifacts is less certain. Materials distributed by the Sanitary Commission in Jacksonville, and South Carolina, (Table 4.1 and

Appendix A) are similar to the types of artifacts present in this assemblage. Because of this similarity and the label on the box, I believe that the entire assemblage probably was sent by the Sanitary Commission. The intended use for these supplies is less certain because of the lack of residue in the storage containers, but some possibilities will be discussed in chapter 5.

CHAPTER 5

CONCLUSION

The previous chapters have examined the historical background and context of an artifact assemblage found in the cargo hold of the U.S. Army Transport *Maple Leaf*. After analyzing the assemblage it has been established that the entire assemblage likely was distributed by the Sanitary Commission to the brigade *Maple Leaf* transported. It is not possible to assign specific functions to the components of the assemblage, but functions consistent with Sanitary Commission practices can be identified. This assemblage provides a physical link between the Sanitary Commission and Army surgeons and helps to contextualize the exposure of Army surgeons to Sanitary Commission recommendations. These data and interpretations can now be placed in perspective through a consideration of Thomas Kuhn's theory of scientific revolutions to help understand the development of scientific thought with respect to medical processes in the later nineteenth century.

Possible Functions of the Assemblage

To understand the relationship of this assemblage to sanitary practices and to the nature of scientific change, one must consider how the artifacts were used. Original documentation of the configuration of the artifacts within the box was not available for study. The size of the box meant that the ceramic jar had to be placed on its side to fit in the box with its lid closed. It is unlikely that it contained a liquid because its lid does not make a sufficiently tight seal to prevent leakage while on its side. There was no documentation discussing the contents of the ceramic jar. It is unlikely that it contained bandages considering the excellent preservation of organic remains found on *Maple Leaf* and the lack of materials recovered from inside the jar. The glass bottle probably held approximately 1.5 fl ounces (44.6 ml) of a liquid or powder because its cork made a tight seal. Sanitary Commission documents rarely mention specific amounts of disinfectants or

other medicines, which were usually transported in bottles (Table 4.1 and Appendix A). The bottle may have held an anesthetic or liquid disinfectant to clean wounds or equipment. These types of bottles were used to hold anything from morphine to pepper in the Civil War (Lord 1995:12).

The glass vessel may have been a drinking vessel to administer medicine. Many of the administered medicines were not yet in pill form and had to be stirred in water and taken orally (Johnson 1917:130). The glass vessel could also have been used for temporary storage of a liquid or solution for immediate use or perhaps employed for the practice of cupping.

Cupping was another method for drawing blood which was also used to “draw” boils or other surface eruptions. A cup was heated by dropping burning material into it, its lip was greased, and the cup was then inverted over a scarified point on the skin. The cup developed suction as the burning material consumed the oxygen, and blood or pus was drawn through the skin opening. [McGrew 1985:33]

In Army medicine, sponges often were used to soak up liquids or blood from wounds or to apply liquids to other surfaces. After the war, surgeon W.W. Keen commented on the lack of sanitation when using sponges:

We used undisinfected instruments from undisinfected plush-lined cases, and still worse used marine sponges which had been used in prior pus cases and had been only washed in tap water. If a sponge or an instrument fell on the floor it was washed and squeezed in a basin of tap water and used as if it were clean. [Adams 1985:127]

Another common use for sponges in the Civil War was the application of inhaled anesthetics (Bynum 1994:121). A sponge was soaked in ether and placed over a patient's mouth and the gas inhaled, producing a general anesthetic effect allowing for major surgeries to be performed relatively painlessly (Bynum 1994:121). The fused, two-part bowl with drain holes may be related to such practices although understanding its purpose is difficult because there are few examples of similar, contemporary bowls. The bowl was probably used as a resting place for something wet to drain into the bowl because a liquid could drip through the holes in the upper level and be captured in the

bowl of the lower level. The liquid could then be poured out from the hole on the side of the bowl. The U.S. Civil War Medical Museum in Fredrick, Maryland, has been contacted about the bowl, but they were also unable to identify the bowl or its function.

The block of matches is similar to the type of matches used by individual persons at home or in camp settings (Figure 4.3). The matches are not the same type used by other army occupations, such as the artillery. Those matches were larger with more chemicals on the tip (Lord 1995:114).

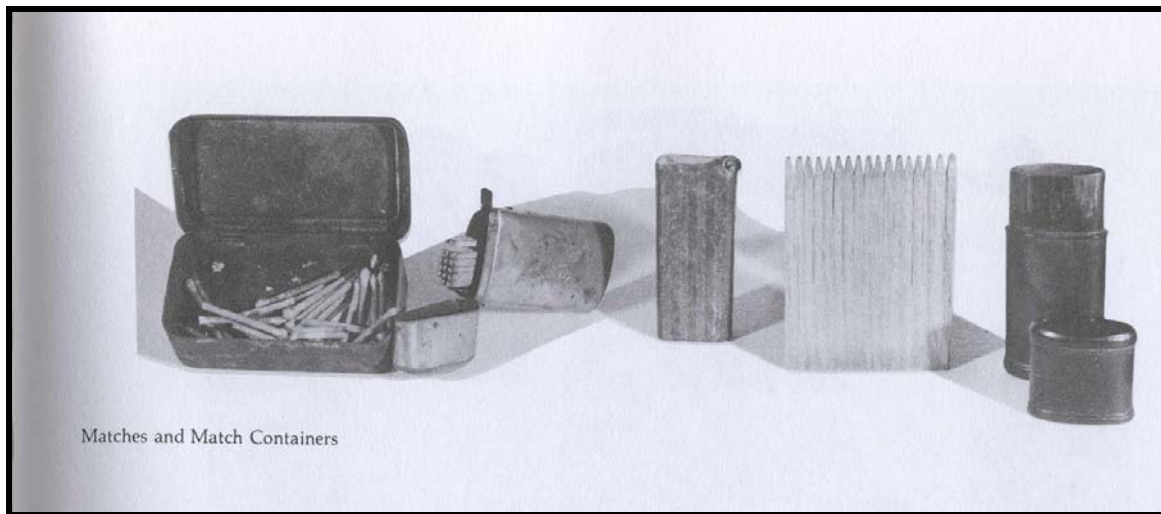


Figure 5.1. Common personal matches and containers (from Lord 1995:115).

Original field documentation identified the piece of rubber as a tourniquet, but this identification is problematic. Tourniquets were widely used in Civil War medicine as a means of slowing or stopping blood flow to an injured limb (Adams 1985:123). A surgical tourniquet commonly was a piece of cloth with a buckle and tightening device to completely cut off blood flow to a limb (Figure 5.2) (Chisolm 1864:210). Most surgeons' kits, both military and personal, were equipped with a surgical tourniquet to facilitate amputations (Lord 1995:281). There were also elastic rubber catheters in surgeons' kits to facilitate ventilating a patient (Lord 1995:220). These catheters were hollow, and the elastic piece of rubber recovered is solid, indicating that it was not likely a catheter.

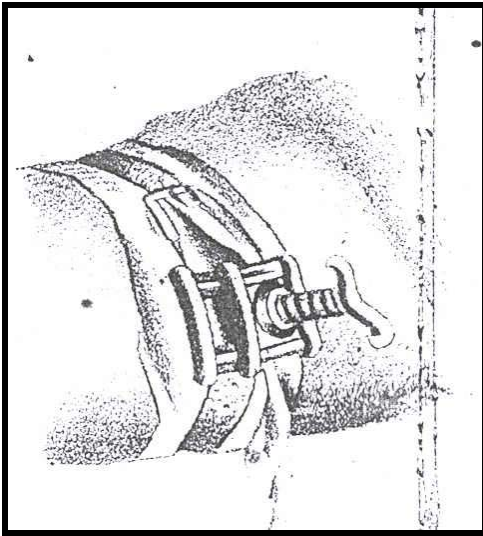


Figure 5.2. Surgical Tourniquet (Chisolm 1864:plate 14).

This piece of rubber may be a different type of tourniquet, one that restricts but does not cut off blood flow. Tourniquets of this type were often used to help “find a vein” for injection or bloodletting (McGrew 1985:33). There is not much evidence for the use of rubber tourniquets in the Civil War because most contemporary literature about tourniquets concerns amputation.

The tin tray and three flat metal pieces were not available for study; their potential uses will not be addressed. The round tin dish was three inches in diameter, but there is no indication of the height of its sides or thickness. There are supply lists indicating tin trays and plates from the Sanitary Commission, (Appendix A), but without documentation, any conclusion concerning function would be speculation. The flat metal pieces are not described in any detail. Without direct examination of the metal pieces or tray, and without an image, assigning a function to them is impossible.

Scientific Development and Morals

The assemblage recovered from *Maple Leaf* provides an example of the types of artifacts that the Sanitary Commission distributed to troops and hospitals in the field. Through the efforts of the Sanitary Commission, moral values of cleanliness and diet were forced onto scientific medical professionals by the use of sanitary practices. The

military hierarchy of the Union Army had no vested interest in any specific medical paradigm; its interest lay in victory on the battlefield. For victory to be insured soldiers needed to arrive at a battle with the ability to fight and with sufficient morale to confront the enemy. Soldiers also needed to be able to return to service as soon as possible after a relatively minor wound.

The medical community was opposed to these new procedures and practices because they lacked scientific basis. The current medical paradigm during the Civil War could not explain why sanitary practices reduced disease and death. The bacteriological cause of infection and disease was not known before the advent of germ theory. The Sanitary Commission wanted odor-causing wound infections cleaned to remove offensive odors. Conventional surgeons saw this practice as merely cosmetic rather than serving a medical purpose because the Sanitary Commission proposed its sanitary practices to eliminate odor, not to better heal wounds. The new techniques did not remain in use after the war because they were not grounded in science. Forced adoption by the Army caused short-term changes in sanitation and health practices, but doctors did not continue to employ Sanitary Commission methods. It was only after a change in ideology that the same practices were used. The medical community at large again adopted many of the same practices after the acceptance of germ theory. The underlying understanding of bacteria and its interaction with disease transmission was the primary difference between practices of sanitation in the Civil War and those utilized after the advent of germ theory.

The works of Thomas Kuhn describe radical paradigm shifts, or scientific revolutions, that drastically alter the very basis of scientific thought (Kuhn 2000:14). Scientific revolutions occur when an existing theoretical paradigm is supplanted by a new paradigm that better describes phenomena. Without sufficient support, radical shifts in ideology usually are not accepted by the community at large (Gluckman 1968:231). Under normal scientific circumstances, technological and practical change is directly tied to the current accepted paradigm (Hoyningen-Huene 1992:493). The actions of the military during the Civil War permitted sanitary concerns of the Sanitary Commission to circumvent normal scientific processes and force new sanitary practices on the medical community before a shift in paradigms made the cause of their effectiveness known. Despite success in treatment of wounds by following recommendations to remove odors,

doctors returned to traditional practices until the new paradigm of germ theory replaced the ideas current in the Civil War. The *Maple Leaf* assemblage offers a way to contextualize the changing sanitation practices during the Civil War, reconstructed through historical records and interpreted by using Kuhn's framework.

APPENDIX A

SANITARY COMMISSION SUPPLIES OF SOUTH CAROLINA, 1863

Table A.1. Receipts and Issues in the Department of South Carolina, 1863 (U.S. Sanitary Commission 1866:241-242).

Item	Received	Issued	In Store	In Assemblage
Cotton shirts	4,900	4,544	356	
Woolen shirts	5,758	3,534	2224	
Cotton drawers	3,163	3,013	150	
Cotton flannel drawers	568	406	162	
Woolen flannel drawers	2,676	1,552	1124	
Cotton socks	2,107	1,890	217	
Woolen socks	3,532	1,271	2261	
Slippers	2,736	2,499	237	
Wrappers	1,089	789	330	
Handkerchiefs	9,154	6,814	2340	
Outside clothing (boxes)	6	5	1	
Bed-sacks	1,472	1,350	122	
Pillow ticks	1,888	1,517	371	
Pillows	1,263	1,118	145	
Pillow cases	3,206	2,396	610	
Sheets	2,859	2,531	326	
Blankets	701	435	206	
Quilts	712	682	20	
Towels	9,776	7,106	2670	
Cushions	2,213	2,023	190	
Lint (bbls)	39	32	7	
Bandages (bbls)	34	31	3	
Old cotton	112	91	21	
Groceries, miscellaneous (lbs)	104	104	0	
Beef-stock (lbs)	3,629	2,885	744	
Dried fruit (bbls)	70	63	7	
Dried apples (bbls)	87	82	5	
Green apples (bbls)	209	209	0	
Ale (bbls)	5	5	0	
Crackers (bbls)	392	330 ½	61 ½	
Sugar, white (bbls)	34 ½	32 ½	2	
Vinegar (bbls)	36	30	6	
Cabbage in currie (bbls)	255	253	2	
Onions (bbls)	219	217	2	
Pickles (bbls)	119	107	2	
Jellies and preservers (boxes)	65	63	2	
Domestic wine (boxes)	70	63	7	
Foreign wine (bottls.)	619	583	36	

Item	Received	Issued	In Store	In Assemblage
Brandy (bottls.)	612	542	70	
Whisky (bottls.)	638	566	72	
Berry, cordial (bottls.)	582	526	56	
Berry, shrub (bottls.)	324	300	24	
Cherry brandy (bottls.)	484	472	12	
Blackberry brandy (bottls.)	184	184	0	
Lemons (boxes)	40	40	0	
Conct. Lemon (boxes)	6	6	0	
Cider (cases)	16	15	1	
Syrups (boxes)	4	3	1	
Ext. ginger	15	13	2	
Ext. ginger (bbls)	2	2	0	
Arrow root (lbs)	225	182	43	
Apple butter (galls)	60	57	3	
Beef-stock (lbs)	3,629	2,885	744	
Butter (lbs)	375	355	20	
Broma (lbs)	216	192	24	
Candles (lbs)	108	81	27	
Cheese (lbs)	135	115	20	
Cocoa (lbs)	400	359	41	
Chocolate (lbs)	1,400	920	480	
Coffee (lbs)	1,452	1,071	381	
Conds. Milk (lbs)	4,002	3,170	832	
Corn starch (lbs)	2,150	1,366	784	
Tapioca (lbs)	100	100	0	
Farina (lbs)	2,300	1,436	864	
Ext. ginger (boxes)	15	13	2	
Ext. ginger (barrels)	2	2	0	
Cider (cases)	16	15	1	
Gelatine (boxes)	10	8	2	
Nutmegs (lbs)	2	2	0	
Oat meal (lbs)	150	150	0	
Tea (lbs)	560	510	50	
Tomatoes (boxes)	107	101	6	
Tomatoes, fresh (bushels)	50	50	0	
Fish, preserved (lbs)	5,000	5,000	0	
Mustard (lbs)	25	22	3	
Tamarinds (bbls)	10	10	0	
Lemons (boxes)	40	40	0	
Lemons, concent. (boxes)	6	6	0	
Oranges (bbls)	70	70	0	
Hospital utensils (doz.)	12	12	0	
Alcohol (galls)	10	7	3	
Bay rum and Cologne (botts)	200	180	20	?

Item	Received	Issued	In Store	In Assemblage
Fans	2,000	2,000	0	
Corabs (gross)	10	6	4	
Lanterns	26	22	4	
Sponges (lbs)	8	5	3	x
Tin cups	1,705	1,693	12	?
Tin pans or basins	804	729	12	?
Tin plates	925	920	5	?
Tin spoons	1,000	978	22	
Flannel bandages	2,236	1,911	325	
Lime and Disf. Agents (bbls)	8	4	4	?
Pipes (box)	1	1	0	
Tobacco, papers (doz)	205	205	0	
Reading matter (boxes)	6	6	0	
Ice (tons)	390	300	90	
Quinine (ozs)	62	29	33	?
Morphine (ozs)	3	319	53	?
Chloroform (lbs)	25	22	3	?
Tannin (ozs)	6	6	0	
Liq. Ferri Nitratis (lbs)	55	44	11	
Mosquito Netting (pieces)	60	60	0	
Eggs (doz)	79	79	0	
Egg nog (boxes)	2	2	0	
Oil silk	70	36	34	
Rubber cloth	63	35	23	
Miscellaneous (boxes)	70	69	1	
Hops (barrels)	2	1	1	
Fresh garden vegetables	15	15	0	
Potatoes	354	354	0	

APPENDIX: B

FACSIMILES OF ARTIFACT DOCUMENTATION FROM THE STATE OF FLORIDA

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

C *

Box Disinfectant

Artifact Number: 00177 Description: Disinfectant Box

Material: Wood M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience: 22 Boards to Port, at Center of Hole, 2' Deep

Comments: All artifacts came out of wood crate #00175.

Dimensions:

Photo Roll # Before Treatment: Weight Before Treatment:

Narrative Condition Analysis:

Conservation Code: FD

Conservation Procedure: Treatment procedure for wood; Stored in water and 10% solution of Polyethylene Glycol (PEG), until PEG vats are available. Soft wood will be in each different vat of PEG for 90 days and hard wood will be in each vat for 60 days. The artifact will go through 4 different solutions; PEG400 at 25%, PEG400 at 50%, PEG1000 at 25%, and PEG1000 at 50%. At the end of the last vat the item will be weighed, wrapped in handy wrap, and then frozen for 48 hours. The plastic wrap is then removed and the item

Detailed Description of Artifact: Writing on top of Box "U.S. Sanitation DEPT. / WASHINGTON D.C." Items 00176, 00179, 00180, 00181, 00182, 00183, 00184, 00185, 00189 all came out of this Box. The box is 14" long x 8 5/8" wide x 5" tall, the top slide open and closed in grooves along the top

ARTIFACT ANALYSIS

ARTIFACT NUMBER:

ARTIFACT NUMBER: 00177

CATEGORY:

RECOVERY NUMBER:

CLASS:

PROVENIENCE:

TYPE:

LOCATION:

MILITARY/CIVILIAN -- CIRCLE

RECORDER: TOM PARHAM

DATE: 9-23-92

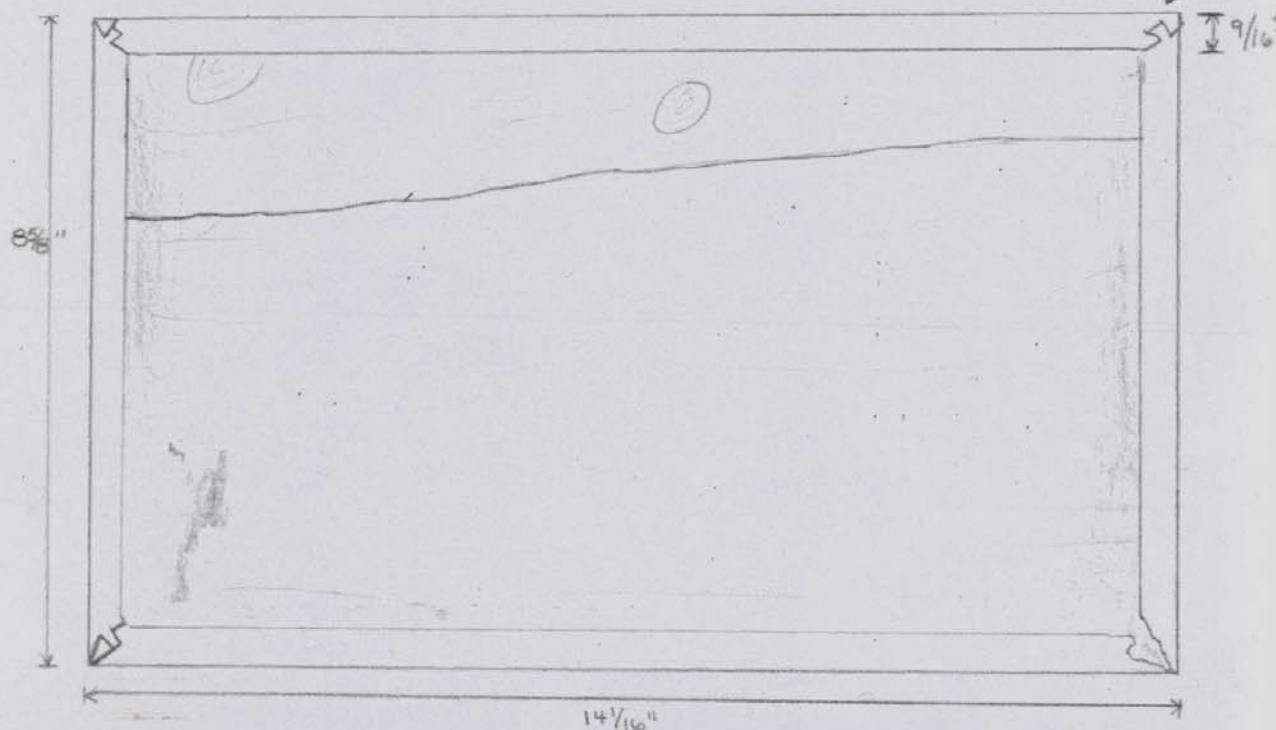
MATERIAL:

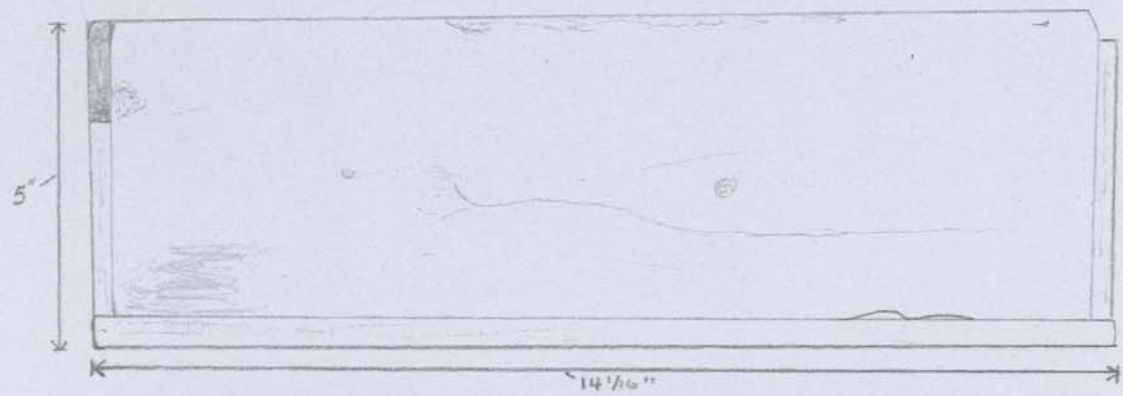
DESCRIPTION/CONDITION: U.S. SANITARY COMMISSION BOX. STENCIL HAS FADED +
DISAPPEARED DUE TO PRESERVATIVE (PEG). SOME EROSION,
BUT BOX IS COMPLETE.

WEIGHT: Grams

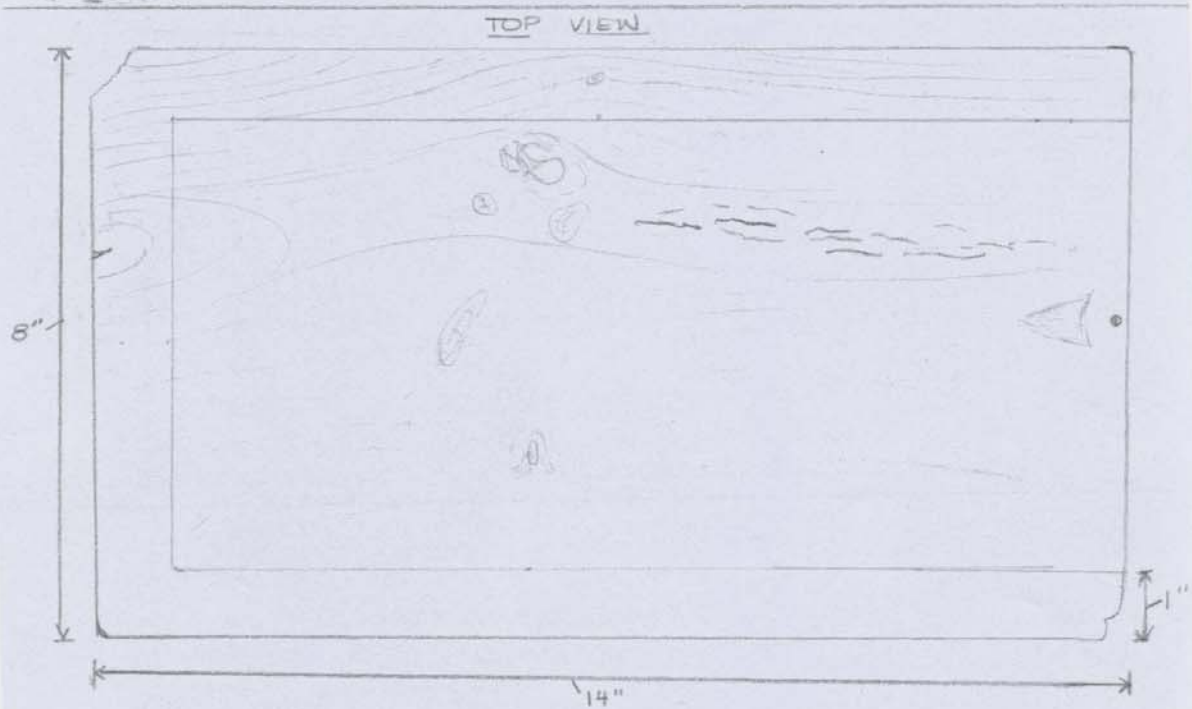
DRAWING (Measurements in millimeters and inches)

SEE REVERSE →

TOP VIEW
(LID REMOVED)NOTE GROOVED
CONSTRUCTION



SIDE VIEW



SIDE VIEW



{ NOTE: EDGES OF LID ARE BEVELLED. EDGES ARE BEGINNING TO CURVE, AS A RESULT OF BEING SATURATED WITH PEG PRESERVATIVE. }

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

MOSH *

Artifact Number: 00178 Description: Jar with Lid

Material: Porcelain M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Dimensions: 5 1/4", Base 3 5/8"

Photo Roll # Before Treatment: 9 Weight Before Treatment:

Narrative Condition Analysis: *Good*

Conservation Code...: W

Conservation Procedure: Treatment for artifacts only requiring washing; Many items only require a good fresh water wash because they have not become water logged or have not absorbed any chloride in them. We have found this can encompass anything from metal, wood, porcelain, to rubber, glass, and many other different materials. The wash may require some mechanical cleaning and use of soap also. The items treated in this manner are being closely watched for any deterioration.

Detailed Description of Artifact: White cylindrical with lid. Cracked glaze. Lid is cracked in 3 places. Jar is 5/16" thick with a 3/8" neck, and a 3 3/16" opening. Lid is 3/16" thick.

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

mosH*

Artifact Number: 00179 Description: ^{Glass} Beaker

Material: Glass M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Dimensions: 3 1/4", Base diameter 2"

Photo Roll # Before Treatment: 2 Weight Before Treatment:

Narrative Condition Analysis: *Good*

Conservation Code...: W

Conservation Procedure:

Detailed Description of Artifact: Clear with graphite pontil. Has an inward rolled flared lip with a 2 3/4" opening. Has no mold seam.

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

MOSH *

Artifact Number: 00180 Description: Tourniquet

Material: Rubber M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Dimensions: 9", 1/4" x 3/8"

Photo Roll # Before Treatment: 17 Weight Before Treatment:

Narrative Condition Analysis: Good

Conservation Code...: W

Conservation Procedure: Treatment for artifacts only requiring washing; Many items only require a good fresh water wash because they have not become water logged or have not absorbed any chloride in them. We have found this can encompass anything from metal, wood, porcelain, to rubber, glass, and many other different materials. The wash may require some mechanical cleaning and use of soap also. The items treated in this manner are being closely watched for any deterioration.

Detailed Description of Artifact: Has single knot tied 4" from one end/ 4 3/4" from other end. Rectangular.

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

Mosk *

Artifact Number: 00181 Description: Bottle with Cork

Material: Glass M2: Cork M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Dimensions: 5 1/16", Base 2 1/8"

Photo Roll # Before Treatment: 2 Weight Before Treatment:

Narrative Condition Analysis: *Good*

Conservation Code...: W

Conservation Procedure:

Detailed Description of Artifact: Clear with visible two-piece mold seam.
Has 5/8" neck with a balled lip. Has 1 1/2" opening. Has no pontil.

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

MOSH *

Artifact Number: 00182 Description: Bowl similar to a Cuspidor

Material: Porcelain M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience: 22 Boards to Port, at Center of Hole, 2' Deep

Comments: All artifacts came out of wood crate #00176.

Dimensions: 2 1/4", Base diameter 2 5/8"

Photo Roll # Before Treatment: 3 Weight Before Treatment:

Narrative Condition Analysis: *Good*

Conservation Code...: W

Conservation Procedure: Treatment for artifacts only requiring washing; Many items only require a good fresh water wash because they have not become water logged or have not absorbed any chloride in them. We have found this can encompass anything from metal, wood, porcelain, to rubber, glass, and many other different materials. The wash may require some mechanical cleaning and use of soap also. The items treated in this manner are being closely watched for any deterioration.

Detailed Description of Artifact: Porcelain, cracked. Has an outward rolled lip with 3 1/4" opening. Has two levels. Top level is 1 1/4" deep, has six 3/16" holes surrounding a larger 3/4" opening. Top level is 3/16" thick. Lower level is 1" deep. On outside encircling bowl is a 1 1/4" x 1" petal design; 1/2" x 5/8" opening for spout where cotton or a filter is placed.

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

*

Artifact Number: 00183 Description: Sponge

Material: Sponge M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Dimensions: 2 7/8" x 2 1/4" x 1 1/4"

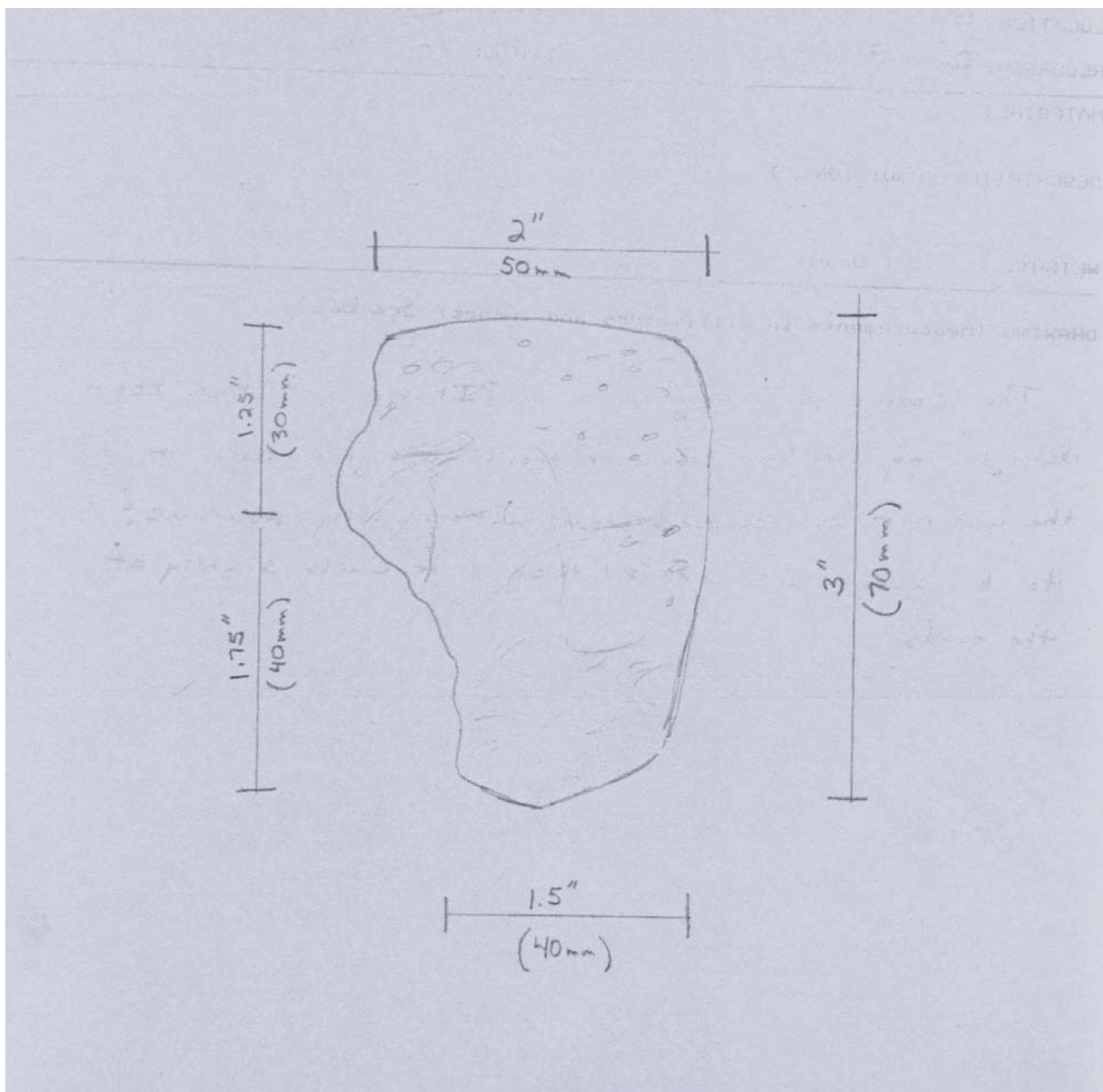
Photo Roll # Before Treatment: 14 Weight Before Treatment:

Narrative Condition Analysis: Good

Conservation Code...: W

Conservation Procedure: Treatment for artifacts only requiring washing; Many items only require a good fresh water wash because they have not become water logged or have not absorbed any chloride in them. We have found this can encompass anything from metal, wood, porcelain, to rubber, glass, and many other different materials. The wash may require some mechanical cleaning and use of soap also. The items treated in this manner are being closely watched for any deterioration.

Detailed Description of Artifact: Natural. Dark brown. 1 1/4" thick at widest point.



Page 1

St. Johns
Archaeological Expeditions, Inc.

Artifact Number : 00184	Recovery Number: 25
Category #: 4	Category Description: federal
Description: Dish, small	
Material: Tin	M2: M3:
Date found: 6/26/88	
Diver 1 Sheet: 4	Diver 2 Sheet: 4
Diver 1 Code : 007	Diver 2 Code : 002
Diver 1 Name : Holland	Diver 2 Name : Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Regiment: Company:
Owner.... Last Name: Unknown First Name: Middle Int:

Conservation Code...: EL

Conservation Procedure: Treatment procedure for metal; Stored in water until EL tank is available. The item is first mechanically cleaned of all encrustations that can be removed without damaging the item. It then goes into the electrolysis tank. We are at present using a solution of NaOH at 2% and distilled water for our electrolyte. They are taken out periodical and cleaned some more, and then inspected. The time in EL depends on several variables which are the type of metal, size, amount of encrustation on the item, and the amount of chloride in the item. After the third stage in EL it is then placed into a fresh water electrolysis bath to remove the NaOH. From here it is immersed into a 99% solution of alcohol to accelerate water removal. When removed from the alcohol bath the artifact is ready to be coated with tannic acid or micro crystalin wax. At this point they are ready to be reassembled and have a detailed analysis of use and construction.

Disposition #: 1 Disposition: Maple Leaf Conservatory
Location: LIC

Detailed Description of Artifact: Small round tin iron dish.

Conservation Record: In October 15, 1988, this item was placed in electrolysis and October 16, 1988 the plate was lost in electrolysis.

Weight Before Treatment:

Dimensions: 3 " in diameter

Photo Roll # Before Treatment:

Dimesnions After Treatment:

Weight After Treatment:

Photo Roll # After Treatment:

Narrative Condition Analysis: Item is a small tin iron dish. The original size is approximately three inches in diameter. It is possible this aritfact will not survive electrolysis.

Observations: Evidently, there was not enough metal in this plate to withstand electrolysis. In the future, an item this brittle should be coated and not placed in electrolysis.

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

LIC *

Artifact Number: 00185 Description: Flat Pieces

Material: Tin M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience 22 Boards to Port, at Center of Hole, 2' Deep

Comments All artifacts came out of wood crate #00176.

Dimensions:

Photo Roll # Before Treatment: Weight Before Treatment:

Narrative Condition Analysis:

Conservation Code...: EL

Conservation Procedure:

Detailed Description of Artifact:

St. Johns Archaeological Expeditions, Inc.
Condition Report One
Artifact Inventory

TMS *

Artifact Number: 00189 Description: Matches Block

Material: Wood M2: M3:

Category #: Category Description:

Recovery Number: 25 Date found: 6/26/88

Diver 1 Sheet: 4 Diver 1 Code: 007 Diver 1 Name: Holland

Diver 2 Sheet: 4 Diver 2 Code: 002 Diver 2 Name: Manley

Provenience: 22 Boards to Port, at Center of Hole, 2' Deep

Comments: All artifacts came out of wood crate #00176.

Dimensions: 2" x 1 5/8" x 1"

Photo Roll # Before Treatment: 17 Weight Before Treatment:

Narrative Condition Analysis: *Good*

Conservation Code...: FD

Conservation Procedure: Treatment procedure for wood; Stored in water and 10% solution of Polyethylene Glycol (PEG), until PEG vats are available. Soft wood will be in each different vat of PEG for 90 days and hard wood will be in each vat for 60 days. The artifact will go through 4 different solutions; PEG400 at 25%, PEG400 at 50%, PEG1000 at 25%, and PEG1000 at 50%. At the end of the last vat the item will be weighed, wrapped in handy wrap, and then frozen for 48 hours. The plastic wrap is then removed and the item

Detailed Description of Artifact: Rectangular. Has remnants of sulfur. Has 3 loose matches. Is missing others. 85 matches left. Match length is 1 1/2" with 1/2" base.

ARTIFACT NUMBER	DESCRIPTION	NARRATIVE DESCRIPTION
00153	Hook	for chin strap on forage cap.
00154	Fastener	1/16" thick. Hook section is 1/2" long and 1/8" wide. 1/8" diameter, sides are 1 1/2" forming a triangle. Item was used for a connector on a kacksack.
00155	Suspenders hinge	Hook section is missing. Widest opening is 1 3/8". Opening at hinge section is 7/8". Handle is less than 1/16" thick but is 3/16" wide and has vine design on one side and on the other is "PATENT 1855".
00156	Tobacco Tins	Many pieces of varying size. One reads "W. GAIL & AX'S TALISMAN TOBACCO No. 28 BALTIMORE". Another has a picture of grapes and a barrel along with "FINE CUT CHEWING TOBACCO/NATIVE/FLAVOR". Another piece has the picture of a plantation.
00157	Hinges (4)	Two pieces to each hinge. Each has three 1/4" openings for attachment. Some corrosion. Three of them have "3" etched in the middle above an opening.
00158	Screws Wood (19)	Some corrosion. Head is 3/8" in diameter. Wood screws 1 1/2" x #10.
00159	Bundle of Nails	Approx. 44. Range of sizes from 1 3/4" to 3/4".
00160	Shoe Sole	One sole is in pieces with some leather from the shoe. Found Inspectors mark on one piece of leather, "E. BRADLEY/INSPECTOR/NEW YORK."
00161	Assorted Straps	
00162	Brush shoe	2 pieces. Broken at hole end. Rounded at edges. Has circular design of approx. 1/4" holes (24 of them) at one end. One still contains pieces of brush bristles.
00163	Straight Edge	Has crescents on each end at 20 degree curve. Possibly some type of drawing aid.
00164	Picture Frame and Glass	Glass has imprint of oval. Gold frame is decorated florally with poinsettia type flowers at each corner. There are 2 pieces of glass and the frame is in 4 pieces. Oval opening is 1 1/2" x 2". Back piece of glass still has a faint image of a woman.
00176	Crate	Two sides 18 1/4" x 12", two ends 12 1/4" x 11 1/2", bottom piece is 18 1/4" x 14". Items were recovered from this crate and then the crate was brought up.
00177	Box Disinfectant	Writing on top of the box "U.S. SANITATION DEPT. / WASHINGTON D.C." Item's 00178, 00179, 00180, 00181, 00182, 00183, 00184, 00185, 00189 all came out of this box. The box is 14" long x 8 5/8" wide x 5" tall. The top slides open and close in grooves along the top.
00178	Jar with Lid	White cylindrical with lid. Cracked glaze. Lid is cracked in 3 places. Jar is 5/16" thick with a 3/8" neck, and a 3 3/16" opening. Lid is 3/16" thick.
00179	Glass	Clear with graphite pontil. Has an inward rolled flared lip with a 2 3/4" opening. Has no mold seam.
00180	Tourniquet	Has single knot tied 4" from one end/ 4 3/4" from other end. Rectangular.
00181	Bottle with Cork	Clear with visible two-piece mold seam. Has 5/8" neck with a balled lip. Has 1 1/2" opening. Has no pontil.
00182	Bowl similar to a Cuspidor	Porcelain, cracked. Has an outward rolled lip with 3 1/4" opening. Has two levels. Top level is 1 1/4" deep, has six 3/16" holes surrounding a larger 3/4" opening. Top level is 3/16" thick. Lower level is 1" deep. On outside encircling bowl is a 1 1/4" x 1" petal design;

APPENDIX C

DISCUSSION OF CONSERVATION PRACTICES

Conservation treatment of artifacts recovered from aqueous environments is a field of intense study and discussion. Treatments used on this assemblage have been listed and described in Chapter 3.

The most widely used treatment was washing an artifact with deionized water to remove soluble salts. Readings to determine the salinity of the water during this process were not taken and it is unknown if the artifacts were washed or placed in a bath. Without knowing the amount of salts being removed from an artifact it is impossible to know for certain when enough salts have been removed to allow it to dry (Jenssen 1987:122). One standard duration for the baths does not work; each artifact will diffuse salts at different rates. Retention of salts may be the cause for some cracks present in the glaze of the ceramic artifacts upon examination in 2003.

Treatment of wood with polyethylene glycol (PEG) is an accepted and widely used treatment for waterlogged wood and other organics (Grattan 1988:239-240). PEG has some properties that must be taken into account when devising an appropriate treatment for organics. It is widely known throughout the conservation community that PEG will disintegrate iron if it is part of a composite artifact. Treating the box with PEG disintegrated the iron nails holding it together giving it the appearance in 2003 of falling apart (Figure 3.2). These nails should have been removed before treatment and stabilized separately according to their own properties. The match block also exhibited some weeping of PEG upon examination in 2003. The block was tacky to the touch and stuck to the glass shelf where it was displayed. This is indicative of too high a concentration of PEG within the matrix of an artifact. The artifact cannot retain the entire amount of PEG and will start to seep out (Grattan 1988:247).

The most destructive side effect of these conservation treatments was the disintegration of four artifacts, three flat metal fragments and the tin tray. As stated in

chapter 3 electrolytic reduction can damage weaker metals, and there are other alternatives that are less destructive. A process of immersion in deionized water and boiling would have removed soluble salts without damage to the integrity of the artifact (North 1987:216-217). The disintegration of these artifacts in electrolysis probably indicates that there was not much metal remaining to be conserved. All artifacts should be sketched or photographed and recorded prior to a treatment that could result in their destruction.

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BIOGRAPHICAL SKETCH

I was born in St. Louis, Missouri where he attended Catholic primary and Secondary Schools. I enlisted for four years in the U.S. Navy became an operations specialist on the U.S.S. Blue Ridge home ported in Yokosuka, Japan. I then attended Florida State University and earned a Bachelor's degree in Anthropology with a minor in Classics. I primarily studied Underwater Archaeology with a concentration in historic shipwrecks. I Remained at FSU to earn a Master's degree in Anthropology.