A COMPARISON OF EXCAVATION METHODS BETWEEN THE WAR EAGLE AND BERTRAND STEAMBOATS

ASHLEY MARQUARDT

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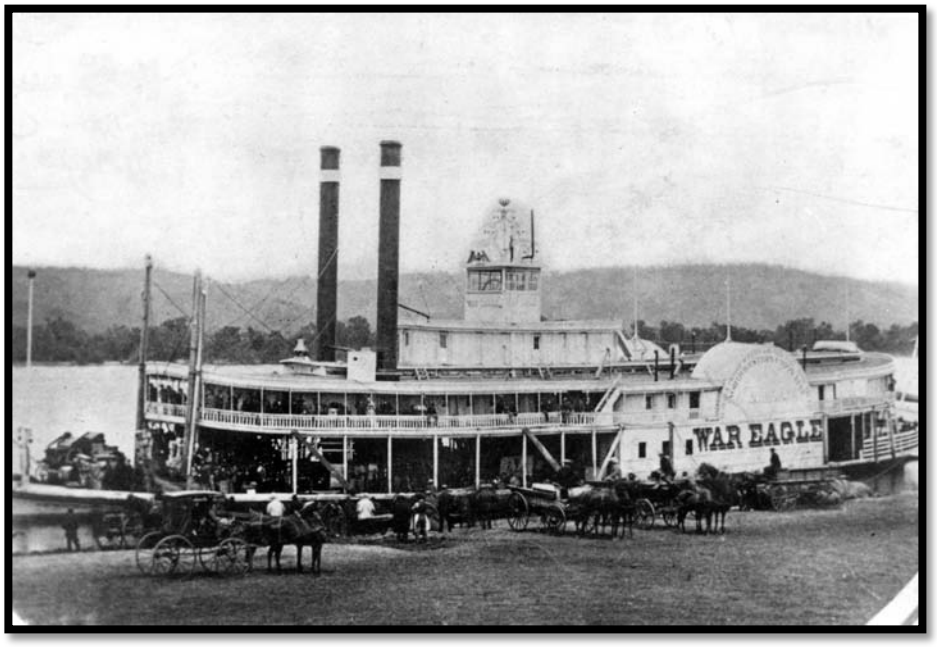

Figure 1.1 War Eagle photo from Special Collections University of Wisconsin-La Crosse

Abstract

The steamboats Bertrand and War Eagle operated in a similar brief period of time in the United States and were both primarily excavated in the 1960's. The sites described in this paper are representative of a terrestrial waterlogged site (Bertrand) and an underwater river site (War Eagle.) The paper highlights the problems associated with underwater archaeology compared to terrestrial. This paper is a synthesis of materials and a comparison of the Bertrand steamboat and War Eagle steamboat and the resulting archaeology. This comparison will discuss the excavation methods utilized by each group to their respected steamboats during the 1960's and how those methods impacted the archaeology record of these sites.

Introduction

The War Eagle and the Bertrand were both steamboats in operation in the 1800's. They both sank within 5 years of each other. The sites of these steamboats were handled in two very different ways, but both were primarily researched in the 1960's. This comparison highlights the differences between a systematic excavation of a steamboat (the Bertrand example) and the salvage, surveyed documenting, and preservation of the War Eagle site. The excavation methods used by archeologist can have an impact on the artifact assemblage and the site interpretation this comparison can determine those impacts. The background is given for the importance of the steamboat age, the history, people, and practices that are underwater archaeology, and the two steamboats in question. The methodology discusses the literary review process and the museum visits that were taken for the purpose of tracking down artifacts. The results are the excavation procedures of the steamboats. The comparison between the War Eagle and Bertrand is found in the conclusion and an extra section on the future of the War Eagle ends the paper.

Background

The use of Steamboats for transportation in the United States on the nation's river systems specifically the Mississippi was a brief chapter in time. Steam brought about the first major technological change that would forever change the landscape of the United States. The War Eagle was an example of this new technology at its peak. The War Eagle steamboat was a tragic chapter in La Crosse Wisconsin's history. The advent of steamers had an effect on immigration, transportation, and commerce according to A History of La Crosse, Wisconsin: 1841-1900 by Albert H. Sanford and H. J. Hirshheimer (Sanford and Hirshheimer 1951). The ability to move people and goods at a quicker rate increased the westward expansion. The boats

had to be adapted to handle the rivers conditions. The hull was flattened and boilers and engine were placed on the decks with cabins. The cargo was placed on the deck so were the passengers who didn't buy cabins. Additional decks were built on top of the main deck and smokestacks were placed in the middle rising above the decks (Sanford and Hirsheimer 1951). The craftsmanship of the steamers was heavy with ornamentation. The most visible feature of the steamboat was the paddlewheel, a large wheel that was located either on the side or the stern (back of the boat) to provide locomotion. The first introduction was the side-wheel, fueled by wood. Steamboats carried everything including river ice used for commercial distribution (Sanford and Hirshheimer 1951). The steamboat dominated the waters until the advent of the railroad which was the beginning of the end for the steamboats. The only existing steamboats in la Crosse today are the Julia Belle Swain and La Crosse Queen according to A History of La Crosse, Wisconsin in the Twentieth Century: Reinventing La Crosse Again and Again by Susan T. Hessel and Gayda Hollnagel. (Hessel and Hollnagel 2007).

Why is Underwater Archaeology different?

The focus of underwater archaeology is often, but not always ships or other watercraft. Since these sites do not represent a residence or burial or other types of sites typical with terrestrial they are researched in a different way. The sites in underwater archaeology often represent a specific period of time not a range of occupation, and a single event, which usually results in people referring to them as time capsules even though time capsules are intentional and these sites are often created unintentionally. They also contain more than what is found at terrestrial sites for example an occupation site contains artifacts that are referred to as the "trash" we as humans leave behind. Another example would be a burial, in many burials people bury their loved ones with only the best that their society creates. In underwater archaeology the artifacts

usually represent trade or items of commerce. They also can include a wide range of artifacts between the "trash" and the very best. Since these sites contain this range of artifacts it is possible to expand our research design regarding these sites. According to Richard A. Gould in Archaeology and the Social History of Ships, "To what extent should underwater archaeologists apply and test ideas about the human past based on concepts of culture and society more commonly associated with social sciences than with history?" This statement explains the type of research conducted. An underwater archaeologist looks to understand the site through its impacts on the social aspect of society, our culture. Terrestrial archaeologists do this as well but are limited by the artifact assemblage; you can't research what you don't have. The underwater archaeologist's main goal isn't to discover the long term changes in a site over hundreds of years, but the social changes occurring that are reflected in the material remains, for example many different classes can occupy the same vessel and their status is reflected in their artifact remains. However, this does not mean their research goals do not overlap, both study the cultural changes.

The advent of the research goal or question has led us to the actual practice of archaeology underwater. Before this addition anything done on or with shipwrecks was salvage. The history and development of underwater archaeology begins in the 1940's. Underwater archaeology was shaped largely by people like Lamboglia, Cousteau, Taillez, and Bass. The start of the change from salvage to underwater archaeology was Cousteau's technological contributions in the 1940's. According to Peter Thorckmorton states in Shipwrecks and Archaeology: The Unharvested Sea, "Archaeology under water remained, in fact impossible until the 1940's, when a limited freedom of seas was given ordinary men through the work of a Frenchmen, Jacques-Yves Cousteau. Before Cousteau, men explored the undersea world like

timid savages living at the edge of a hostile jungle which they visited with trepidation and explored at the risk of their lives" (Throckmorton, 1969.) Cousteau had open up the seas for a broad range of people when he created the scuba system, a self contained underwater breathing apparatus. The creation of the scuba is described in Shipwrecks and Archaeology: The Unharvested Sea, like such, "He (Cousteau) then got Emile Gagnan to adapt to underwater use an air-regulating device originally built to meter gas in wartime wood burning automobile engines. The result was the Aqua-lung, which has done more than any other device to open up the shallow depths of ocean to man." This device made underwater scientific research possible.

Cousteau next big contribution was the push to have the device used exactly for science. "In 1944, after two creative years of thinking and experimenting while immobilized under the German occupation of France, Cousteau founded the Undersea Research Group of the French navy and then by a superlative stroke of diplomacy, created his own brilliant group out of it, with the support of the French navy, the National Geographic Society, and other institutions. They gathered recruits for their wonderful gadget, the Aqua-lung." (Throckmorton,1969.) The incorporation of scientists into the world of sea meant that archaeology would soon be expanding its focus from land to water, and in this way the archaeology entered the water. This happened in the late 40's according to Peter Throckmorton, "Cousteau and his group had always been interested in ancient shipwrecks, and the possibilities of excavating them. In 1948 he and Commander Taillez had relocated the Mahdia wreck off Tunis, but were able to work for less than eleven diving hours on the site. By 1952 Cousteau was independent and determined to make an experimental undersea excavation" (Throckmorton, 1969.) Cousteau didn't stop with the creation of the scuba or the Undersea Research Group, he also began to create ways of solving the problem excavating wrecks like the Mahdia.

Cousteau's contributions included the adaptation of the underwater breathing apparatus to a contained unit, the creation of scientific based research teams, and influencing the other major figures that were beginning to emerge. Taillez was one of the talented men that worked alongside Cousteau in his research team. Taillez would go on to make serious contributions to way in which we view the handling of wrecks. Cousteau's next adaptation as described by Peter Throckmorton was the airlift, "Cousteau's group then built the first archaeological airlift, or mammoth pump, for removing mud. The device had been invented long before, at the turn of the century, and had been used for pumping water from mines and for mud-pumping harbors. In principles it was simple: a non-collapsible, flexible pipe led from the surface to the bottom 150 feet below. Air injected into the bottom of the pipe rose to the surface, creating a strong suction at the bottom. It functioned as a giant underwater vacuum cleaner. With it, divers were able to clear off the surface cover and get to the timbers of the ship" (Throckmorton,1969.) This is the point at which exploration turned towards excavation although still solidly in salvage.

Peter Throckmorton remarks on this turn, when commenting on the divers issues with dealing with mud over a wreck, "Commercial salvage divers with conventional equipment could not do a satisfactory undersea archaeological excavation-The obvious problem was that of excavation" This new problem was also being experienced by other major figures of the time. Lamboglia realized the problems associated with salvage equipment, he had been using a steel grab on a Roman Ship of the first century and realized it was a poor choice of tool of excavation (Throckmorton,1969). Lamboglia remarked in the 1950's that the "road was now open for development of new techniques of underwater excavation, and that good work in the future could only be done by well-organized professional groups"(Throckmorton,1969). However in this time period archaeologists themselves were rarely trained in underwater scuba practices and had

to rely on the use of salvage divers, but the scuba was gaining popularity and the possibility for an all archaeologist team was emerging. The process of underwater expeditions began to include the idea that not only could work underwater be done, but it could possibly be done professionally and systematically.

In the late 40's early 50's Dumas entered and started to introduce the idea of a site plan, "1949-1950, Frederic Dumas dived on the wreck five times in 1949 and four times in 1950 and was able to make a sketch of the site while it was virtually undisturbed." (Throckmorton,1969.) This concern for the layout of the site was reflected by others; however the limitations of time on a diver eliminated the possibility of a complete and accurate survey. The result was experimentation in photography. The first attempt to use photography is discussed in Shipwrecks and Archaeology: The Unharvested Sea, "Dimitri Rebikoff, one of the pioneer French divers and a well-known inventor of underwater equipment, suggested photogrammetry in the early 1950's" (Throckmorton,1969.) Taillez tried to make a mosaic of photos, unfortunately photographs underwater couldn't be adapted for mapping and distortions from the environment changed the result making it less accurate. (Throckmorton,1969). Lamboglia's idea was a tape grid over a wreck, in two-meter grids, the grid were photographed, numbered, and drawn before anything was removed (Throckmorton,1969.) He tried this 1958 and discovered the divers were unable to accurately draw the large grids effectively. He modified his design; he also had been recording the objects found and structures uncovered. It is because of this that Lamboglia was the first person to realize the size and orientation of a ship (Throckmorton,1969.)

The excavation with the greatest amounts of contributions to underwater archaeology was that of the Congloue. "The Congloue was the developing ground for all the tools that are today a necessary part of underwater archaeologist's equipment, such as an airlift, underwater pressure

jets, underwater photography, and by default underwater surveying. Cousteau demonstrated both that it was possible to excavate an ancient shipwreck and that such a project was worth carrying out." (Throckmorton,1969.) After the Congloue, Cousteau's protégé Taillez ushered in the next phase in the development. Peter Throckmorton states this of Taillez, "his plan was simple and effective, but as always when someone tries to do something new, the experts were delighted to point out errors. His first requirement was a floating base, one which could be easily towed to the site and remain there for the duration of the work. On it would be mounted the high-pressure compressors for filling Aqua-lung tanks, and the big low-pressure compressor needed for running the airlift. A shack on the barge would serve for storage of finds, office, and sleeping quarters for the men who stood watch at night." (Throckmorton,1969.) The idea of permanent base was considered necessary to do any serious work on a project. The stage was set by the 1960's for systematic underwater excavations.

Taillez recognized this in 1950 when he was quoted saying "for the present, it must be said, underwater archaeology is still in the early stages. It must find its feet through the experience gained on the first sites. Titan is one of them…We have tried sincerely, to the best of our ability, but I know how many mistakes were made…If we had been assisted in the beginning by an archaeologist, he would surely have noted with much greater accuracy the position of each object; by personal inspection he would have drawn more information from the slightest indications. But I can at least show that beginning and conducting an underwater (excavation) is definitely a difficult task which demands …faith, persistence, and courage. It cannot be undertaken by casual methods, but, on the contrary, necessitates over a long period the preparation of appropriate marine appliances and of specialized equipment. Underwater excavation is a problem for sailors and divers rather than the archaeologist. How difficult it is,

particularly in this century of specialization, to be all three at once! The archaeologist in particular must realize that he cannot accomplish this task without the help of the other two. It is for the leader if the excavation to coordinate these three tasks. Sailor, divers, and archaeologist will ease his position if they work as a team and neither permit any activity on a wreck nor bring up any object for which the information obtained from its position on the site had not been recorded" (Throckmorton, 1969.)

The environment of an underwater site is different from a terrestrial site for obvious reasons, it's submerged. This obstacle has to be dealt with through a variety of different ways such as the use of scuba equipment or the creation of a dry site by building of a coffer dam. Even the locating of a site requires specialized equipment that terrestrial does not need. These would include side scan sonar, sub bottom profilers, magnetometers, adapted forms of GPS, other technologies, and human divers exploring underwater. The environment of the site poses new problems for archaeologists such as visibility, conducting work in a "weightless" airless environment, a lack of strata, recovery of artifacts, and so forth. The first issue to address is our approach. Earlier the research question in archaeology was discussed, now the general understanding of sites should be considered. Richard Gould brought up this point in "Shipwreck Anthropology," in which he states, "Non-destructive approaches place more emphasis on controlled use of regional sampling and in-situ recording than one finds in excavation-oriented archaeology. In most cases they involve leaving the wreck and its associated remains in place on the seabed as close as possible to the condition in which they found, including replacing any items removed to the laboratory for recording and analysis" (Gould, 1983.) The days of full and complete excavation are gone, in exchange is a less invasive version. Richard Gould discusses the application of sampling to underwater archaeology, by asserting the use of survey of

elimination, a survey that systematically eliminates ambiguities about what wreck materials are present, or survey by design, a wreck surveyed by hypothesis (Gould, 1983.) Gould states that, "Even if one had unlimited funds and time for research, it would not always be a good idea to attempt total excavation" (1983.)

The War Eagle

The War Eagle was an example of this new technology at its peak. The War Eagle according to the Army Corps of Engineers, "*Documentation for a finding of No Adverse Effect: the War Eagle La Crosse County, WI;*" the War Eagle was one of nine other steamboats by the same name. The War Eagle was built in Fulton, Ohio in 1853-1854. It weighed 296 tons was 219 feet in length by 27 feet in width, made of Oak (hull), contained 3 boilers-all 4 feet long, and 46 staterooms. The War Eagle was first owned by the Minnesota Packet line, then by the Galena Boat line, reorganized into the Northwestern packet Company in 1863, which was also known as the White Collar Lines owned by William F. and Peyton Davidson originally the La Crosse and St. Paul Packet Company (1861) based in La Crosse (Army Corp of Engineers, 1985.) The War Eagle was known for being the first to reach St.Paul after the ice broke up in the spring of 1855, as well as being involved in the Civil War. The War Eagle carried company K from Winona and Company F from Red Wing upriver to Fort Snelling and the Minnesota Regiment down to Prairie Du Chien. In March of 1862, it was shot at in the Tennessee River delivering Army supplies. The War Eagle steamboat was a tragic chapter in La Crosse Wisconsin's history. On May 14, 1870 the War Eagle would sink and take 5 people with it into the Black river mouth. The War Eagle was docked by the Milwaukee Railroad Depot and was being loaded. Captain Thomas Cushing noticed a barrel of Kerosene leaking and called to have the carpenter tighten the barrel hoops (Army Corp of Engineers, 1985.) The carpenter's lantern caught on fire and the

fire spread to the rest of the vessel and from there to the waterfront resulting in one of La Crosse's worst fires. The total damage included the War Eagle sinking, 5 dead, 100 tons of cargo gone, the ship's log lost, destroyed railroad depot, 3 freight warehouses, a 80 foot grain elevator, 9 railroad cars, wharves, wharf sheds, a large area of railroad tracks, an empty barge (Webb), and the Keokuk and Mollie Mohler steamboats suffered minor damages.

Figure 1.2 Replica barrel of the kerosene barrel that started the fire.

The Bertrand

The Bertrand was built in 1864 and sank in 1865 on April 1. The boat was called a mountain steamer meant to help facilitate the expansion of the United States and establish new communities according to Jerome E. Petsche in The Steamboat Bertrand: History, Excavation, and Architecture (Petsche, 1974.) The Bertrand's role was to provide the means for people and goods to go back and forth between the west and the east. The Bertrand met its demise April 1 of 1865 when the steamboat hit a snag in what is now known as the Desoto Wildlife Refuge near Omaha, Nebraska. The steamboat slowly sank and very little damage was done to the boat in comparison of that of the War Eagle. Before the Bertrand sank all passengers were evacuated and some of the cargo was saved. It was estimated that one third of the cargo and possibly most of the passengers' effects was removed from the Bertrand before it finally sank (Petsche, 1974.) A group of salvagers hired by the insurance company worked at salvaging cargo from the

Bertrand for a month before another steamboat, the Cora II also sank in the area and the salvagers moved to that wreck. When they returned to the Bertrand, the steamboat had been mostly covered in the quick accumulating sediment of this area. The Bertrand wouldn't be disturbed until it was discovered in the 1960's.

Methods

Literary Review

The War Eagle Steamboat history is explored through a literary review of materials in Special Collections, government documents, material at the Mississippi Valley Archaeology Center (MVAC), Winona Historical Society Museum's archives, books on relating to the subject, newspapers, and online sources. During the review process one consideration that was important was the understanding that nine War Eagle steamboats exist in the Mississippi river area, to determine the correct War Eagle, information such as; captain name, city of manufacturing, company or ownership, route paths, dates of use, etc were used to determine the proper War Eagle. The review revealed the destruction of the passenger list. The company that owned the War Eagle (White Collar Lines) did not have insurance. The Winona Newspapers also documented the steamboats' activities of the area and included the mention of their cargo numbers in their articles, creating the possibility of a simple estimate of the cargo. The creating of inventory or similar set of materials could be established through the comparison of another steamboat similar to the War Eagle. A synthesis is created from this literary review and used to create a comparison of both steamboats in regards to their excavation strategy. The practices common in archaeology both terrestrial and underwater is discussed to help the reader

understand the key differences. The information provided by underwater will be greater because less is known by the general reader about underwater archaeology compared to its more established counterpart terrestrial. The aspects of archaeology discussed will include its history, research premise, techniques or methods, equipment and tools, excavation, documentation, conservation, museum practices, salvage, and the laws regarding archaeological sites. All these topics will used to help understand the factors the affected both sites during their excavation and existence.

Museum Visits and tracking the artifacts

The second part of the methodology is the tracking down of the artifacts recovered from the War Eagle from a variety of sources including the Winona County Historical Society's 1960's explorations and local sport divers. The purpose of these visits was to determine how much of the artifact collection still remained and what artifacts existed. The second part of this examination was determining what kind of conservation practices were utilized by the recovering parties and if they had a lasting impact on the artifacts condition and integrity.

The War Eagle and the Bertrand were selected for comparison because of their similar time period of sinking concluding they would be subject to a similar time frame regarding decomposition, their similar period of time of excavation/salvage concluding their similar time frame for archaeological practices and methods, and their very different style of excavation demonstrating the differences in archeological record and conservation. The Bertrand sank in 1865 and was largely ignored. One salvage operation was carried out by the insurance company following the sinking, however this attempt was abandoned when another steamboat sank in within the area and the divers were redirected (Petsche, 1974.) When the salvage crew returned

to the Bertrand the sediment had filled in the wreck and it was lost to the bottom of the river. The area in which it had sank eventually drained after considerable sediment had accumulated on the steamboat. The Bertrand was then systematically excavated using the terrestrial method of excavation. The War Eagle burned and sank in 1870 and was in relatively shallow water and was frequently disturbed by residents of the surrounding area. The two sites will be compared using a literature review of the results of these two sites and a comparison of the artifact conservation practices. The artifact comparison helps demonstrate the amount of information that can be lost by different excavation/ recovery approaches and conservation methods.

Results

The War Eagle

The War Eagle steamboat's troubles didn't end the day it sank. The War Eagle would be a site to be disturbed by a variety of sources. The owners possibly took the boilers and the engine the year later. Families and friends of the victims of the War Eagle participated in recovery operations to retrieve the bodies of loved ones. These operations required damaging the wreck to find bodies. The site was mixed in context when the burned materials from the waterfront that the War Eagle fire had started were dumped in the same location as the War Eagle. When waters dropped in 1931 residents in La Crosse sieved artifacts from the wreck. In 1937 artifacts from the possible galley were pumped out during a dredging operation in the black river by the Army corps of Engineers as mentioned in their 1985 report (Army Corp of Engineers, 1985.) In 1962 the War Eagle caught the eye of the Winona County Historical Society, who originally planned to tow the hull to Winona for restoration and display. The Winona divers did however; collect artifacts from the wreck using a high pressure hose to remove silt. In 1963 Winona divers came

back with a salvage barge and a winch to raise some of the larger artifacts found during 1962. These artifacts were taken to the Winona County Historical Society Museum. The exploration of the War Eagle was not an excavation, but a salvage attempt because it did not include the documenting of the site or systematic excavation. Winona County Historical Society hired the Diving Marine Salvage Co. of Galesville to salvage the War Eagle. The total number of items report in the news was 40 from the first attempt (La Crosse Tribune, 1963.) A portion of these artifacts were destroyed on March 21, 1981 in a fire at the museum. The irony of the fire was the museum, the Julius C. Wilkie, happened to be a steamboat as well and sank as a result of the fire (Army of Engineers, 1985.) The records pertaining to the items recovered were most likely destroyed in this fire. This speculation is based on the visit to Winona County Historical Society to review the War Eagle collection and records. The collection consists of a box of 'ironstone' dishes. The records include newspaper articles and a list of items taken from the War Eagle, no catalogue exists and the items in the box are not listed on list. The two small exhibits that remain of the War Eagle contain items that were passenger personal items, and only a few of those items are listed. The visit to the La Crosse County Historical Society Riverside Museum revealed that an exhibit had been given to La Crosse from Winona; again this exhibit contains a few items from the list but largely items that are unlisted. The largest portion of the collection at Riverside comes from private sport divers' collections, primarily Dennis Brandt.

Figure 1.3 Bottles retrieved by sport divers on display at Riverside.

The wreck was visited by sport divers after the creation of scuba. One of these divers Dennis Brandt provided most of the material from the War Eagle that can

be found at Riverside and Mississippi Valley Archaeology Center because of the donation of items from La Crosse Historical Society to MVAC. Dennis Brandt was able to relay information about his recovery methods and the general condition of the boat when he used to dive the wreck. He stated that he used as simple hose to create holes in the sediment and then would investigate the materials that would appear in the hole created, he would then place small delicate items in his wet suit, use a bag to hold artifacts together, and would use lift bags to recover larger items (Dennis Brandt and George Italiano, personal correspondence 2009.) A lift bag is a small bag that is tied to the item and then a diver uses his regulator to push streams of air into the bag, slowly bringing it to the surface. The Winona County Historical Society had their conservation handled by the salvage company they hired. The items the Winona County Historical Society recovered are still in good condition. Dennis Brandt described his method of treatment as using a wire brush on the metal items and air drying the wood. The air drying of wood can cause considerable damage to wood, especially if the duration underwater is considerable. It is because of this that the wood is showing the signs of deterioration. However, a sport diver is not trained in conservation practices. The Army corps of Engineers reported the causes of disturbance to the wreck are as follows: the initial activity following the fire and sinking of the War Eagle (leveling, filling, and rebuilding), the sieving of the hull in 1931, recreational and commercial navigation, sport divers and air compressors, as well as dredging attempts made in the river (Army Corp of Engineers, 1985.)

Steamboat Bertrand

The Bertrand was rediscovered in 1968 by salvors Jesse Pursell and Sam Corbino, who used newspaper articles and a series of maps of the river and area to determine the approximate location of the Bertrand Steamboat according to Jerome E. Petsche in The Steamboat Bertrand:

History, Excavation, and Architecture (Petsche, 1974.) The salvors used a flux gate magnetometer to detect anomalies that would have given away the Bertrand's final resting spot. The magnetometer measures the gamma or the differences in the magnetic field. The salvors created a grid after initially reading high readings on the magnetometer in an effort to establish the boundaries of the steamboat. The highest readings given by the magnetometer indicated what would eventually be revealed as the location of the steamboat that the Plows, ammunition, building supplies, and other frontier essentials were stored. The salvors then utilized augers to drill holes down into the ground to determine the type of object and depth of the object that was detected. After drilling the site the salvors were convinced they had found the Bertrand and submitted their plan of excavation.

The salvors conducted the excavation with a crew and under the supervision of the Chief, Midwest Archaeological Center, National Park Service representative, Dr. Wilfred D. Logan. The site was protected by the Act for the Preservation of American Antiquities and the salvors had submitted proposals before they started their work to comply with the law and create a contract in which they would receive 60 percent of the value of the Bertrand's mercury, whiskey, and gold. The steamboat Bertrand was systematically excavated in 1968. The first part of the excavation was the use of a dragline used to remove 15ft of soil. The result was a slumped collapse caused by the existing water table, about 10 feet from the surface. The salvors probed the site using an 18 foot water pipe jet as a probe to determine the depth of the boat. A dragline was used a second time to remove silt. A dredging operation was then conducted on a platform, which was done to pump water.

The dredge flow discharged through a ½ inch screen hopper. Then two divers attempted to make locate the Bertrand. They were hampered by low visibility and the presence of a layer of

silt. The salvors also had additional problems such as the high water table, bank slumping, rains, dredge clogging. Eventually the salvors installed wells to lower the water table. Then, the salvors shaped the edges of the site to correct the problem of slumping. The site was then excavated as a terrestrial site. The site had started as what one would have thought to be a terrestrial site but the water table changed that assumption, then the draining on the table made the site a wetland style site in its deepest levels because the wells controlling the table weren't deep enough. The crew created charts, maps, scale drawings, photographs, and field notes of the site.

The site would reveal 200,000 artifacts, all properly preserved and documented. The artifacts included items such as foodstuffs, liquor, patent medicines, textiles, wearing apparel, sewing supplies, household goods, mining supplies, agricultural supplies, hardware, tools, building supplies, and other items. These items reflected the frontier needs and the westward expansion that was occurring during this time period. The Mercury containers revealed the mining processes that were occurring in the west, also some of the containers showed signs of having been disturbed and few were above the deck covered with a different soil color as the others were below, indicating a previous salvage attempt had been made. The artifacts in the central portion of the Bertrand had been crushed and the hull's integrity was compromised.

The artifacts were then preserved and conserved. The conditions of the salvors agreement made the preservation process difficult. The first stage of cargo removal suffered because conservators were not present nor was a laboratory. When the laboratory was set up the artifacts were washed, sealed in polyethylene and stored in a garage bay. The humidity was controlled through moist burlap bags. The rise of temperatures led to the installation of window mount air conditioners and textiles were put into refrigeration. The artifacts were initially kept in water filled canvas tanks however fungi started to grow on the tanks. Thymol was added to fungi. The

wood was removed and stacked to dry. Eventually the new laboratory was built and proper conservation ensued. The complexity of the materials recovered posed problems for the conservators. The wood artifacts were specifically treated with polyethylene glycol. The wood was stabilized with ethyl alcohol and weighs were taken to note any significant changes. In addition to this some pieces were treated with Gelva V-7, butyl acetate, propyl acetate, and resins. The impregnation of the solutions into the wood was done with a vacuum device. The most effective treatment of the stabilized wood was the application of the polyethylene glycol. The metal artifacts were conserved in a variety of different ways some of which are more abrasive than others. The use of blasters and chemicals were utilized on the artifacts. However the preferred methods were that of the less abrasive natural such as ultra-sonic transducer tanks, electrolysis, and the like that worked to remove impurities from pores rather than scrap them off.

Archaeology Issues

The problems that arise in underwater archaeology include low visibility, ship integrity, identification, looters, and other unforeseen issues. The War Eagle has issues with low visibility and will always. People have made attempts to photograph the vessel, but the visibility hampers this task. The Army Corps of Engineers reported the existence of a piling from the Mobil dock that goes right through the War Eagle's hull (Army Corp of Engineers 1985.) This is both a problem and a benefit; the piling ruins the integrity of the ship yet protects it from traffic and from being moved as was the case with the Winona Museum. Ownership is the biggest problem in underwater archaeology. Winona's claim to the War Eagle was the based on its trips to Winona when in use and the transporting of soldiers during the civil war. The abandonment of vessels leaves a murky definition to the claim of ownership. In the 1960's it was acceptable to

operate according to the “finder’s keepers” rule. A law protecting the underwater sites didn’t exist until the 1980’s.

A bigger problem than ownership is looting or taking of artifacts or portions of ships from their original structure. Looters take artifacts from ships without any form of systematic study that would document context and give the items meaning. The role of divers has changed considerably. In the beginning of the creation of underwater archaeology divers were used in the excavation process, however since then the gap between archaeologist and diver has been bridged by the presence and requirement of all underwater archaeologists to be diver certified. The diver can no longer participate in excavations or expeditions without the proper archaeological training. In the 1970’s handbooks existed detailing how to conduct an archaeological excavation as a recreation diver. An example of this inclusive albeit harmful attitude is found in Nautical Archaeology: A Handbook for Skin Divers by Bill St John Wilkes, in which he explains archaeology in practice in a very detailed manner including equipment, methodology, research conducted to locate wrecks, and the reasons for doing underwater archaeology (Wilkes, 1971.)

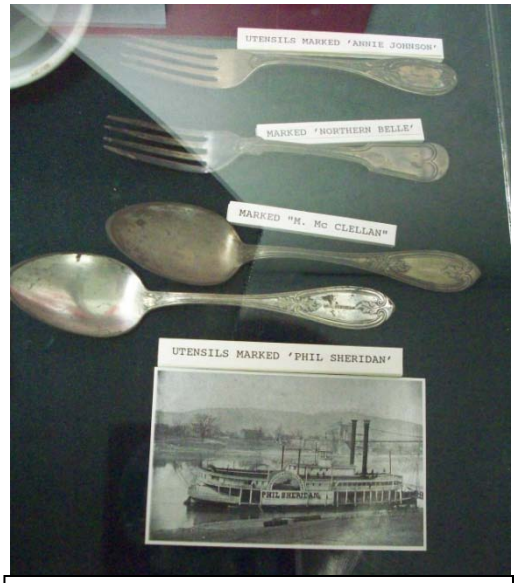

Figure 1.4 Spoons from other steamboats

Context is another problem unique to this ship. The sinking of the War Eagle included a fire that consumed the waterfront; the items from that fire were discarded in the river alongside the War Eagle mixing context. Furthermore in 1931 the vessel was moved changing the interpretation of the wrecks sinking and debris pattern. Also, items were found from other steamboats, this is possibly because the War

Eagle burned and sank at the dock and the dock would have a considerable amount of items that would have fallen overboard from other steamboats during loading and unloading of boats.

Eventually the site was protected by the state and city, keeping it safe from disturbances and creating an ordinance to protect the site. The ordinance is the 'Ordinance to create Subsection(s) of Section 7.04 of the Code of Ordinances of the City of La Crosse Entitled Abandoned Ships-Salvage Regulated' (City of La Crosse, 1988.) The ordinance was created to back up the recently passed Abandoned shipwreck Act. The ordinance stated that a permit was required to conduct any type of salvage and the ordinance stated that items recovered from the abandoned ships in the area could be taken from the salvors from the purpose of preservation. The advent of new laws protecting underwater sites is discussed by Jack E. Custer and Sandra Custer in An Investigation of Submerged Historical Properties in the Upper Mississippi River and the Illinois Waterway, the abandoned shipwreck Act was created in December 19, 1987 and stated that the "title of the ships transferred to the state provided the ship was embedded in submerged lands, embedding being firmly affixed in the submerged lands or in coralline formation such that the use of tools of excavation are required in order to move the bottom sediments to gain access to the shipwreck." (Custer, 1997.) The implication of this law was the end of treasure diving and unrestricted salvaging. The government was the owner of such properties and determined their future with the exception of any ships found on Indian tribe lands. The passing of the ordinance 7.04 in La Crosse was documented by the La Crosse Tribune (Radloff, 1988.)

Conclusions and Discussion

The comparison of these two sites brings up serious issues. One being they are similar in time period, but not in their sinking. The Bertrand had the benefit of slowly sinking after being damaged minimally and then quickly covered by sediment that protected its contents. The War Eagle was a disaster in every sense of the word. The War Eagle's fire would have caused considerable damage to the vessel and the waterfront, which was mixed in with it. It was then frequently disturbed in efforts to recovery items and initially bodies, as well as moved and sections destroyed to make room for new riverfront improvement. The different professional agencies that handled the War Eagle didn't do so in the hopes of gaining scientific knowledge, but for other motives. It is because of this that the War Eagle's artifacts were mishandled. The Bertrand's artifacts were properly preserved, documented, and conserved.

The Future of the War Eagle

The question is now what is the future of the War Eagle? The War Eagle is still not listed on the National Register of Historic Places. If this would occur it would make it easier to establish the site as being significant to archaeology and the region. Local interest has been expressed in building a coffer dam to create a permanent archaeological dig that would be made part of a museum exhibit completely devoted to the War Eagle. This a possible proposal being organized by George Italino of the La Crosse County Historical Society (Brandt, Dennis and George Italiano personal correspondence, 2009) It is important to note that although a coffer dam offers the opportunity to systematically excavate a site in controlled conditions the coffer dam itself comes with hazards. The coffer dam can cause ships to lose their buoyancy, resulting in extra weight being displaced on the wreck which can distort and break them and their contents, waterlogged timbers can also dry out to the point of disintegration (Johnstone, 1974.) Gradual pumping and maintenance through sprinkler systems are necessary to protect and preserve the

integrity of the site. Once the site is pumped of its water the excavators still cannot walk on the wreck, they must install walkways or planks suspended over the wreck structure. The other considerations of coffer dams are environmental impacts, obstructing waterway traffic, and surrounding properties.

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