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A Sacred Place: Honoring the Ocean's Deepest Battlefield

by Hans van Tilburg, Jim Delgado, Mike Brennan, Phil Hartmeyer, Daniel Wagner

From September 1-28, 2023, the Ocean Exploration Trust (OET), supported by NOAA Ocean Exploration via the Ocean Exploration Cooperative Institute, conducted a telepresence-enabled expedition to explore the deep-sea natural and cultural resources of the Papahānaumokuākea Marine National Monument, the marine protected area that extends hundreds of miles to the northwest from the main Hawaiian Islands. The multidisciplinary mission was titled Ala ʻAumoana Kai Uli (*path of the deep-sea traveler*), in recognition of the deep cultural significance of the area for Kānaka ʻŌiwi (Native Hawaiians). The expedition used the Exploration Vessel *Nautilus*' remotely operated vehicles (ROVs) and acoustic sonars to survey this remote part of the ocean, sampling the rich diversity of biology and ancient geology of a series of submerged seamounts, documenting the unique ecosystems and geological history of the Pacific Ocean.

The middle watch in the ROV control van on board E/V Nautilus. *The expedition broadcast all deep ocean surveys live on the internet. Image courtesy of Ocean Exploration Trust.*

This northernmost portion of the Monument is also the location of the Battle of Midway, the pivotal naval aviation engagement on June 4-7, 1942, during which squadrons of aircraft attacked and defended Midway Island and engaged opposing carriers and carrier groups. By the end of the combat, one American and four Japanese and aircraft carriers were sunk, along with an American destroyer and a Japanese cruiser, and hundreds of aircraft. Thousands of lives were lost. Having suffered significant losses, Japanese strike force leaders made the decision to withdraw from the planned invasion of Midway Island. The encounter is considered one of the war's most significant battles, as it marked a critical American victory in the face of early Japanese naval advances in the Pacific, and the full emergence of naval aviation's role in World War II.

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Notes from the Prez – Steven Anthony

Congratulations to MAHS! We just completed our 36th annual Introductory Course in Underwater Archaeology a few weeks ago! The course was conducted by Zoom technology again this year and the students are now completing their final exams. We enjoyed getting to know a new dedicated class of recreational divers from all around the country including California, Oregon, Ohio, Canada, Florida, Virginia, and many other states in between. It seems that we are all experienced Zoomers now, so the classes went well with only a few hiccups to report!

We were also blessed with a sterling faculty again this year. Dr. John Seidel, Executive Director of St. Mary's Historic City Museum, took the lead; Dr. John Bratten, University of West Florida, presented Conservation; A.J. Daverede, recently retired from the National Archives, conducted Archival Research; Dr. Susan Langley, Maryland State Underwater Archaeologist, and I anchored the Maritime Law and Ethics class; and MAHS member David Shaw presented a new and updated Photography and Videography class. Student feedback was positive and inspiring again this year.

Planning for our 2024 Field School in Underwater Archaeology is also underway. Over 20 years ago, MAHS conducted sonar and mapping surveys of shipwrecks located in the Pamunkey River near the Pamunkey Indian Reservation and White House landing, Virginia. This was the former site of one of the Union Army's major supply depots for McClellan's Peninsula Campaign (1862) and Grant's Overland Campaign (1864) intended to attack Richmond City during the American Civil War. This year the MAHS Directors decided to return to the river to complete the survey work with the intention of filing a National Register of Historic Places nomination for that site to recognize the important historic resources located there.

The new Virginia State Underwater Archaeologist, Brendan Burke, supports our continuing survey work on the Pamunkey River, and we are currently in the process of obtaining landowner approval for access to the riverbank. This will make water entry much easier as we explore what may turn out to be Union shipwrecks burned by JEB Stuart during his famous ride around General McClellan's army in 1862. Our progress on this project will be posted on MAHSmail for members to follow as we move forward.

In other news, Jim Smailes, MAHS Secretary and Treasurer, attended the annual meeting of the Society of Historical Archaeology in Oakland CA during January of this year and represented MAHS at the annual ACUA

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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.

Left: Gun tubs along the flight deck of the USS Yorktown. *Gun shielding had been cut away and the anti-aircraft guns jettisoned in an attempt to right the ship. Right: The fire-ravaged tower of the USS* Yorktown. *Images courtesy of Ocean Exploration Trust.*

The Archaeological Objectives

The month-long multidisciplinary expedition provided roughly one week for the non-invasive, ROV-based archaeological surveys of three of the four historically significant aircraft carriers lost during the battle: *Yorktown*, *Kaga*, and *Akagi*. Co-leads from Southeastern Archaeological Research, Inc. (SEARCH) were joined by archaeologists from NOAA and colleagues from Japan, the U.S. Navy, and OET for mission planning. Over 100 experts around the world were connected to ship operations via telepresence technology and helped guide the mission and provide valuable real-time interpretation. The 2023 archaeological survey was the first to comprehensively survey the wreck sites, though not the first to investigate the Midway battlefield. In 1998, a National Geographic Society expedition led by OET Founder and President Dr. Robert Ballard and consisting of a team of scientists and U.S. and Japanese Midway veterans, located and photographed the wreck of USS *Yorktown*. In 1999, a joint expedition between Nauticos Corporation and the U.S. Naval Oceanographic Office located a large piece of wreckage, subsequently identified as part of the upper hangar deck of *Kaga*. And in 2019, Vulcan, Inc. and Naval History and Heritage Command led a multi-week expedition aboard R/V *Petrel*. The 2019 team located the main wreck of *Kaga* and *Akagi*, the flagship of the Japanese strike force. A partial visual exploration of *Kaga* by ROV was completed, and *Akagi* was mapped by sonar.

The archaeological objectives of the Ala ʻAumoana Kai Uli expedition reported here, therefore, featured the first detailed views of USS *Yorktown* since it was first located 25 years ago, the first-ever visual survey of *Akagi* by ROV, and a completed visual survey of *Kaga*. During a combined 43 hours of deep ocean survey (below 5,000 meters), each one of these historically significant wrecks was methodically circumnavigated and recorded, bringing to light details of the battle and subsequent sinking-related damage (the Japanese aircraft carriers were scuttled), as well as the environmental processes that have continued to change the sites over time.

USS *Yorktown* remains upright and relatively preserved in the cold deep waters, with the majority of wooden flight deck intact except for aft sections of the overhanging structure. Close examination of the extremely corroded bridge and superstructure reveals the changes wrought by the intense fires and heat initiated from the explosions on deck. The ROV survey recorded numerous locations where antiaircraft gun shields had been cut away and weapons jettisoned, in attempts by the crew to save their capsizing ship. The survey of *Akagi* provided striking views of the almost-completely destroyed flight deck, and massive damage resulting from internal explosions within the enclosed hangar below. Fires raged from severed fuel lines, and large sections of the carrier's hangar walls and much of the bridge superstructure are missing. *Kaga* is in even worse condition than *Akagi*, having been reduced by explosions and subsequent fires to a mere hulk. The flight deck and hanger superstructure are completely gone, and the wreck is flattened to the seafloor.

The lower deck and hull side of the Japanese aircraft carrier Kaga. *The hangar and flight decks above are absent. Image courtesy of Ocean Exploration Trust.*

Survey data collected during the archaeological site investigations are still being analyzed, and plans are underway for a collaborative 2024 workshop that will bring together the many subject-matter experts and supporting agencies to finalize and publish the results of the mission's battlefield investigation; in other words, there is much more discovery to come.

The Broader Cultural Setting

The archaeological analysis of the shipwrecks will answer many long-standing questions about the details of the battle. There are, however, other aspects to this Battle of Midway investigation, most importantly the broader cultural aspects of honoring all those who lost their lives on both sides of the battle and respecting the sacred nature of the ocean and atolls surrounding the battlefield itself.

The intention to honor those lost during the battle and follow proper protocols where the potential for human remains is involved existed from the earliest planning phases of the mission. The 2016 expansion of the Monument (Presidential Proclamation 9478) brought these shipwrecks and aircraft under federal management as properties "of great historic interest…," the Battle of Midway being:

> …one of the most important naval battles of World War II…Eyewitness accounts and historical records tell the stories of the destroyer USS *Hammann*, five Japanese vessels (the four aircraft carriers *Hiryu*, *Soryu*, *Kaga*, and *Akagi*, and the cruiser *Mikuma*), and several hundred aircraft that were also lost during the battle in this area…All told, the adjacent area serves as a final resting place for the more than 3,000 people lost during the battle.

The naval battlefield and specifically the vessel wreck sites are considered war graves, places of remembrance and recent significance in national and international history. Both the NOAA Office of Ocean Exploration and Research and the NOAA Office of National Marine Sanctuaries, partners on the mission, have internal guidance on managing sensitive data. This guidance prohibits the public distribution of specific positions of significant sites, as well as of images of human remains. Contingencies for encountering such remains during the live telepresence dives were built into operational plans.

Furthermore, maritime archaeologists and preservation experts from Japan were integrated into the mission planning meetings early on, and discussions focused on the appropriate recognition of war losses, appropriate terminology, and observations of cultural protocols and practice. Officials at the Japanese Consulate in Washington, D.C., were also brought into the discussions. In the end, no human remains were seen during the non-invasive ROV surveys, and the live-broadcast dives during the mission included respectful remarks from both ship and shore side teams, and moments of silence in recognition of those lost during the battle. The media event held in Silver Spring, Maryland, at which U.S. Navy, NOAA leadership, and officials from the Japanese consulate in Washington, D.C, gathered to view the last images from *Kaga*, marked a highpoint for the project of reconciliation and friendship between nations that had once been fierce enemies locked in a terrible war.

Both launch and recovery of the ROV Hercules *during the multidisciplinary missions were accompanied by Hawaiian cultural protocol on the stern deck of* Nautilus. *Image courtesy of NOAA.*

Perhaps most fittingly, these World War II wreck sites rest in a place already very sacred to the Hawaiian people. Papahānaumokuākea Marine National Monument has cultural significance far beyond the naval battle that occurred 80+ years ago. The cultural importance and connection between the atolls and ocean to the northwest and the Hawaiian people who discovered and settled the main Hawaiian Islands some 1,200+ years ago, predates all modern history, conservation efforts, and federal boundary-making by many centuries. The Presidential Proclamation 9478 (cited above) also provides one of the most succinct and direct statements of the area's importance to Native Hawaiian culture:

> The ocean will always be seen as an integral part of cultural identity for the Native Hawaiian community. The deep sea, the ocean surface, the sky, and all the living things in the area adjacent to the Monument are important to this culture and are deeply rooted in

creation and settlement stories. Native Hawaiian culture considers the Monument and the adjacent area a sacred place. This place contains the boundary between Ao, the world of light and the living, and Pō the world of the gods and spirits from which all life is born and to which ancestors return after death.

The sailors and airmen who lost their lives in the Battle of Midway came to rest in a place already sacred to the Kānaka ʻŌiwi of the Hawaiian Islands. The Ocean Exploration Trust has been working to build an equitable and ethical relationship with the Indigenous host culture of Hawai`i since the first expedition to the area in 2018, specifically engaging with the Papahānaumokuākea Native Hawaiian Cultural Working Group to appropriately weave Hawaiian culture into the planning and execution of deep-ocean exploration expeditions. The name itself of the 2023 expedition, Ala ʻAumoana Kai Uli was composed in collaboration with OET, former Kānaka OET interns, NOAA, and members of the Cultural Working Group. All of the three watch groups conducting 24-hour ROV operations on board the ship, whether featuring biological sampling, geological investigations or archaeological survey, included cultural staff and discussions of the Indigenous significance of place and resources. The Ala ʻAumoana Kai Uli expedition provides an impressive example of weaving together Indigenous Knowledge with multidisciplinary marine science and telepresence outreach.

Considering that the significance of honoring those lost in the historic battle in 1942 falls wholly within the broader and older oceanic setting of Hawaiians who have passed, it might not be surprising that the most moving tribute to the remembrance of the Battle of Midway came from the Hawaiian perspective. Each dive was launched and closed with protocol ceremonies to honor this place and all who lost their lives in ways that reflected their significance to Kānaka ʻŌiwi, Japanese, and U.S. military families and communities. And prior to the expedition, the Hawaiian cultural team consulted with the archaeology team and created a unique hula choreographed to the Japanese folk song "Voice of the Sea," honoring the nearly 3,400 lives lost in the violent wartime conflict. The hula was performed on the deck of EV *Nautilus* at sunset by Kānaka ʻŌiwi cultural practitioners, immediately following the third and final ROV dive and directly above the Japanese aircraft carrier *Kaga*.

Intangible values provided the intersection between the sacred nature of the Monument and the special remembrance associated with the Battle of Midway. The loss of life represented by the shipwrecks, rather than the physical property of the wrecks themselves, makes their location, from the Hawaiian perspective, a *wahi pana* or storied place, one of great sadness. The Hawaiian cultural team shared selected 'Ōlelo Noʻeau or Hawaiian proverbs during the wreck survey dives:

#2033 Luʻuluʻu Hanakahi i ka ua nui.
Weighted down is Hanakahi by the heavy rain.
(Hanakahi was an ancient chief associated with Hilo, Hawaiʻi. This expression was much used in Hawaiian dirges, laments for the dead to express heaviness of the heart as tears that pour like rain.)

#2079 Pō Hilo I ka ua Kanilehua.
Hilo is darkened by the Kanilehua rain.
(Said of one who is weighted by sorrow and grief.)

The violent nature of the battle and the extreme loss of life, in combination with the intensity of a challenging deep ocean wreck investigation and the slow and deliberate detailing of the damage and destruction of the warships, had a powerful impact on the entire E/V *Nautilus* and shore-based survey team. On this expedition, the integration of respect held by Hawaiians for this sacred place with the marine science mission, and the shared acknowledgement of loss at the Battle of Midway shipwreck sites, helped to bridge the cultural distances between American, Japanese, *and* Kānaka ʻŌiwi perspectives and values, and discovered some common ground during a deep ocean science mission in a very special place.

The expedition's cultural team performing a hula following the last wreck survey dive on the carrier Kaga*. The ceremonial dance was set to the Japanese folk song "Voice of the Sea." Image courtesy of Ocean Exploration Trust.*

The initial focus of maritime heritage surveys is usually on the technical aspects of maritime archaeology, as well as on the impacts of the wrecking event or battle damage, and the subsequent site formation processes that play a

role in the interpretation of the contemporary wreck site. And those aspects are central to the protection and management of archaeological resources. But the intangible values of wreck sites, particularly where there has been significant loss of life, are clearly important as well. Whether actual human remains are extant or not, these World War II wrecks are memorials to those who died in a pivotal battle in the previous century, and naturally therefore, they evoke a special attitude of care and preservation. Lying within the larger Monument, they evoke an attitude of respect and care for all the culturally significant resources within the rocks and sea life and waters of Papahānaumokuākea.

Further information on the Nautilus *cruise:*
https://nautiluslive.org/cruise/na154

Hans Van Tilburg is the Maritime Heritage Coordinator for NOAA's National Marine Sanctuaries Program.

Jim Delgado is Senior Vice President of SEARCH, a maritime heritage firm.

Mike Brennan is a Principal Investigator and Maritime Archaeologist at SEARCH.

Phil Hartmeyer is a Marine Archaeologist at NOAA's Ocean Exploration.

Daniel Wagner is Chief Scientist for the Ocean Exploration Trust. ⚓

From Classroom to Field Exploration: Deep-Sea Archaeological Surveys of Battle of Midway Wrecks in Hawai'i's Papahānaumokuākea Marine National Monument

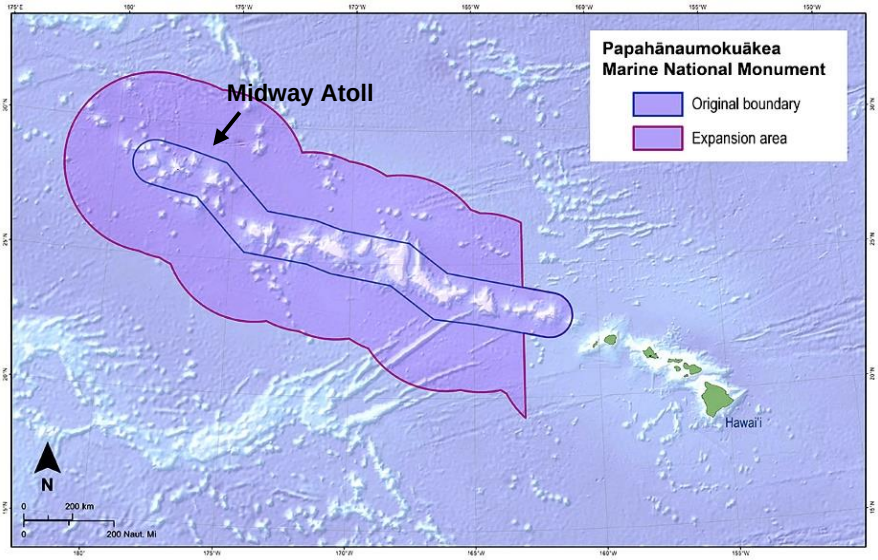
by Mia DeNardi

In September 2023, the Ocean Exploration Trust's Exploration Vessel (E/V) *Nautilus* conducted three remotely operated vehicle (ROV) dives capturing video of aircraft carriers from the June 1942 Battle of Midway in the most remote and northwestern section of Hawai'i's Papahānaumokuākea Marine National Monument (PMNM) during the Ala 'Aumoana Kai Uli (*path of the deep-sea traveler*) expedition. The dives were more than 5,100 meters deep (>16,600 feet, 2,770 fathoms), and the deepest ROV dives for *Nautilus* to date.

PMNM holds the distinction of being the largest contiguous conservation area under U.S. protection and stands among the world's most expansive marine conservation zones. Encompassing 582,578 square miles of the Pacific Ocean (1,508,870 square kilometers), its size exceeds that of all the national parks in the United States combined. The Ala 'Aumoana Kai Uli expedition within PMNM was a 27-day NOAA-funded project to collect baseline data needed to support management in the most remote sections of the monument.

I was asked if I could fill an empty seafloor mapping and navigator position part-way through the exploration season aboard *Nautilus*. To my excitement, one of the trips was exploring the area around the Battle of Midway. The preliminary expedition plan was to locate and take non-invasive video footage via ROV of aircraft carriers and other ships we could locate during the allotted time we had in the area.

This expedition was of particular interest to me as I



Papahānaumokuākea Marine National Monument. Image courtesy of NOAA.

had taken the Introductory Course in Underwater Archaeology offered virtually by the Maritime Archaeological and Historical Society (MAHS) in early 2021, partly taught by my previous Washington College colleague, Dr. John Seidel, while I was at home during the COVID-19 lockdown.

The course covered ship architecture, archival research, how to properly document and conserve items found at an archaeological site, and ethical considerations and the relevant laws about the field. Unfortunately, due to the lockdown, we were unable to participate in the practical SCUBA training, though we did cover topics about what the work would be like, even though we were stuck on land.

We had a self-paced and comprehensive final exam

Monitoring live ROV footage of the USS Yorktown*. Image courtesy of Ocean Exploration Trust.*

covering the topics throughout the course, and to my surprise, one of the most interesting and fun parts of the final was performing digital archival research.

I was busy with another mapping transit cruise a month before the Midway expedition. I wasn't asked to help with research, just to serve as a mapper and navigator. But as I had a break between the cruises and was curious after learning about archival research in my class, I started digging into what I could find about the battle and the various ships that were lost.

I used my geospatial background to try to approximate where the vessels might be located based on several sources I had collected. Since I live in the Washington, D.C., metro area, I visited the Library of Congress and looked through all the images, maps, and atlases I could find related to the battle and ships of interest.

I knew there would be expert maritime archaeologists onboard, and I didn't want to step on their toes or insinuate they wouldn't have already looked at the sources I found. I shared my research with Daniel Wagner, one of the expedition leaders for the trip, who passed it along to some of the archaeologists, James (Jim) Delgado and Mike Brennan from SEARCH Inc. and NOAA's Hans Van Tilburg, who would all be working on the project. Luckily, no one seemed offended, and my geospatial work seemed to be potentially useful.

As a geographer, it was exciting to be part of the team that was mapping and locating the three aircraft carriers with the multibeam and backscatter data we collected while we were underway in preparation for the ROV dives.

Visual Survey of the USS *Yorktown*

Our first dive target was to film the USS *Yorktown*, which had been located by Dr. Robert Ballard 25 years prior during a joint U.S. Navy and National Geographic Society expedition.

It was a reverent experience filming around the carrier. While on watch, I navigated the ROV *Atalanta* around the side of *Yorktown*. We could see inside the eerily empty hangers via their large, doorless entryways.

As we crept along, I knew many people were hoping to find airplanes inside. I did not want to see one though. To me, airplanes signified the most intrinsically personal final moments for many of the casualties from the battle. But for others, they were a monument to the individuals' sacrifices.

It was cathartic to discuss how we felt about what we were seeing with one another and to hear different perspectives on what each element we found meant to others. Having people onboard with various opinions and perspectives made the work even more reflective and valuable for those ashore listening to the discoveries through our own lenses.

We conducted cultural protocols with Hawaiian liaisons before and after each dive, fostering reflection and honoring those lost. Our team emphasized the importance of protocol, defined as established etiquette ensuring reverence, purpose, and respect, and taught all of us so much that can only be learned through participating with open minds and hearts. We learned Hawaiian protocols often include oli (chants) to unite participants, and we spoke oli together often. As we entered the boundaries of Papahānaumokuākea, crew members offered hoʻokupu (gifts) of freshwater and salt as a symbolic gift to the spiritual and cultural realms we were voyaging into. We also performed a special protocol as we left the boundary on our way home.

The author (left) assembling an expendable bathy-thermograph. Image courtesy of Ocean Exploration Trust.

Visual Survey of the Japanese Aircraft Carrier *Akagi*

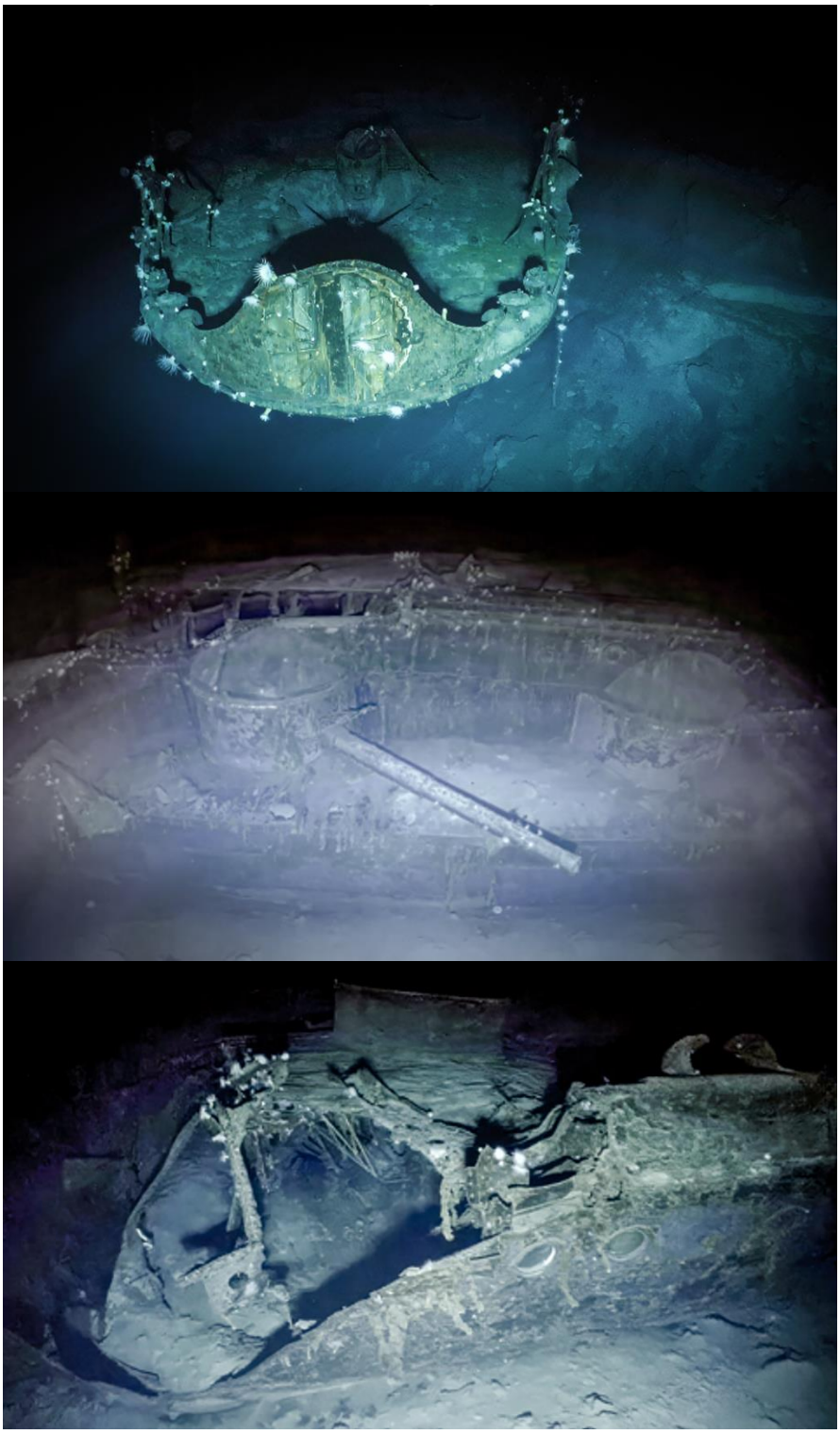
Our second target, the aircraft carrier of the Imperial Japanese Navy *Akagi*, was first located in 2019 by Vulcan Inc. during a sonar mapping survey. I was the navigator working when ROV *Atalanta* descended onto *Akagi*, making us the first humans to see the carrier since 1942.

It was such a powerful and unforgettable moment, and I wished that the Japanese archaeologists working with us from ashore were able to be in the room with us. We initially looked for smokestacks, gun tubs, and known damage areas to identify that it was indeed the *Akagi*. When we approached the bow, we were able to see the honored imperial symbol of Japan, a chrysanthemum flower crest, still there, and James Delgado provided insight from shore on how it likely was gilded wood based on the condition we were seeing.

Visual Survey of the Japanese Aircraft Carrier *Kaga*

Our final dive target for this portion of the expedition was the Japanese aircraft carrier *Kaga*. Of the three carriers that we filmed, *Kaga* had incurred the most damage. There were four direct hits from U.S. bombs. We could see the torpedo damage, and the hull bent into an almost 'V' formation. Even more damage was noted inside the carrier as fires ignited the weapons and fuel aboard the ship. As we did with *Akagi*, we looked for features that confirmed it was the *Kaga*, such as the location of notable gun tubs as well as lettering on the ship.

Rear Admiral Samuel J. Cox, who serves as the Director of Naval History and Heritage Command and Curator of the Navy, was able to join us from ashore during the dive and commented on the valor and sacrifice of both the U.S. and Japanese servicemen. The Admiral noted that these sites deserved to be treated with as much respect as we treat the memorials at the Arlington National Cemetery.



Top: Akagi*'s chrysanthemum flower crest on the bow of the carrier; middle: large casemate gun on the lower deck of* Kaga*; bottom: view of battle damage to* Kaga*. Images courtesy of Ocean Exploration Trust.*

Concluding Thoughts

Taking the MAHS Introductory Course in Underwater Archaeology led me down an unexpectedly adventurous path. Being part of the Ala 'Aumoana Kai Uli expedition aboard E/V *Nautilus* was a profoundly meaningful experience. My involvement began with a spontaneous contribution of geospatial research, merging my skills with my curiosity about maritime archaeology. Navigating the ROV around the USS *Yorktown* and the Japanese aircraft carriers *Akagi* and *Kaga*, I witnessed history unfold. The collaborative

atmosphere, rich discussions, and cultural protocols added depth to our discoveries. Honoring those who served and perished in the Battle of Midway was not just a scientific endeavor; it became a tribute to valor and sacrifice of both American and Japanese soldiers, sailors, and airmen. The expedition, blending technological exploration and historical reverence, underscored the importance of treating these maritime sites with the utmost respect, and why we should work to preserve and protect them.

Note to maritime archaeology students:

If you are interested in the field and would like to do more:

- Reach out to the class presenters to see if there is anything you can work on to help their work.
- Start researching your own project of interest and share your findings with contacts you made in the course.
- Sign up for newsletters and attend local conferences in your area.
- Look for ways to expand skill sets that are complementary to maritime archaeology, such as seafloor mapping or data logging internships and opportunities for people new to the field.

These historic dives were conducted by E/V Nautilus *during the Ala ʻAumoana Kai Uli expedition. The Battle of Midway surveys were made possible by the expertise, support, and collaboration of many partners, including Ocean Exploration Trust, NOAA Ocean Exploration, NOAA Ocean Exploration Cooperative Institute, NOAA Office of National Marine Sanctuaries, SEARCH, Inc., U.S. Naval History and Heritage Command, International Midway Memorial Foundation, Papahānaumokuākea Marine National Monument, Office of Hawaiian Affairs, the State of Hawai'i, U.S. Fish & Wildlife Service, University of Maryland, University of Rhode Island, University of Hawai'i, Bureau of Ocean Energy Management, Defense POW/MIA Accounting Agency, Air/Sea Heritage Foundation, and our Japanese archaeological colleagues from Teikyo University, Tokai University, and Tokyo University of Marine Science and Technology.*

Mia DeNardi is an independent researcher with expertise in geospatial technology supporting deep-sea mapping expeditions. ⚓.

Arnold's Bay: Updates and Highlights from a Revolutionary War Battlefield Site in Vermont

by Cherilyn Gilligan

In 2020, the Lake Champlain Maritime Museum was awarded an American Battlefield Protection Program grant to investigate a little-known battlefield from the American War of Independence in Arnold's Bay, Panton, Vermont. Starting a project of this scale during the first year of the pandemic was a great challenge, but one thing COVID did in our favor was to help the Museum launch our first (now annual) Virtual Archaeology Conference to showcase our work. If you want greater details about the last few years of the Arnold's Bay Project, please check out the Lake Champlain Maritime Museum's YouTube channel where you will find recordings of past presentations.

The Arnold's Bay Project was carried out in collaboration with the Native American Stockbridge-Munsee Community, and we partnered with the Advanced Metal Detecting for the Archaeologist (AMDA) group in 2021 for a metal detector survey of the shoreline and farmed fields that border the bay. We had permission from private landowners for the survey, and we also worked under Vermont State permits to access the bottomlands of the bay, and under

"The Philadelphia *Sinking Assisted by the Galley* Washington*." Ernest Haas. Lake Champlain Maritime Museum Collection.*

Detail from "The Attack and defeat of the American fleet under Benedict Arnold by the King's fleet on Lake Champlain." Library of Congress.

permit from the Naval History and Heritage Command (NHHC) to access the row galley *Congress*. This past year's fieldwork (2023) on the remains of *Congress* was funded by an anonymous donor, which allowed our staff to further reach our original research goals that were thwarted by the ongoing global pandemic. Under agreements with Vermont State and the Navy, the Museum will serve as a repository for these collections. Once the artifacts are conserved, the collections will be made available to the public for research. This article will orient you to the site, familiarize you with our research goals, and summarize the last few years of the project with some highlights.

The action that took place in Arnold's Bay marked the end of a running battle up Lake Champlain and was the last naval engagement in the northern theater of the conflict in the year of 1776. In the summer of that year, the American War of Independence had turned into a naval arms race on Lake Champlain after the American forces retreated from their failed attack on Canada and back up Lake Champlain in June. Control of the lake meant control of the major transportation route into the northern colonies, the ability to reach plentiful natural resources, and to have access to major cities in the colonies. If the British took control of Lake Champlain, they could essentially split the colonies in half and effectively divide and conquer the rebel forces. In defense, the Americans raced to build a fleet that could secure their hold on the lake, and the British raced to build up their fleet for invasion.

On the morning of October 11th, 1776, General Benedict Arnold with his fleet of 15 vessels and some bateaux, carrying 500 men with little to no sailing experience, spotted the British fleet around 8:00 am from their position between Valcour Island and the New York shoreline. Various primary sources indicate the larger British fleet consisted of 20-28 ships manned with trained and experienced Royal Navy officers and crews. They sailed south past Valcour Island before they spotted the American fleet (pictured to the left) and had to turn back, into the wind, to face them. The American fleet was badly damaged by the end of the first day, resulting in the loss of vessels *Royal Savage*, *Philadelphia*, *New Jersey*, and *Spitfire*. A running battle ensued after the remaining American fleet snuck past the British line during the night and continued heading south towards their stronghold at Fort Ticonderoga. By the evening of the 12th, the British were back in pursuit, while the Americans struggled to row their battered fleet through the night. In the early morning of the 13th, the British vessels engaged the Americans once again. The badly damaged row galley, *Washington*, was overwhelmed quickly and forced to strike its colors. Its crew and captain were captured. The running battle continued over nine miles south to where the row galley *Congress*, along with the smaller gunboats *Boston*, *Connecticut*, *New Haven*, and *Providence*, were run aground in a shallow bay and ordered burned with their flags flying to avoid capture. Arnold ordered his men to

Congress *escaping, Ferris Bay (now Arnold's Bay). Ernest Haas. Lake Champlain Maritime Museum Collection.*

shore to set up a line of defense against the British, who continued to fire upon them from beyond the mouth of the bay. The large British boats could not follow into the shallow bay, which measured about 15 feet (4.6 m) at the deepest part of the mouth, so they continued to fire at the American rebels from deeper water. When the boats were burned beyond use, Arnold and his remaining men, along with the Ferris family from the homestead on the bay, fled south on foot toward Crown Point, the northernmost area under American control, and eventually to Fort Ticonderoga. The bay now bears the name 'Arnold's Bay' and is located in present-day Panton, Vermont.

Now that we are familiar with the storyline of events, I will summarize the last few years of our archaeological investigation of this battlefield site along with some highlights, with a focus on the remains of *Congress*, the only extant remnants of a vessel from this event left in the bay.

One of the main objectives of our archaeological investigation was to produce site boundary and feature data in order to modernize our understanding of this battlefield site. We have a handful of primary documents from the battle, so part of our work has been to determine how those accounts measure up to the archaeological data that we have been generating, along with data from the 1980s excavations of the Ferris Homestead and from the excavations of the *Congress* in the 1960s.

Post-depositional disturbance of this site has been immense over the last 250 years. It began almost immediately with the British salvaging what they could from the ruined boats. It was also common practice at the time to take wood from wrecks for mementos. We find things like canes, rulers, gavels, and even unmodified chunks of wood said to be from *Congress* and *Royal Savage*, in historical societies and museums all around Vermont and New York.

In the 1890s, there was an attempt to remove *Congress* from the bay. The effort ended up breaking the ship apart and about 30 feet (9.1 m) of the stern end of the vessel was dragged on shore. This piece was eventually moved to nearby Chimney Point, where it continued to deteriorate. Only a few frames have made their way into the Museum's collection. The same fate is unfortunately true for the four gunboats that were removed from the site, the last of which was raised in the 1950s. There are a few photographs from that event in the Museum's collection, but the boat was eventually left to rot on the New York shore.

Our last research question involved investigating exactly what was left of the row galley *Congress* underwater, determining how intact that portion of the vessel was, and attempting to discern something about the ship's construction from the remains. At this time,

Gunboat raised from Arnold's Bay, 1952. Barranco Research Files. Lake Champlain Maritime Museum Collection.

this is the only known row galley example that still exists archaeologically, making this wreck of great interest to maritime archaeologists like ourselves.

During 2021, our first archaeological investigations took place by means of a metal detection survey through the farmed fields behind Arnold's Bay and along the shoreline of the bay. Our friends with AMDA group partnered with us and taught their Register for Professional Archaeologists (RPA) certified course concurrently with the survey to help us investigate the terrestrial portion of our battlefield site. Metal detection in an archaeological setting is not always the best tool for every job. In this specific case, in order to answer our research questions, metal detection turned out to be a great tool to see ammunition scattered across this site and help us determine site boundaries as well as feature data for the site. We were able to use this survey technique across the surrounding farm field and the transitional shoreline. The surrounding farmland is privately owned, and the landowners graciously allowed the Museum access and permission to run the metal detection course and even joined our class. This family has been enormously helpful to the project over the past few years, and we are very thankful for their generosity. We also partnered with the Stockbridge-Munsee during this portion of the project, but unfortunately, COVID inhibited the ability of tribal members to travel for the course. Luckily, their Tribal Historic Preservation Officer (THPO) was able to join us on site, and if you check out the Museum's recorded conference papers from 2021 you will see the THPOs presentation on the Stockbridge Militia and their role in the American War of Independence.The AMDA survey produced metal objects such as musket balls, case shot in various sizes, a lead jaws pad or flint wrapper, a bayonet scabbard hook, buckle fragments, buttons, and more. These are all examples of personal items that you can imagine might

have fallen from soldiers' clothing and gear as they jumped overboard into the bay and ran for cover under British fire. By spatially mapping these data, we were able to see artifact density of these types of personal items in specific areas and infer the main route that soldiers took reaching land after abandoning their boats. Case shot in the fields confirms the primary accounts of cannon fire in certain directions by British boats at the mouth of Arnold's Bay. Our terrestrial investigations did not find the American line of defense, suggesting that the feature was too ephemeral to withstand the two centuries of farming that came afterwards.

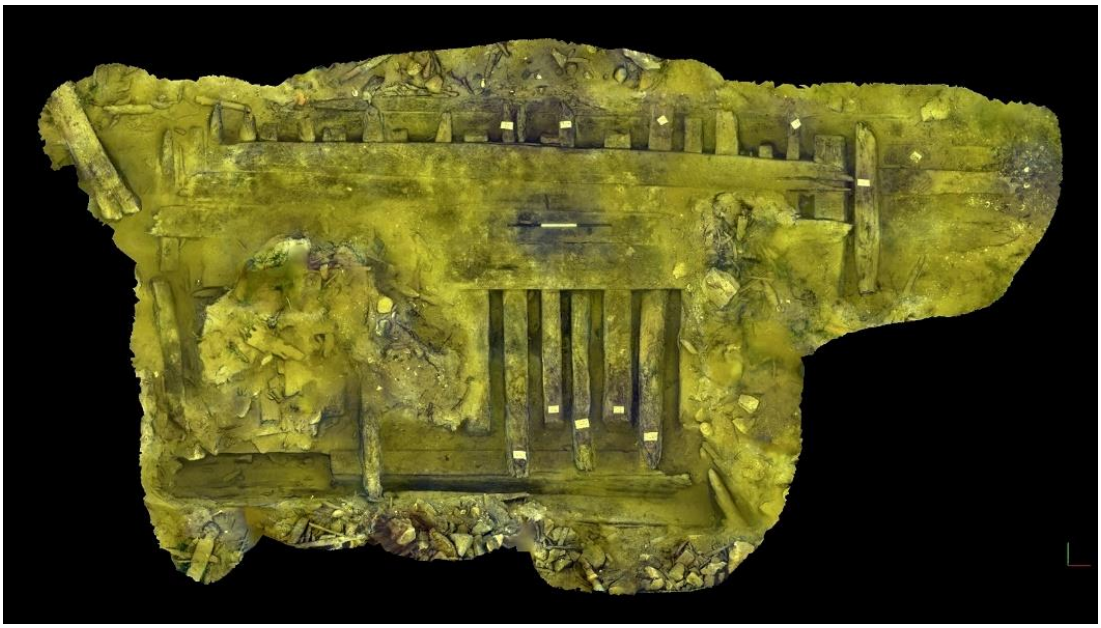
During the field season of 2021, we also laid two underwater transects roughly north to south in orientation, in close proximity to the known location of *Congress.* Along these transects, we used metal detectors along the east and west of the lines, finding many musket balls, examples of iron case shot, a cannon ball, a cupreous shoe buckle and more, and recording locational measurements along the way for all recovered objects. From the data we gathered along these transects, we hypothesized the possible orientation of *Congress* before it was broken apart in the 1890s. We also found what may be the location of one of the burned gunboats, based on the presence of melted lead and a large space of negative data along a transect.

The 2022 season expanded our underwater investigations, establishing more transects in-shore of the known wreckage and extending existing lines further south. We mapped a tapering of artifact density to the southern end of the site and to the northern ends of our transects, giving us an idea of battlefield boundary lines through the density of items located from this time period. We left the transect on the far left alone after finding what may have been more articulated timbers potentially related to *Congress.* At that point in the project, we did not yet have our permit from the NHHC to be able to investigate the row galley, so we spent our time investigating site boundaries and clues about vessels locations. Among the several hundred artifacts we cataloged in 2022, we found examples of personal items like a spoon handle engraved with the initials A.P., a glass-lined cupreous inkwell, a hand grenade with the wooden fuse still in place, two bayonet examples, a two-tined fork with a bone handle, and the cupreous hinge from a folding ruler, among many more. In addition to mapping all located metal objects, we were able to map in the ballast pile to the north of the *Congress* remains. This pile was apparently moved off the wreckage during the 1960s investigation.

On the last week of the project in 2022, we received our NHHC archaeological permit, so we set to work investigating the remains of *Congress.* We excavated a single trench across the wreckage using an induction dredge. From this trench, we discovered that the orientation of this section of ship was not what we expected. Sticking out of the mud, we had seen what we thought were frame ends from each side of the bottom of the vessel, but our investigation determined that the section we were looking at was only one side of the boat, broken apart at the keel.

In 2023, we wanted to uncover more of the remains and see how much of the keel was present along the intact portion, and how far the portion extended to either side. We also had a large enough crew to lay two more underwater transects perpendicular to the others (east to west) that could test further west of the site than we had previously explored and extend across an area we hypothesized could be a location of one of the beached and burned gunboats.

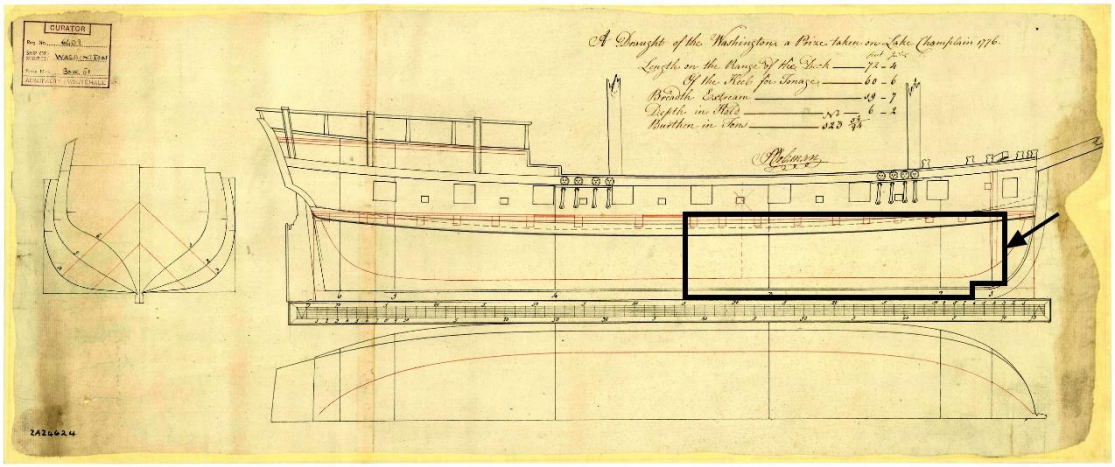
Chris Sabick produced a photogrammetric model of *Congress*. The resulting imagery shows that *Congress* was built using an open framing technique, not uncommon for the time period. This means the timber frames you see in the image below (with white tags) are not attached to each other, but instead are fastened to the hull and ceiling planking. Using lines plans from



Photogrammetric model of the remains of Congress, *2023. Chris Sabick, Lake Champlain Maritime Museum.*

Congress' twin ship, *Washington*, we were able to extract the shape of the hull from the portion we excavated and compare that to the historical rendering.

In the classic fashion of big projects like this one, we have certainly generated more questions than we started with! We are continuing to conserve artifacts and crunch data from the project, so stay tuned to the Lake Champlain Maritime Museum's social media accounts for more updates.



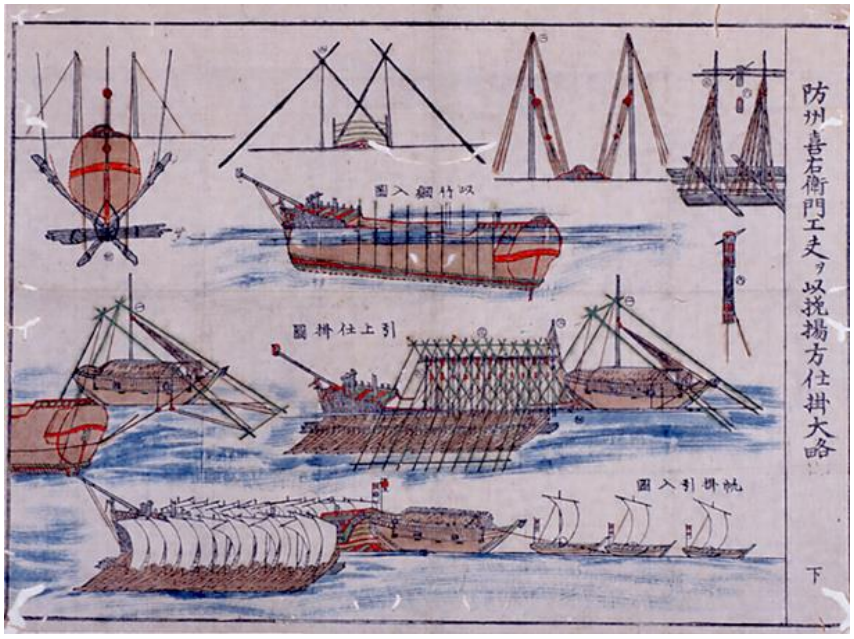
The portion of Congress *uncovered during the 2023 field season is highlighted on the lines plan of sister ship* Washington.
National Maritime Museum, Greenwich, London, public domain.

Cherilyn Gilligan is the Co-Director of Archaeology at the Lake Champlain Maritime Museum. ⚓

Japanese Cognition of Western Vessels from 1790-1853

by Dante Petersen Stanley

Japanese construction of Western-style vessels post-1853 emanated from a 250-year political paradigm shattered by the opening of Japanese ports to American trade by U.S. Navy Commodore Matthew Perry in 1853-54. From the middle of the 17th century, Japan, under the Tokugawa Shogunate, pursued a form of informal diplomacy, restricting the flow of trade and heavily regulating the travel of information and people. The Tokugawa Shogunate was established after the Sengoku (Warring States) period in 1603, and the eventual paradigm formed from a series of political edicts in the Kan'ei era (1624-1644) in response to early turmoil and rebellions. The spread of Christianity in southern Japan led to a ban on Christianity in 1635, a series of Christian Revolts against the shogun (1637), and the expulsion of the Spanish (1624) and Portuguese (1639). Concurrently, a ban on foreign travel by Japanese subjects was introduced in 1635 along with a prohibition against daimyos, or feudal lords, building vessels larger than 90 tons. The Dutch were the sole European presence accepted by the Shogunate, and in 1641 were limited to Nagasaki, with one or two vessels visiting every year. By the turn of the 19th century, an environment had developed where strict political controls created a clear divide between the internal and external maritime worlds.



Lifting of Eliza, *Illustration of Kiemon's device for salvaging a ship.*
Courtesy of Kobe City Museum

Fractures to this world order started to occur in the late 18th century. Russians were present in Sakhalin and Hokkaido in the 1790s, with violence fomenting in 1806, only resolving by 1812. This was coupled with the HMS *Phaeton* incident in 1808, when the British Royal Navy vessel *Phaeton* entered Nagasaki harbor in search of Dutch merchant vessels. During the 1790s and early 1800s, American vessels subcontracted by the Dutch

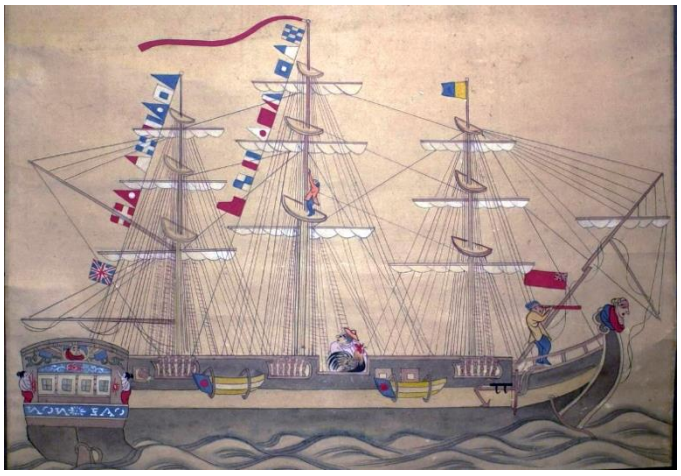
traded in Nagasaki under the Dutch flag, because of the Napoleonic Wars.

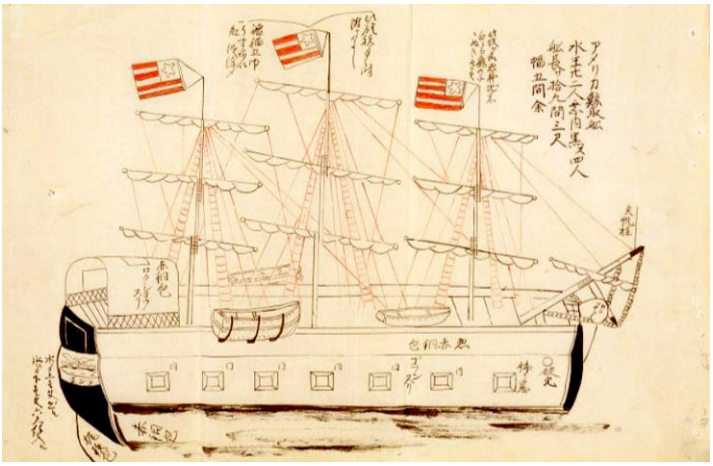
Starting in the 1810s, Western whalers operated off the coast of Japan and informally traded with local fishermen. Officially, the whaleships *Brothers* and *Saracen* resupplied in Uraga, Edo Bay, in 1818 and 1822. Violent scuffles between Japanese officials and Western whalers in 1825 resulted in the Expulsion Edict of 1825, which ordered the shelling and repelling of any non-Dutch Western vessel spotted off the Japanese coast. The Expulsion Edict was a result of a multitude of Western intrusions, specifically by whalers, into the internal maritime space, a situation exacerbated by fears of Russian aggression. The Edict was countermanded in 1842 to supply and send off vessels, a clear response to the overwhelming British victories in China during the First Opium War. Concurrently, a significant increase in Western whalers operating off the northeast coast of Japan and Hokkaido occurred. In 1845, the whaling ship *Manhattan* repatriated Japanese castaways to Uraga. In 1846, USS *Columbus*, under the command of Commodore James Biddle, was in Uraga to potentially start trade negotiations, but failed. In 1853, Perry engaged in a series of diplomatic overtures, resulting in Japan slowly adopting Euro-Western diplomacy via the 1854 Treaty of Kanagawa.

In the 1790s through the early 19th century, visual representations focused on the whole of the vessel, specifically the keel, garboard strakes, stem, and rudder post. Some depictions were far from accurate, but they were attempts to depict or understand the vessel in its entirety. This was coupled with extremely nascent attempts at Western-style construction culminating in the *Sankoku* Maru (named the "three-country ship" because of the construction methods it borrowed from the Dutch, Chinese, and Japanese) in 1787. But *Sankoku* Maru wrecked in 1789, and political pressures after 1793 curtailed any further experimentation.

From the 1810s to the 1830s, a process of conflation and abstraction of the vessel's construction started to occur, connected to the rise of whalers and the 1825 Expulsion Edict. Construction elements slowly lost their original meaning and conflated forms of construction emerge. Vernacular elements of construction also start to appear during the abstraction. Given that multiple prints of the whale ships *Brothers* and *Saracen* exist, these trends can be tracked across the VR related to those vessels.

The exponential growth of whaling vessels post-1842 also resulted in numerous depictions of the whaling ship *Manhattan*, and the American naval ship USS *Columbus*. Construction elements are absent and a focus





Left: Saracen, *Courtesy of the British Museum. Right: Whaling Ship* Manhattan, *Courtesy of National Archives of Japan*

As a side effect of these interactions, a visual record (VR) formed, documenting the presence of Western vessels. Thirty-seven prints of more than eleven American and British vessels over a 60-year period exist alongside imported and transcribed European lines plans. Certain construction elements, which we will refer to as nodes of cognition, start to emerge in the VR and seemingly dovetail with construction aspects of Japanese Western-style vessels built post-1853. By noting and tracking nodes of cognition, knowledge of Western construction drifts from its original meaning through processes of conflation and hybridization while supposedly representing the original.

on external elements and the presence of vernacular features suggest hybridity. The prevailing depictions belie the 60 years of contact, verging on rudimentary. The vector of knowledge runs counter to popularly held beliefs that were buoyed by the images after 1842.

In contrast to the VR, which exists as an informal tableau of knowledge, are European lines plans imported for potential construction purposes. The treatise *Gunkan zukai* (warship plans) was transcribed and translated by 1808 in response to Russian aggression. The manuscript was a compilation of late 17th century and early 18th century French, Dutch, and English plates. A Dutch manual from 1822 (*Handleiding tot de kennis in den*

scheepsbouw) was transcribed and offered as a synthesis of contemporary 19th-century Western maritime knowledge. Copies made of the plans show clear examples of cognitive drift, as the drawings lost detail, conflated meaning, and actively changed construction elements while seemingly presenting the copies as accurate.

Clear examples of cognitive drift exist. The first example is the movement of the bow, specifically the conflation of the stem. Part of this conflation is visible in the depiction of a divider between the bow and the rest of the vessel, but it is likely the stem. This is followed by the movement of the stem. The final example is the construction of the stern and transom, most notably a transition from depictions of a helm port to a very likely depiction of a vernacular stern.

The divide between the bow and the rest of the vessel started with the first depiction of American vessels in *Lady Washington* and is seen up to the Expulsion Edict. It is likely depicting the stem but supposed to represent the difference between bow and midships. This pattern exists up to prints in 1830. The disappearance of the trend paradoxically highlights the trend because depictions of the stem are either absent or copies of earlier prints in images post-1840.

Other examples of this trend are the movement of the stem and the disappearance of certain features. *Brothers* and *Saracen* both are shown in four different prints, and the wide variance in depictions allows for tracking of features. For instance, elements such as knightheads and their placement are extremely specific, connecting to the stem and bowsprit. The disappearance, transformations, and movement of knightshead allow for understanding of how the bow was shifted, contrasted against typical configurations in Western designs. The knightshead should line up with the stem, and the knee of the head should be the furthest extension. However, in some images of the VR, the knightheads either disappear or change function, being no longer connected to the stem. This developed from the knee of the head being conflated with the stem.

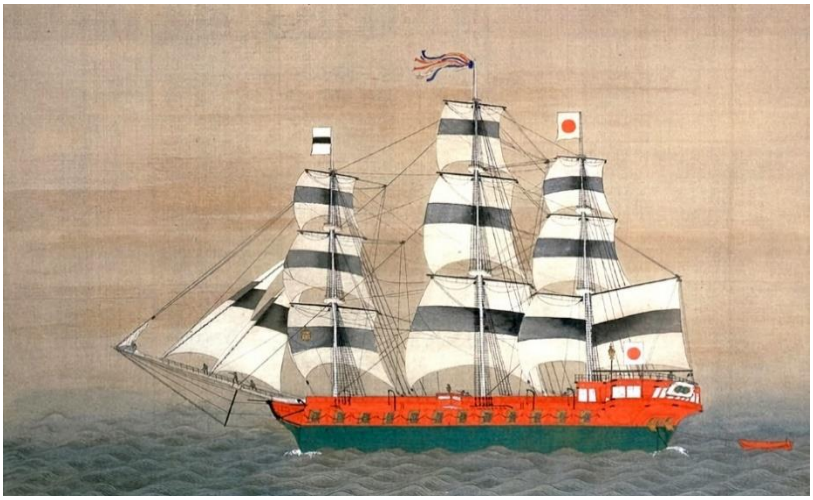
The other transformations are in the stern, largely emanating from vernacular design features. From 1790 to 1846, depictions of the stern shift from likely traditional Euro-Western depictions to the clear representations of a Japanese vernacular construction, a *chiri*. A *chiri* is a type of Japanese stern, an open transom allowing for the lifting of the rudder.

The *chiri* starts to seep into the Japanese documentation of Western vessels, and by 1846, clear depictions of *chiri* exist in portrayals of the whaling ships *Manhattan* and USS *Columbus.* It is also possibly seen in the Japanese copy of the Dutch manual *Handleiding tot de kennis in den scheepsbouw*.

Chiri, or open transom. Jikūkan Museum, Osaka, Photo by Dr. Michelle Damian

The copies of the Dutch document also show other transitions. Cognitive drift affected the transition of knowledge, possibly a result of the political system and the ongoing industrial revolution in the west. Drift is seen in the copying of the sheer plan and cartoon of the bow and transom. These transitions then dovetail with Western-style vessels constructed post-1853.

Before 1853, some experiments with sloop-type vessels occurred, flying in the face of the ban on large vessels, and in a possible depiction of the type, a clear *chiri* stern exists. After 1853, with the ban of large vessels repealed by the Shogunate, a spate of Western-style vessel constructions emerged, with five of particular note: *Shohei* Maru, *Hoo* Maru, *Asahi* Maru, *Hayatori* Maru, and *Jingo* Maru. The first three were either ordered and built by the Shogunate or by daimyos with heavy Shogunate influence after 1853. The other two were ordered solely by Himeji Domain and built between 1856-1863. The discussion rests on visual evidence available from these drawings and is not the total sum of Western-style vessels constructed. The bow on *Asahi* Maru matches visual elements in the VR, with the line and the forward stem. Unlike earlier visual depictions, the line likely does not represent the stem, and the knee of the head is conflated with the stem, pushing the bow forward. The transom likely has a fusion *chiri*, it has a stem post from the keel, but a smaller hole is present, likely to horizontally access the rudder from a deck above the waterline. *Hoo* Maru has an extant lines plan, and possibly has some influences from imported plans of a cutter and whaling vessels (although this is extremely tentative). Evidence of the stem and bow being moved forward, as in the headrails, suggest the change was decorative. A Western-style *chiri* (a stern post being merged with Japanese



Asahi *Maru*. *Image courtesy of Museum of Maritime Science* (船の科学館), *Tokyo.*

vernacular construction) is possible but is only visible in the plans. *Shohei* Maru has a stem and an external element, but it likely emerges above the waterline, and defeats the purpose of a cutwater/knee of the head. In the stern, a very tiny Western-style *chiri* is present above the stern post.

Illustrations of other Japanese vessels display similar changes. In a combined illustration of *Hayatori* and *Jingo* Maru, the *Hayatori* Maru's stem follows the trend of moving the bow forward, conflating the stem and external elements. The stem is also exceptionally large. However, there is no *chiri*. In *Jingo* Maru, there is a large external element, yet the bow curves suggest an internal stem. Post-1853, there is some knowledge of Western construction, but enough gaps exist for vernacular stopgaps to occur. These vernacular stopgaps disappear in later Western-style constructions but likely emerge in purpose-built hybrid constructions in the Meiji era.

A unique environment existed from 1790 to 1853. Japan had only limited official contact with one European country and severe internal restrictions against foreign travel contrasted against an undulating yet constant stream of Western contact. These points of contacts formed the VR, and cognition of Western vessels is filtered through the VR. By 1853, with Perry opening up Japan, construction of Western-style vessels began.

Links to any existing archaeological sites are still unclear, but these connections have the potential to shed light on the transitions. There is a current dearth of sites with vessels from this time period that contain these features: novel solutions may be needed. While the research presented here is collections-based, it rests on archaeological theory. Until a wreck site from this time frame is found, built using the hybrid techniques described, the interpretations regarding construction are at best tenuous.

Dante Petersen Stanley, born in Nagano, Japan, is a Masters' candidate in East Carolina University's Maritime Program. ⚓

BOOK REVIEW

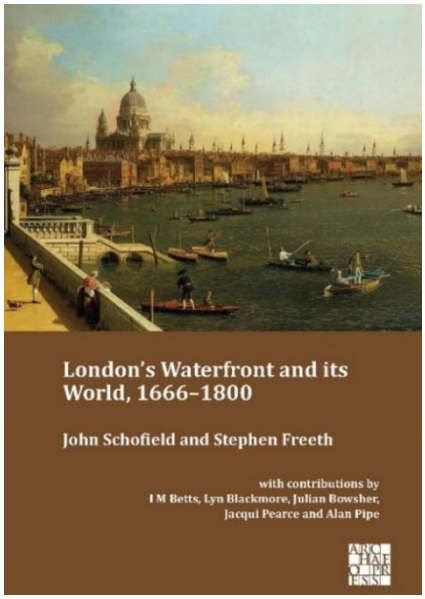
London's Waterfront and its World, 1666–1800

by John Schofield and Stephen Freeth (Archaeopress 2023)

reviewed by Dennis Knepper

In 1666, a massive fire swept through London. The Great Fire of London, as it is known historically, has been seen as a critical point in London's transformation from a medieval city to a modern commercial center. The fire claimed many lives and destroyed most of the structures along a large section of the city's waterfront, and in the process directly influenced changes in London's relationship with the wider mercantile world.

A recent publication, *London's Waterfront and its World, 1666–1800*, by John Schofield and Stephen Freeth, details an extensive historical and archaeological study along a section of the waterfront damaged by the fire.



One of the largest cities in the western world at the time, London contained some 300,000 to 400,000 people crowded in an urban area dense with wooden structures in a maze of narrow, winding streets and alleys. Among the results of the fire, warehouses replaced the largely residential warrens along the Thames waterfront, while wider streets more readily connected merchants and shipping companies with the river.

London's Waterfront and its World examines both the physical and socioeconomic changes wrought by the blaze, following its immediate impact in the 17th century through to the turn of the 19th century and beyond. The investigation reported in the book concentrated on four sites on Thames Street, near London Bridge in the City of London, an area that formed the center of London's trading waterfront at this period. Fieldwork for the study was conducted by the Museum of London between 1974-84, and analysis and reporting has been ongoing ever since.

A companion publication, released in 2018, reported findings in the same area from the medieval and post-medieval periods to the time of the Great Fire (1100-1666). That study was initially designed to investigate the process of filling and land reclamation along the bank of the Thames for the extension of waterfront properties into the river. The work documented in the current volume has as its primary focus the century following the fire, the period from 1666 to 1776. The investigation was carried out in the context of a wider documentary study of the waterfront as it extended eastwards to Deptford, where the London Docks were established at the start of the 19th century, and which signaled the expansion of London's modern, worldwide commerce.

Historical archaeologists, in comparison to prehistoric archaeologists, often have the advantage of extensive documentary evidence with which to work, evidence including maps, deeds or other public records, journals, newspaper articles, or paintings. *London's Waterfront and its World* is an example of well-designed research based on sources such as these. A deep archival record was available for the area and was expertly drawn upon to study the development of waterfront life and commerce as the latter expanded along the river. Archaeological evidence, including the remains of buildings and associated yard areas, as well as analysis of literally thousands of artifacts, was used to supplement the documentary evidence and tell a more complete story of the people who occupied the structures, detailing, as the authors note, "specific aspects of culture, fashion and religious beliefs."

The excavations were conducted on four properties along Thames Street near the east end of the fire damaged area: from west to east, Swan Lane; Seal House; New Fresh Wharf; and Billingsgate Lorry Park. The placement of wide area excavations within these locations was based on the analysis of historical maps. The excavations exposed building foundations, interior floor deposits, cellars, exterior yard deposits, and features including a gravel-based cesspit and a well, the latter in the basement of one of the houses and dug through the remains of medieval buildings on the site.

After relatively short descriptions of the excavation results at each of the four sites, interpretive studies are presented, including examinations of life in the city during the period describing the industries, buildings, shops, and warehouses that, following the fire, advanced the growth of shipping and international trade.

The interpretation continues beyond the late 18th century to examine the rise of large-scale warehousing, along with 19th-century reforms that further addressed congestion resulting from expanded trade and ship traffic. In a brief coda, the authors bring the story to the present by describing the enormous changes that were again brought to the city by a more modern form of devastation: aerial bombing during World War II. Once an avenue busy with waterfront laborers, Thames Street is now a major thoroughfare characterized as "a thundering bypass…lined with largely characterless modernist buildings (which are usually replaced every 30 years and sometimes less)."

Artifact analyses indicated the increasing international, global reach of London commerce during the period. Luxury ceramics such as Chinese porcelains for tea ware and dining ware were becoming more readily available, as seen in items excavated at the Billingsgate Lorry Park location. Cowrie shells were also recovered at Billingsgate. In many parts of Asia, particularly in China and India, these shells had been used as currency for centuries. Most of the shells from the Billingsgate excavations were identified as native to the Maldives, one of the main source areas. They were carried from the Indian Ocean to the Mediterranean by Arab traders, and from there they developed into the regular market currency in many places in Africa.

As market tender, the shells inevitably became an important part of the slave trade. The presence of cowrie shells in the Billingsgate warehouses was seen by the researchers as direct evidence of London's involvement in the trade in slaves. While Liverpool and Bristol were dominant in the commerce, documents record London's active participation as well, and the waterfront investigation provided some of the first tangible evidence of the trade discovered archaeologically in London.

In the short term, the Great Fire of London reportedly destroyed 15 percent of the city's housing, causing the displacement of what had been a densely packed residential population along the waterfront and contributing to an increase in population density in the growing suburbs. The exact number of casualties, even in terms of the order of magnitude, is not clear. However, the fire may ironically have saved many lives. Plagues had ravaged the city repeatedly over the centuries, the latest occurring just a year earlier, in 1665, in which tens of thousands died. The fires cleansed the area, however, destroying the unsanitary housing that contained the rats and fleas that transmitted the disease. Plagues did not afflict the city thereafter.

In the longer term, to hold that a fire in a comparatively small area, however catastrophic, could be seen alone as a watershed event in British history might seem an exaggeration. And this was one of the conclusions of the study overall. The fire did result in significant changes to the waterfront, but important continuities were also noted. The event promoted transformations to the port of London at a time when the new British empire was rapidly developing. It swept away the crowded warren of housing along the waterfront leading to the construction of large warehouses, as increased shipping required more space to store and distribute goods. Renovated streets allowed goods to flow more easily to and from the repositories, and rebuilt docks more effectively accommodated an ever-growing number of ships. The new port facilities expanded as the area was reconstructed and eventually stretched downstream to the east as far as Deptford.

This is a handsomely produced volume, from the design of the cover, with Canaletto's contemporary painting of the Thames, to the layout of the text and quality of the illustrations. The text itself runs to 215 pages and is followed by appendices that include artifact analyses, a bibliography, and an index. The book is available in hard cover and printed on heavy bond A4 paper (the format we reviewed), or in digital form. It is among several titles by Archaeopress that are part of their open access content, available for personal use as a pdf file in a free download, as is the companion 2018 study of the medieval period.

London's Waterfront and its World, 1666–1800 is largely an archival study, relying heavily on the analysis of an extensive documentary record. The archaeological work, however, while supplemental, serves to inform the archival analysis, documenting physical alterations to the waterfront structures during the period and affording evidence for studies of consumer tastes and consumption, "reveal[ing] a rich urban culture with many elements of foreign fashions." The book is a prime example of a comprehensive historical archaeology study that serves as a model for maritime and non-maritime researchers alike. ⚓

Preznotes, continued from page 2

Board of Directors meeting. The conference in Oakland attracted more than 600 professionals and students, with almost 400 sessions, including 137 underwater sessions and 25 posters. Workshops and tours took advantage of the Bay Area's historic forts and ships at the San Francisco Maritime Museum.

Jim and the MAHS Board have also been working hard on updating the MAHS survey gear and dive emergency first aid supplies to support our impending survey work this summer.

Thanks to all those who have made MAHS so successful all these years. We are pleased to have survived the pandemic and look forward to getting back to our field projects.

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.
3. 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 Statement 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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General membership meetings of the Maritime Archaeological and Historical Society are held on a bi-monthly basis, the second Tuesday of the month. Meetings are conducted by Zoom Technology starting at 7:30 pm EST. See the Meeting Schedule posted on our website at https://www.mahsnet.org/meetings.php for more information.

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