

# MAHSNews



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## **A Mini-ROV Expedition to the SS *Tahoe*: Citizen Scientists, Engineers, and Archaeologists Exploring the Deep—Together**

*By Denise Jaffke and John Foster*

In June 2016, a team of software engineers used OpenROV (open-source remotely operated vehicle) submersibles to explore the SS *Tahoe*, a submerged steamer that once shuttled passengers and mail around Lake Tahoe. The expedition was not funded or planned by California State Parks or NOAA, but it was an opportunity for both agencies to help support a new citizen exploration model. The OpenROV organizers asked the NOAA Office of Ocean Exploration and Research, and Parks’ Maritime Heritage Program for advice.

They designed their expedition with attention to the telepresence model that E/V *Nautilus*, NOAA Ship *Okeanos Explorer*, and other ships have used to engage on-shore science parties and the public during expeditions. They documented the expedition, capturing high resolution video, and engaged virtual citizen explorers online and demonstrated best practices for citizen exploration. The project proved to be a success for all involved, and we hope the experience will encourage our associates to embrace the citizen science movement and become actively involved in developing similar procedures to guide future exploration.

When the community of ocean explorers met for the first National Forum on Ocean Exploration in 2013, they identified citizen exploration as an important component



*OpenROV Project Crew on the shore of Lake Tahoe.  
Photo by D. Jaffke.*

of a new, coordinated ocean exploration program. They said that as the cost of technology dropped and capabilities grew greater, more and better tools would be available to those who wanted to become explorers in their own right—and that these new citizen explorers were poised to make important contributions to our understanding of the ocean environment. Increasingly, citizen scientists are able to contribute by annotating

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## Notes from the Prez – Steven Anthony

MAHS conducted its Introductory Course in Underwater Archaeology for the 29th consecutive year! We are looking forward to our 30th Anniversary class in 2018.

The 2017 class was wonderful group of engaged divers interested in learning about the science of underwater archaeology and the role recreational divers can play in the protection and preservation of historic shipwrecks. Thanks to all of our dedicated instructors for their unwavering support. The highlights of the course again this year were the well-attended tour of the USS *Constellation*, in Baltimore Harbor, and the pool session where everyone had the opportunity to try out their newly learned trilateration skills on the MAHS *Lil' Sinkenteen*, our mock shipwreck assembled on the pool floor.

The next step in the MAHS certification process is participation in the MAHS Field School, which will be conducted again on Pickles Reef in the Florida Keys from June 22 through June 25. Pickles Reef is not new to MAHS. We recently completed a multiyear survey of the Barrel Wreck for the Florida Keys National Marine Sanctuary. Brenda Altmeier and Matt Lawrence have been actively involved in our work on that project and will be working with us again this year. They have asked MAHS to explore a site locally referred to as the "Gear Wreck." The objective is to identify the source of the features found on the site which could possibly be related to the Barrel Wreck site that we have been studying.

In January, Jim Smailes attended the 2017 Conference on Historical and Underwater Archaeology, in Fort Worth, Texas. As is custom, Jim represented MAHS at the board meeting of the Advisory Council for Underwater Archaeology. MAHS has been actively involved as an Institutional Advisory member to ACUA for many years and plays an active role on the Recreational Diver Training Committee and as an advocate for the role of sport divers as stewards of underwater cultural resources worldwide.

The issue of the *Titanic* bankruptcy emerged in the news in January. RMS Titanic, Inc., filed a motion for default judgment against France in December 2016, in their ongoing effort to obtain title to certain *Titanic* artifacts. The RMS Titanic plan was to sell these artifacts and use the proceeds to pay creditors. Since France had not responded and with the deadline approaching, MAHS coordinated with local maritime counsel to evaluate the prospect of MAHS submitting an Amicus Brief in support of an additional extension of

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MAHSNEWS will consider articles and notices for publication which enhance public awareness and appreciation of maritime history, archaeology, and heritage preservation.

data sets or images collected during ocean exploration conducted by large ships and deep-diving remotely operated vehicles. Citizen scientists can participate in deep-ocean exploration in real time by calling up live feeds from telepresence-enabled expeditions on their computers and mobile devices. But citizen explorers are now conducting their own expeditions using newly affordable, capable tools.

David Lang and Eric Stackpole co-founded OpenROV as an open-source hardware project, a startup, and a DIY community. OpenROV is a low-cost telerobotic submarine built with the goal of making underwater exploration and education affordable. Their ROV is small, weighing about five pounds, and is powered by C batteries. It can be assembled from common materials, with the most expensive piece being the BeagleBone Linux computer. The submarine is controlled from a laptop computer connected via a tether and is equipped with on-board LED lights and a camera.

OpenROV is an open-source hardware project. By providing the list of the submarine parts and instructions on how to assemble them, the developers aim to bring underwater exploration to a broader public. The forum provides a platform for users to discuss ideas, solve problems, and share information. The accompanying OpenExplorer is a digital field journal for folks to share different stages of their personal expeditions.

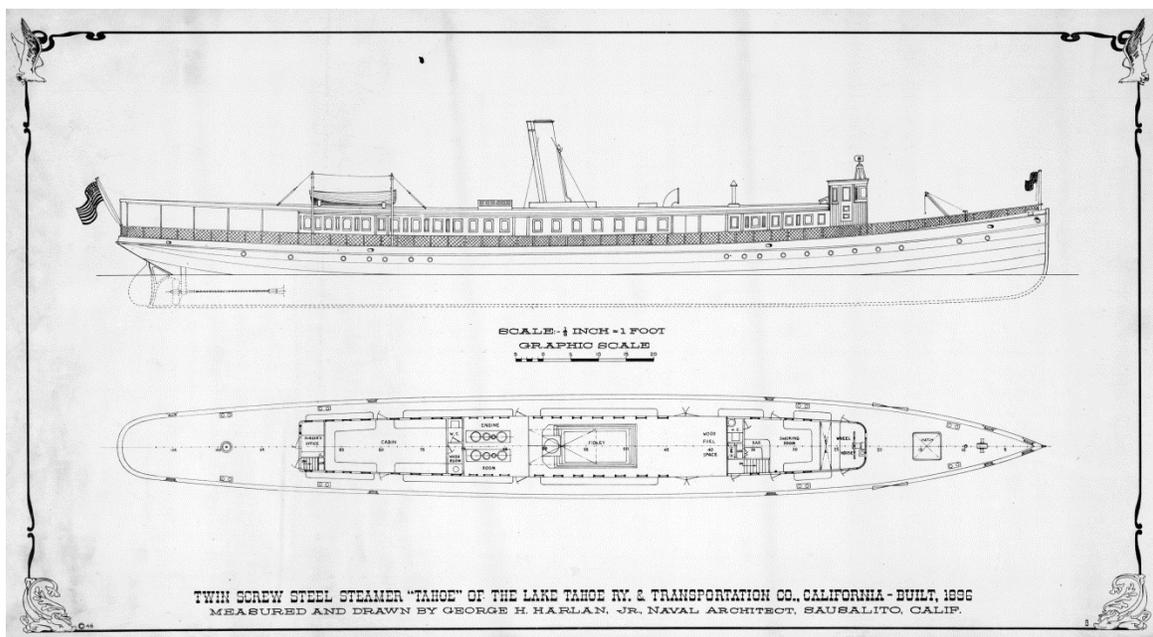
The OpenROV project team couldn't have picked a better subject for their expedition than the Steamer *Tahoe*. The *SS Tahoe* is the most celebrated vessel of Lake Tahoe's historic past and represents the golden age



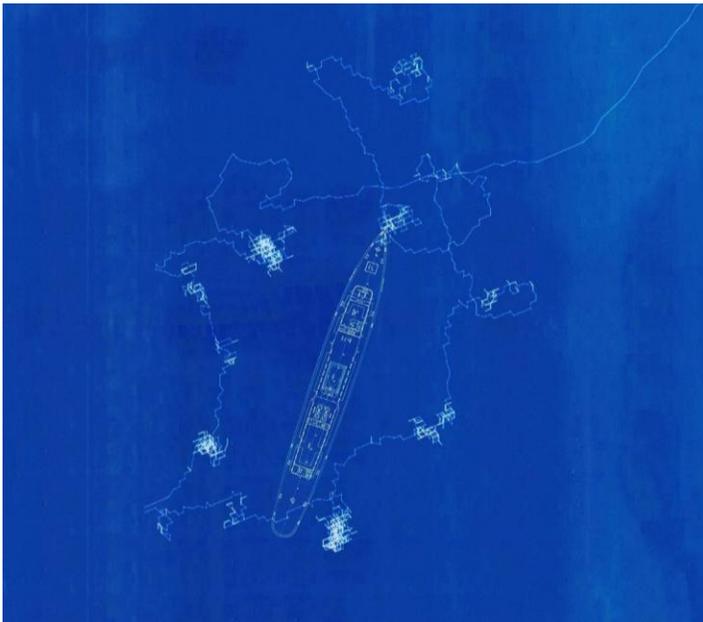
*SS Tahoe on the lake. Image Courtesy of the Nevada Historical Society.*

of recreation and transportation in the region. She rests in water that only highly experienced divers can reach which adds to the allure of the deep, cold waters of the lake. Additionally, the calm, clear waters of Lake Tahoe and excellent site preservation provide great visuals for appreciation by a broader on-line community.

*SS Tahoe* was launched with much fanfare on June 24, 1896, and spent the next 40 years in service around the lake. The ship's hull was built in sections at Union Iron Works in San Francisco and was sent by rail to Carson City, Nevada, where the sections were loaded onto horse/mule team wagons and hauled over the pass to Glenbrook, Nevada. Measuring 169 feet in length, the steamer was twice the length of most of the other steamers traveling around the lake at the time. Her



*Drawings of SS Tahoe. Image Courtesy of the Nevada Historical Society.*



*ROV path. Image Courtesy of OpenROV.*

narrow, sleek profile, with a beam of only 18 feet, allowed her to reach top speeds for the time. She featured a straight stem and an elliptical stern and had a total displacement of 154 tons. *Tahoe* had two huge steam engines which turned two brass, three-bladed propellers, one mounted on each side of a large rudder under her curved stern. The hull was divided into eight watertight compartments giving her strength and buoyancy. Brass fixtures, accentuated by mahogany trim, and lavish upholstery heightened the luxury status of the so-called Queen of the Lake.

The steamer marks Lake Tahoe's gilded age, when northern California's elite were able to travel for pleasure and only the wealthy managed to escape the high summer temperatures of lower elevations. That soon changed as roads were being built and improved to accommodate the automobile, allowing folks with more modest means to access and enjoy the high country during the sweltering summer months.

Significant road improvements in the late 1920s created easier automobile access, and the general economic decline of the early 1930s resulted in a steep drop in both freight and passenger revenue for the *Tahoe*. Laid up by the depression and having lost her lucrative mail contract, the "Queen" was abandoned and vandalized at her mooring. Finally, her Bliss family owners decided to give the vessel a proper burial and had her towed to Glenbrook. On August 29, 1940, she was scuttled and settled on a steep slope. Today her bow rests at 380 feet and her stern at almost 500 feet deep.

In 2002, the SS *Tahoe* became Nevada's first submerged site listed on the National Register of Historic Places. She is an essential touchstone of Lake Tahoe's collective identity and a treasured piece of the lake's history. While other steamers were sunk in deep

water, it was the intent of the Bliss family to sink the vessel in shallow water near where she was originally launched so she might be visible from the surface. Not knowing the location of the Glenbrook canyon shelf, the vessel was unintentionally sunk in deep water where only highly skilled technical divers have been able to visit.

In 1999, Martin McClellan established the nonprofit New Millennium Dive Expeditions and began raising funds to test their computer theory models related to decompression diving at altitude and to obtain the first imagery of the SS *Tahoe* wreckage. With three years of planning and fundraising, McClellan and colleague, Brian Morris, conducted four dives to photodocument the vessel, 60 years after it was scuttled.

OpenROV's research and development team briefly visited the *Tahoe* in 2014, but it wasn't until 2016 that they were able to capture high resolution imagery of the vessel and surrounding site. A "command center" was set up at a house on shore to observe and guide dives, while a crew of two navigated to the wreck dive site and managed deployment of the ROV. They outfitted a small inflatable boat with long-range communication equipment, an ultra-short baseline acoustic positioning system, and a low-cost dynamic positioning system. The purpose for building this system was to demonstrate that many of the capabilities one might think would require a large research vessel can actually be achieved with off-the-shelf parts that are portable and relatively inexpensive. We were there to identify elements of the wreck, document its condition, and answer questions from the online community. We later used the high resolution video to prepare a supplemental site record.

The *Tahoe* is in remarkable condition despite a few bumps and bruises. The vessel was purposely sunk near the lake's eastern shore, but it hit the shelf off the Glenbrook fault and slid down to its current depth, on a steep 30 degree slope. The vessel tilts only slightly to its port side. The tiller is bent at 90 degrees. The aft air funnels and boiler stack are warped from the impact.



*Stern of SS Tahoe illuminated by the ROV. Image Courtesy of OpenROV.*

The roof, cabin, and pilothouse were dislodged from the vessel and remain in ruins where the vessel struck bottom at 335 feet. The National Register nomination from 2012 reported that the portholes had been removed, but we confirmed that a few still remain in place. The upper deck area aft of the amidships engine compartment was damaged when an unauthorized 1960s salvage operation attempted to recover the vessel. Railing ripped from the deck now sits on both sides of the bow. Aside from this relatively minor damage, the Queen of the Lake is in fantastic condition.

Archaeology stirs the public interest like few other topics. Solving the detective story, connecting to past life histories, and appreciating change through time are all part of the draw. Adding water into the mix just accentuates the attraction and fascination. The trick is to balance public interpretation and outreach with conservation and protection—but for resource managers, that is part of our mission. Ever dwindling budgets and reductions in personnel force us to find innovative ways to fulfill our increasing responsibilities and workload. We believe part of the solution is to foster public

awareness of cultural heritage resources through the citizen science movement. By working with companies like OpenROV, we can share our archaeological values and procedures while exploring, documenting, and interpreting resources together.

It's not always easy, but by working with the public in these truly collaborative projects, we hope to instill a sense of stewardship in a greater portion of society helping to preserve and protect these sensitive resources. The first order of business is to develop best practices for underwater exploration that can be adopted by the citizen science community at large. We look to our colleagues to help implement this much needed partnership. Archaeological discovery and inquiry is becoming more democratic, and the chance to engage with our public and commercial partners is now, before we miss the proverbial boat.

*Denise Jaffke is Associate State Archaeologist with the California Department of Parks and Recreation.*

*John Foster is Senior State Archaeologist (Retired) also with the California Department of Parks and Recreation. ⚓*

## Maritime Heritage in Virginia: Archeological Society of Virginia Establishes the Maritime Heritage Chapter

*by Thomas Berkey*

The Archeological Society of Virginia, or ASV, is the state of Virginia's avocational archaeology society. Drawing its membership from a cross section of the population, the ASV's aim is to promote the study of archaeology and anthropology throughout the state. Founded in 1940, the ASV is one of the oldest state avocational societies in the United States. It has 15 regional chapters statewide and recently announced the founding of a new chapter, the Maritime Heritage Chapter, or MHC. It is the organization's first theme-oriented chapter. Its first president is John Broadwater, well-known to many in the archaeological community. Bruce Terrell, a long-standing MAHS advisor, will be vice president.

With the creation of the MHC, Virginia essentially reestablishes itself in the world of underwater archaeology and maritime heritage preservation. Until the mid-1990s, Virginia had a state-level program within the Department of Historic Resources (VDHR), headed by Paul Hundley, Bruce Larson, and lastly by John Broadwater. When the program was closed down, purportedly due to budget cuts, Broadwater moved on to the Office of National

Marine Sanctuaries, an agency of the National Oceanic and Atmospheric Administration, where he was program manager of the Maritime Heritage Program and manager of the Monitor National Marine Sanctuary. Retired from the public sector in 2010, Broadwater currently heads a maritime archaeology consulting company. He now returns to Virginia maritime archaeology as president of the new ASV chapter.

Virginia has literally thousands of miles of coastline, much of which includes the Chesapeake Bay shore. The state thus boasts an extensive and varied assortment of maritime sites, located along river estuaries, bay and ocean shores, and dating from Native American to modern times. Following the long hiatus without a statewide program to investigate these sites, Virginia now joins the nearby jurisdictions of

Maryland and Delaware in maritime preservation efforts. The Maritime Heritage Chapter will assist and work with the ASV and the VDHR, along with other organizations with related goals.

The ASV/MHC held its first meeting in Richmond in February of this year. Officers were elected and general planning sessions were conducted. The meeting

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# Explosion Aboard Steamer USS *Tulip*: Site Investigations and Management of a Union Gunboat Wreck from the American Civil War

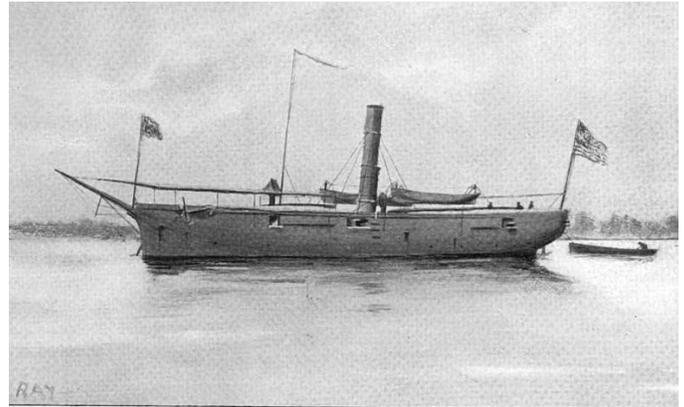
by George Schwarz

In March 2016, the U.S. Navy conducted an archaeological survey of the American Civil War gunboat USS *Tulip*. The survey was a joint effort by the Naval History and Heritage Command (NHHC) and SUPSALV, the Supervisor of Salvage and Diving, the Navy's Diving Program Division, in conjunction with the Institute of Maritime History (IMH), an avocational group based in Maryland. The researchers utilized an autonomous underwater vehicle with side scan sonar to map the wreck and delineate the extent of the associated debris field, along with a remotely operated vehicle for wreck site observation. A follow-up survey in May 2016, in which NHHC teamed with the Lighthouse Archaeological Maritime Program, of St. Augustine, Florida, and IMH, collected magnetometer data over the site to detect iron objects in and around the wreck.

Originally named *Chih Kiang* and intended for use by the Chinese military as a lighthouse tender, USS *Tulip* was built by master shipwright James C. Jewett of New York City in 1862-3. She was instead purchased by the U.S. Navy on 22 June 1863, renamed *Tulip*, and fitted for service as a gunboat, joining the Potomac River Flotilla in August 1863.

USS *Tulip* was a 240-ton screw-propelled gunboat measuring 97 feet 3 inches in length, 21 feet 9 inches in beam, with a 9-foot 6-inch depth of hold. She had a complement of 57, carried two 24-pounder smoothbore cannon and one 20-pounder Parrot rifle. She was powered by a non-condensing, high-pressure, horizontal direct acting steam engine (2 cylinders) with twin boilers. Although originally built with two masts and a bowsprit, prior to naval service the masts were removed to lower her profile. *Tulip* joined the Potomac Flotilla in 1863 with her sister ship *Fuchsia*.

That force patrolled the river, protecting Union waterborne communications between the nation's capital and its port cities during the Civil War. Designated as a



UNITED STATES STEAMER FUCHSIA.

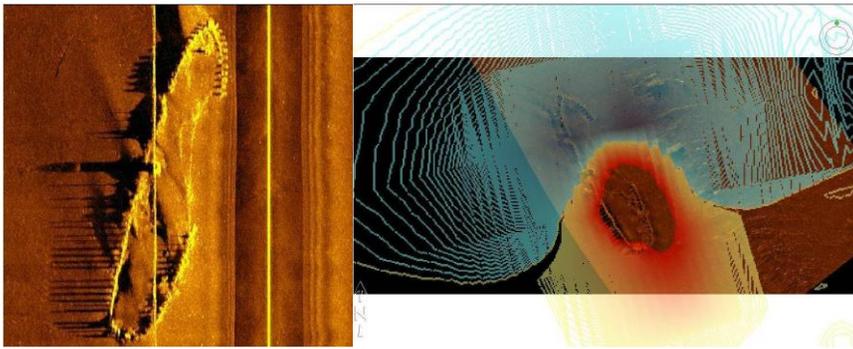
*There are no known images of USS Tulip. This is a wash drawing of her sister ship, USS Fuchsia, by Clary Ray, December 1896 (NH 57834).*

fourth-rate gunboat, *Tulip* may have initially performed towing duties at the Washington Navy Yard before serving in operations against Confederate forces on the Rappahannock. *Tulip* carried Federal troops and supported naval landing parties which from time to time went ashore for operations against Confederate traffic across the river.

As the gunboat continued her wartime riverine service into 1864, she developed a defective starboard boiler. Commander Foxhall A. Parker, commanding the Potomac Flotilla, ordered *Tulip* to return to the Washington Navy Yard for repairs. *Tulip* got underway on 11 November with orders to steam only the port boiler. Not long after departing from St. Inigoes Creek, St. Mary's County, Maryland, her engineers, under the command of acting Captain W.H. Smith, began supplying steam to the starboard boiler. When abreast of Ragged Point with a full head of steam in both boilers, the starboard member exploded, devastating the ship and instantly killing 47 of the 57-man crew. Of the 10 survivors, two died later as a result of their injuries.



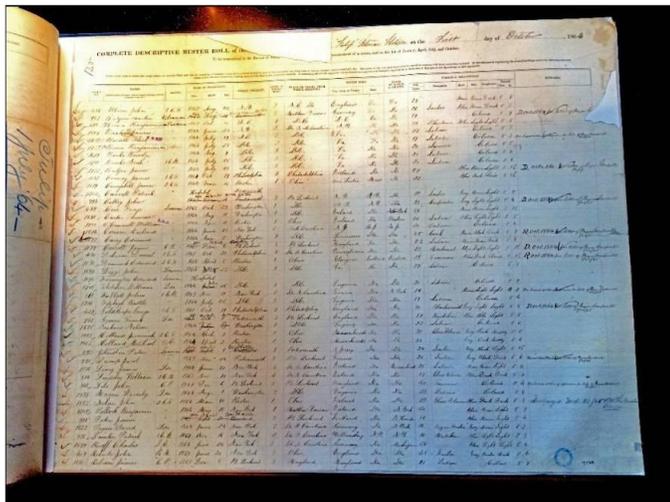
*SUPSALV and IMH observing autonomous underwater vehicle as it conducts side scan sonar to map wreck and debris field (U.S. Navy photo by George Schwarz/Released).*



Left, side scan sonar image of USS Tulip from September 2015 showing an overhead view of the vessel as it lies on the silty bottom of the Potomac River; right, contour map overlaid with side scan sonar data (Naval Surface Warfare Division /NHHC/UA Photographs).



Conserved artifacts from USS Tulip. From left: lantern, sextant, lock and key (NHHC/UA Photograph).



Ship's log and vessel roster 1864, National Archives and Records Administration (NHHC/UA Photograph).

The sonar surveys conducted by the NHHC team resulted in a detailed view of the wreck, while a preliminary map from the magnetometer survey showed an broad debris field. Magnetic signatures ranging from 2 to 80 nT (nanotesla) indicate that major components of the shipwreck lie outside of the immediate wreck area. The next phase of the survey project will be to ground truth individual anomalies and more closely map this debris field.

*Tulip* was subjected to extensive looting in the 1960s and 70s, but in the 1990s, a Maryland Historical

Trust investigation resulted in the return of over 1,500 artifacts to NHHC for conservation, study, and exhibit. Artifacts recovered from USS *Tulip* range from ordnance and navigational instruments to personal effects, lanterns, buttons, small arms, ceramics, glassware, and ship hardware.

Protected under the Sunken Military Craft Act, *Tulip* is an example of the management and study of one of Navy's complex shipwrecks. The site offers a unique opportunity to study an American Civil War-era screw steam warship when screw propulsion technology was less than a decade old, but it also contains sensitive materials such as human remains and unexploded ordnance. U.S. Navy ship logs, archival records, and eyewitness accounts, in combination with archaeological evidence, have aided our understanding of this era of maritime history and American culture. Approximately half of the 1,500 artifacts recovered from the wreck are still undergoing conservation, but these objects have already provided valuable information on operations aboard a Potomac River gunboat from this period, including details on food preparation, crew recreation, clothing, small arms and personal weaponry, shipboard security, lighting, and steam navigation, among others.

The remains of eight sailors who had washed up on shore were buried in an unmarked grave shortly after the incident. In 1940, the U.S. Navy erected a memorial near the gravesite to honor those lost in the disaster. Relatives and local residents gather each November to attend a U.S. Naval Air Station Patuxent River ceremony to commemorate the service of *Tulip*'s crew.



Plaque commemorating the sailors of USS Tulip (NHHC/UA Photograph).

This article was adapted from a poster presented at the 2017 Society for Historical Archaeology Conference on Historical and Underwater Archaeology. George Schwarz is manager of the Underwater Archaeology Branch Conservation Laboratory at the Naval History & Heritage Command <http://www.nhhc.gov>

# Cleaning Submerged Artillery: Conserving Cannon from Blackbeard's Flagship, *Queen Anne's Revenge*

by Erik Farrell and Jeremy Borrelli

**Q**ueen Anne's *Revenge* was the flagship of Blackbeard, one of the most notorious pirates in world history. Originally the French slave-trading vessel *La Concorde*, the ship and its crew were taken by Blackbeard, who renamed the ship *Queen Anne's Revenge (QAR)* in 1717. Blackbeard continued his piratical activities, sailing up the North American coast and entering North Carolina at Beaufort Inlet where, a year later, he grounded *QAR* on a sandbar. Blackbeard abandoned the ship, which was eventually claimed by the Atlantic.

Nearly 300 years later, the North Carolina Department of Natural and Cultural Resources took ownership and archaeological control of the site, and in 2006 began complete excavation and recovery of the shipwreck remains. Since the site's discovery in 1996, underwater excavation, documentation and recovery operations have yielded a collection of 31 naval cannon. These include 23 cast-iron cannon and one bronze signal gun. Of the recovered guns, 18 are in either active conservation or wet storage, while six have been fully conserved.

As the entity charged with the conservation of materials from *QAR*, the Queen Anne's Revenge Conservation Laboratory (QAR Lab) has developed a set of tools and methods for the preservation of cannon from the wreck site. These methods build upon established and published protocols, but in many cases include improvements to tool design and/or alterations to the previously published processes. Some of these tools and



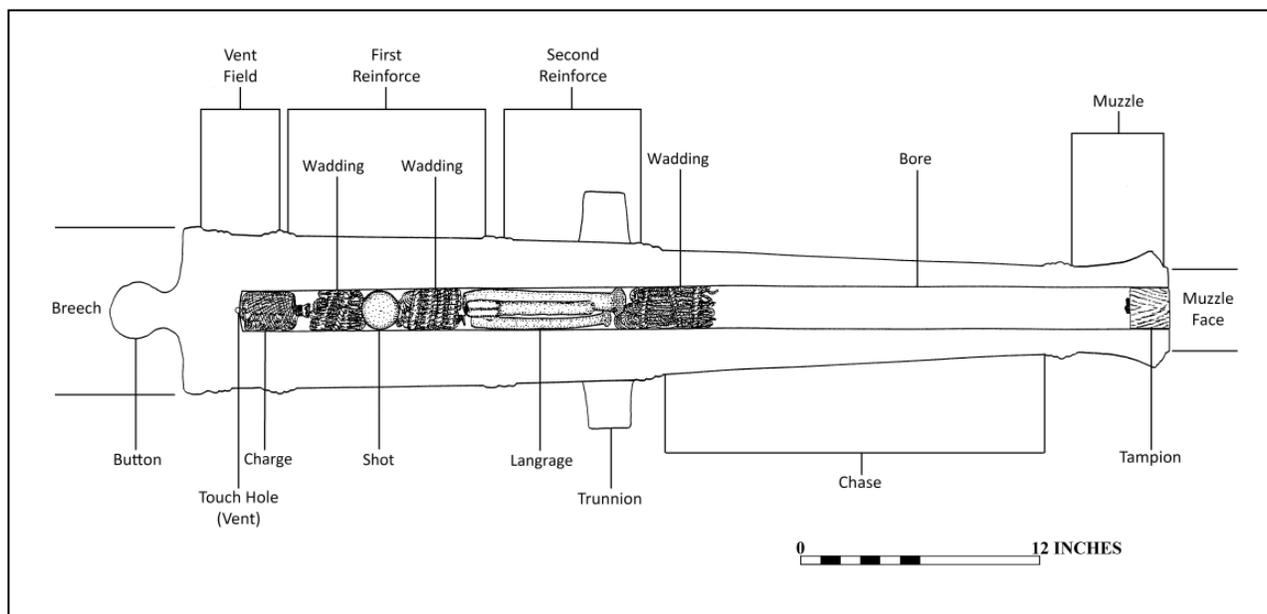
*Divers raising one of 23 cannon from the Queen Anne's Revenge shipwreck site. All images courtesy of North Carolina Department of Natural and Cultural Resources Staff.*

methods are unique to the QAR Lab and may be of varying appropriateness to other sites and objects.

**Note: If there is any suspicion that a gun from a shipwreck might be loaded, trained Explosive Ordnance Disposal (EOD) technicians should be consulted. Do not use the methods detailed in this article on any loaded ordnance without consulting both a qualified EOD technician and a conservator.**

## METHODOLOGY

QAR Lab currently uses the basic treatment plan outlined below, altered as necessary for individual guns.



*Labeled diagram of Cannon C19.*

As an overall plan this broadly follows standard protocol for cleaning concreted objects (see the reading list at the end of this article), but with modifications at key points.

1. Cleaning of the muzzle face and button with an air scribe, occasionally using hammer and chisel for the removal of ballast stones.
2. Cleaning of the remaining surface with an air scribe, occasionally using hammer and chisel. A thin layer of concretion is left *only* on trunnion ends and top of first reinforce.
3. Cleaning of the bore using a coring drill and hand tools.
4. Electrolytic reduction in 2.5% sodium carbonate (or 1% sodium hydroxide on small guns as appropriate).
5. Removal of remaining surface concretion after 6-12 months in electrolytic reduction if the current is stable. Additional fine cleaning with a scalpel and assorted air scribes as needed.
6. Insertion of a bar anode in the bore, and use of evolved hydrogen to remove any remaining concretion from the bore interior.
7. Rinsing in reverse-osmosis purified water.
8. Dehydration/drying.
9. Application of tannic acid, Paraloid B72, and microcrystalline wax coatings.
10. Transfer to final display, in this case the North Carolina Maritime Museum in Beaufort, North Carolina.



*Conservator cleaning cannon surface using an air scribe.*

## **SURFACE CLEANING**

In the past, including previous protocols at QAR Lab, surface cleaning of concreted cannon has often been carried out rapidly, using a hammer and chisel to

deconcrete the entire gun in a matter of hours or days. The current protocol makes several important changes, including the use of air scribes to carry out all cleaning, except for removal of large ballast stones.

This improves recovery of fragile materials, recovery of organics, and accuracy in recording the archaeological context of artifacts. The time required to deconcrete a cannon is increased, but since QAR is mandated for complete recovery and conservation, the overall increase is insignificant—the concretion from a cannon must be broken down and all artifacts within conserved, regardless of where that happens. The amount of time required is broadly the same whether the work occurs on or off the cannon's surface. As a result, surface cleaning reliant primarily on air scribes has significant benefits to QAR Lab while carrying minimal downsides. Additionally, concretion is intentionally left in place on areas of cannon which are more likely to bear identifying marks. This allows diagnostic areas, such as the tampions and vent to be better protected during the initial stages of desalination via electrolytic reduction.



*Partially cleaned cannon with concretion left in place on areas likely to hold identifying marks.*

## **BORING**

Due to the confined space of a cannon bore, drilling methods are often employed to deconcrete the interior surface of the bore. One published source (North's "Conservation of Metals" listed below) recommends essentially re-boring the cannon to a wider diameter, removing all concretion and some of the graphitized surface. The QAR Lab implements a modified version of this approach whereby the largest possible coring bit, which will *not* remove any of the original surface is used. This results in a layer of 1-4 mm of concretion remaining. The remaining concretion is removed electrolytically via intentional evolution of hydrogen.

This method is not ideal, as some QAR cannon have exhibited corrosion in the bore after conservation: incomplete deconcretion (leading to incomplete desalination) is one of several possible contributing

factors. While more damaging initially, it is thus possible North's method results in better long-term stability.

## TAMPION REMOVAL

There are few publications noting the methods used in the removal of tampions (wooden plugs that were used to keep water from entering the bore) from archaeological cannon. QAR Lab uses a broad range of tools, depending on how mineralized and/or damaged a tampion may be. All tools have limitations, and a combination of tools and methods is often most successful in removing any given tampion. Methods are attempted in the following order from least to most damaging:

1. Scalpel [#11 blade]
2. PaleoAro Scribe
3. Hammered #11 scalpel
4. Shaped brass wedges
5. Shaped steel wedges
6. Splitting wedge or chisel
7. Coring drill



*Using a shaped steel wedge to loosen a tampion.*

## UNLOADING

Of QAR cannon conserved or x-rayed, approximately 70 percent have been loaded with ammunition. Again, all unloading attempts should be evaluated by a knowledgeable expert (EOD technician) on a case-by-case basis. Description of the process used by the QAR Lab is provided below for informational purposes only, not as a standard procedure to be replicated on all cannon.

The primary instrument used for unloading these guns is a modification of a previous design by Nathan Henry of the North Carolina Underwater Archaeology Branch. The tool is essentially a sprung steel scoop attached to a heavy threaded rod. The core of the scoop is designed to minimize the chances of the head being

lost inside the cannon, with multiple attachment points and heavy welds to hold the scoop in place. A trapezoidal threaded rod is used instead of a triangular piece to provide a greater cross-sectional area, making it harder to strip the threads. Variations in this method exist that can also be used in conjunction with this method (e.g. remote-drilling the touchhole with a non-sparking bit, then flooding the chamber with water).

## DESALINATION

QAR Lab uses electrolytic reduction to expedite desalination of cannon. This is a well-published method of desalinating archaeological iron, and the only notable variations used at QAR Lab included bore anodes and staged surface cleaning. Potentiostatic reduction would represent an improvement upon the standard method used, but represents a significant increase in equipment costs.



*Lexan (polycarbonate) drying enclosure for a 1-pounder cannon.*

## DRYING & PROTECTIVE COATINGS

The procedure for drying cannon at QAR Lab differs somewhat from that of other iron objects as an inevitable result of artifact size. Ideally, iron being dried after desalination should be removed from water into an atmosphere with relative humidity as low as possible; akaganeite formation occurs at any relative humidity greater than 12 percent, while chloride-driven corrosion occurs through multiple mechanisms at relative humidity greater than 20 percent.

In the past, QAR Lab has encased cannon in a polyethylene sheet 'tent' with a ducted dehumidifier pumping in dry air. On its own, this will achieve a relative humidity of 25-35 percent; silica gel is used to drive humidity lower. In a recent modification to this design, QAR Lab staff have developed a Plexiglas storage enclosure that is set in a wooden frame and has attachment points built into the container for the ducted

dehumidifier. This improvement presents a more permanent solution to longer-term storage and relative humidity control for the cannon.

Silica gel tubes have been designed which can fit into cannon bores to aid in the drying process and decrease post-conservation corrosion. Segmented tubes allow silica gel to be inserted down the entire length of the gun, even in cases with only 12-18 inches of space available in front of the muzzle.

On the exterior surfaces of cannon, QAR Lab uses tannic acid, Paraloid B72, and microcrystalline wax as protective coatings, which is a well-established combination of materials for preservation of archaeological iron.



*Applying tannic acid to a cannon.*

## RECORDING

On lightly concreted cannon where the locations of trunnions, the muzzle face, and the base ring can be determined, objects are given length measurements relative to these markers (e.g., 36.5 cm forward of the base ring, 85.7 cm rearward of the trunnion centerline). A radial measurement is then included in degrees where the vent is at 0°, right trunnion 90°, bottom of gun at 180°, and left trunnion at 270°. An object can then be mapped relative to the gun's length and its circumference.

Heavily concreted cannon may require additional illustrations during cleaning to map objects onto the gun. New technologies—notably 3D photogrammetry—are being investigated to replace time-consuming illustration in these circumstances. In all cases, detailed written documentation is maintained and supplemented with conventional photography. Post-conservation recording follows a system developed at Texas A&M University (Hoyt 1986 below).

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*This article was adapted from a poster presented at the 2017 Society for Historical Archaeology Conference on Historical and Underwater Archaeology.*

*The authors recommend the following as additional reading. This list includes works specifically noted in the text.*

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*The authors would like to thank the QAR Lab staff consisting of Sarah Watkins-Kenney, Kim Kenyon, Courtney Page, Terry Williams, Karen Martindale, Arianna DiMucci, Stephen Atkinson, Elise Carroll, Kim Urban and Tim Smith, in addition to the North Carolina Underwater Archaeology Branch and Department of Natural and Cultural Resources, Division of Historical Resources staff, all of whom have contributed significant time and effort to the preservation of these historic artifacts.*

*Erik Farrell is QAR Conservator at the Queen Anne's Revenge Conservation Lab.*

*Jeremy Borrelli is QAR Staff Archaeologist at the Queen Anne's Revenge Conservation Lab. ⚓*

# The Storm Wreck: A Wartime Refugee Vessel Lost at St. Augustine, Florida at the End of the Revolutionary War

by *Carolane Veilleux and Chuck Meide*

In 2009, archaeologists from LAMP, the Lighthouse Archaeological Maritime Program, in St. Augustine, Florida, discovered the colonial shipwreck site known as the Storm Wreck (8SJ5459). The shipwreck is located in 7.5 to 9 meters (25-30 feet) of water, close to shore near the St. Augustine Inlet, an infamous ship trap that claimed as many as 24 vessels annually in the 1780s. The wreck has been the subject of an intensive archaeological excavation every summer from 2010-2015. Archaeological and historical research has led to the identification of this shipwreck as one of 16 refugee ships lost on or around 31 December 1782, on route from Charleston, South Carolina, to St. Augustine, carrying troops, Loyalist civilians, their slaves, and whatever possessions they could manage to bring with them.



*Raising one of the cannon from the Storm Wreck. Image courtesy of LAMP.*

The archaeological site consists of a dense distribution of buried concretions and other artifacts covering an area of about 10 m by 6 m, with more widely scattered and buried material expanding outwards. Metal detector surveys beyond the main excavation area indicate that the wider scatter covers an area of at least 30 m by 26 m, and a few isolated artifacts have been found as far as 45 m from the approximate center of the site. No articulated hull remains have been encountered to date, although a few individual hull members have been discovered. While shipwreck material is typically buried under at least 30 to 60 cm of sand, erosion periodically exposes artifacts. When first discovered, all of the wreckage was buried, and there were no signs that divers had visited the site.

Conditions on the wreck are often challenging. Sudden storms can produce heavy surge, while extremely poor or non-existent visibility is common. Despite these challenges, six seasons of fieldwork have

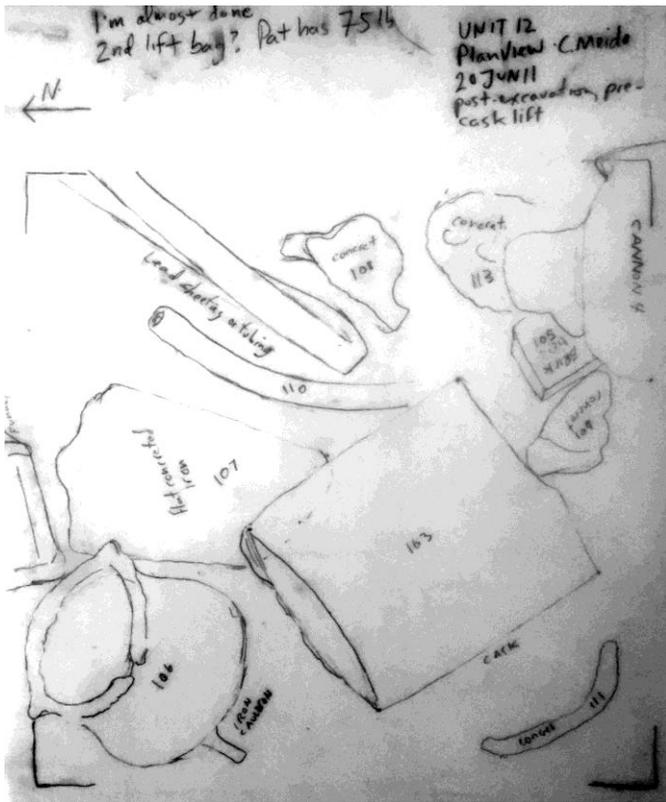
been undertaken in conjunction with LAMP's annual four-week field school. Using a 36-foot ex-trawler on loan from the Institute of Maritime History as the main diving platform, 1,371 dives have been completed on the wreck for a total of 1,094 hours and 12 minutes of bottom time. Ninety-two divers have participated in the excavations, including 55 students and dozens of volunteers. A total of 481 numbered field specimens have been collected. Many of these are concretions containing multiple artifacts which are eventually separated and treated in the lab, and thus conservation activity has increased the artifact count, and there are currently more than 650 cataloged field specimens. A very large number of tiny lead pellets known as Rupert shot have not been individually counted, but boost the artifact total into the thousands.

A grid system was established on the site during the first field season, and it has been expanded over the years to provide horizontal control for excavation. Referenced to a ten-meter-long polypropylene baseline, excavation grids were fashioned of PVC piping in 1 m by 1 m or 1 m by 2 m sizes, and marked at 10-cm intervals with black electrical tape discernible by touch for divers in low visibility. The grids were pinned to the seafloor using long fiberglass rods, which adequately secured them for the duration of a field season. Most grids were recovered at the end of each season, though several were left in place to reestablish the grid system in the future.

Over six years, 48 meter-square units have been excavated using two handheld, 4-in. (10.2 cm) diameter induction dredges. All dredge spoil has been filtered through an attached mesh bag. After the discovery of tiny lead pellets in the dredge spoil early in the first season, doubled mesh bags were used to ensure the complete recovery of even the smallest of artifacts. This resulted in a sizable amount of dredge spoil, mainly in the form of shell hash, which was sorted by laboratory volunteers during and after the close of fieldwork.

Divers excavated in arbitrary levels. The site is characterized by deep deposits of sand that constantly shift, typically with no discernible sediment stratigraphy, the exception being a dark layer of organic sediment which seems to represent mud deposits brought by outgoing tides from estuarine rivers that have filled voids left by scouring events. Excavated areas left untouched for more than a day or two would fill as sand in surrounding areas slumped into the unit; backfilling is rarely required.

There was usually no need for pre-disturbance



Example of scaled drawing of an excavation unit.  
Image courtesy of LAMP.

drawings before excavation, as all cultural material was buried. However, during the second season, erosion revealed previously buried cannons and other artifacts in a section of the site. Detailed 1:5 scaled drawings were made of each unit on mylar sheets when visibility allowed

Once recorded, artifacts were recovered by hand and brought to the surface in sturdy plastic baskets lined with window screen, preventing the loss of small objects. Lift bags were used to raise most of the baskets. For the heaviest objects, such as cannons, a heavy-duty davit was employed.

Every collected artifact was cataloged in the field and then more thoroughly in the laboratory during or following conservation. In some cases the decision was made to return an artifact to its original location underwater after documentation. This was done in the case of a large nail cask, a plank, and concretions such as clusters of nails determined by x-ray to offer little diagnostic value. The proximity of LAMP's headquarters to the site has made the replacement process relatively simple.

The Storm Wreck was discovered in August 2009 as a result of a remote sensing survey. A single magnetic anomaly from the survey was tested with a hydraulic probe. Using the probe to clear sand, a wooden plank, several concretions, two ballast stones, and a large, concreted cauldron were encountered in zero-visibility conditions.

Since the initial discovery of the site, one large and three small cauldrons have been found, along with a plank and a timber, and numerous concretions and small finds, including a brass buckle, wine glass base, and a large amount of tiny lead Rupert shot. X-ray analysis of concretions has revealed clothing irons, ship fittings, tools, a coin (deconcreted in 2014 and found to be a gold guinea dated 1774), navigational dividers, and a small boxlock pistol. Also found embedded within the concreted contents of the smallest cauldron was an intact green pea.

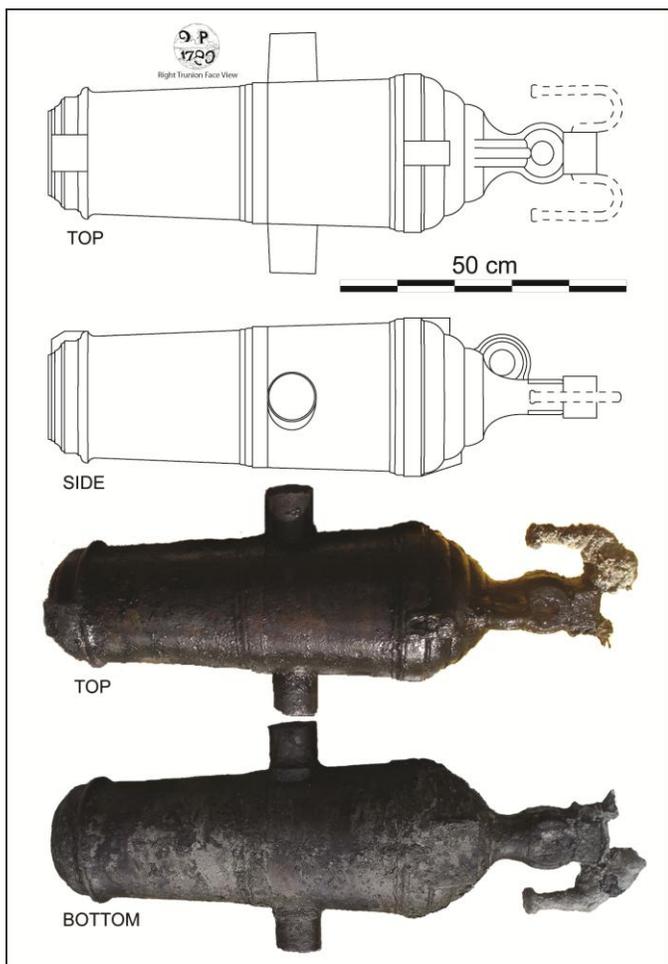
LAMP archaeologists have found a total of seven cannon and the ship's bell at the site. Given its rarity and vulnerability to exposure, the bell was immediately documented and recovered. It was almost completely intact, missing only part of its wooden headstock and its clapper. These two components were later located on site and recovered. The bell was cleaned, but it bore no inscription or indication of the year or ship's name.

Among the guns were five traditional cannon (one with its carriage partially intact) and two carronades. One of each type has been raised. The recovered carronade was dated 1780, which remains the *terminus post quem* for the wrecksite.

Among other finds are additional iron and copper cookware, pewter spoons and plates, clothing irons, buttons, bricks, casks of nails, cannonballs, and shoe buckles. A second gold guinea, this dated 1776, was



The bell from the Storm Wreck: above, as recovered from the site; below, conserved and drawn.  
Images courtesy of LAMP.



*Carronade from the Storm Wreck.  
Images courtesy of LAMP.*

also found. Other objects of note include a sector rule, brass keg tap, furniture drawer pull, a door lock wrapped with its key in cloth, a false watch face, an assortment of lead weights, and a livestock tether. British military artifacts include regimental buttons, a well-preserved British sea service pistol, and three Brown Bess muskets. Subsequent x-ray imaging showed that two of the muskets were loaded and half-cocked, ready for use. A button from the 71<sup>st</sup> Regiment of Foot provided the first conclusive evidence that the Storm Wreck vessel had been part of the Charleston evacuation fleet

Another significant find was a heavy, lead deck pump. It displayed cut marks indicating that it had been forcibly removed from the ship to jettison overboard in hopes of saving the grounded vessel. The artifact provided some of the first clues as to the circumstances of the wrecking event itself.

In 2014 LAMP secured grant support from Florida's Bureau of Historic Preservation which funded two additional conservators and significant laboratory expenses for two years. Despite this grant, the backlog of artifacts in storage resulted in a less aggressive excavation strategy in the final two field seasons, and a new program of metal detecting was begun to better

understand the buried extent of the site while minimizing artifact recovery.

The first datable artifacts found on the shipwreck were tiny lead pellets concentrated throughout the central excavation area. Known as Rupert shot after their alleged inventor, Prince Rupert of the Rhine, they were first publicized in 1665, but then used throughout the colonial period. The date range for the ship was further narrowed as more recovered artifacts were dated to the 18<sup>th</sup> century, with some—such as the base of a drinking glass dated to ca. 1780-1805—suggesting origins in the late 18<sup>th</sup> century. Hopes that the ship's bell would provide a date, or even a ship's name, were soon quelled once the artifact was cleared of concretion. Three other dated objects have been recovered from the wreck, however. The *terminus post quem* of 1780 was provided by the recovered carronade. In addition, two gold guinea coins from the reign of George III were dated 1774 and 1776.

The various absolute and relative dates suggested the Storm ship was lost sometime in the final two decades of the 18<sup>th</sup> century, or perhaps early in the 19<sup>th</sup>. Researchers compiled a list of potential shipwreck candidates lost between 1780 and 1820. The primary working hypothesis was that the wreck represented one of 16 Loyalist refugee ships lost on the bar in December 1782. The ships were all from the last fleet employed by British authorities to evacuate Charleston of troops, Loyalist civilians, and enslaved Africans. The regularity of 18<sup>th</sup>-century British material culture, with a high frequency of domestic items expected of refugees fleeing their homes, increasingly convinced researchers of this scenario.

Military buttons provided more evidence that the ship had been part of the Charleston evacuation fleet. A Royal Provincial regimental button, from an unspecified Loyalist regiment, was considered strong circumstantial evidence that the Storm ship carried Loyalists. The button from the 71<sup>st</sup> Regiment mentioned earlier provided the first definitive evidence linking this



*Lead deck pump.  
Image courtesy of LAMP.*



*Documenting one of the cannon  
from the Storm Wreck while in conservation.  
Image courtesy of LAMP.*

shipwreck with the Charleston evacuation fleet. Eventually, buttons from three additional British Army regiments known to have been aboard the same fleet have been identified in the assemblage.

These buttons, in conjunction with the entirety of the archaeological data as it is currently understood, have convinced researchers that the Storm Wreck was indeed one of the military transports evacuating troops and civilians that was lost on or around 31 December 1782 on the St. Augustine bar. Several research trips to the British National Archives and other repositories have provided a rich historical context and fuller understanding of this shipwreck. As is often the case, however, archaeology has raised as many questions as it has answered. None of the regiments on the fleet were destined for St. Augustine, and they arrived safely in New York, Jamaica, and other destinations. Why these buttons, which are clearly associated with the evacuation fleet but not with a vessel bound for Florida, ended up on a transport wrecked off St. Augustine remains a mystery.

As a vessel carrying Loyalist refugees to Florida in 1782, the Storm Wreck promises to lend considerable insight into an underappreciated but dynamic period of Florida's history, that of the Loyalist influx at the end of the American Revolution. But this site can also provide a much broader perspective into the archaeology of refugees. It is believed that the Storm Wreck represents the only wartime refugee shipwreck from any time period to be archaeologically investigated. As such, and with its well-preserved assemblage of material culture coupled with a rich documentary context, it has the potential to enable a better understanding of the behavior of wartime refugees diachronically and cross-culturally. The artifacts give us an extraordinary glimpse of what British colonists used in their everyday lives in a

situation that was anything but ordinary. The range of artifacts provides insight into the assortment of people caught up in forced exodus. Specialized tools suggest craftsmen such as shoemakers and shipwrights were present alongside soldiers, merchants, and farmers. Personal objects reflecting various levels of social status—from a spoon inscribed with an “X” by its probably illiterate owner, to the gold coins, decorative shoe buckle, and boxlock pistol undoubtedly belonging to a gentleman—suggest the full spectrum of colonial society was on board, from enslaved laborers to landed gentry. The ongoing study of these artifacts demonstrates what items were chosen during a crisis as absolutely essential, not only for survival but also to keep life as normal as possible when faced with a dangerous and uncertain future. These refugees brought cookware, tableware, and fireplace hardware to feed the family, kettles and porcelain teawares to maintain the stability and comfort of daily teatime, and the hardware, furnishings, and tools with which to rebuild new homes and new lives.

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The 2015 excavation season was the final major field operation planned for the site in the foreseeable future. Artifact conservation and investigations in the laboratory will continue for years to come. Public archaeology is ongoing, as the site has been interpreted for St. Augustine Lighthouse & Maritime Museum visitors since the inception of fieldwork.



ST. AUGUSTINE  
LIGHTHOUSE  
& MARITIME MUSEUM

*While the excavation of the Storm Wreck has been self-funded by LAMP and the St. Augustine Lighthouse & Maritime Museum, the original survey, the exhibit, and much of the conservation were funded with grants from the Bureau of Historic Preservation, Division of Historical Resources, Florida Department of State with the Florida Historical Commission. The Institute of Maritime History generously provided the research vessel used for seven summers. This project's great success ultimately lies with the superlative team of LAMP/Lighthouse staff, students, and volunteers who have given their time, talent, and passion to this shipwreck. Thanks to them all.*

*Detailed articles related to the Storm Wreck can be found in the ACUA Underwater Archaeology Proceedings 2016 (<https://acuaonline.org/Publications/>).*

*Carolane Veilleux is a graduate student at the University of Montreal.*

*Chuck Meide is Director of LAMP. ⚓*

## ***Faces of the Civil War Navies: An Album of Union and Confederate Sailors***

by Ronald S. Coddington (Johns Hopkins University Press, 2016)

reviewed by Dennis Knepper

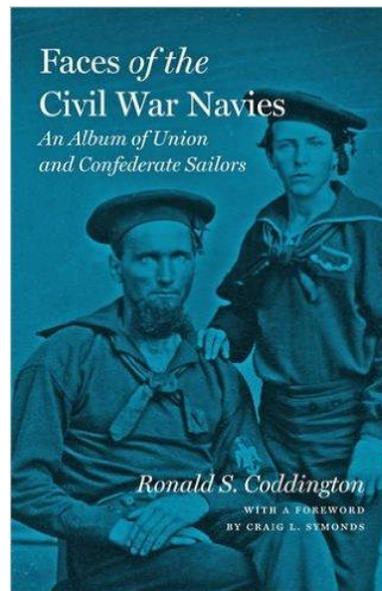
The history of the American Civil War consists of the stories of its soldiers and sailors. A fine collection of those stories is assembled in a new volume, *Faces of the Civil War Navies: An Album of Union and Confederate Sailors*, by Ronald Coddington.

The book is part of a unique series created by Coddington that presents paired photographic and biographical portraits from the Civil War. The books grew out of a column Coddington wrote in the periodical *Civil War News* called “Faces of War” in which each month he profiled a soldier, illustrating the narrative with an original *carte de visite* photograph.

The *carte de visite* was a small, inexpensive photograph printed on paper that was pasted on a thin sheet of card-board the size of a visiting card, measuring about two-and-a-half-by-four-inches. Developed in France, they were mementos, usually portraits of individuals or families that were exchanged among friends and collected in albums during the Victorian era in England. They quickly became popular, enough so to earn the term “cardomania” in the contemporary press. The *cartes* appeared in the United States in 1860, at the start of the Civil War. Soldiers going off to war posed for their pictures to serve as keepsakes for those they left behind at home.

Coddington collected his columns featuring the images in his first book, *Faces of the Civil War: An Album of Union Soldiers and Their Stories*, in 2004. A second and third volume followed: *Faces of the Confederacy* and *African American Faces of the Civil War*. As the author noted, “each volume represented a larger narrative thread.” Now a fourth thread has been added to the story: *Faces of the Civil War Navies: An Album of Union and Confederate Sailors*. All four of the books are published by The Johns Hopkins University Press.

In an extended preface to the current volume, Coddington describes the introduction of photographic technology in the mid-19<sup>th</sup> century, and in particular the *carte de visite* and its impact on the war in what he describes as the democratization of photography. They were “a cheap and reproducible form of social media... accessible to all...they provided the common soldier in America with a profound individualism once reserved for a select group of gentlemen officers through canvas and oils...Now for the first time in history, the freckled face of the greenest private could be glimpsed on par with the wrinkled countenance of his seasoned colonel.”



The book contains 77 images and stories. In keeping with the social leveling represented by the *cartes* themselves, the subjects range from Rear Admirals and Commanders to engineers, ensigns, lieutenants, ordinary seamen, and landsmen. Each narrative tracks its subject through a particular action or event, and when possible follows them

after their service with a brief note about their return to civilian life. The profiles are arranged in rough chronological order based on the date of the sailor’s story.

Most of the subjects are Union sailors; 12 of the portraits are Confederates. While the latter number may seem low at first, Coddington notes that it represents 16 percent of the total, while Confederate sailors made up only about 6 percent of the combined navies: 84,415 Union sailors to 5,213 Confederate.

The profiles contain details of often little known actions, such as the capture of a U.S. Treasury revenue cutter by Confederate raiders in the harbor of Portsmouth, Maine; or a nighttime raid in small boats that burned and destroyed a Confederate blockade runner that had run aground in Mobile Bay; or a Union gunboat shelling Confederate positions at Yorktown with its heavy Parrot rifle that helped to open the way for McClellan’s aborted Peninsula Campaign.

The book is a fine addition to Coddington’s *Faces* series, bringing a human sensibility to what history has recorded as a fierce and brutal conflict. The edition is produced to JHU’s usual high standards, printed on heavy bond paper with good quality graphic reproductions. The 77 profiles account for 328 pages and are followed by 51 pages of endnotes that often add additional detailed information about the individuals or the actions in which they participated. A thorough bibliography and a serviceable index round out the volume. ⚓

## **Forty Years Master: A Life in Sail and Steam** by Daniel O. Killman (Texas A&M University Press, 2016)

reviewed by Dennis Knepper

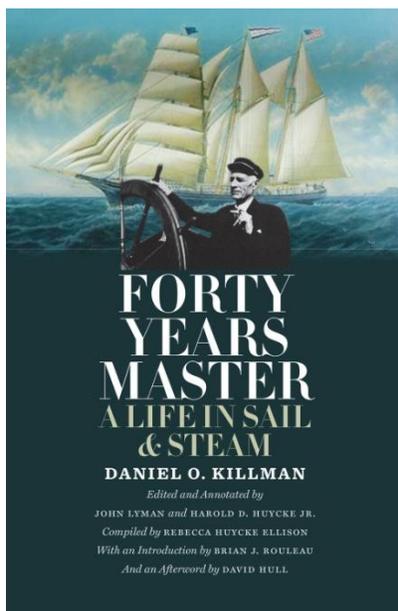
For most who make their living from the sea, life is hard, and those so engaged are equally hard individuals. This view has rarely been more clearly demonstrated than in a recently published memoir, *Forty Years Master: A Life in Sail and Steam*, by Daniel O. Killman.

Killman was born to a family of sailors that included his father and two grandfathers, three uncles, and two brothers, all of whom were ship's masters or captains. Daniel Killman went to sea in 1878, just shy of his eighteenth birthday, serving as an ordinary seaman on his brother Thomas' ship *Masonic*, a square-rigger bound for Nagasaki around Cape Horn. Convinced from the start that he would follow in the family tradition and become a ship captain, Killman went on to serve as mate on several vessels and did soon make master. Throughout his career he commanded a wide variety of ships that sailed along the American West Coast and across the Pacific Ocean, ships that included lumber haulers, supply vessels for Arctic whalers, four and five-masted schooners, and steam-powered freighters.

The author portrays himself as a hard-nosed / hard-bitten ship's master. Like Horatio Nelson, he was plagued by seasickness but persevered through force of will. Unlike Nelson, he enforced discipline on the vessels he commanded by means of personal toughness and the intimidation that it implies. Early in his story, he tells of being a relatively green third mate obliged to fight and overcome a sailor who refused an order: "it was up to me to lick Jack or stop going to sea...After this I was obeyed without any talk."

Personal violence and loyalty were characteristic of Killman's long career. His toughness is reflected in the plain-spoken and direct tone used throughout the narrative. At times fascinating in the details of events and crises aboard the various ships he commanded, the account comes at you briskly in short, declarative sentences, almost like a court deposition or a police blotter—think Sgt. Joe Friday, "just the facts." The narration is generally lacking in description or reflection and can feel relentless, even overwhelming at times.

The volume is a recent addition to the ever-growing literature of naval memoirs. Some of the more well-known, such as Richard Dana's *Two Years Before the Mast* or Henry Baynham's *Before the Mast*, portray the



life of the common sailor. Killman's work joins chronicles from the upper decks, written by officers and commanders. Subtitled *A Life in Sail and Steam*, Killman's tale echoes Alfred Mahan's classic *From Sail to Steam*, spanning one of the great transitions in technology that occurred at the end of the 19<sup>th</sup> century and mirroring the momentous economic and social changes of the era.

Killman spent fifty years at sea, forty of them as master. His memoir was written in the late 1920s, purportedly from memory. It is not until a note some 230 pages into the text that it is suggested that Killman most likely consulted records such as ship logs in recreating his adventures. And yet there are few dates

attached to the events that are recounted. The successive voyages and the details of the action that occur are reeled off with little context, suggesting that they were indeed reconstructed largely from memory, and that while logs may have been reviewed, they were probably not the primary source of the tale.

Although the work spans the sail-steam evolution, Killman treats the transition almost with indifference, as a seemingly minor personal hurdle to be overcome with little effort: "I thought it would be a good time to pass for steam...I went to school for a few weeks and passed." In the end, he appeared to be as disillusioned at the loss of American dominance in international shipping at the hands of foreign shippers and flags of convenience during the period as he was sad at the passing of the great sailing vessels. At the close of his saga, however, he does express in a few phrases a feeling of loss for the days of sail—nostalgia may be too strong a term for this plainspoken sailor: "a steamer...is operated by machinery and has no charms for anyone. Sailing is a lost art."

Killman's manuscript was brought to light in the mid-1970s, forty years after his death, by Pacific Coast maritime historians John Lyman and Harold D. Huycke, Jr., who edited the text, researched and corroborated the information it contains, and collected photographic illustrations. The context and chronological details they provide are found in lengthy and informative endnotes, which run to more than 60 pages. The book and endnotes were further edited by Huycke's daughter, Rebecca Huycke Ellison. ⚓

*continued from page 5*

was attended by more than 40 individuals representing a variety of organizations. Mike Barber, Virginia State Archaeologist, provided an introductory statement on the importance of historic context. Broadwater then outlined areas within the chapter to be developed, including maritime research, education, outreach, dive safety, training and project planning and reporting. Specific projects will be announced in the near future. Representing MAHS, I provided a brief on our organization, its goals, training courses and field schools.

Clyde Smith, Historic Resources Board Chairman for VDHR, presented an interesting account of the search for the Confederate submarine *H.L. Hunley* that was lost after sinking the USS *Housatonic* on February 17, 1864, in the outer harbor of Charleston, South Carolina. Smith, a good friend of author Clive Cussler and who accompanied him on various shipwreck

searches, told about the initial discovery of the *Hunley* in the early 1970s when it was partially uncovered from the sand but misidentified as a sunken channel marker. The submarine was not "officially discovered" until 1995. The discovery has also been a source of contention and suits between Cussler and Dr. Lee Spence. *Hunley* was raised in 2000 and is now at the Warren Lasch Conservation Center in Charleston. The remainder of the meeting was taken up with sessions on underwater historic property permitting and chapter planning.

Membership in the new chapter is open to the interested public and there are currently no membership dues. However, membership in ASV is required along with agreement to promote the Society's objectives and follow its Code of Ethics.

*The ASV/MHC can be found on the Internet at <https://maritimeheritageva.org/> and on Facebook at <https://www.facebook.com/MaritimeASV/>. *

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the time to respond. At the last minute France did in fact respond, claiming protection for the artifacts under several principles of sovereign immunity.

In the February General Membership meeting, Dave Shaw conducted the first 3D photogrammetry course for members and students. The class was well attended and everyone congratulated Dave on a great presentation. These photogrammetry workshops will continue throughout the year.

On behalf of all of us at MAHS I also want to thank Dave Shaw for the work he has done to bring the MAHS Facebook page to the public. It was a lot of work but the page is becoming more populated with new images of MAHS projects, and now seems to be attracting lots of "likes." Anyone looking to help Dave with this project please let him know.

Also in February, Tom Berkey represented MAHS at the first meeting of the Archaeological Society of Virginia's new Maritime Heritage Chapter organizational meeting. One of our longest standing advisors, Bruce Terrell serves as the organization's Vice President. Tom introduced information about the MAHS Introductory Course in Underwater Archaeology to the new members. Clyde Smith, Virginia Department of Historic Resources (DHR) Historic Resources Board Chairman, also provided an interesting account on the search for the Confederate submarine *H.L. Hunley*. For more information, see the short article in this issue of the newsletter.

The April MAHS General Membership meeting was well attended. Bill Chadwell was the guest speaker

and he described the mission, goals and operations of the Battle of the Atlantic Research Group, or BAREG as they are locally known. BAREG has been working closely with Joe Hoyt of NOAA, who has been conducting an ongoing study of the World War II activity of German U-boats that preyed on allied shipping along the coast of North Carolina. Bill spoke about the U-522 project, in which BAREG will be following the trail of one of that U-boat's cruises, to document the wrecks of five or six of the ships it sank during the cruise. Bill noted that BAREG projects mostly focus on wrecks at depths requiring technical diving skills and training.

In May, Jim Smailes represented MAHS in a presentation to Archaeology in the Community, a nonprofit organization dedicated to involving school age children in archaeology. It was a fun day for everyone and Jim helped the students learn more about how an underwater archaeological site is surveyed.

The upcoming MAHS Field School is next on our agenda. We will report on these activities in our Fall newsletter. If any MAHS members want to attend please be sure to contact us soon.

See you on the water,

Steven Anthony  
President



**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  
Application for Membership**

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.

Name (print) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (H) \_\_\_\_\_ (O) \_\_\_\_\_ (FAX) \_\_\_\_\_

E-mail \_\_\_\_\_

<b>DUES ENCLOSED</b>	
___ \$30	<b>Individual</b>
___ \$35	<b>Family</b>
___ \$50	<b>Sponsor</b>
___ \$100	<b>Patron</b>

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

\_\_\_\_\_

Please mail this form along with your check to: MAHS at PO Box 44382, L'Enfant Plaza, Washington, D.C., 20026

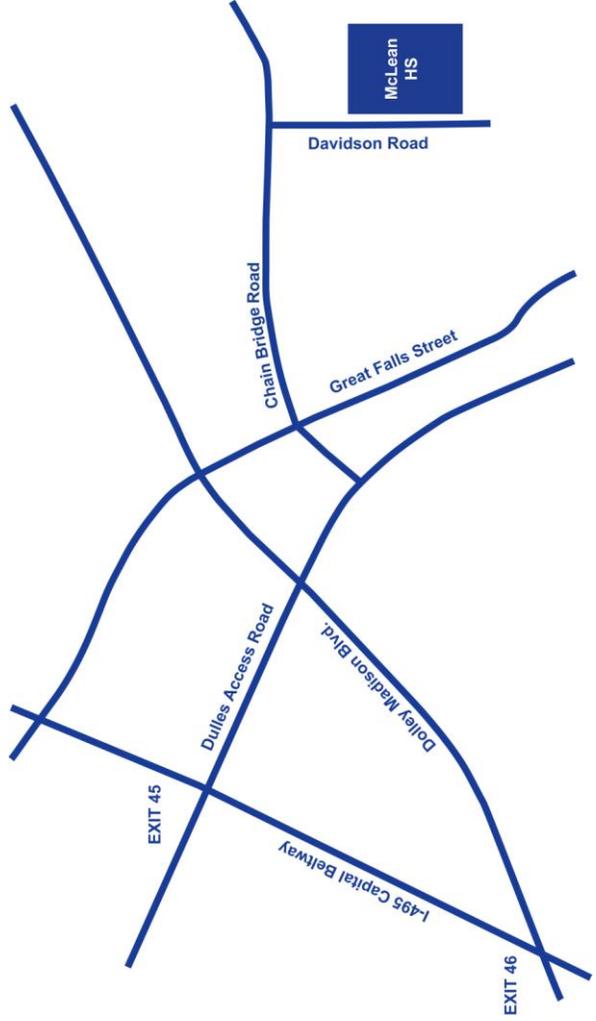
General membership meetings of the Maritime Archaeological and Historical Society are held on a bi-monthly basis, the second Tuesday of each month. Meetings are held at 7:30 p.m. at McLean High School, in McLean, Virginia, except in August and December. Meetings in August and December are held at other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

Check the website [www.MAHSNet.org](http://www.MAHSNet.org) for e-mail advisories about any schedule changes.

## Renew Now!

It's time to renew your membership in MAHS. It's easy. Just complete the application form on the inside back cover and sign the Ethics Statement, enclose a check for your dues, and mail! Thank you!



**MARITIME ARCHAEOLOGICAL AND  
HISTORICAL SOCIETY**

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Washington, DC 20026  
[www.mahsnet.org](http://www.mahsnet.org)

**ADDRESS SERVICE REQUESTED**