

# MAHSN News



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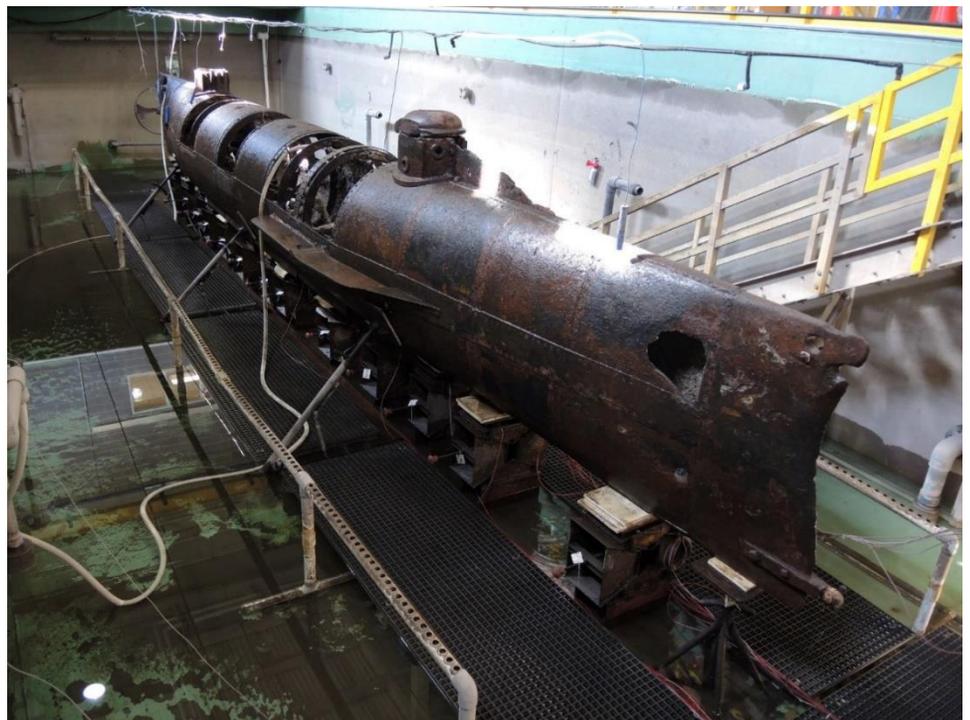
FALL 2020

## Where We Are Now: Research and Conservation on the *H.L. Hunley*

By Michael Scafuri, Nicholas DeLong, and Johanna Rivera

On the night of February 17, 1864, the *H.L. Hunley* submarine attacked and sank the blockading sloop-of-war USS *Housatonic* off the coast of Charleston, South Carolina, marking the first time that a submersible sank an enemy ship in combat. However, the submarine failed to return to shore that night, and *H.L. Hunley* entered into nautical legend for over a century, as historians and researchers speculated on the fate of this historic vessel. The submarine was found in 1995 and raised in 2000, beginning the scientific investigation and conservation treatment of the vessel.

The archaeological and conservation work on *H.L. Hunley* is being conducted at Clemson University’s Warren Lasch Conservation Center (WLCC) in Charleston. With the subsequent opening and excavation of the interior of the submarine, over 3,000 artifacts were recovered including the skeletal remains of her eight-man crew. This has led to an exhaustive multidisciplinary study of the submarine and its artifact assemblage with the goal of not only determining why the submarine was lost, but also to better understand the design of the vessel, the motivations of the builders and



*H.L. Hunley* in its treatment tank following deconcretion.  
All images in this article courtesy of Friends of the Hunley.

crew, and the social and cultural context that fostered this historic event.

### Research and Investigation

The archaeological investigation of the submarine has revealed many clues related to the attack and to the

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## Notes from the Prez – Steven Anthony

In the previous issue of MAHSnews (Spring 2020), I noted that the Coronavirus “Stay At Home” orders were beginning to be set aside and folks seemed to be accepting the new normal as the country began to open up again. Mask wearing and social distancing had become a routine in our daily lives. However, despite all the precautions, this terrible scourge would not go away. In the Fall, the case numbers began to climb again.

I know there are several dive boats advertising for new charters, but the MAHS Board of Directors has decided to continue the suspension of our activities to protect our students and members from the accelerating spread of this deadly plague. So, all MAHS in-person activities remain suspended until it is determined to be safe to travel and congregate again.

The recent announcement of the new Pfizer and Moderna vaccines gives us renewed hope. It places the prospect of a cure in focus and signals a pathway forward. At least now we can see that there is an end in sight and the return to normal activities is relatively close at hand.

Last March, MAHS completed the 2020 live course by converting the last few classes to virtual mode. Over the summer we converted the remaining classes in anticipation of the commencement of the 2021 course, recognizing that the new vaccines may not be implemented in our community until later next spring. The scheduling of the MAHS 2021 Field School is still unknown. We will re-evaluate the situation early next year to determine if we can safely commence diving activities in June. Keep an eye on our web site, [www.mahsnet.org](http://www.mahsnet.org), for updates.

Throughout all of this, we continued to offer our DVD version of the Introductory Course, and as we approach the yearend we will be awarding diplomas to all of those who successfully completed the course this year.

The MAHS Board remained active during this time as well, taking advantage of the downtime to review our Introductory Course classes and begin the process of updating to create a new online version of the course for our distance learning students. The first step was to complete the posting of our DVD video series on Google Drive. Now we can begin the updating process.

Also, Jim Smailes continues to publish and distribute MAHSNEWS, and Tom Berkey continues to circulate MAHSmail with interesting maritime archaeology news items and relevant articles for our members. Dave Shaw kept our Facebook page alive, and Dennis Knepper and I have been working to complete

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*Damage to the forward conning tower starboard viewport.*

condition of the submarine related to its loss in 1864.

But many questions remain concerning the causes of its loss. Over the years, the archaeological team has tried to explore all possibilities in an attempt to get to the bottom of this mystery. Studying the damage to the submarine's hull has been an important part of this investigation. The two largest hull breaches, located close to both the bow and stern of the starboard side of the submarine, were determined to have been the result of post-sinking scour and corrosion. This was confirmed by a geological study of the sedimentation of the interior. There is also damage on some exterior components that, while not outwardly significant in terms of the sinking, has still not been adequately explained. More importantly, there are smaller hull breaches in the forward section of the crew compartment that could be significant: a broken viewport in the cast iron forward conning tower; and a separated hull attachment for the forward ballast intake valve. An initial ballistic study conducted at the H. P. White Laboratory, in Street, Maryland in 2010, determined that weapons fired from *Housatonic*, while capable of inflicting some damage, would not have had enough force to break the cast iron of the conning tower. In 2013, a collaboration was initiated with the Naval History and Heritage Command and the Naval Surface Warfare Center, Carderock Division, to examine the blast effects of Hunley's torpedo. After extensive explosion simulations and live testing, the force of the blast was determined to have been insufficient to damage the submarine or harm the crew. While this testing has not provided any clear or definitive explanations, it has helped tentatively narrow down the possible factors that may have contributed to the loss of *H.L. Hunley*.

The identities of the final crew of the submarine have also been somewhat of a mystery. After extensive

genealogical research and forensic analysis, we now have a better understanding of who these men were. But there are still many questions about this aspect of the *H.L. Hunley* story. Research is currently ongoing into both the histories of each crewman and how they became a part of the final mission. Of the eight crewmen, only one has a positive DNA confirmation. Genealogical research has largely confirmed the identities of the remaining crewmen, but many details are still unclear. This can be seen in the story of Captain George E. Dixon, the most famous member of the *Hunley* crew. While his record of service during the war is known, his life prior to the war is largely a mystery. Service records tell the tale of the other crewmen, but a more comprehensive study of their artifacts may provide additional information about their lives and about their role during the *Hunley*'s last mission. An ongoing study of the clothing and associated textiles of the crew will hopefully clarify their identities. Questions relating to what they wore and why they did or did not dress with military uniforms may be significant. Similarly, the personal objects each man carried with him may indicate the individual status of the person and their preparation for the mission.

### **Diagnostic Artifacts**

The personal artifacts of the crew have been examined in some detail as they underwent conservation treatment. Artifacts such as these can illuminate the lives of the crewmen, their military roles and experience, as well as their social and economic status during this period. Many artifacts associated with their clothing (e.g., buttons, shoes, suspenders, and hats) have been studied and analyzed in this regard. Additional personal effects such as pocketknives, smoking pipes, matches, and a leather wallet have provided information about the individual men and what they felt was necessary to bring onboard the submarine. Captain George Dixon's personal artifacts tell an even more interesting story. The most notable of these was his famous \$20 gold coin. The coin relates to a period story that Dixon was shot in the leg at the Battle of Shiloh in 1862 and survived due to the ball impacting the coin in his pocket. The recovered coin does indeed show warping from the impact, traces of lead, and was inscribed with the date of the event and Dixon's initials, confirming the story and his identity. In addition, he also carried with him two pieces of jewelry, a gold pocket watch and fob, a folding ruler, and a good quality pocketknife. His clothing was similarly well made with fine fabric, including a silk-lined jacket, silver suspender clasps, and boots. These objects confirm that Dixon was relatively well off in comparison to the other members of the crew.

The crew of *Hunley* wore a wide variety of clothing, with little to no apparent uniformity among the

crew. While some information about the apparel of the crew can be determined based on the surviving textiles, relatively little material has survived. The majority of what has been gleaned is based on the buttons, buckles, and shoes.



*Captain George E. Dixon's gold coin.*

Three different types of shoe were located among the remains of the *Hunley* crew. Of the eight pairs, six were brogans, one was a mid-calf riding boot, and one was a low-quarter shoe. Out of the eight pairs, only George Dixon's mid-calf leather boots would not have been available through a military depot or been standard issue during the time. While the brogans differ slightly, they are all fairly indicative of the standard military issue shoe worn by Confederate soldiers. Joseph Ridgeway's low-quarter shoes were machine made and of slightly nicer quality, but this type of shoe has also been associated with military personnel during the Civil War.



*Leather brogan-type shoes attributed to James Wicks.*

In total, 188 buttons were recovered from the submarine, with 64 having distinguishable military markings. To date, researchers have located more than 40 button variations. They vary in material, structure, and size. The large number and variety reflect a wide range of clothing worn by the crewmembers. Of the eight-person crew, only six were found with clearly identifiable military buttons. The military buttons, however, do not give much clarity in regards to uniformity or dress code within the submarine.

Of the six crewmen found with military buttons, J. F. Carlsen, located in the middle of the submarine, is the only crewmember with clearly identifiable Confederate jacket buttons. Seventeen buttons are associated with Carlsen, the majority of which are typical bone or prosser (ceramic) buttons used for under garments or trousers. Nine of the buttons are brass with a large 'A' for the C.S.A artillery. The nine artillery buttons would likely have come from a "shell Jacket."

The only other crewmember with any distinguishable Confederate buttons was Miller, sitting at the number six position in the submarine. Miller was found with two 13 mm English Script 'I' infantry buttons that are associated with the remains of his kepi. Miller's jacket buttons, however, are emblemized with an 'Infantry Eagle' that are representative of a pre-Civil War Federal Jacket. Additionally, both C. Lumpkin and James Wicks were found with Federal Navy buttons, rather than Confederate Navy buttons. Lastly, one of the more interesting sets of buttons found on the submarine were 21 fouled anchor buttons belonging to Arnold Becker, in the number two position behind the captain. Initial assessment of the fouled anchor buttons indicated that they might have been associated with the Confederate Navy, but further research revealed that they were actually from the British Merchant Marine. Both George Dixon and Frank Collins were discovered with no associated military clothing. Dixon, in fact, was in what would appear to be rather high-end civilian clothing consisting of suede, silk, and high-quality wool.

As previously mentioned, this wide range of clothing associated with the crew of *Hunley* indicates no standard uniform among the men. There also appears to be no evidence the crew was required to wear the uniform from the unit or military branch that they were recruited from. While historical research has confirmed that five of the crewmembers served on the C.S.N. *Indian Chief*, no C.S.N. buttons were recovered. The overall analysis of the buttons suggests that the



*Carlsen's 'A' stamped C.S.A. artillery buttons.*

crew was allowed to dress in any way they deemed appropriate and may have simply chosen garments that were the most comfortable.

The number of buttons found in the submarine is also of note because there are fewer buttons than was anticipated with some crewmembers. This may indicate the crew were wearing minimal clothing because of the conditions within the sub. The exception was Dixon, who had several layers of clothing and a large number of associated buttons. With so little textile remaining, it is difficult to verify exactly what each person's clothing would have been but the analysis of the buttons and shoes indicates that the crewmembers of the submarine were not a military unit in the traditional sense and likely functioned closer to a crew from a privateer.

### **Conservation**

The ongoing conservation of the *H.L. Hunley* submarine has been a decades-long endeavor to safely conserve and treat the hull and artifact assemblage of the vessel. The conservators and scientists on the project have worked over the years to stabilize and conserve the submarine. The conservation tasks associated with this have often been extremely challenging. Not only did the process involve the conservation of thousands of artifacts, but also the long-term stabilization, deconcretion, and desalination of the wrought and cast-iron hull.

All artifacts excavated from the submarine have been stabilized and carefully handled according to their specific conservation and treatment requirements. Metal artifacts were kept in a storage solution until chloride salts absorbed from seawater could be safely removed. The treatment of metal artifacts involved material identification through various analytical and imaging techniques, surface cleaning and concretion removal,

and desalination in different chemical solutions.

Most organic materials (e.g. wood, leather, textiles) required stabilization and impregnation with polyethylene glycol and freeze drying to prevent collapse of their degraded cell structures. At this point, the majority of the metal and organic artifacts excavated from the submarine have been conserved and documented, giving the team the opportunity to focus in the conservation and deconcretion of the hull.

In order to conserve the *Hunley* submarine's hull, several steps have been taken over the years to identify techniques that would stabilize the submarine and develop and define display conditions that would minimize the need for future conservation work. These steps involved the removal of high-risk materials from the submarine (such as organic elements), the removal of glass viewports (which would become unstable in strong alkaline solutions), the disassembly and removal of mechanical components (such as cast iron pumps), paint analysis, metal and biofouling analysis, rotation of the submarine to an upright position, and the modification of the fluid management system to safely desalinate the submarine in sodium hydroxide.

The marine concretion covering the submarine was the result of years of macrofaunal growth and debris accumulation on the surface of the vessel while it rested on the seafloor. This growth, combined with iron corrosion products, formed a very hard protective concretion layer. In order to begin active desalination, this concretion needed to be completely removed and the submarine placed in a solution of sodium hydroxide. The full deconcretion of the submarine's interior and exterior took approximately five years. A number of techniques and tools were used to aid in the removal of concretion, the most effective being mechanical cleaning with hand tools such as pneumatic chisels, surgical chisels, and hammers. Thousands of pounds of concretion were removed from the hull by a team of four conservators. This deconcretion would be accomplished each day by draining the sodium hydroxide solution from the *Hunley* tank and transferring it to the outdoor holding vats while conservators conducted their work.

The removal of concretion from the hull's exterior revealed evidence of erosion, fractures, and inherent material defects. The deconcretion of the interior revealed features representing components and equipment related to the submarine's operation, including the ballast system, the dive plane counterweight, steering rod, the depth gauge system, and the propulsion system.

One of the many challenges of this phase of the project has been to monitor the corrosion of the submarine and to adjust the concentration of sodium hydroxide in the *Hunley* tank to maintain the highest possible pH. A cathodic protection system installed early

on in the project has played an important role in keeping the corrosion at bay as more metal surface was exposed during the deconcretion.

Throughout the past year, the conservation team has continued to monitor and work on the desalination of the hull of the submarine. The protocols for desalination and characterization of chlorides are currently undergoing evaluation to determine the end point of the treatment. Plans are currently being undertaken for the completion of the project that will involve the rinsing, drying, coating, and final display of *H.L. Hunley*.

### The Path Forward for *Hunley* and the WLCC

As the conservation work of the *H.L. Hunley* moves toward completion, the archaeological team will be finalizing their research on the both the hull and the artifact assemblage from the submarine. This research will be made available through peer reviewed publications and in a three-volume series of reports in collaboration with the Naval History and Heritage Command. The first of these volumes was published in 2016 and is publicly available. Through careful examination and diligent research, it is hoped that many of the questions about this historic vessel and the event in which it took part can be answered and that other

avenues may be opened for researchers to someday help solve one of history's most enduring mysteries.

For further information the authors suggest the following:

<https://www.clemson.edu/centers-institutes/conservation/>

<https://www.history.navy.mil/content/history/nhhc/research/underwater-archaeology/sites-and-projects/ship-wrecksites/hl-hunley/recovery-report.html>

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## Maritime Archaeology in Tierra del Fuego, Argentina

by Dolores Elkin

A multi-year project was recently carried out along the Atlantic coast of Tierra del Fuego with the goal of recording archaeological evidence from the earliest time periods until the first decades of the 20<sup>th</sup> century. The project was coordinated by the heritage agency of the province of Tierra del Fuego, and provided valuable data arising from an extensive survey of a strip of coastline that included the intertidal zone and stretched about 200 kilometers in length. The research team was formed by researchers from Tierra del Fuego and other parts of Argentina specializing in the archaeology of past hunter-gatherer societies, as well as maritime historical archaeologists from the Underwater Archaeology Program of the National Institute of Anthropology (Programa de Arqueología Subacuática-Argentina). The latter were focused on



Survey in the intertidal zone, Tierra del Fuego. From left, D. Elkin, C. Murray, M. Grosso. Photo courtesy of Programa de Arqueología Subacuática (PROAS).



*Iron cannon ball in the intertidal zone.  
Photo courtesy of PROAS.*

locating and conducting basic surveys of any remains of nautical origin.

To date, the project has been very successful. Throughout the various field seasons, and also in collaboration with local communities which revealed an increasing awareness of the rich maritime historical heritage of the region, several sites were located. Two of the sites were noted as particularly significant: the wreck of an 18th-century frigate, *Purísima Concepción*; and a site consisting of the cargo of an unidentified vessel from the 19th century. Both are described below.

**I**n January 1765 the Spanish merchant frigate *Purísima Concepción* was sailing along the Cape Horn route towards Peru carrying cargo and passengers to the colony in Lima. In the middle of an overcast night, the ship ran aground on the Atlantic coast of Tierra del Fuego.

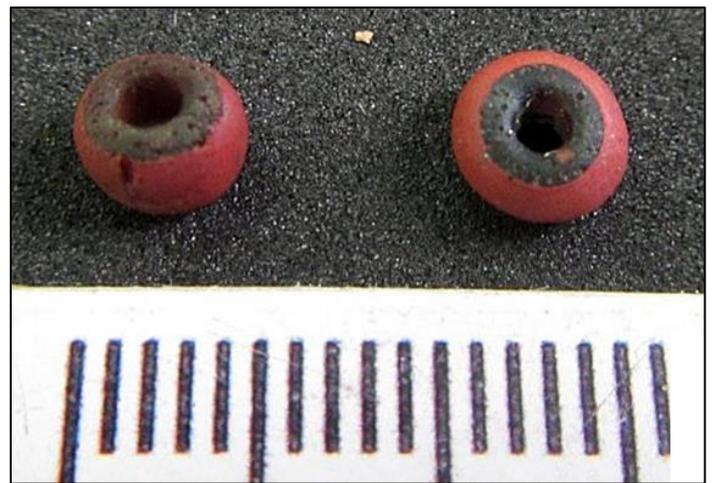
All 193 people on board survived the accident and sought refuge in a small bay close to the wreck site. They lived there for nearly three months, while slowly building a new vessel using elements salvaged from the wreck, as well as timber from the nearby forest. One of the outstanding aspects of this period in which the *Purísima Concepción* crew stayed in Tierra del Fuego is that they lived in total harmony with the native people, sharing various activities with them, even holding the first Catholic mass on the island, on the 10<sup>th</sup> of January, 1765. Finally, on April 2<sup>nd</sup>, the new vessel was

launched, enabling all the shipwreck survivors to return safely to Buenos Aires and eventually back to Spain.

The first archaeological finds that gave a clue to the location of the *Purísima Concepción* wreck site were a group of iron cannon balls and various 18<sup>th</sup>-century ceramic sherds, all of which were found in the intertidal zone. This area was likely the site at which the people from the *Purísima Concepción* disembarked, according to the geographic descriptions contained in the diary written by an anonymous member of the crew. If the cannon shot indeed belong to that vessel, the wreck itself and site and the survivors' camp could not be far away.

A new field expedition was then conducted, with the goal of searching for—and hopefully finding—the shipwreck site and the survivors' camp. The work would be conducted in the areas which were considered to have the highest chance of providing the archaeological evidence we were expecting to find. Again, the written primary sources were very useful research tools in terms of the describing the environment and providing other relevant information.

As for the land search for the survivors' camp, several test pits were excavated on a grass plain and adjacent forest located in the northwestern coast of an inlet known as Caleta Falsa. The finds mainly consisted of Spanish and English ceramic sherds from the 18<sup>th</sup> century, some fragments of flat wood that could be part of the foundations of the structures built by the ship survivors, and materials such as glass beads that revealed contact between European and native people.



*Glass beads, possibly from the survivor's camp.  
Photo by M. Vazquez.*

The underwater survey searching for the shipwreck site was mainly conducted with a magnetometer, given that the remains probably consisted of the lowest parts of the vessel containing most of the 20 iron cannon presumed to have been on board of the *Purísima Concepción*. Several magnetic anomalies were noted

and appear highly consistent with the archaeological expectations. However, it was not possible to confirm the targets due to adverse diving conditions.

Further surveys were done in the intertidal zone adjacent to the sector where the magnetometry searches were conducted. The main finds consisted of more 18<sup>th</sup>-century ceramic sherds and iron cannon balls that matched the caliber of the cannon of the *Purísima Concepción*.

These several lines of evidence suggest that the remains of the *Purísima Concepción* and the survivors' camp have been located, thus accomplishing the goals and objectives of this specific project. Nonetheless, future and more thorough surveys, both on land and underwater, would be very helpful for a better understanding of this historic event.

The second site on the Atlantic coast of Tierra del Fuego that was studied was formed by an intriguing series of wooden baskets located in the intertidal zone. The containers held large quantities of what appeared to be historic European ceramic, glass tableware, and toilet ware. Many artifacts were also scattered around the baskets reaching the supratidal area. The site was designated Playa Donata 3, after the name of the beach where they the artifacts occurred.

The containers were visible when they were originally found, but only a few months later they were completely covered by the sand to a depth of between 50 and 60 cm. Besides revealing a significant natural sedimentary process—the covering and uncovering the archaeological materials—the situation presented constraints in terms of the speed and manner of the recovery work, which could only be conducted in the moments where the artifacts were not covered by water.



Left, banded ware mug. Photo courtesy of PROAS. Right, child's mug with alphabet decoration. Photo by O. Mella.

In total, 11 baskets with their contents were excavated, and hundreds of additional remains were collected from the surrounding area. The positions of all of the finds were recorded with GPS and were subject to basic in situ photographic recording. Thanks to the fact that some of the artifacts are good chronological and cultural indicators, the cargo was subsequently identified as British in origin and dating from the second half of the 19<sup>th</sup> century.

It is worth noting that no shipwreck had been recorded in the area which could be associated with these materials, thus leading us to believe that the artifacts may have come from a vessel that continued its journey, probably around Cape Horn towards the Pacific Ocean. This latter inference, the direction of travel, is based on the fact that there were no ports on the Atlantic side at the time that seemed suitable for a merchant vessel, while the Chilean and Peruvian coast, on the Pacific Ocean, had several.

*continued on page 18*



Wooden crate with ceramic plates, Playa Donata 3 site. Photo by M. Vazquez.



Bottle base, embossed "IB DN", Playa Donata 3 site. Photo courtesy of PROAS.

# The Clipper Ship *Redemptora*, 1851-1898: Archaeology, History, and Heritage Management

by Geraldo Hostin

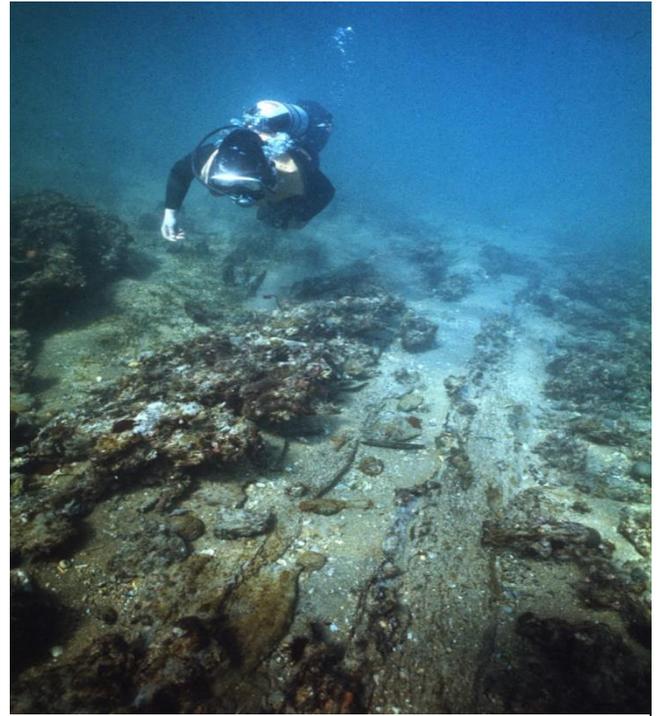
## Introduction

The historic shipwrecks presently located in Jervoise Bay, Western Australia, are the result of many years of accidents and of the practice of vessel abandonment, making this location significant for maritime archaeology. One of the oldest wrecks in the collection, identified only in 1978, is the 19<sup>th</sup>-century North American-built ship *Redemptora* (1852-1898), whose importance for archaeology, history, and heritage has not been fully appreciated. This report is based on my Master of Professional Archaeology thesis at the University of Western Australia, which utilized data from archaeological reports and archives in conjunction with new documentary evidence to illustrate the ship's past in a more comprehensive way and to propose preservation strategies.

Before my investigations began, all that was known about the *Redemptora* came from archives of the Western Australia Shipwrecks Museum in Fremantle. The vessel was described as a Brazilian full-rigged wooden sailing ship of 1,250 tons and built c. 1853 at an unknown United States location. During its last voyage from Rio de Janeiro to Eastern Australia under the command of Captain Casavecchia, carrying a cargo of sugar, coffee, and ballast for the owners the Gianelli brothers, the ship was caught by storms off the coast of South Africa and, with masts, rigging, and hull damaged, had its voyage diverted to Fremantle, Western Australia due to an imminent danger of sinking. After its arrival on 16 October 1888, a damage survey was conducted, and the vessel was found to be expensive to fully repair. It was bought by a Mr. Lilly on behalf of Adelaide Steamship Company for £315, and started a new career as a coal hulk, operating out of Careening Bay, Garden Island, finally being abandoned at an unknown date. The wreck is in shallow waters, about 3-5 m deep, within the confines of the Australian Marine Engineering (AME) property, Henderson, south of Fremantle, and close to active shipping lanes.

## History Discovered

A short report in an 1888 edition of Rio de Janeiro newspaper, *The Rio News* (written for the local British community) opened the doors for the vessel's past in America and Brazil to me. One of the August 1888 issues had a hitherto unnoticed announcement which stated that *Redemptora*, *ex-North America* and *Marianna VI*, and built in Dariscotta (sic), Maine, in 1852, was about to leave Rio de Janeiro for Australia.



*Redemptora* ca. 1980. Courtesy of Patrick Baker, Western Australia Shipwrecks Museum.

In a rather ominous statement, the report mentioned it was strange that such a task had been entrusted to a 36-year old vessel. Newspapers from 1888-1889 in the National Library Archives in Rio de Janeiro provided more results: page 3 of the *Diario do Commercio*, dated 13 July 1889, revealed that the ship was the property of the Gianelli Brothers.

In the British and American ships registers, two contemporary vessels of similar size were extant: *North American*, built in Damariscotta in 1851 (Lloyd's Register of American Shipping 1859, register 1568); and *North America* (Lloyd's Register of American Shipping 1859, register 1567), a ship built in Boston c. 1852, and designed by Donald McKay of the famous *Flying Cloud*. After the 1865 issue of the American Lloyd's Register, *North America* is never listed again. Since the latter disappeared from register, the identification of *Redemptora* with the *North America* was questionable.

Documents found in the Portuguese Navy archives in Lisbon helped settle the matter. They report an incident in 1869, when an American vessel coming from Indonesia and registered under the American flag ran aground while entering a Portuguese port. The ship was later sold to a Portuguese shipping company. The 1869 purchase documents are clear. They stated that the seller

was Capt. George Mitchell, master of the full-rigged ship named *North American* from New York. This ship would be renamed *Marianna VI* and had the following dimensions: length 57.50 m, breadth 10.40 m, depth 8.55 m, 1578.55 tons with a flush deck. *Marianna VI* was renamed and sold in Brazil. In the Lloyd's Register of Ships 1890, it appeared briefly as *Philadelphia*, with the following observation: ex *Marianna VI*.

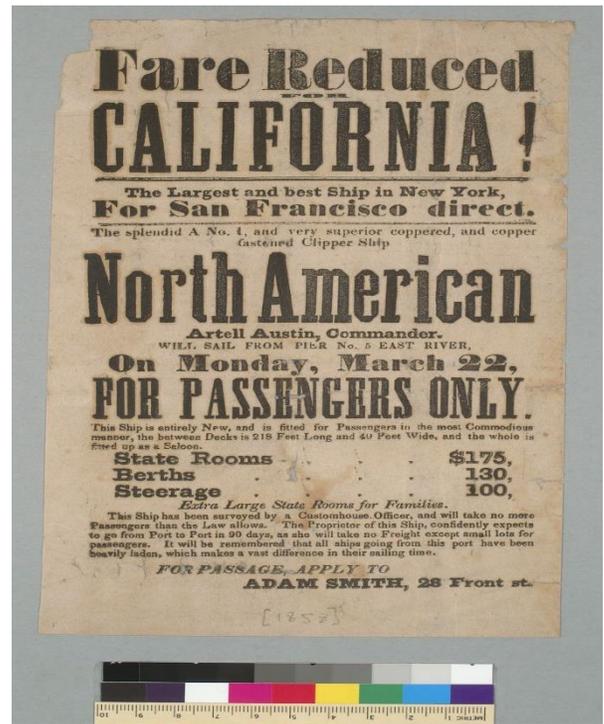
So, *Redemptora*'s original name was *North American*. A closer examination of Lloyd's Register of American Shipping 1859, register 1568, indicated that this ship had its keel laid in 1851, and was built in Damariscotta, Maine, by Algernon Austin.

The state of Maine was an important center of shipbuilding in the early 1840s, and produced most of North America's large square-rigged wooden ships in the 1890s. Algernon Austin was the co-owner or employee of Austin & Hall, a shipbuilding firm which appeared after 1850. This company built many other clipper ships, such as the *Black Warrior* in 1853 and *Voyager* in 1874, and Austin's shipyard was near the present Congregational Church in Damariscotta. Contemporary documents also described *North American* as a clipper ship.

At the time *North American* was built, the centuries-long evolution of the wooden sailing ship was approaching a highpoint in Great Britain, the USA, and



Captain Artell Austin and his wife Hannah.  
Courtesy of Calvin Dodge, Damariscotta.



Clipper ship *North American* advertisement.  
UC Berkeley, Bancroft Library. 1852, BANC PIC  
1963.002:1821—A.

some European countries; the opening of new trade and immigration routes called for faster, reliable, and lucrative ships. The fine-lined clipper ship built for speed, sometimes at the expense of cargo capacity, was one answer to such demands and was highly influential in changing the sailing ship design due to its efficiency. *North American* was built to transport passengers during the California Gold Rush, and its first master was Capt. Artell Austin, a relative of Algernon.

The ship's first voyage was colorfully described in a report by C.W. Blaisdell, for *The Frontier Palladium* newspaper in 1852. The voyage took longer than expected and advertised due to weather conditions, and yet, except for the occasional brawl of passengers with the ship's cook, the crossing was relatively peaceful. Unfortunately, some incidents of death did occur on board, including Captain Austin's baby daughter, whose body was later brought back to Maine for burial. During the last leg of the voyage in the Pacific, the infamous filibuster, Parker French, was met on another ship but was denied a ticket to California by Captain Austin.

In an 1852 letter (now at the Huntington Library), from Robert W. Butterfield to his mother, we have a somewhat cynical description of the conditions encountered at Cape Horn:

*Imagine yourself situated in a dull and unattractive building of [sic] a stormy night in the last days of November, with no*

*fire, and darkness just made visible by the glimmering here and there of long intervals from each other of dull lanterns, with the angry winds howling around you, making the every joint, brace & timber creak, squeak & crackle—causing the doors to slam and the windows to rattle, and you have a scene not unlike the condition in which the passengers of the ‘Splendid A No.1 Copper bottomed, Clipper Ship North American’ found themselves upon the nights and days of these times of which I am now speaking.*



North America, *Mariners Museum Collection, Accession # 1935.0591.000001.*

It seems there was a mixing up of identities in the newspapers in the 19<sup>th</sup> century between *North American* (*Redemptora*) and *North America*. This makes it difficult to find a definite picture of our ship. As an example, a watercolor painted by artist Duncan McFarlane, now in the Mariners Museum, Newport News, bears the name *North America*. The description states that the ship was “built by Austin & Co in Maine,” suggesting it was in fact *North American*.

From early 1851 to 1869, *North American* hailed from New York. Its owners or consignees were J.W. Phillips, ca. 1858, Williams & Guion, ca. 1861, and A. Jacquemot ca. 1868. During the years 1861-1862, the ship was used to transport immigrants and cargo between Liverpool and New York. The ship’s activities during the Civil War years of 1863-1865 are unknown; it is possible that it might have been used to carry Union troops, a subject worth investigating.

### **A Brazilian Ship**

The name *Redemptora* is related to a Brazilian Princess, Isabel of Brazil. Her importance for Brazilian history is remarkable. After freeing all African slaves in Brazil on

13 May 1888, she was almost immediately known by Brazilians as ‘A Redemptora’ or ‘The Redemptress.’ Although this humanitarian deed would soon cost her father, Emperor Pedro II, the Brazilian crown, it brought the Royal Family admiration and gratitude from the ‘common folk’ that exists to this day.

The shipowners, Gianelli Brothers, had political contacts with the Brazilian Royal Family, which helped them establish the Fluminense mill in Rio de Janeiro in 1887, according to the archives of the Bunge company, its present successor. It is probable they renamed the ship *Redemptora* in honor of Princess Isabel sometime between May and August 1888.

The need for the ship’s voyage to Australia, under the command of Captain Casavecchia, was simple. Brazil was receiving a growing number of European immigrants in the last decades of the 19<sup>th</sup> century, a tactic used by the Imperial House to disrupt slavery. The Europeans were accustomed to a different diet than were the Brazilians. Brazilian farmers and mills (such as the Fluminense) did not produce enough wheat to supply an increasing demand, and thus an attempt was made to purchase wheat at low prices from Australia. *Redemptora* was damaged in the storm off South Africa during her initial voyage for wheat and limped into Freemantle.

After being sold and doing service for ten years as a coal hulk in Western Australian waters, the ship was put up for sale again in 1898, but no one wanted to purchase



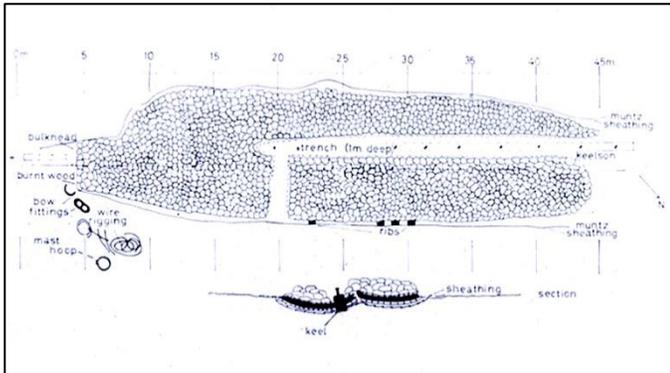
*Isabel of Brazil.  
Insley Pacheco, 1887.  
Public domain.*

it. At that time, it was unserviceable to its current owners and probably of little further use. It is highly likely that the ship’s abandonment occurred in 1898. The place of its beaching, south of Woodman’s Point, is a rather apt description of its location. Replicating the common practice in those days, workers emptied the vessel of all valuable items before burning it to obtain copper

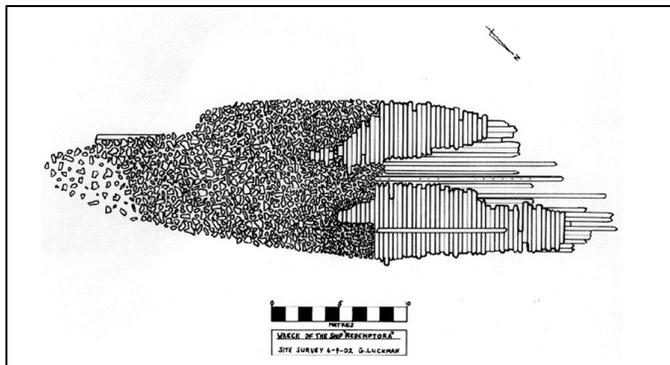
for recycling. That was a rather inglorious end for a vessel with a such rich past.

## Archaeology

The remains were positively identified by archaeologist Michael McCarthy in 1978. What survived was the lower part of the hull covered by ballast stones, hence its initial name, “the Wreck of Stones.”



Redemptora in 1978.  
Western Australia Shipwrecks Museum.



The wreck in 2002.  
Western Australia Shipwrecks Museum.

A few archaeological expeditions have been carried out at the site by the Shipwrecks Museum, consisting basically of surveys/assessments. Some architectural elements and objects of everyday use were collected and are within the predicted date range for the shipwreck, mirroring its last days of useful life. My own artifact analysis yielded little information on the people who lived in the ship. In all, the scarcity of such objects makes archaeological analysis quite limited in scope, but further excavations could expose more items.

## Conservation Issues

The remains of this ship are potentially at risk due to its exposed location, industrial expansion plans, and environmental changes. Shipping activities, at least since 2002, have also caused disturbance to the wreck, and as a result its timbers are degrading.

Management or protective policies by the Western Australia Shipwrecks Museum in the past were rather passive, reflecting the partial knowledge of the shipwreck, and until a few decades ago were covered by ineffective legislation. This has been somewhat altered with the blanket protection provided by changes in the *Historic Shipwrecks Act* in 1993. The last known assessment of significance by the Museum in 2014 has also included preservation issues.

Bearing this problem in mind, options for a new conservation management plan with stakeholder consultation, following the guidelines established by Australia ICOMOS Burra Charter for Places of Cultural Significance, were proposed in my Master's thesis and delivered to the Shipwrecks Museum officers. While no final agreement has been reached between stakeholders, it is recommended to cover the wreck in situ to prevent further deterioration.

In 2014, the wreck's importance was assessed by the Shipwrecks Museum as being from high to moderate. A reassessment of significance is needed since the historical, archaeological, technical, and educational values have increased with the new data uncovered. As to the technical and archaeological value something else must be said. The scholar Basil Greenhill in his 1993 book *Sail's Last Century*, truly stated that “the printed sources can hardly convey the full range of wooden shipbuilding techniques.” Even if ship's plans existed in the days of *Redemptora*, much of the information about its construction was not recorded, as there was a practical side to the shipwright's art that was learned by everyday practice. Archaeologists might obtain this knowledge to a certain extent only by direct inspection of the ship or shipwreck. Hence, it is acceptable to conclude that this vessel has good potential for research on architectural and technological aspects from the heyday of wooden shipbuilding technology.

## Conclusion

From a conservation point of view, *Redemptora's* story is a good example of how difficult problems develop when economic and heritage interests are at odds and how imperfect legislation and unintentional lack of historical and archaeological knowledge combine to make heritage matters very complex. It is expected that a more proactive course of action will be taken to preserve this significant shipwreck for future generations. On the historical and archaeological side, the new findings concerning the vessel's former history abroad are particularly noteworthy and have elevated the heritage status of the wreck significantly, as its value goes beyond Australian borders. In America, its construction as a wooden clipper ship to transport

*continued on page 18*

# Dauntless Protection: Managing U.S. Navy Aircraft Wrecks in Lake Michigan

by Blair Atcheson, Alexis Catsambis, and Agustin Ortiz

With the United States' sudden entrance into World War II, the U.S. Navy rapidly needed to train aviators and to conduct the training in a place safe from the threat of enemy attack. Located north of Chicago on Lake Michigan, Naval Air Station Glenview was chosen for Carrier Qualification Training (CQT). The Navy converted two former side-wheel passenger steamers, USS *Sable* (IX-81) and USS *Wolverine* (IX-64), into training carriers. From 1942 to 1945, CTQ at NAS Glenview qualified over 17,000 pilots with a combined total of at least 142,560 successful takeoffs.



*USS Wolverine (IX-64) at Buffalo, New York, in early 1942 just after completion. At the left is the stern of SS Greater Buffalo, just beginning conversion to USS Sable (IX-81). Photo courtesy of C.C. Wright. (NHHC Photo NH 81059. U.S. Navy photo released).*

Based on available records, only 120 aircraft are known to have been lost in the lake over the course of three years. Eight of the losses were associated with fatalities, and there were approximately 200 additional deck accidents. Considering the number of pilots qualified, CTQ at NAS Glenview had a staggering success rate.

The Navy utilized nine different aircraft types on Lake Michigan, eight of which are represented in the wreck assemblage: TBF/TBM Avenger, F4U Corsair, SBD Dauntless, TDN-1 Drone, F6F Hellcat, SNJ Texan, SB2U Vindicator, and F4F/FM Wildcat. As a group, and individually, the aircraft wrecks represent a unique and important piece of WWII history and highlight an



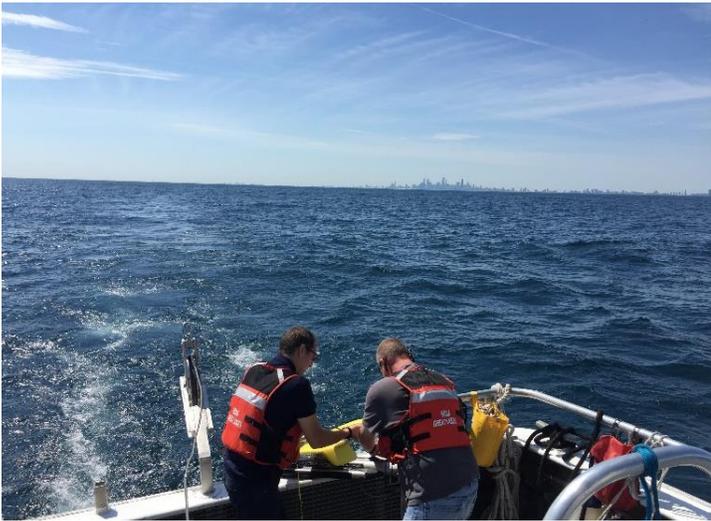
*SBD Dauntless dive bomber takes off from USS Wolverine (IX-64), 20 March 1943. Note ice in water. (NHHC photo 80-G-75409. U.S. Navy photo released).*

often-overlooked, yet vital aspect in the development of U.S. naval aviation and aviators—carrier training.

## Why Lake Michigan?

Due to Lake Michigan's relatively shallow depths and cold, freshwater preservation conditions, U.S. Navy WWII aircraft lost there during CQT have long been the focus of salvage and recovery operations, both authorized and illicit. This work has been done without the benefit of full site documentation or consideration of the collection as a whole. As a consequence, the Naval History and Heritage Command's (NHHC) Underwater Archaeology (UA) Branch has launched a multi-year research initiative to produce a full and comprehensive accounting of sunken military craft in the lake. The effort also supports UA's larger aviation research goals.

Extensive archival research has confirmed the count of 120 aircraft lost during CQT and that 50 aircraft have subsequently been recovered. While no longer fully intact due to significant recoveries, the collection as a whole remains one of the largest concentrations of WWII U.S. Navy aircraft and includes eight different types, some of which were combat veterans. In addition to being U.S. Navy sunken military craft, the wreck sites provide an important data set for studies in Aviation Archaeology, highlighting a unique facet of life in the Navy. The wreck sites also provide a stark reminder, especially those associated with fatalities, that the war



*Alexis Catsambis (left), NHHC Underwater Archaeology Branch, and Colin Stewart (right), NOAA's Office of Coast Survey, prepare to launch the side scan sonar for survey operations, 7 Sept 2019. (U.S. Navy photo by Blair Atcheson/Released).*

penetrated life on the home front for civilians and military.

### **U.S. Navy Sunken Military Craft**

The Naval History and Heritage Command's Underwater Archaeology Branch is responsible for the management, research, conservation, and interpretation of U.S. Navy sunken and terrestrial craft, a group that includes over 3,000 shipwrecks and 15,000 aircraft wrecks distributed across the globe. These sites represent a fragile collection of non-renewable resources that in addition to their historical value are often considered war graves. Further, they may contain unexploded ordnance, classified information or material, or environmental hazards.

Sunken and terrestrial military craft under the jurisdiction of the Department of the Navy remain government property regardless of their location or the passage of time. The former are afforded further protection from unauthorized disturbance under the Sunken Military Craft Act. While the Navy prefers non-intrusive, in situ research on sunken military craft, NHHC maintains a permitting program to authorize controlled site disturbance for archaeological, historical, and educational purposes.

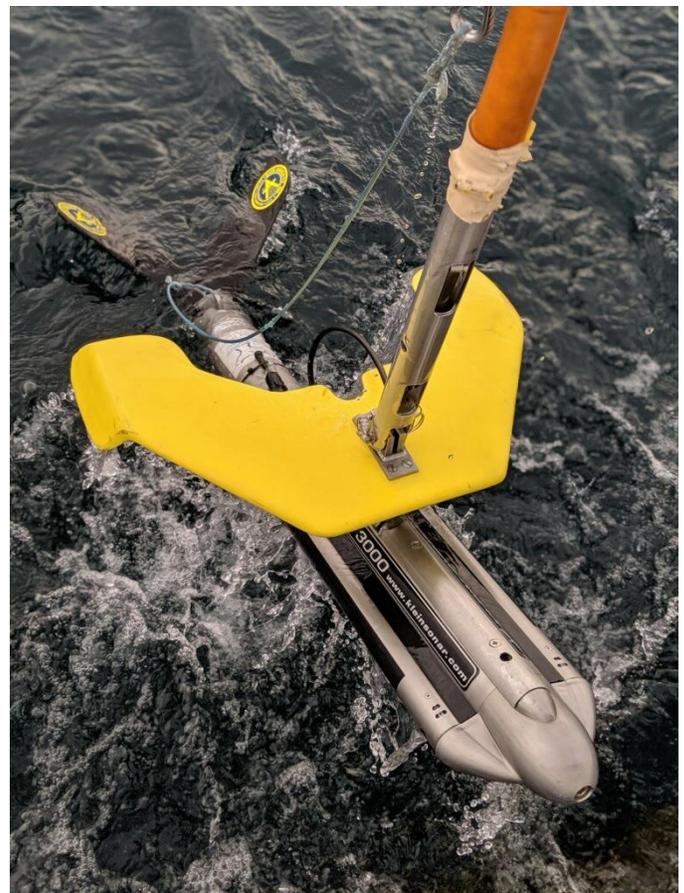
### **2019 Lake Michigan Survey**

The 2019 Lake Michigan Survey was planned on the long-term objectives of locating and obtaining quality baseline data on wreck sites to inform the development of a comprehensive management plan for the collection. In addition, the selected targets allow UA to assess threats and hazards such as zebra mussels, looting, and salvage in a variety of conditions and

depths, and apply the result of the survey to the collection as a whole. The Lake Michigan Survey is part of one of UA's long-term research initiatives to study and compare U.S. Navy aircraft training losses regionally.

Over ten survey days, the team surveyed seven of nine target areas. The areas were selected because they likely contained aircraft that met the key goals of the survey and included a representative sample of the aircraft types left in the lake. The survey objectives were to locate and document nine specifically chosen aircraft wrecks utilizing a variety of remote sensing tools, including side-scan sonar, a multibeam echosounder, and a magnetometer. The survey allowed comparative analysis of the historic record with the actual locations of the wrecks, the ability to check state of preservation of the wrecks, determine environmental or human impacts, and collect data to develop a management plan for Lake Michigan.

The survey covered approximately 30 square kilometers, and within that area two ships and two aircraft were located. Both ships were wooden hulled civilian vessels. The aircraft were naval TBF-1



*Remote sensing data was collected with NOAA's side scan sonar system and onboard multibeam ecosounder. Here, NOAA's Klein 3000 is launched from R/V Storm, 9 Sept 2019. (U.S. Navy photo by Alexis Catsambis/Released).*

Avengers. While the specific identities have not been determined yet, it is hoped that a short list of likely candidates in combination with a follow-up survey using a remotely operated vehicle or diver survey will finalize identifications.

NHHC-UA partnered for the survey with the National Oceanic and Atmospheric Administration (NOAA) Maritime Heritage Program and Thunder Bay National Marine Sanctuary (TBNMS). NOAA and TBNMS provided the survey vessel R/V *Storm*, along with marine operations support through the Great Lakes Environmental Research Lab, and hydrographic survey staff and expertise from the Office of Coast Survey. The survey provided the Navy and NOAA an opportunity to collaborate on a project that met the mission objectives of both agencies.

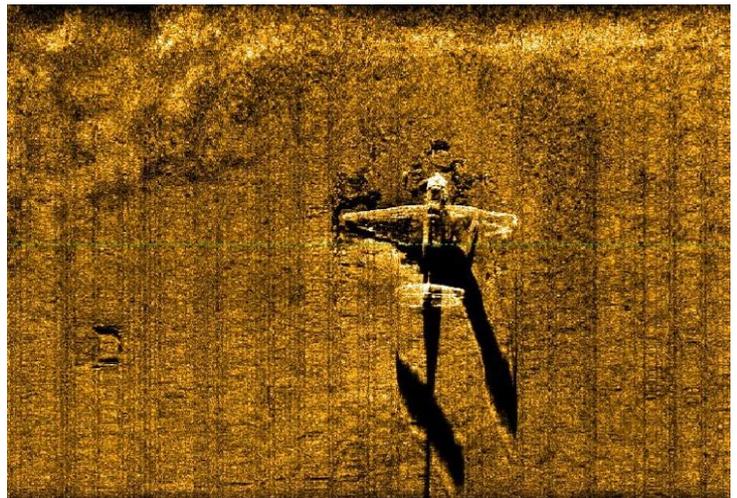
*Blair Atcheson, Alexis Catsambis, and Agustin Ortiz are Archaeologists with NHHC/UAB. ⚓*



*TBF-1 Avengers in flight formation over Norfolk, Virginia. (NHHC photo 80-G-426849. U.S. Navy photo released).*



*NHHC underwater archaeologist, George Schwarz, reviews remote sensing data 9 SEP 2019. (U.S. Navy photo by Alexis Catsambis/Released).*



*Side scan sonar image of an U.S. Navy Avenger on the Lake Michigan lake bed 9 SEP 2019. (U.S. Navy photo by Alexis Catsambis/Released).*

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# ***Tree Story: The History of the World Written in Rings***

by Valerie Trouet (Johns Hopkins University Press 2020)

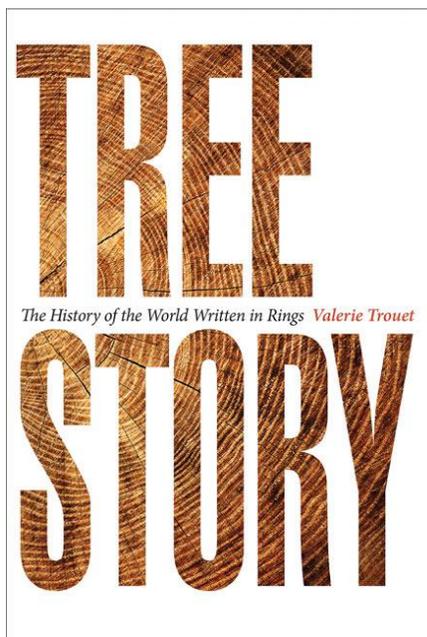
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reviewed by Dennis Knepper

The noted Belgian nautical archaeologist Lucien Basch stated in the early 1970s that “the most important limitation [of nautical archaeology]...is the virtual impossibility of deducing the shipyard where a vessel was built.” Since that time, wood studies including species identification and dendrochronology have opened new avenues for shipwreck interpretation. While archaeologists are still not routinely able to pinpoint the specific shipyard from which a vessel originated, they have made great strides in discovering the types of wood used in a ship’s construction, the dates and general locations of production and repairs, and even the patterns of timber trade supporting a ship’s construction. The whaler *Charles W. Morgan*, for example, built in 1841 in New Bedford, Massachusetts, contained a group of timbers identified as southern pine that tree-ring analysis indicated were a match for sequences from two stands of trees in South Carolina.

A recently published book, *Tree Story*, by Valerie Trouet, is a comprehensive look at the science behind this type of analysis. Trouet describes herself as a dendroclimatologist, a scientist specializing in climate reconstruction through the study of the patterns of annual growth rings in trees. The subtitle of the book, *The History of the World Written in Rings*, captures the intended scope of her work. The publisher’s summary on the dust jacket flap states the book blends popular science, travelogue, and cultural history “defly woven together to demonstrate the ways in which dendrochronology sheds light on global climate dynamics and uncovers the clear links between humans and our leafy neighbors.”

Wood is a critical part of the maritime world, used in the construction of docks and piers, of bulkheads and warehouses—and, of course, ships. Its detailed study is thus a natural part of maritime research. *Tree Story* treats tree-ring studies widely, detailing extensive background on dendrochronology, the history of its development, and the implications of the resulting data for a range of disciplines that includes maritime history and archaeology. Trouet is an associate professor in the Laboratory of Tree-Ring Research at the University of



Arizona, with two decades of experience as a paleoclimatologist and more than 60 scientific papers to her credit. She has worked in sub-Saharan Africa, Siberia, the Californian Sierra Nevada, and the Balkans, and she uses her experiences in these varied geographic regions as backdrop to her text.

While describing the anatomy of a tree and the formation of its tell-tale rings, Trouet explains the processes involved in dendrochronological work, from extracting samples in the field, to preparing thin sections in the lab and employing statistical techniques used to interpret the patterns seen in various samples.

Dendrochronology, says Trouet, involves more than just counting

rings. Reading ring patterns requires “a little talent for pattern recognition, a lot of training and concentration, and a proper understanding of what makes trees tick.” The development of rings and the key to their readability, she notes, is a direct result of the fact that trees experience an arboreal form of seasonal affective disorder—they hibernate during the winter when days are shorter, resulting in slowed growth that is recorded in their annual cycle of ring development.

Trees also suffer what she refers to as annual affective disorder, referring to uneven growth depending on local or regional weather conditions. The effects are typically seen in the difference between wet and dry conditions, when a tree will, respectively, grow well and produce a thick ring or grow poorly resulting in a thin ring. “Trees remember,” she notes. “They record history and they don’t lie.”

The patterned variation in rings can be recognized across regions and through long stretches of time in a process referred to as cross-dating, which involves matching ring patterns of known date with those from trees of increasing age. The chronologies developed from cross-dated tree ring data can be extensive: the longest series at present is an oak-pine chronology from subfossil German oak and Scottish pine that spans 12,650 years. The potential lengths of tree-ring chronologies are in theory almost limitless, since rings may be preserved in much older, fully fossilized wood.

Fossilization typically requires millions of years to develop, however, and thus while possible, cross-dated series that extensive have not yet been constructed.

Trouet writes engagingly as she explains occasionally abstruse-seeming processes in clear, comprehensible language that is generally free of jargon. The descriptions are interwoven with narratives of field work and the history of the discipline that are often explanatory in themselves.

Much of the book concerns insights into climate change as revealed in the paleoclimatic data from the author's research. This is no surprise given her professional interests. Yet, tree-ring analyses have been used in a wide variety of other areas, from museum studies to maritime history, and Trouet includes examples from many disciplines throughout her text. She notes, for instance, that dendrochronological analysis and provenancing verified the authenticity of one the most famous Stradivarius violins, settling a long-running dispute over the origin of the instrument.

Beyond chronology, economic and sociological information can be gained from timber studies revealing, for example, patterns of timber trade. Cross-dating timbers from the so-called Karschau ship, a medieval wreck from northern Germany, determined that the vessel had been built from trees felled in Denmark in A.D. 1140. Other studies have shown that timber was exported heavily from the Baltics to western Europe after oak-beech forests largely disappeared as a result of the construction of "castles, cathedrals, ships, and palaces, leaving old-growth, high-quality oak timber a scarce—and thus expensive—commodity."

Another example the author cites from the maritime world also illustrates her entertaining narrative approach seen in playful chapter titles such as "Three Tree-Ring Scientists Walk into a Bar." This chapter describes an analysis of maritime data developed with two other researchers (thus the three scientists) during meetings at conferences and coffee shops (thus the bar). The work combined tree-ring dates, historical weather records, and shipwreck archives. Initially, a colleague used tree-ring analysis to study hurricane frequency, analyzing growth suppression in rings from slash pines in the Florida Keys that resulted from salt water inundation during major storms. The investigation accurately recognized 40 of 44 hurricanes recorded historically near the study site at

Big Pine Key since 1851, when instrumental meteorological recording began. After thus validating the method, further cross-dating extended the chronology and associated storm frequency to less well-documented times, as far back as 1707.

Trouet and another colleague then used records from Spanish archives in Seville, that included listings of ships lost in hurricanes from the late 15<sup>th</sup> through the mid-19<sup>th</sup> centuries, as a proxy for even earlier storms. Combining the early storm data with historical data, the three researchers developed a 500-year record of hurricanes in the Caribbean.

A gap of about 70 years occurred in both hurricane and shipwreck frequency, which also correlated with a period of low sunspot activity known as the Maunder Minimum. Climatologists have associated this period with an event referred to as the Little Ice Age, a cold period intensive enough to have lowered ocean temperatures. Hurricanes require warm water to fully develop, and thus tree-ring data helped to establish a link between low solar radiation and reduced hurricane activity. Curiously, this period also correlated with the so-called Golden Age of Piracy, the peak of pirating and privateering in the Caribbean that was likely abetted by calmer seas and increased ship traffic.

*Tree Story* should be well-received by a variety of readers, professional and non-professional alike. While at first glance geared primarily toward climate studies, the book will interest all who work with wood and the past, including maritime archaeologists and historians, museum scientists, and art historians. It describes how dendrochronology and provenance analyses are carried out and what they can and cannot tell us. The book is well-written and designed, with good pacing that intermixes entertaining and informative narrative in focused chapters that are not overlong.

*Tree Story* is a good example of recent works that one reviewer notes as "smart non-fiction: sophisticated academic books for a broad audience." It is another handsomely produced volume from Johns Hopkins University Press, with clear typography enhanced with illustrations that are specifically designed for grayscale printing by graphic designer Oliver Uberti. Useful end matter includes a short list of recommended reading, a bibliography arranged by chapter, and a serviceable index. †

Tierra del Fuego *continued from page 8*

The ceramic collection includes white granite ware, banded ware, lusterware and transferware, and the forms include tea cups, plates of various sizes and shapes, pitchers, mugs, vegetable or soup tureens, chamber pots, and sets of washing jugs and bowls. Remains of small mugs with alphabet decoration, made for children, were also found.

The baskets or crates themselves are particularly interesting since they are a type of artifact seldom reported from archaeological excavations. Botanical analyses revealed the bodies were made of hazel lathes, with two lateral “handles” made of oak. None of the crates seem to have had a lid or cover, but remains of a thick fabric made of hemp were found in association with the baskets. The fabric could have been used to

protect the materials contained inside, or may have been part of the merchandise as well.

The glass collection from Playa Donata 3 consisted almost exclusively of green or brown beer or wine bottles made with three-part molds. Many have an embossed mark with the letters IB DN and a number 2 or 3. These marks have not yet been identified.

As research in both archaeological sites progresses, we expect new information to be generated about European merchant vessels of the 18<sup>th</sup> and 19<sup>th</sup> century which ventured into the dreaded Cape Horn route, at the southernmost tip of the Americas.

*Dolores Elkin is Director of Underwater Archaeology Program (PROAS), National Institute of Anthropology, Argentina, and a Researcher at the country's National Research Council (CONICET) ⚓*

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Redemptora *continued from page 12*

immigrants during the Gold Rush makes *Redemptora ex-North American* one of the few American wooden clipper shipwrecks in shallow waters that can be studied. There is also potential for new historical discoveries in Brazil, Portugal, and the United States. Finally, the ship's final name is emblematic of an important political moment in Brazil when the practice of slavery was extinguished by a royal personage whose name has never been forgotten.

*Geraldo Hostin holds a Master's degree in Archaeology from the University of Western Australia and currently lives in Perth. His thesis on Redemptora is available at: [researchgate.net/publication/327622688\\_The\\_Clipper\\_Ship\\_Redemptora\\_1851-1898\\_A\\_Study\\_in\\_Archaeology\\_History\\_and\\_Heritage\\_Management](https://www.researchgate.net/publication/327622688_The_Clipper_Ship_Redemptora_1851-1898_A_Study_in_Archaeology_History_and_Heritage_Management). ⚓*

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PrezNotes *continued from page 2*

the Pamunkey River project reports. I have also been contributing time to the Recreational Diver Heritage Committee of the Advisory Council for Underwater Archaeology.

The announcement in November of the new vaccines restores the hope and anticipation for our return to a healthy and thriving community. In turn, this affords the opportunity for our members and students to renew their interest in maritime archaeology and return to the exploration and preservation of our nation's historic shipwrecks.

We look forward to this new beginning and extend our best wishes for the holiday season and a healthy and happier New Year.

See you on the water,  
Steven Anthony



**MARITIME ARCHAEOLOGICAL AND HISTORICAL SOCIETY**

***Statement of Ethics***

The Maritime Archaeological and Historical Society is organized for the purpose of enhancing public awareness and appreciation of the significance of submerged cultural resources and the science of maritime archaeology. In pursuit of this mandate, members may come into contact with unique information and cultural material associated with terrestrial and underwater sites containing evidence of the history of humankind. To protect these sites from destruction by commercial salvors and amateur souvenir hunters, the Society seeks to encourage its members to abide by the highest ethical standards. Therefore, as a condition of membership and pursuant to Article 2, Section 1 (A) of the bylaws, the undersigned executes this statement of ethics acknowledging adherence to the standards and policies of the Society, and further agrees as follows:

- 1. To regard all archaeological sites, artifacts and related information as potentially significant resources in accordance with federal, state, and international law and the principles and standards of contemporary archaeological science.
- 2. To maintain the confidentiality of the location of archaeological sites.  
To excavate or otherwise disturb an archaeological site solely for the purpose of scientific research conducted under the supervision of a qualified archaeologist operating in accordance with the rules and regulations of federal or foreign governments. Artifacts shall not be removed until their context and provenience have been recorded and only when the artifact and related data have been designated for research, public display or otherwise for the common good.
- 4. To conduct oneself in a manner that protects the ethical integrity of the member, the archaeological site and the Society and prevents involvement in criminal violations of applicable vandalism statutes.
- 5. To observe these standards and aid in securing observance of these standards by fellow members and non-members.
- 6. To recognize that any member who violates the standards and policies of the Society shall be subject to sanctions and possible expulsion in accordance with Article 2, Section 4 of the bylaws.

Signature \_\_\_\_\_ Date \_\_\_\_\_

**MARITIME ARCHAEOLOGICAL AND HISTORICAL SOCIETY  
PO Box 44382, L'Enfant Plaza, Washington, D.C. 20026  
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Membership in the Maritime Archaeological and Historical Society is open to all persons interested in maritime history or archaeology whether or not they are divers. Members of MAHS have first preference for enrollment in all courses and other activities and projects of the Society. To join MAHS, please sign the Standards of Ethics above and send it to MAHS along with your check and this application form. You may also submit dues via our website at <http://www.mahsnet.org/membership.php>.

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___ \$35	<b>Family</b>
___ \$50	<b>Sponsor</b>
___ \$100	<b>Patron</b>

**Skills (circle):** research/dive/video/communications/writing/first aid/other:  
\_\_\_\_\_

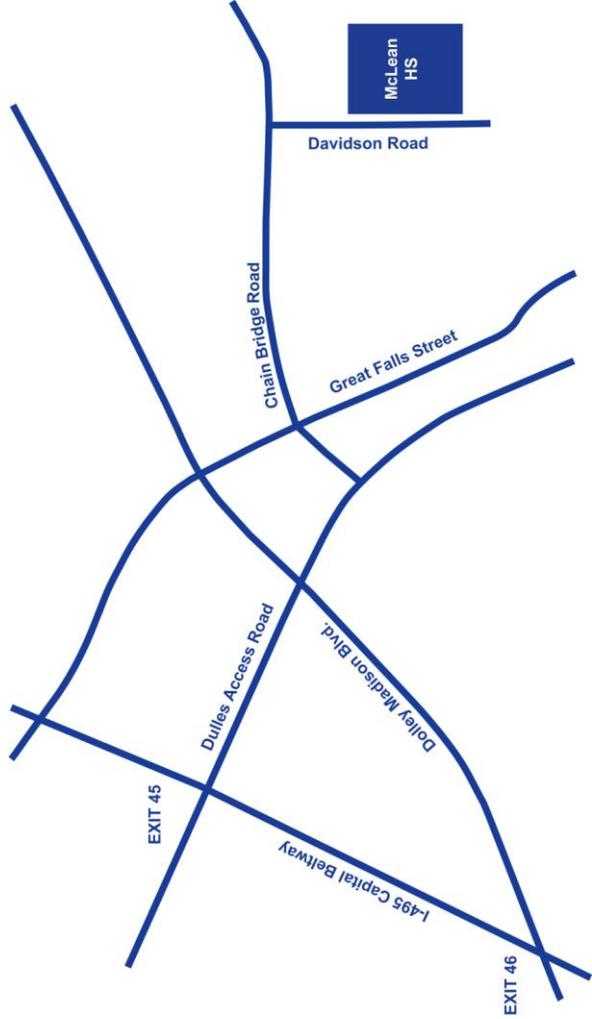
General membership meetings of the Maritime Archaeological and Historical Society are held on a bi-monthly basis, the second Tuesday of each month. Meetings are held at 7:30 p.m. at McLean High School, in McLean, Virginia, except in August and December. Meetings in August and December are held at other locations for special events and holiday parties

Please join us and bring a friend. The school is located on Davidson Road, just inside the Capital Beltway (I-495) - use Exit 45, coming from Maryland, or Exit 46, coming from Virginia.

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