

EDITORS' NOTE



ANNE V. STOKES, PH.D. FLORIDA HISTORICAL SOCIETY BOARD OF DIRECTORS AND CEO OF SEARCH

e are delighted to have the opportunity again to co-edit this year's Florida Historical Society magazine, Adventures in Floridα Archαeology. The past year has seen some victories for cultural resource managers and state residents, especially a federal court ruling that confirmed France's ownership of the likely wreck of Jean Ribault's flagship, Lα Trinité, lost in the vicinity of Cape Canaveral in 1565. The alternative was to allow it to be salvaged by treasure hunters and the artifacts sold. We look forward to detailing the archaeological recovery of this important site, which relates directly to the founding of Florida, in a future AFA issue.

Florida has numerous well-documented and researched cultural resources, many of which are accessible to the public. As detailed in "The Cat Came Back," several artifacts from the 1896 Key Marco excavation, including the famous Key Marco Cat, are on loan to the Marco Island Historical Museum. "Digging in Circles" describes the well-known Miami Circle archaeological site, as well as other pre-Columbian circles near the mouth of the Miami River that have been incorporated into public parks and the grounds of private commercial properties. Although not on public land, "From Shipwreck to Historic Boatyard" highlights a partnership between local residents, professional archaeologists, and the City of West Palm Beach that allowed a long-standing mystery to be solved. No doubt many AFA readers have heard about or even visited the "Spring Break Wreck," a late-19th to early 20th-century merchant schooner



KC SMITH
FLORIDA HISTORICAL SOCIETY BOARD
OF DIRECTORS

that washed ashore in St. Johns County last year. It currently can be seen at the Guana Tolomato Matanzas National Estuarine Research Reserve (GTM). And if you are in the vicinity of Cedar Key, particularly at the Summer Solstice, make sure to visit the archaeological site described in "Solstice Feasts and Other Gatherings" to see how Native Americans adapted to their environment thousands of years ago.

Cultural resources are at risk in Florida and throughout the world from natural disaster, effects of climate change, and civil conflict. Recent proposed changes to the National Historic Preservation Act have the potential to erode protection of significant sites by affecting how and when historic properties are listed on the National Register. The Florida Historical Society is committed to the preservation and promotion of our shared history through this publication and our quarterly journal, programming on public radio and TV, and events held around the state throughout the year. We invite you to join the Society and become involved in our mission.

The articles in this magazine highlight some of the fascinating archaeological sites and cultural resources in our state. We hope you enjoy this edition of Adventures in Florida Archaeology. Prior editions are available online at myfloridahistory.org/fhsai. We wish to thank the researchers who contributed to this issue and everyone who devotes their time to protecting, curating, and interpreting our state's irreplaceable cultural heritage.

TABLE OF CONTENTS

O2 ICE AGE WAKULLA SPRINGS

MYSTERIES ON LAND AND UNDERWATER
James S. Dunbar and C. Andrew Hemmings

13 THE CAT CAME BACK ICONIC CALUSA ARTIFACTS RETURN TO FLORIDA

Ben Brotemarkle

20 SOLSTICE FEASTS AND OTHER GATHERINGS

RESEARCH AT SHELL MOUND ON THE GULF COAST

Kenneth E. Sassaman

27 FROM SHIPWRECK TO HISTORIC BOATYARD

HISTORICAL ARCHAEOLOGY AND COMMUNITY COLLABORATION

Odlanyer Hernandez de Lara and Robert S. Carr

33 A FOREST OF CLUES

HISTORIC SHIPWRECK AS ALLEGORY ON THE FIRST COAST

Brendan Burke

▲ A DIGGING IN CIRCLES

PREHISTORIC ARCHITECTURE ON THE MIAMI RIVER

Robert S. Carr and Ryan Franklin

57 RIBAULT'S LOST FLAGSHIP

A UNIQUE ARCHAEOLOGICAL OPPORTUNITY FOR FLORIDA

James Delgado

5.6 HURRICANE IRMA CANOE

THE REST OF THE STORY KC Smith



ON THE COVER:

THE FLORIDIANS worship the Column erected by the Commander on his first voyage. Colorized engraving by Theodor de Bry, based on images by Jacques Le Moyne de Morgues. Originally published in La Floride française, scène de la vie indienne, peintes en 1564, by Charles de la Roncière, Les Éditions nationales, 1928; reprinted in French Florida by Charles de La Roncière, edited by Benjamin S. DiBiase, FHS Press, 2014.

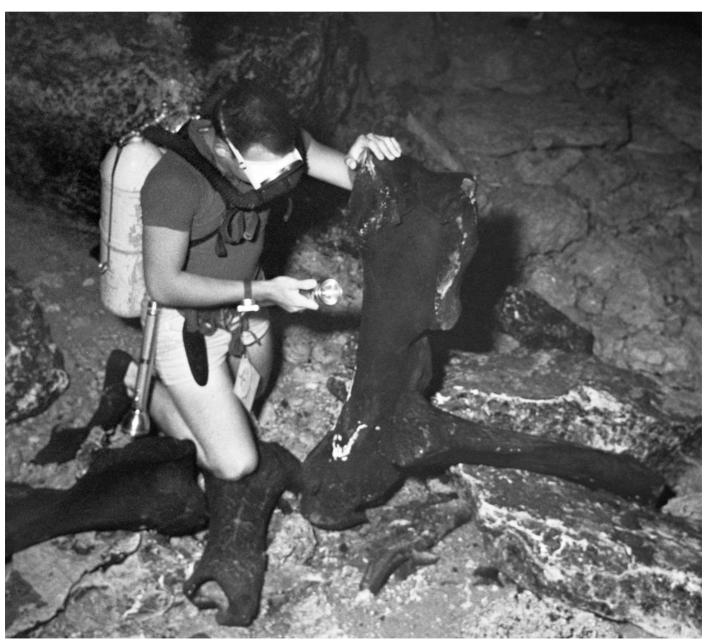




ICE AGE WAKULLA SPRINGS

MYSTERIES ON LAND AND UNDERWATER

James S. Dunbar and C. Andrew Hemmings



An FSU scuba diver examines the front leg element (humerus) of a mastodon at Wakulla Springs, 1957. State Library and Archives of Florida, Florida Memory, image #Co25341.

The story of prehistoric peoples is not preserved in the written word, and the "pages" of Paleoindian cultures cannot be traced to historic records.

However, the sediment layers that accumulated over time within a site's stratigraphy contain "chapters" of information about human activity that took place in that location.



Dr. Andy Hemmings (left) tends the archaeological screens with project volunteers Patti Sanzone and George Apthorp. Photo by Joe Latvis

he Edward Ball Wakulla Springs State Park is home to one of the largest and deepest freshwater springs in the world. A major geological system that includes a cave opening into the Floridan aquifer and a temperate, consistent outflow of about 260 million gallons per day, the spring forms the headwaters of the nine-mile Wakulla River, which meanders through cypress swamps and hardwood hammocks on its way to Apalachee Bay and provides a lush habitat for myriad species of animals.

Speculation about how long this environment has lured wildlife was sparked in 1850, when the skeletal remains of an American mastodon were recovered in shallow water near the spring's headwaters. At the time, fledgling paleontologists were uncertain how a mastodon skeleton fit together, particularly how the animal's tusks fit into its skull. Regardless, the discovery led to scientific interest and a mystical feeling about the spring. Why were large mega-mammal bones found in an underwater setting? How long had the area attracted human curiosity and use?

Answering these questions requires a bit of background about the geological epoch called the Pleistocene, which lasted from about 2.6 million to about 12,000 years ago. During that time, the Earth experienced long and widespread periods of glaciation. The first Homo sapiens, forebears to modern humans, evolved during the late Pleistocene, and the end of the epoch corresponded with the final glacial period. About 22,000 years ago during the last glacial maximum, ice sheets still covered much of the globe, and sea level was about 470 feet below present, which exposed continental shelves and created extensive coastal plains. Wakulla Springs was about 215 miles from the nearest point on the Gulf of Mexico shoreline.

Although a huge ice sheet dipped well into North America, Florida was far from being frozen because it was part of a southeastern coastal plain in which conditions were unusually pleasant. Given this environmentally idyllic setting, all manner and size of animals were attracted to places like Wakulla Springs for potable water and nearby sources of food. Most of the animals were plant eaters that existed together, either congregating in herds or maintaining solitary habits. However, with abundant herbivories to choose from, carnivores abounded, and among them was the primary predator—early modern humans, called Paleoindians. Small bands of people hunted animals of all sizes, gathered plants, nuts, and fruits,

and used other natural resources such as stone, bone, and wood. Crop cultivation was unnecessary, but it also may have been impossible according to some modern researchers, because episodes of climate change in the late Pleistocene occurred too frequently for plant husbandry to develop or be sustained. Regardless, where better to live, hunt, and gather than in areas where vital natural resources were abundant?

Human populations also flourished in areas of Florida, southwest Georgia, and southeast Alabama that had chert-bearing limestone at or near the ground's surface. Paleoindians favored such places for two reasons. Chert—a hard, fine-grained quartz that includes a variation called flint—was their preferred toolmaking material. Water also was a factor. Paleoindians were attracted to limestone regions where sources of potable water consistently could be found. In the late Pleistocene, rainfall impacted local conditions more than it does today because of the lower sea level. With ample rainfall, inland water tables were sufficient to cause river channels to flow, but during periods of extended drought, water tables dropped and surface drainage came to an end. In addition, limestone areas of Florida and the Southeast contain one of the nation's largest groundwater storage tanks—the



A fluted Clovis-like point was found in situ in the sediment-sampling column. Photo by Joe Latvis

Floridan Aquifer. Limestone naturally is riddled with interconnected underground waterways that eventually ascend to surface openings. The main vent at Wakulla Springs is just such an opening. In the distant past, when rainfall elevated the water level above the ground surface, the Wakulla River flowed; when rainfall did not, the spring was a waterhole oasis.

Rainfall also affected the availability of wildlife. During the last glacial recession, Florida's savannah-like environment attracted an assemblage of animal spe-



Signage in the Park near the research site identifies project sponsors. Photo by Joe Latvis

cies that were "non-obligate" or "obligate" drinkers. The former did not require exposed potable water sources to survive. They gained sufficient moisture opportunistically from the vegetation they ate and thus could occupy large, dispersed ranges. Obligate drinkers needed to be exposed constantly to potable water sources, which restricted their range and, in all but the most austere drought conditions, favored predators. Eventually, these animals had to seek waterholes, and predators used this to their advantage.

Given the interplay between environment, animals, and humankind, Wakulla Springs is an excellent laboratory for archaeologists searching for the first Floridians and striving to understand the many aspects of early human lifeways.

IN SEARCH OF PALEOINDIANS AT WAKULLA: A HISTORY OF RESEARCH

In the early twentieth century, E. H. Sellards, the first state geologist, reported two occasions in which mastodon remains were recovered from Wakulla Springs. According to an unverified legend, the most complete set of bones was en route to a northeastern museum when its transport ship purportedly wrecked in a storm. In 1916, Sellards also reported human remains associated with Pleistocene megafauna bones at the Vero site in south-central Florida; later, this revelation became very controversial, a discussion that continues today. In 1930, the second

state geologist, Herman Gunter, chose not to publicize the fact that artifacts had been found with another Wakulla mastodon. A decade later, only after recent research demonstrated that Paleoindians and Pleistocene megafauna had coexisted did project diver Clarence Simpson dare to mention in a letter that, "[W]e recovered a number of them [Paleoindian points] while taking the Wakulla mastodon out at Wakulla Springs." Eventually, the recovery of these bones prompted a project to reconstruct the skeleton, which today is displayed at the Museum of Florida History in Tallahassee.

In late 1955, a group of six Florida State University (FSU) students began a two-year research project at Wakulla Springs that eventually included 100 dives in the mouth of the cave. They were assisted on land by Stanley J. Olsen, a vertebrate paleontologist who had trained at the Harvard Museum of Comparative Zoology and who had been invited by Herman Gunter in 1956 to join the Florida Geological Survey. Olsen helped the "frogmen" by identifying and photographing the fossils they recovered. This ground-breaking team explored and collected in the Wakulla "Bone Room," roughly 300 feet into the cave and at depths of 215 to 230 feet.

Overlooking the spring, the rustic but luxurious Lodge at Wakulla had opened its doors in September 1937. At the time, it was considered to be the most elegant building south of Tallahassee. During construction, artifacts were encountered within the building's footprint. Sometime around 1948, a display was created in the lobby that contained a mastodon skull fragment-a piece from the palate or oral-nasal cavities, and a Paleoindian projectile point of the "Simpson" type rested on the palate between the tooth rows. Simpson points served as knives and were manufactured in a distinctive manner. They are uncommon, with only a few dozen specimens documented statewide. In 1986, when the State of Florida purchased the lodge and surrounding 2,900 acres of property, someone removed the point from the display case, and it has been missing ever since. Unfortunately, like the mastodon remains that perished in the mythical shipwreck and other artifacts and fossils taken from the property, these specimens are lost to science. Some records and photographs exist, but they are inadequate to interpret the archaeological record accurately. They are equivocal evidence that can only ask, "What was going on?"

The winds of change began in the 1990s with research by B. Calvin Jones, a Florida Department of



Archaeologist Gerald Brinkley prepares to take a position shot on an artifact. Photo by Joe Latvis

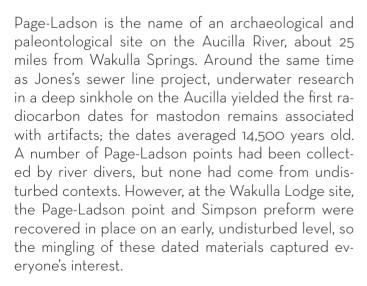
State archaeologist with an uncanny sense for finding important sites. As a homeowner along the Wakulla River, Jones had been interested in Wakulla Springs for years. In 1971, he documented a Late Paleoindian "Dalton" projectile point found by one of the FSU cave divers and later found evidence of early human activity around the springhead. In 1995, Jones and a crew of volunteers and park staff used archaeological techniques to excavate a sewer line, and the salvage project exceeded all expectations. A Simpson point preform, an early stage in the production of a Simpson point, was recovered near another early artifact type known as a Page-Ladson-like point. The preform was used as a tool in its own right, and large flakes removed from it were used to make other types of stone tools including Page-Ladson-like points.



Fifth-grade students from a Wakulla County school help with the screen sifting. Public archaeology and education have been important components of the project. Photo by Joe Latvis



A Simpson point was recovered in place, a first in Florida archaeology. Photo by Joe Latvis



In 2008, funding from the National Geographic Society enabled researchers to return to the Wakulla Lodge site to obtain Optically Stimulated Luminescence (OSL) dates from the Simpson artifact level. A technique for dating the last time quartz-laden sediment was exposed to light, OSL was not available as an archaeological tool when Jones excavated the site. Conducted in the same location, the new excavation yielded OSL dates from the early level of 13,500 years BP as the youngest possible age and a central age of about 14,700 ffl 1,200 years old.



ARI board member and project volunteer Tom Harmon carefully uncovers a feature in Paleo Unit 25 on a level below the Simpson point. Photo by Joe Latvis

In 2015 and 2016, the Aucilla Research Institute (ARI) Inc., a 501(c)(3) research and educational facility in north Florida, began grid testing around the springhead and along the river inside the state park. Posthole diggers with eight-foot-long handles were used to dig 25-cm levels to depths of 1.5 m or more. More than 800 tests were completed on fifty acres of park property, resulting in new sites and the adjustment of recorded site boundaries. Grants from the Friends of Wakulla Springs and Florida Division of Historical Resources (DHR) allowed ARI to conduct the grid testing. The Institute began in-depth archaeological testing on prehistoric and colonial sites in 2017, again funded by DHR and private donations. However, this article will highlight research on the oldest Paleoindian and Early Archaic findings-in particular, the land components of the Lodge site and underwater components near the springhead, collectively referred to as Wakulla Springs.

TERRESTRIAL INVESTIGATION OF THE WAKULLA LODGE SITE

Based on the posthole tests, the Lodge site boundary was extended further west to encompass about seventeen acres of high ground overlooking the springhead. The first test units west of the Lodge revealed Paleoindian Clovis, possible Suwannee, and Dalton artifacts. The Early Archaic component included an array of different-aged components—evidenced by Bolen Beveled, Kirk Corner Notched, Wacissa, and Kirk Stemmed projectile points—that was truly exceptional and mind-boggling for the archaeologists. Less than a handful of Paleoindian sites in North America have that many different early cultures represented at the same site. It was a first in Florida.

Operations eventually were moved directly adjacent to the Lodge near the original Jones sewer line test. Here we uncovered a Paleoindian Simpson component below a possible Suwannee component, and an Early Archaic Bolen component above those. In 2008, we had identified a likely Clovis component based on a prismatic blade tool typically associated with the culture, although similar tools since have been recovered from pre-Clovis levels in Texas. Our Clovis-like prismatic blade was recovered from a level that yielded a late Clovis OSL age. We interpret this to mean that people conducted activity on the high ground overlooking the springhead for an extended period of time in the Pleistocene and well into the modern geological epoch known as the Holocene, which began about 12,000 years ago.

We were striving to explain Paleoindian activities at Wakulla, and one of the first mysteries was presented by the early artifacts. Deeper levels of the site produced only minor amounts of chert flakes, most of which were small to tiny. This type of evidence is easy to overlook or regard as insignificant, but that is not the case. It is certainly not the type of stone tool production waste, known as debitage, found at a camp site or other area of prolonged human activity. However, when a minor scattering of waste flakes is found with formalized artifacts such as points, scrap-



Retired surveyor and project volunteer Tom Watters (left) discusses the establishment of control points with archaeologist Gerald Brinkley and FSU student Emilee McGann. Photo by Joe Latvis



On a cold winter day, divers with the Woodville Karst Plain Project prepare to 3D map the Wakulla Springs "Bone Room." Depths in the Bone Room reach as much as 240 feet below the water surface. Photo by Joe Latvis

ers, and other tools, as we discovered at Wakulla, what does that indicate about the early use of the site? For archaeologists, scant evidence of stone tool maintenance and no indication of primary stone tool production suggests a primary hunting site at which people killed and butchered their prey, but did not establish a camp site in a place constantly frequented by predators. Wakulla Springs appears to have been a protein procurement site for this period.

Appreciating a second mystery found deep inside Wakulla's sediment column requires a few details relating to geoarchaeology. In some areas of the southeastern U.S., late Pleistocene sediments show a spike in platinum, a rare earth element. Deposits of this chemical element became concentrated in sediment columns either by a major volcanic eruption or an extraterrestrial (ET) airburst or impactfor example, an atmospheric explosion of astronomical objects such as asteroids or meteoroids. The southeastern platinum accumulation appears to be related to the latter phenomenon. Moreover, although the time of platinum accumulation varies across the U.S., it appears to coincide roughly with the abrupt onset of a cooling period that may have caused environmental changes.

Test units at Wakulla have yielded platinum concentrations, and their origin remains a mystery. Regardless, identification of platinum spikes has become an important chronological marker for geoarchaeologists such as Dr. Chris Moore and Dr. Mark Brooks (emeritus) of the University of South Carolina, who have studied Wakulla's platinum phenomenon. Deep sand sediment columns often cannot be radiocarbon dated because they lack meaningful preservation of organic material. In addition, throughout the Southeast, the distinction between sediment levels in

deep sand columns often are ambiguous. However, scientists now believe the identification of a platinum anomaly indicates where the post-Clovis, Clovis, and pre-Clovis levels are located.

POTENTIAL ACADEMIC QUESTIONS AND A MYSTERY SOLVED

Dr. Dan Morse of the FSU anthropology department was a pioneer of forensic criminal investigations, and he also documented aspects and features of archaeological sites. In 1970, he photographed the large Simpson point then on display in the Wakulla Lodge. That point had the same degree of patina as other Paleoindian artifacts that Calvin Jones later recovered adjacent to the building, including a large lithic object that he and a colleague identified as a Simpson preform. Consequently, the Lodge site became known for having a Simpson component, but that assessment was met with scientific skepticism. Was the Simpson preform actually part of a unique cultural toolkit and, if so, did it predate the Clovis period? The fact that the Simpson point on display had been stolen made the situation equivocal because the evdence was missing.

The suspected Simpson level had been dated by OSL to about 13,500 years old, which helped to bolster its pre-Clovis placement, but where were the diagnostic artifacts from this stratum? In past years, archaeological investigations adjacent to the Lodge have proven to be enlightening. We now know that the Simpson level is 3.5 to 3.6 ft below the ground surface, at the same level in which Jones found the preform and other artifacts. More important, our excavations have identified a very large, palm-sized scraper and a Simpson point at this level. The Simpson point mystery is resolved; the Wakulla Lodge is the first Simpson site with this tool-making tradition found in a meaningful context.



Project lab manager Bridgette Borders examines a specimen recovered during excavation. Photo by Jerry Klein



Project Director Jim Dunbar (foreground) oversees the excavation, conducted primarily with trained volunteers.

Photo by Jerry Klein



Techniques of archaeological excavation were in full view of visitors to Wakulla Springs. Photo by Jerry Klein

MYSTERIOUS WATERS: THE WAKULLA SPRINGS BONE ROOM

More than sixty years after it first was explored, the Wakulla Springs cave's "Bone Room" has been carefully documented with video and 3D photography, thanks to the work of tech-divers from the Woodville Karst Plain Project, led by Casey McKinlay, and David Ulloa from Valeo Films Inc. An important step in the Aucilla Research Institute's underwater initiative, their documentation will enable a mysterious part of the system to be mapped and thoroughly studied for the first time.

Wally Jenkins was among the FSU "frogmen" who explored the Bone Room in 1955. He kept the only known account of the dives, what the divers found, and, in some cases, what they recovered. During the two-and-a-half years of cave exploration, a sample of fossil bones and artifacts was recovered. Stanley Olsen, the paleontologist working with the team, was not a deep-water diver and did not promote preservation; rather, he believed in collecting underwater specimens for private ownership. The location of the recovered items is largely unknown. A diagnostic typology was not available until Ripley Bullen prepared A Guide to Florida Projectile Points in 1967; hence,



G.M. Ponton; Mr. Christie, owner of the spring; Herman Gunter, geologist; and J. Clarence Simpson, diving team member (?) [sic] examine bones recovered from the spring, 1930. State Library and Archives of Florida, Florida Memory, image #PR10543.

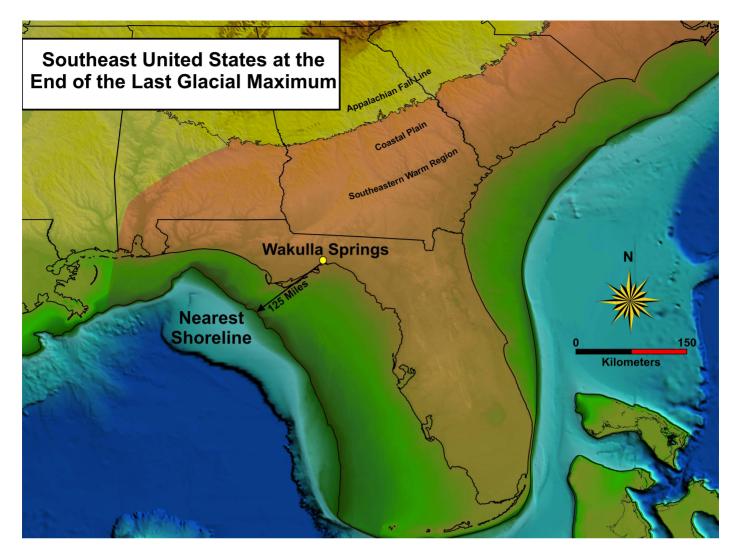
Jenkin's dive log is not specific about the artifact types they recovered. For example, in one entry he states, "Garry found a spear point in 230 feet of water. It was similar to ones we had previously found in the outer springs. Perhaps it was one of the spears which killed the animal whose bones, tusks, and teeth we have found in this deep water grave."

From the 1960s onward, collecting in the Bone Room appears to have been limited, and once Wakulla Springs became a state park, cave diving was not allowed without a scientific research permit. Unfortunately, dives that were allowed have not yielded any maps of specific fossils and artifacts. ARI expects to complete its 3D map based on the high-resolution photographs by May 2019. From the preliminary photogrammetry, it appears that the Bone Room has been stripped of many large, obvious bones, but important specimens remain. The finished map will provide information about the species that are present and artifacts that remain in the cave.

General observations from the modern Bone Room images and previous observations from dives in an area just above the Bone Room in 180 feet of water suggest that there may be buried levels that conceal undisturbed site components. However, scientific investigation at great depth is not among our current objectives, in part because the project would require mixed-gas and cave diving training. Nonetheless, the prospect is tantalizing. One geological investigation in the mid-1960s found evidence of a low water table stand in the cave mouth about 165 feet below present, suggesting that Wakulla was once an isolated pond or sinkhole; exactly when remains unknown.

VICKERY MASTODON AND BANDED MYSTERY SNAILS

Much closer to the surface, the skeletal remains of the Vickery mastodon is accessible to divers using shallow-water underwater breathing apparatus. Located in seven to eight feet of water, it poses minor challenges compared to the mixed-gas and decompression procedures required for deep-water diving.



Because the Page-Ladson site has, and Wakulla Springs appears to have, evidence of human activity 14,500 years ago, the potential for archaeological sites on the outer continental shelf extends to the distance shown on the map. Image by James Dunbar

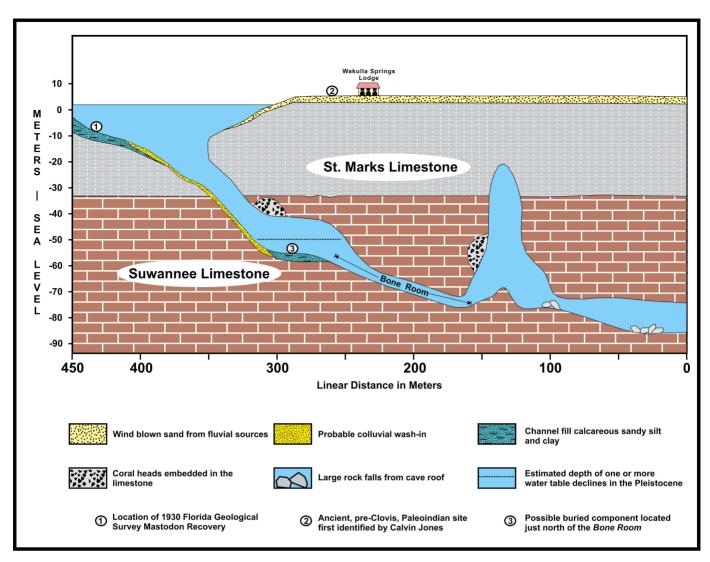
In 2007, park ranger Jason Vickery accidently found the mastodon while planting eel grass plugs. Our first questions were how much of the animal's skeleton is represented and how deeply is it buried? Coring operations to the north, east, and west of the mastodon revealed a sequence of about 3.5 ft of sediment. We placed a ground penetrating radar (GPR) unit in one of the park's glass-bottom boats to obtain a view of the subsurface sediment. The GPR reading showed undisturbed sediment levels around the remains, but ground disturbance immediately around the mastodon itself. We believe the disturbed area was caused by the animal's struggle in its death throes.

Site testing in 2019 revealed two superficial layers of sediment younger than the elephant bones. The two upper levels contained modern artifacts that park visitors have lost and prehistoric carved bone artifacts that most likely are several hundred to a few thousand years old. In the bottom of the upper levels, we found two chipped stone artifacts that are diagnostic of post-Paleoindian/Early Archaic times, between 11,500 to 8,500 years ago. We tentatively believe that

both of the upper levels have been deposited in the last 100 years or are unconsolidated enough to allow modern tourist artifacts to intrude inside them.

The mastodon bones are in the lowest level of fine calcium carbonate sediment, mixed with abundant freshwater snails and bones of fish, turtle, and other mammals. Among the shellfish species is the banded mystery snail (Viviparus georgianus), a species extirpated from local coastal rivers along the Big Bend gulf coast for several thousand years. The timing of the species' extinction is uncertain, as is the reason, but saltwater intolerance may have been a factor.

Archaeological puzzles can take a researcher in unexpected directions. Just as the platinum spike in our land excavation provides important information, so too does the localized extinction of the banded mystery snail. It tells us about the past environment and the processes of environmental change. It is notable that the levels laden with mystery snail shells contain the mastodon bones. This suggests the mastodon



This cross-section diagram of Wakulla Springs shows the relation between land and underwater features, including the Lodge and Bone Room. Image compiled by James Dunbar

was wading in a shallow, flowing-water environment, vegetated with the aquatic plants on which the mystery snail thrives.

WHERE'S THE CHERT?

A routine question for archaeologists is where did prehistoric people obtain the resources required for their toolkit? Chert for toolmaking was an important material for many southeastern prehistoric cultures. Paleoindian levels of the Wakulla Lodge site have shown that most diagnostic artifacts were made from a type of chert for which the quarry source is unknown. ARI researchers are still assembling and analyzing data, but we have an initial hypothesis.

Unlike modern people who have tons of heavy equipment, Paleoindians and other prehistoric peoples had hand tools for excavation, but mostly sought exposed rock outcrops to quarry. They broke small, manageable pieces of rock from large boulders, from which they made formalized stone tools. The un-

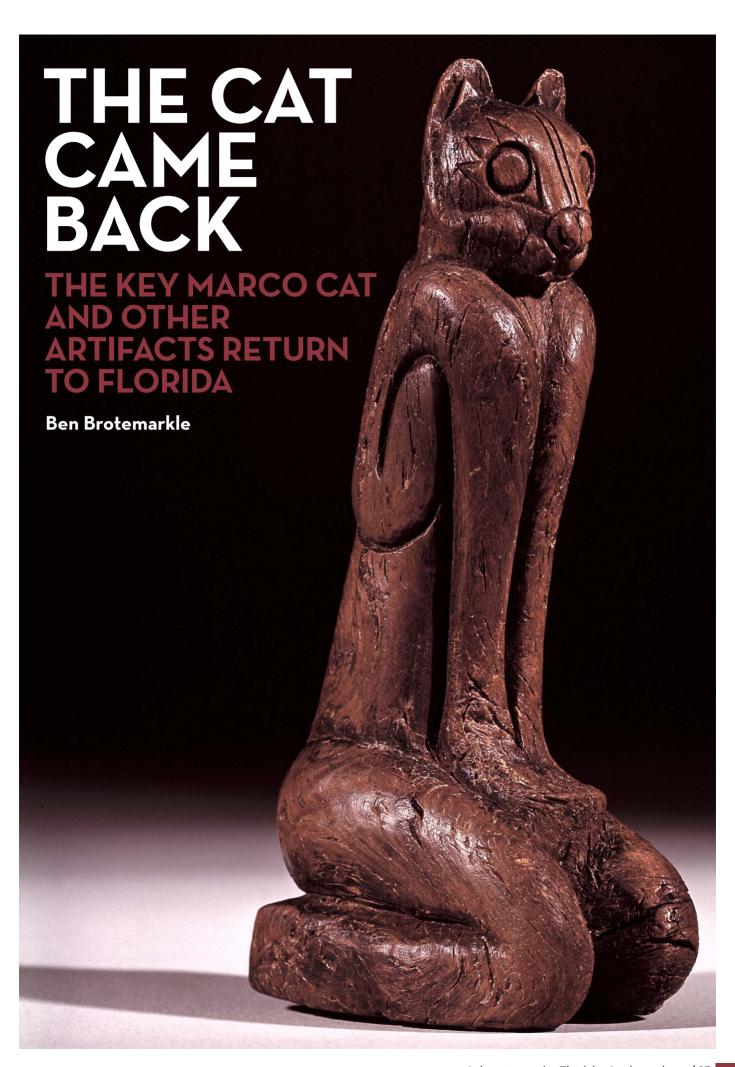
identified rock may have come from a source now inundated by modern inland water tables. Geologically, the St. Marks limestone lies above Suwannee limestone, and the latter often contains chert nodules where the two geologic formations meet. This has been observed in several locations, including a sinkhole in the Wakulla State Forest; however, chert outcrops there have been out of reach without scuba gear for several thousand years. Wakulla Springs flows through an underground channel in the Suwannee limestone and exits to the surface through an opening in the St. Marks limestone. Today, the top of the Suwannee limestone is about 110 ft below the water surface. There may be a chert outcrop in the cave mouth, but this remains to be studied.

Paleoindian archaeology relies on the painstaking testing, sampling, and compilation of information that is otherwise lost in time. Each new find adds a line or paragraph to the pages of the story we are trying to decipher. This work is a type of history reconstructed from prehistoric contexts, with only a fraction of

the evidence preserved and likely to be found in this small excavation. Even with those limitations, Wakulla Springs provides a rich view of the ancient people who once occupied the land and made use of its resources. For thousands of years, the Wakulla Springs system has supported life for myriad species of plants, animals, and people. That continuing legacy is part of our heritage today.

Dr. James Dunbar was an archaeologist with the Bureau of Archaeological Research, Florida Department of State, for 35.5 years. He is now the board chairman of the Aucilla Research Institute Inc. and author of Paleoindian Societies of the Coastal Southeast. He specializes in Paleoindian and pre-Clovis populations in Florida.

Dr. Andrew Hemmings is a Research Associate of the Aucilla Research Institute Inc. His research focuses primarily on Paleoindian sites and environments in North America.



But the cat came back, the very next day The cat came back, we thought she was a goner But the cat came back, it just couldn't stay away

Chorus from "The Cat Came Back"

he popular folk song "The Cat Came Back" by Harry S. Miller was written in 1893. Three years later, the artifact known as the Key Marco Cat came back after centuries of being buried in muck.

In 1896, Frank Hamilton Cushing led an archeological excavation on Marco Island, uncovering ancient artifacts of the Calusa. After more than a century mostly away from Florida, the Key Marco Cat has come home to the Marco Island Historical Museum (MIHM) for an extended stay.

Before European contact in 1513, and for about 250 years after that, the Calusa inhabited much of southwest Florida, including Marco Island. They developed a sophisticated culture and complex society, and depended on hunting and fishing to maintain their existence.

"It was very well established, with centuries of tradition and culture in this area going back maybe as much as 6,000 years, from the Calusa to their Archaic ancestors," says Austin Bell, curator of collections for the Marco Island Historical Society. "One of the reasons was the availability of marine and estuarine resources in the waters all around them. From the fish and shellfish they ate, which were a large part of their diet, they sustained themselves and developed technology such as shell tools, which they used to exploit nearby resources and create a comfortable living situation."

According to archaeologist Bob Carr, executive director of the Archaeological and Historical Conservancy, south Florida and the Pacific Northwest were the only places in North America where agriculture did not take a strong foothold. "That was because the inhabitants had a tremendous amount of marine resources available," says Carr.

In southwest Florida, archaeologists have discovered numerous shell middens that originally were garbage piles of discarded shells and animal bone. These middens later served as the foundations for building structures in dozens of Calusa cities and towns throughout the region. Marco Island, called Key Marco by early archaeologists, was home to powerful political, economic, and religious leaders. The Calusa exerted their power and influence over other indigenous people.

"We know from Spanish documents that they did war with the Tocobaga in the Tampa area to the



Austin Bell, curator of collections at MIHM, is interviewed for the public television series, *The Florida Historical Society Presents: Florida Frontiers*. Photo by Jon White

north, but they were very powerful by the time Europeans arrived," says Bell. "In south Florida, they controlled at least fifty or sixty towns, demanded tribute from people in the Florida Keys, Miami, and Lake Okeechobee, and had influence as far away as Cape Canaveral. There's evidence of trade as far away as Missouri and elsewhere in the Southeast. They were known as a fierce people, not only by the Europeans, but also other tribes in Florida."

Because the Calusa did not keep written records of their own, modern researchers depend on Spanish interpretations about a culture foreign to them.

"Our knowledge of the Calusa is really based on the Spanish contact period," says Carr. "In addition, the window we're looking at is biased in the sense that it's only one period of time in the development of their culture. But at that time, they certainly were the elite, most powerful group in south Florida. They had a relationship with other tribes that was essentially a tribute system. They were receiving lots of goods, and particularly during European contact, things were being salvaged from Spanish ships. Items as simple as iron fasteners to coins and treasure were making their way to the Calusa kingdom. The cacique, the chief of the Calusa, was very powerful in terms of affecting and influencing the policies of other south Florida tribes."

The Spanish had firsthand knowledge about how fierce the Calusa people could be. When Juan Ponce de León sailed around the land he named $L\alpha$ Florid α in 1513, his ships were greeted by Calusa war canoes. When Ponce returned in 1521 to try to establish a permanent settlement, he was mortally wounded by a Calusa weapon.

"The Calusa effectively kept Europeans at arm's length for the better part of two centuries," Bell says, "but ultimately they succumbed due to diseases that were brought in, warring with neighboring tribes, and slavery. Some were actually taken as captives or slaves by tribes to the north that were allied with the English."

In 1763, England took control of Florida from Spain for twenty years. Most of the Calusa people were gone by then.



This alligator figurehead is on loan from the University of Pennsylvania.



This Calusa figurehead depicts either a sea turtle or a bird. Photo courtesy of the University of Pennsylvania

"The Calusa sort of disappear from the historical record around 1763," says Bell. "It's thought that most were driven further south into the Florida Keys, and some then fled on to Cuba, where many soon died of disease. That's really the last documented reference to the Calusa and the native Florida people who were driven out by the European invasion of the continent."

The Seminole and Miccosukee, who arrived in Florida about the same time that the Calusa and other Florida tribes were being driven out, are distinctly different groups with their own unique cultures. It is possible that any Calusa remaining in Florida were absorbed by these new arrivals.

"From a practical standpoint, the Calusa people are no more," Bell says. "There's no place to go to talk to a Calusa person. There's no one that speaks the Calusa language."

For more than a century, the Calusa people and their culture were largely forgotten.

In 1888, W. D. Collier established a general store and post office on Marco Island. While gathering fertilizer for his vegetable garden from a muck pit in 1895, Collier uncovered some unusual items. Word of the discovery reached archaeologist Frank Hamilton Cushing, who was visiting the University of Pennsylvania. Cushing came to Marco Island on a reconnaissance trip to investigate.

"It only took him about an hour to realize that what was coming out of this muck pit was truly special and that he had to organize a full-scale investigation the following year," says Bell. "In 1896, he and a team from the University of Pennsylvania and the Smithsonian Institution came to Marco Island and excavated a site in the muck pit, which he called the Court of the Pile Dwellers, for a period of about three months, finding just unbelievably sophisticated and uniquely preserved artifacts that don't ordinarily survive in archeological sites."

Cushing believed that the early people of Key Marco lived in dwellings that rested on pilings over the water.

The Key Marco Cat that Cushing excavated is one of the most intriguing Precolumbian artifacts to be found in Florida. The six-inch-tall wooden carving is an anthropomorphic, part-feline, part-human figure.

"The Key Marco Cat is significant simply because it's an exquisite piece of art," says Carr. "However, it likely represents an important aspect of the cosmology of the Calusa and the idea that animals were important as deities and totems in their religious beliefs—for example, saying a prayer to the deer totem before you would actually go out to kill a deer. All of this was important ritual in terms of daily life. There's no separation between religion and secular life. Everything was a blend and intermingled."

While it is likely that the Key Marco Cat was related to Calusa cosmology, the definitive purpose of the artifact remains a mystery, open to speculation.

"There are some theories," says Bell. "Perhaps the most popular is taken from Spanish documents that include inferences about a 'temple of idols' where the Calusa worshipped idols, wore masks, and performed masked processions with musical performances. Maybe the cat and other animal figureheads found at Key Marco were the idols the documents refer to. It could have had religious or spiritual im-



This is one of the few surviving human face masks from Frank Hamilton Cushing's 1896 excavation at Marco Island.

portance, or it could have been art for art's sake, or it could have been a piece of furniture. Because the Calusa aren't here to tell us, we don't know for sure." The Key Marco Cat is on loan to the Marco Island Historical Museum from the Smithsonian Institution, which has maintained possession of the artifact since it was excavated in 1896. Four additional objects recovered during Cushing's excavation also are on display, courtesy of the University of Pennsylvania. These include a wooden alligator figurehead and a human face mask. Another artifact has been interpreted as both a sea turtle and a bird figurehead. The controversial painting of a human figure inside of a shell is also part of the new exhibit.

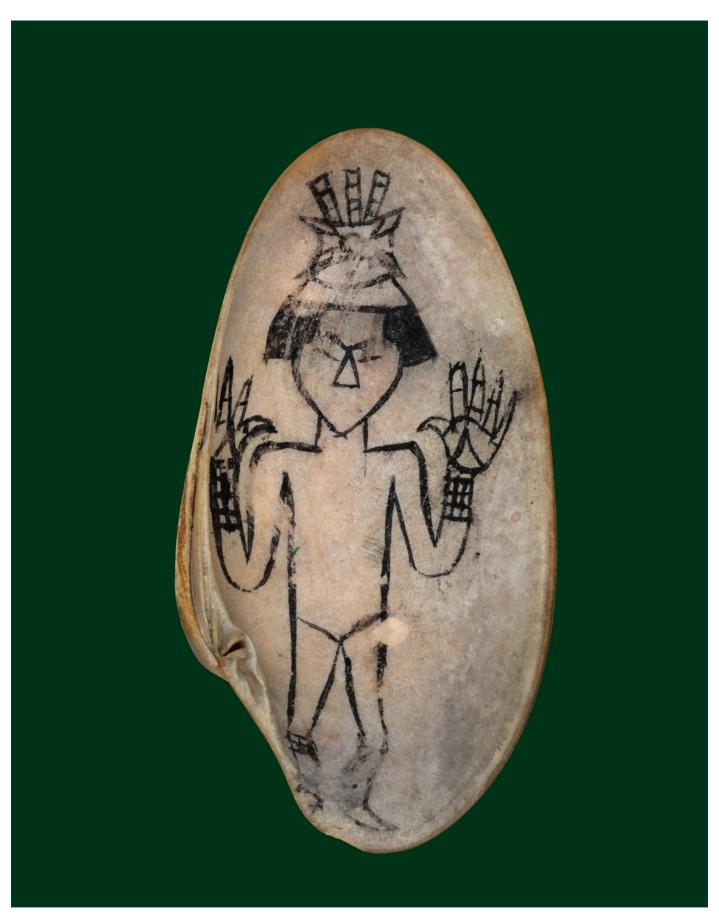


Archaeologist Robert Carr, executive director of the Archaeological and Historical Conservancy, is interviewed for the public television series, *The Florida Historical Society Presents: Florida Frontiers*. Photo by Jon White

"When Cushing returned to Washington, some members of the Bureau of American Ethnology accused him of forging the artifact," says Bell. "Ultimately, it was thought to be authentic, although there are still some doubters as to its authenticity."

Visitors to MIHM are fortunate to be able to view these five fascinating artifacts from the Cushing excavation. Many items he uncovered disintegrated when removed from the anaerobic environment that had preserved them for centuries. Some of those colorfully painted objects now exist only in the watercolors of Wells M. Sawyer, who documented them at the time. Even artifacts that survived the initial excavation shrank, warped, or turned to dust while stored in museum collections over the past century.

"[The archaeologists] found a number of spectacular artifacts—at least fourteen human face masks, animal figureheads, painted wooden carvings—that were just stunning in their artistic sophistication," says Bell. "But they also found lots of utilitarian household items. Especially remarkable is the fishing net. You can actually see the knots they used and the



This shell with a human figure painted inside was controversial, with some people doubting its authenticity.

size of the openings in the net, which survived centuries of sitting in the muck. There were shell tools, wooden boxes, stools, and all sorts of household items that were probably very common, but that we didn't know about before Cushing's excavation, because things made of wood and plant fiber usually disintegrated and did not survive in an archeological context."

MIHM has gone to great lengths to protect the Calusa artifacts on loan from the Smithsonian Institution and the University of Pennsylvania. They are stored in a carefully regulated environment with special lighting. Security guards were hired and additional electronic security installed.

"The exhibit is the culmination of a vision that the founders of the Marco Island Historical Society had twenty-five years ago when they created this organization," says Bell. "They achieved that dream in 2010 when they built a museum architecturally around the idea that these artifacts would come home one day and be put into display cases already in place. So here we are, nine years after the museum opened, and the artifacts are in place. We are so excited to have the artifacts here to share with the public."

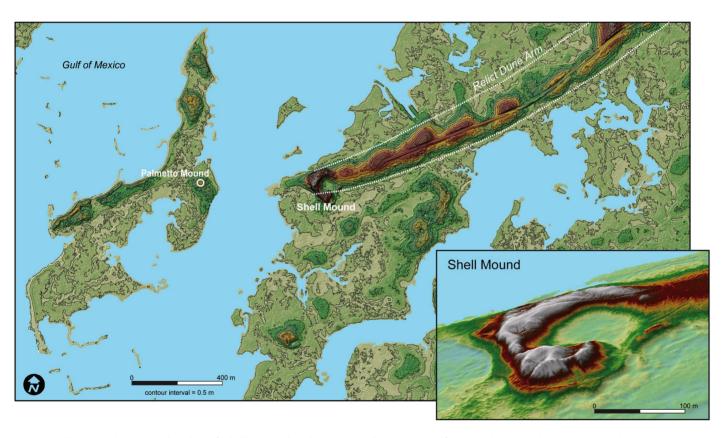
Banners on lamp posts lining the streets of Marco Island announce the return of the Key Marco Cat after more than a century away from its original location. It is clear that the community is proud that this particular cat came home.

Dr. Ben Brotemarkle is executive director of the Florida Historical Society and author of four books on Florida history and culture. He is producer and host of Florida Frontiers: The Weekly Radio Magazine of the Florida Historical Society, heard on NPR affiliates throughout the state, and the public television series The Florida Historical Society Presents: Florida Frontiers.

SOLSTICE FEASTS AND OTHER GATHERINGS

RESEARCH AT SHELL MOUND ON FLORIDA'S GULF COAST

Kenneth E. Sassaman



Topographic map shows the locality of Shell Mound with 3-D inset (lower right) of the C-shaped ridge and open plaza. Image by the author and Terry Barbour from both open-access LiDAR data and higher-resolution LiDAR data provided by GatorEye

e have tried over the past two summers to see the rising sun at Shell Mound on June 21, the longest day of the year. Stormy weather and overcast skies dashed our hopes twice, but we will keep trying in years to come. University of Florida (UF) students and I have been working at this special place north of Cedar Key since 2010. We have un-

covered evidence that Native Americans feasted at Shell Mound during summer solstices. Not coincidentally, the elongated landform on which the site sits is physically aligned with these solar events. Our dating shows that solstice feasts took place from about 400 to 650 CE, the heyday of civic-ceremonial centers on the northern Gulf coast of Florida.

Shell Mound today is an archaeological site on the Lower Suwannee National Wildlife Refuge, under the stewardship of the United States Fish and Wildlife Service. The site is accessible to the public and is outfitted with a new interpretive trail. A nearby county campground is where we await the rising solstice sun.

Even if we do catch a clear sky on the morning of June 21 this year or next, we may never know what it was like for Native Americans to gather at Shell Mound on the longest day of the year. Still, we can learn much from an archaeological record of pits, pots, shell, and animal bone that resulted from the activities of summer feasts. Bony remains consist mostly of fish, but also turtles, water birds, deer, and a variety of other animals. To provision large gatherings, Shell Mound hosts constructed a tidal fish trap and managed offshore oyster beds. They dug large pits and made big pots to process lots of food. Honoring those buried in the cemetery of a nearby island may have been the intent of their feasting, but given the solar timing of these events, communal rit-



Large in-filled pits were exposed in test excavations on the southern slope of dune arm at Shell Mound. Drawing and photos by author

uals of world renewal are another possibility. Some background on the site and its setting helps to put this into perspective.

In its present form, Shell Mound is a C-shaped ridge of mostly oyster shell roughly 180 by 160 m in plan and about 7 m tall at its apex. Enclosed by the ridge is an open plaza 60 m wide. Our test excavations into both the ridge and plaza show that the site evolved over time. It actually started as an intensive occupation on the top of a relict dune arm. Having formed during the last Ice Age when sea level was low and the coast far to the west, parabolic dunes of the region are now mostly eroded away; the one on which Shell Mound resides is among the few with large portions still intact. Prevailing winds of the Ice Age assured that the dune of Shell Mound, like others in the area, would migrate in the direction of the summer solstice rise, resulting in long "arms" or "horns" extending in the opposite direction, the winter solstice set. The orientation of these landforms is a matter of happenstance, but it stands to reason that anyone attentive to the annual migration of the sun would notice the alignments.



A small sample of the thousands of bones of mullet recovered from pit fill at Shell Mound. Photo by author

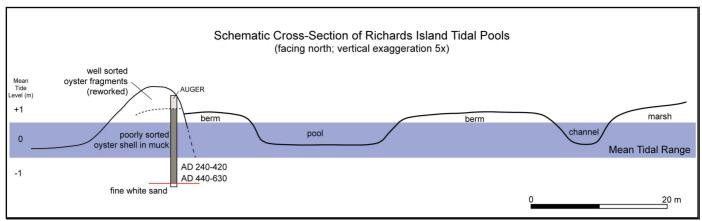
As early as 4,500 years ago, local communities emplaced their dead in cemeteries on the ends of dune arms. The cemetery west of Shell Mound is probably not that old, but it predates summer solstice feasts by at least 500 years. Former UF doctoral student Mark Donop documented the history of this mortuary in his dissertation. What is known today as Palmetto Mound was destroyed long ago by illicit digging, but two large collections of pottery and other materials were available for study at the Florida Museum of Natural History (FLMNH) and the South

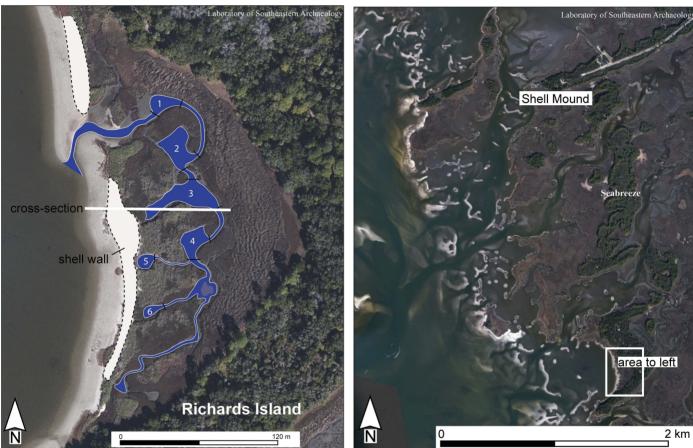


Adult white ibises (Eudocimus albus) like the one shown here were collected by Shell Mound residents occasionally, but more commonly collected were juveniles that were taken from the rookeries of offshore islands in mid to late June. Photo by Kimon Berlin, WikiMedia Commons

Florida Museum. Mark was able to demonstrate that Palmetto Mound was the densest and longest-lived cemetery in the region. It also contained a record number of effigy vessels, most of which likely were emplaced in the cemetery after Shell Mound was abandoned around 650 CE. Despite the importance of Palmetto Mound, mortuary activity actually may have ceased during the period of summer solstice feasts. Two other small mounds in the vicinity of Shell Mound—one recently documented by UF graduate student Anthony Boucher—may have been active mortuaries during this interlude, but they, too, are mostly gone.

The dune arm of Shell Mound was more than a place for the dead. Into the southern side slope of the elevated landform, residents dug pits up to 2 m wide and 1.6 m deep. We presume these were used to cook food, although direct evidence for steaming or roasting eludes us. Irrespective of food processing, pits were backfilled immediately with abundant animal bone, shell, pot sherds, broken stone and shell tools, charcoal, ash, and occasional nonlocal items such as mica and quartz crystal. Thanks to the zooarchaeological expertise of Meggan Blessing, we know that mullet bones dominate the fish remains of pits, followed by the bones of jack, sea trout, red drum, hardhead catfish, and sheepshead, along with lesser amounts of several other species. Turtles make up about 10 percent of the vertebrates, with





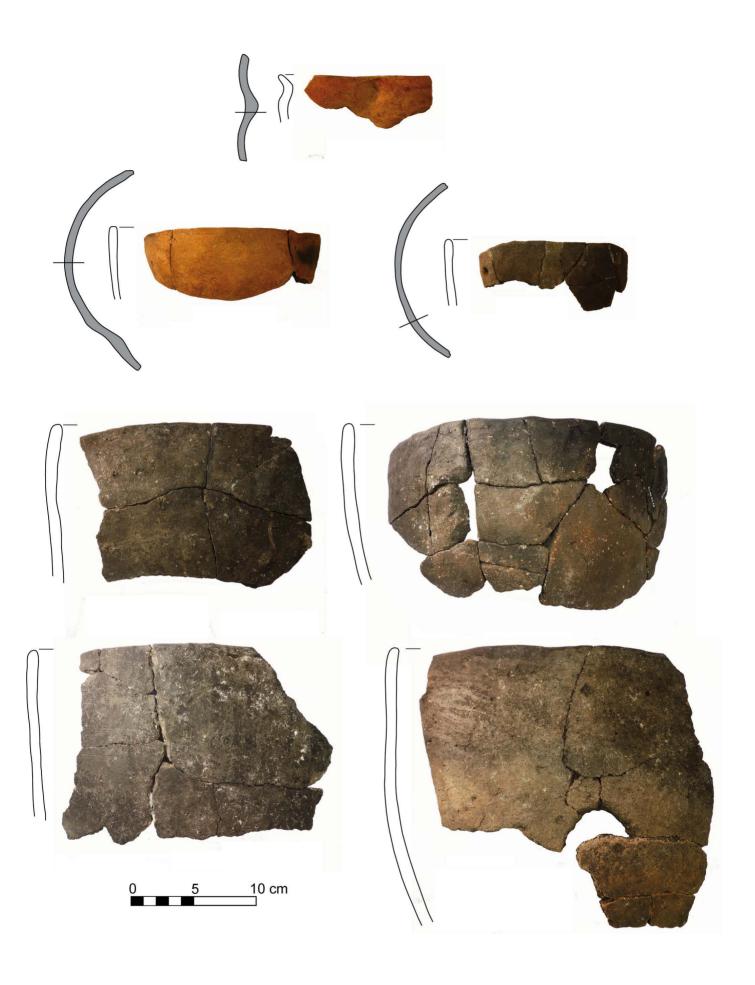
A probable tidal fish trap at Richards Island would have been ideally suited to the mass capture of young mullet and other fishes. Figure by the author

roughly equal numbers of sea and pond turtles, and occasional box turtles. Each of the six pits analyzed thus far also contain the bones of white-tailed deer—at least 17 total and most of them young.

Bird bone in pit features proved to be especially important for estimating the timing of feasting events. Of the 60 birds identified from six pits, more than half are white ibises (Eudocimus albus), a common wading bird in the region. Notably, the majority of ibises were immature when they were collected. In consultation with FLMNH ornithologist Dave Steadman, former UF graduate student Josh Goodwin was able to determine that juvenile ibises were taken in mid to late June, the time of summer solstices.

Rookeries on offshore islands in the Cedar Keys were the likely source of these birds. Josh could not determine whether ibises were collected as food or for nonsubsistence purposes, such as plumage, or perhaps both. Given the prevalence of bird imagery in Native American art, we might expect that the collection and use of birds at Shell Mound went beyond feeding families.

The scale of fish collection and consumption also points to more than daily fare. Mullet, for example, were collected by the hundreds, if not thousands. Those in pits consistently measure about 30 cm in total length, which puts them in the third year of their life, on the verge of their first fall spawning



Fragments of large cooking vessels (bottom two rows) and small serving bowls (top two rows) were recovered from the fill of large pits at Shell Mound. Photo by the author



This is one of eleven new interpretive panels installed on the trail at Shell Mound by the US Fish and Wildlife Service and Friends of the Lower Suwannee National Wildlife Refuge. Photo by Anthony Boucher

run out into the Gulf. Collecting schools of mullet in a nearshore habitat in June would have required some means of mass capture. This is the subject of UF doctoral candidate Ginessa Mahar's research. In addition to experimenting with fish weirs and participating in seine netting with Florida Fish and Wildlife staff, Ginessa is investigating a probable fish trap on Richards Island that may have been ideally suited to capture mullet. Other fishes in Shell Mound pits point to alternative methods of capture, notably nets for the collection of large and small fish.

Oysters, of course, are abundant at Shell Mound, as they are at every pre-Columbian site in the Suwannee estuary. UF graduate student Jessica Jenkins has amassed data to support the idea that oyster beds occasionally were managed. The evidence is subtle but convincing. Jessi has documented traces of parasitism on the attachment scars of subtidal oysters, a condition that could occur only if mature oysters were culled from clusters and younger ones returned to the water for further growth. In addi-

tion, a disproportionate ratio of left to right valves in Shell Mound deposits suggest to Jessi that people were "shelling" oyster beds, a maricultural practice still used today. We do not know if managed oysters were collected for summer solstice feasts. Seasonality studies at other coastal centers in the region indicate that oysters were collected primarily in the winter. That may have been the case at Shell Mound as well, given that the evidence for oyster mariculture is confined to thick strata of mounded shell and not in pits. If so, winter feasts may have been a counterpart to the summer feasts of an annual ritual cycle.

The material culture of Shell Mound pits lends support to the idea that summer solstice feasts were attended by large gatherings of people. Fragments of pottery vessels from feasting pits come from massive, unrefined cooking pots and small, refined serving bowls. UF graduate student Terry Barbour and others have assembled fragments of cooking pots to show that some were as much as 50 cm wide and at least as tall. These were made locally in the tradition

of limestone-tempered Pasco pottery. Remarkably, the surfaces of many of these large vessels were barely smoothed before they were fired; irregularities and exposed coils attest to expedient manufacture. They evidently were not made to last very long, and some were deliberately broken before being deposited in pits. In contrast, small serving vessels assume various forms and were made from a variety of ceramic pastes, some from nonlocal sources. One gets the impression that the hosts of Shell Mound feasts took care of food preparation, and guests arrived with their serving vessels to partake of their generosity.

There is far more to Shell Mound than solstice feasting. After about 100 years of activity on the dune arm. much of the accumulated oyster shell and other materials were dug up and displaced to the south to form the C-shaped mound we see today. We know this because of the widespread occurrence of reverse stratigraphy, the condition of having older deposits on top of younger ones. Whereas this is usually a nightmare for archaeologists expecting to find order in the layers of a site, in this case it signals what we call "terraforming," the deliberate effort to construct a world according to a prescribed design. We may never know why Shell Mound was reconfigured in this way at this time, but it coincides with waning activity at other civic-ceremonial centers in the region. Causes for these developments may trace to climate change and human interventions for dealing with change, not all of which necessitated abandonment. Shell Mound would continue to be occupied and summer solstice feasts held for another century. and Palmetto Mound in fact would witness an uptick in mortuary activity for centuries to follow.

After several field expeditions to Shell Mound and many hours of lab work, we are in a good position to revise the narrative of a site that hitherto was defined more by presumption than serious investigation. To that end, UF archaeologists partnered with USFWS and its Friends organization to design and install new interpretive panels on a trail through the site. Refuge Managers Andrew Gude and Larry Woodward, and USFWS Archaeologist Rick Kanaski, recognized the importance of Shell Mound not only for its historical significance, but also as an archive of ecological information for a region that is feeling the impacts of climate change.

The next time you are in the vicinity of Cedar Key, take the excursion to Shell Mound and see how much more we know now than we did only a decade ago. If you visit during the solstices, look for a group of UF archaeologists and Friends of the Lower Suwannee, whose enduring optimism for clear skies someday will be rewarded.

Dr. Kenneth E. Sassaman is the Hyatt and Cici Brown Professor of Florida Archaeology in the Department of Anthropology, University of Florida.

Acknowledgments. Archaeological investigations at Shell Mound and Palmetto Mound were conducted under permit with the US Fish and Wildlife Service. Much of the field work at both sites was undertaken by students of the Lower Suwannee Archaeological Field School of the University of Florida. Research of the Lower Suwannee Archaeological Survey is supported by the Hyatt and Cici Brown Endowment for Florida Archaeology.

FROM SHIPWRECK TO HISTORIC BOATYARD

HISTORICAL ARCHAEOLOGY AND COMMUNITY COLLABORATION

Odlanyer Hernandez de Lara and Robert S. Carr



This piston assembly from a two-cylinder steam engine was found in 1972 by the former homeowner when excavating to build a swimming pool. Photo courtesy of the AHC

LOOKING FOR A SHIPWRECK

ultural Resource Management (CRM) archaeologists usually record archaeological sites when local, state, or federal laws and ordinances require documenting and mitigating non-renewable resources as part of the planning, permitting, or development process. However, for an archaeological project in the City of West Palm Beach in 2018, there were no municipal requirements, so the community stepped in to help.

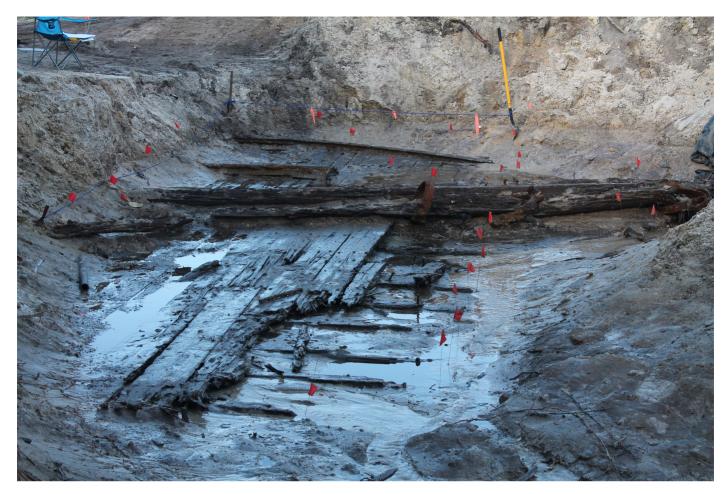
The City of West Palm Beach proposed the installation of a water retention pond in the Northwood neighborhood to alleviate flooding during rain events. This action prompted Carl Flick, a local community leader and avocational historian, to contact the Archaeological and Historical Conservancy (AHC) because he had learned that a shipwreck might be buried on the lot designated for the holding pond.

In 1972, two neighbors had been eyewitnesses to the discovery of a wooden ship when the former property owner was digging a hole for a swimming pool. The neighbors reported that a 100-foot-long ship was buried on Gale's Point, the planned pond site, under fill placed there in 1925 and 1926. One of the informants said that he had observed "the ribs of the ship" and that the ship was oriented northeast-southwest. Reinforcing this narrative, a steam engine had been discovered during the pool excavation, and it is still preserved in the front yard of the parcel. These reports and artifacts were sufficient for the City to agree to conduct an archaeological survey of the parcel because an existing house was scheduled for demolition to allow the pond to be excavated.

To test the theory that a shipwreck was present on the parcel, AHC conducted mechanical trenching in the area where the informants had reported seeing the shipwreck exposed (Carr, Hernandez de Lara, Franklin, Noe, et al. 2018). Three trenches were dug on the east side of the parcel, and a fourth trench



A crankshaft was found beneath house foundations. Photo courtesy of the AHC



This exposed floor feature may have been mistaken as a shipwreck by the informants. Photo courtesy of the AHC

was dug on the west side abutting its southern side, to locate the original shoreline. Each trench averaged 2 m wide and was dug to depths of 1.50 m to 2.50 m below the surface. The water table was about 1 m below the surface, which hampered visibility and created safety issues. Excavated sediments were inspected, and all cultural materials were documented.

As expected from the neighbors' report, fill covers the entire parcel. In the area of the purported shipwreck, the top of the natural sediments under the fill was found 7 to 8 ft below the surface. At this level, archaeologists recovered wood stakes, wood boards, an iron spike, iron nails, glass bottles, a whiteware fragment, and unidentified iron fragments. These items dated to the early- to midtwentieth century (Carr, Hernandez de Lara, Franklin, Noe, et al. 2018); however, none of the artifacts could be attributed conclusively to a shipwreck. The stratigraphy of the excavated areas did not support the informants' version about observing a ship in a large hole. However, no significant disturbances were observed in the fill sediment profiles, indicating that no major digging had been done in the parcel after 1926, when the fill was placed. From an archaeological perspective, no

evidence conclusively indicated that a shipwreck existed on that site.

As a result of the assessment, AHC recommended archaeological monitoring of the demolition, especially the house footings and the swimming pool where the steam engine had been found. Meanwhile, Flick continued his own research by looking through local newspapers and interviewing other informants to corroborate the oral history.

ARCHAEOLOGICAL MONITORING AND DOCUMENTATION

Before the start of archaeological monitoring in the parcel, AHC contacted the owner who had excavated the swimming pool in the early 1970s. He provided new information about the site, reporting that the digging had been limited only to the pool footprint and nowhere else. This coincided with the stratigraphic evidence observed during the archaeological trenching (Carr, Hernandez de Lara, Franklin, Noe, et al. 2018). He provided a photo showing the finished pool and confirmed the size of the excavated area. He also confirmed the discovery of the iron engine still on the parcel, as well as wooden artifacts, some

possibly associated with a ship, including a block and tackle. However, he was sure that he had not uncovered a buried ship.

Demolition on the parcel included all standing structures, the swimming pool, and the driveway. Razing of the house, built on top of fill, resulted in the discovery of a large iron wheel with an attached axle. The wheel measures 1.63 m in diameter, and the axle is 2.1 m long. The wheel has been identified as a crankshaft, and its dimensions are consistent with the pistons uncovered while digging the pool in 1972. Both artifacts likely are parts of the same engine. The swimming pool demolition resulted in the discovery of another large iron artifact located near the northwest corner of the pool. The cylindrical artifact measures 77 cm in diameter by 1.36 m long and has been identified as a vertical boiler, which likely is part of the same steam engine (Carr, Hernandez de Lara, Franklin, Harrington, et al. 2018).

What was reported by the informants to be a ship was revealed under the pool. A wooden structure. apparently a floor, was uncovered at a depth of 1.70 m below the surface. The exposed structure is about 10 m long east-west by 4 m north-south, with wood beams extending another 2 m north. The structure continues south and east beyond the excavation pit. The north and west sides of the floor were uncovered and characterized by wood planks nailed to wood beams separated every 45 to 50 cm. Some of the wood beams have oyster shells attached, indicating their permanent or semi-permanent location underwater. At the structure's western end, an iron rail was uncovered that continues northward beyond the exposed area. A second rail located about 1.50 m to the east had a dead end at the middle of the wood-



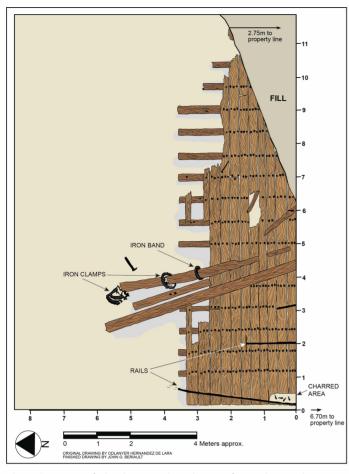
An iron band and iron clamp was found around a possible mast or bowsprit of a ship. Photo courtesy of the AHC

en structure. About 1 m east, a rounded iron bar was found. In the central area, about 4 m from the western end, three wood beams were uncovered; two of them were square, one of which extends for 6 m and continues beyond the south end. The other beam has two iron spikes in the center. The third wood beam is round and has three associated iron clamps and one iron band, indicating it could be the mast of a ship. The beam is broken in at least three places, and two of the clamps are crushed at the northern end. The eastern area of the wooden structure was damaged, which was likely a result of the 1972 digging for the swimming pool where the deepest part of the pool was located.

Artifacts associated with the structure include glass bottles, iron fasteners, and unidentified iron and wood. A spoon and a fork were found in the spoil during a metal-detecting survey. The recovered artifacts date from the late nineteenth to early twentieth centuries. Most of the material appears to be associated with the wood frame building, corresponding to a component of the boatyard depicted on the 1920 Sanborn map. The map confirms the existence of the Mangonia boatvard structures and depicts tracks labeled "ways" (marine railways) extending from a small building to the lake. Superimposing the old map and modern aerial photographs confirmed the correlation between the archaeological findings and the historical map. The piston assembly, crankshaft, and boiler likely are parts of the same machinery originally interpreted as a schooner steam engine; however, the evidence suggests that the engine most likely was used as part of the hoist system for lifting boats from Lake Worth to the boatyard.

The 1920 Sanborn map of West Palm Beach indicates that three historic boatyards were located on the shores of Lake Worth in Mangonia, although oral references indicate that four similar facilities were located northward (not covered in the map). As a result of this research, the site was designated as 8PB17723, the Mangonia Boatyard, situated on the north shore of what was once Gale's Point. The wooden floor uncovered during monitoring of the swimming pool demolition matches the location of a boatyard structure on the map where a possible workshop or repair bay was located.

Informant reports of a "shipwreck" or "ribs of a ship" exposed when the pool was dug in 1972 likely are related to the wooden workshop structure. Its plank-



This planview of the historic boathouse floor shows the various features that may have prompted its identification as a ship. Photo courtesy of the AHC

over-beam construction easily might have been interpreted as the hull of a ship. This structure continues southward beyond the boundary of the project parcel into the neighboring parcel.

PUBLIC PARTICIPATION IN ARCHAEOLOGY

This project is an example of public archaeology, combining the advocacy of community neighbors with efforts by professional archaeologists to produce important information about local history. The community advocated documenting the site, and the City of West Palm Beach responded by hiring archaeologists. The Mangonia Boatyard (8PB17723), which also is known as the Gale's Point Archaeological Site, was built ca. 1900 and was active until ca. 1925. The results of the survey were presented to the community in a presentation to the Northwood Shore Neighborhood Association, where several neighbors and city representatives assisted. The site was reburied under 1.70 m of fill and will be preserved since the water retention area was not dug to that depth.

Although a shipwreck was the original expectation, the evidence revealed a historic boatyard still preserved below the fill, which the community now embraces as a significant archaeological site. An exhibit with some of the most noteworthy artifacts will be built, with signage that interprets Mangonia's history.



Iron fasteners and spike were among other items found with the floor feature and beams. Photo courtesy of the AHC

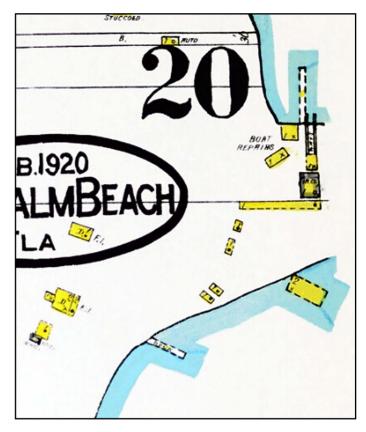
Robert S. Carr has worked as an archaeologist with the Florida Department of State, Division of Historical Resources, and the National Park Service. He co-founded the Archaeological and Historical Conservancy Inc. and has served as its full-time executive director since 1999. He has MS and BA degrees in anthropology from Florida State University. Odlanyer Hernández de Lara has worked with the Archaeological and Historical Conservancy Inc. since 2016. He was previously archaeological advisor to the Castillo de San Severino Slave Route Museum, and has also led numerous projects in Cuba and Argentina.

Acknowledgments: AHC extends its appreciation to Carl Flick, president of the Northwood Shores Neighborhood Association, and the City of West Palm Beach, specifically the Engineering Department and the guidance of Edna Bonelli Rodriguez and Suzanne Berglund. AHC also thanks Dr. Derek Brock and Greg Albritton for information they provided. BG Group, with operator Victor Melendez, helped during mechanical excavations.

BIBLIOGRAPHY

Carr, Robert S., Odlanyer Hernandez de Lara, Ryan Franklin, Timothy A. Harrington, and John Beriault. 2018. "Archaeological Monitoring and Documentation at the Holly Parcel, 3336 North Flagler Drive, City of West Palm Beach, Palm Beach County, Florida." AHC Technical Report, no. 1210. Davie, Florida: Archaeological and Historical Conservancy Inc.

Carr, Robert S., Odlanyer Hernandez de Lara, Ryan Franklin, Alan Noe, and John Beriault. 2018. "A Cultural Resource Assessment of the Holly Parcel, 3336 North Flagler Drive, City of West Palm Beach, Palm Beach County, Florida." AHC Technical Report, no. 1200. Davie, Florida: Archaeological and Historical Conservancy Inc.

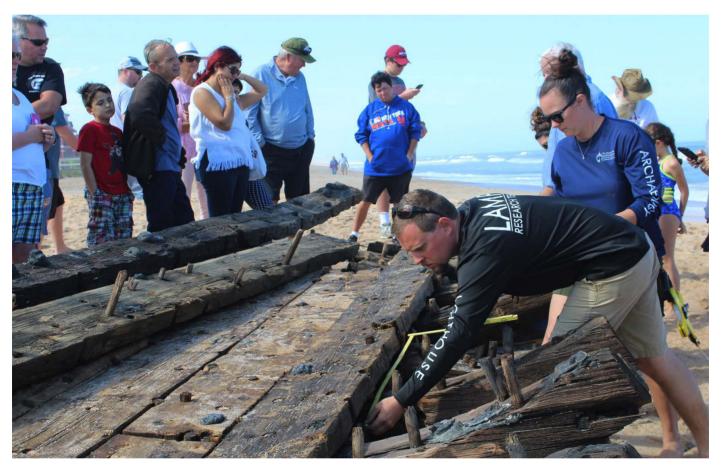


Detail of the 1920 Sanborn map, sheet 20, West Palm Beach. In the complex of structures labeled BOAT REPAIRS, the yellow buildings are wood frame structures with shingle roofs. The larger structure is a metal-clad, wood frame building, meaning it has metal siding and roof, with a metal chimney. The tracks leading to the lagoon from the smallest building labeled WAYS are a marine railway. One or more of these buildings would be a gear room or hoist house and/or house the steam engine. Sanborn Map Company. 1920. West Palm Beach, Palm Beach County, Florida, Insurance Maps of West Palm Beach, Florida 1920 (New York: Sanborn Map Company) http://ufdc.ufl.edu/ UF00074239/00001/20x?search=palm+%3dbeach

A FOREST OF CLUES

HISTORIC SHIPWRECK AS ALLEGORY ON THE FIRST COAST

Brendan Burke

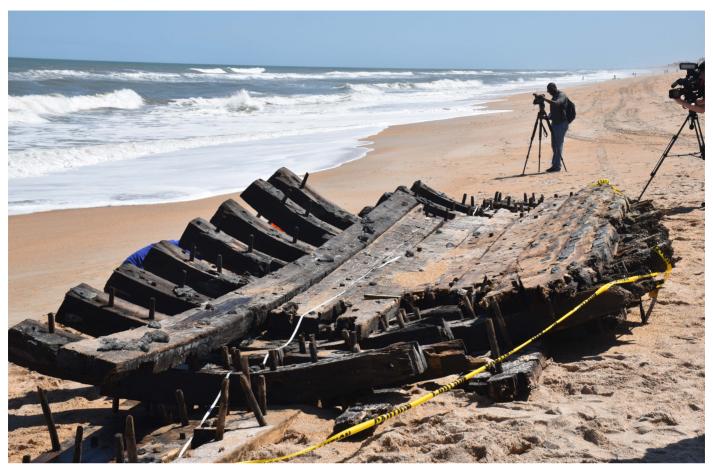


The author and LAMP archaeologist Allyson Ropp measure the frame spacing on the wreck. Research activities never ceased to draw a crowd of locals and tourists. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program

pair of flip-flops dangle from your fingers; your feet are buried in warm, north Florida beach sand; and you look upward and watch cumulus clouds gallop eastward from inshore. A layer above, contrails from long-gone planes streak the sky, and when you count the lines of white exhaust, you think about the thousands of people who have transited the upper atmosphere in the past several hours. Meanwhile, the whoosh of automobiles on nearby Florida A1A reminds you of another form of transportation. Look-

ing seaward, you spy a lone shrimp boat as it moves along the horizon on a quiet Atlantic day.

Six score years ago, contrails and highway noise were nonexistent. The world moved at three mph, commerce was borne on foot and some rail line, and Florida was as maritime as it gets. Reaching St. Augustine required offshore service into the St. Johns River, transfer to a steamboat, and a final sixteen miles via eastbound tramway into town. Earlier, you likely had



LAMP archaeologists and news media recorded the site on its first day out of water. After high tides moved the wreckage down the shoreline and began to break up the structure, LAMP staff secured it to the beach to prevent further destruction. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program

to heave to for days, waiting offshore for a pilot and the abatement of foul winds to run the inlet and enter the harbor. Alas, most Florida beachgoers never realize the reliance our ancestors placed on seagoing commerce. But, from time to time, the sea has ways of reminding us of the past...

When the sun rose on South Ponte Vedra Beach on March 28, 2018, a hulking mass of timbers rested on the beach, glistening with seawater. During the nocturnal high tide, part of a historic wooden vessel emerged from the waves and became beached. As large as a whale, the wooden timbers looked almost new; only a rusty mineral staining made them look old. Instantly, the wreck drew a crowd. It was Spring Break in northeast Florida, and millions of folks had flocked to beaches, including those in St. Johns County. Meanwhile, thousands of tourists were visiting nearby St. Augustine, and it wasn't long before word got out that there was a shipwreck to see on the shoreline.

The St. Augustine Lighthouse & Maritime Museum includes a maritime archaeology research division called LAMP (Lighthouse Archaeological Maritime Program), whose staff have responded to a fair num-

ber of marooned ship timbers on the beach and occasionally an articulated segment of a ship's hull. Typically, a lone plank or frame washes ashore, and it's riddled with shipworm damage and heavily ablated from the action of the sea. County beach patrols want them gone—rusted iron fasteners in the surf are a liability, so we diligently document them, make drawings and photos, and record whatever details can be extracted. Although these migratory fragments often arouse more questions than provide answers, this was not the case with the "Spring Break Wreck" as we came to know it.

Mid-morning on March 28, my colleagues and I reported to the wreck site. We were greeted by the pile of timbers, 48-feet-long overall, surrounded by a throng of people, a news helicopter and drone circling overhead, and two news teams on the beach, recording segments for their evening broadcasts. One of our first calls was to the Bureau of Archaeological Research (BAR), an agency of the Florida Department of State, since the wreckage was located on state-controlled land. During the course of working with the wreckage, we were in close communication with BAR regarding what to do with the wreck. Over the next four days, we undertook a recordation,



Frame XXIIII (24) was marked by the builders. Individual frame members, called futtocks, each have a specific place in a ship's architecture. If the right curve is not in the right place, the ship's form is thrown off. During the manufacturing process, some futtocks were marked with the "frame station" to ensure proper placement. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program

preservation, and interpretation effort of considerable scope. Local law enforcement told us that more than a thousand cars per day were stopping to see the wreck. Police issued trespass warnings as people scrambled over fences and through yards to get to the beach. To control the crowds, we established a simple, temporary rope barrier while recording to keep people off the wreck and impede the taking of souvenir treenails. At all times on site, we tasked a team member to provide interpretation of the remains and our activities.

During the wreck's first night ashore, it washed south about seventy-five meters and started to break up. To prevent further damage, BAR archaeologists decided the wreck should be moved out of the tidal zone, if possible. During that effort, two large, shooting boom cranes became stuck in the sand, so we decided, as an alternative, to stake and tie the wreck in place. Several large screw anchors were placed around the wreck, and ropes and straps were webbed over the remains to hold them tightly to the beach. This strategy was effective until the wreck was moved to a nearby research preserve in mid-April. That endeavor required a large, front end loader that lifted the stabilized wreckage in a sling suspended beneath the machine's lifting forks. The hull thus was trucked about two miles south to the Guana Tolomato Matanzas National Estuarine Research Reserve (GTM), where it sits today at the west end of the Guana Lake dam, interpreted for public visitation.

In analyzing the Spring Break Wreck, we looked at three primary data sets—the wood species used in construction, processing marks on vessel components, and construction methods. Samples of each type of timber were taken and delivered to Dr. Lee Newsom, an archaeologist and ethnobotanist at Flagler College, for species identification. Analysis revealed five distinct species, including southern yellow pine (Pinus sp.), American beech (Fagus grandiflora), white pine (Pinus strobus), white oak (Quercus alba), and a type of spruce (Fagus sp.). The vessel was framed out of beech below the waterline and then alternated with white pine from near the waterline upwards. Outer hull planking was from southern yellow pine below the waterline and an unidentified hardwood, possibly beech, above the waterline. Out of more than 250 wrecks examined by Newsom, this was only the second instance in which beech was used to any degree in vessel framing. Only the Rose Hill Wreck (Wilde-Ramsing 1992) included beech as a framing wood, and in that instance, it was interpreted as a possible repair material. Beech was long considered a substandard shipbuilding material and only used when suitable woods, such as white oak, no longer were available. Beech has a high degree of volumetric shrinkage when curing from green to seasoned and a low degree of rot resistance.

White pine was found in upper framing, although it appears at and below the waterline. Like beech, white pine was considered a fine wood for milling and use in dry areas. However, it seldom was used in framing and actually was regarded as a mark of desperation in the arena of quality shipbuilding timber. By all appearances, the southern yellow pine used for the vessel planking was the highest quality of wood employed. Tight grained and resin-rich, the hard pine is a testament to the old growth pine for-



This square peg, cut from beech, helped hold together two futtocks during construction. Until a composite frame was fastened to inner ceiling and outer hull planking, it was not very strong. These fasteners did not need to be watertight, and square pegs driven into a round hole prevented deformation of the frame as it was erected on the keel. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program

ests of the American south. A thin section sampled from a pine hull plank shows dense annular rings and high resin content-the wood's natural resistance to saltwater penetration and rot. Today, pine is thought of as something from which to build a shed or plank a deck. The southern yellow pine we know now rarely contains more than a few rings per inch, rarely is more than thirty years old, and is primarily sapwood. It is raised in pine "nurseries" that we call tree farms and planted as a monoculture crop, as with corn, wheat, or soybeans. We raise these pine trees carefully to maximize the growth rates, encouraging maximum creation of spring and summer wood. These are the lighter bands of wood, sandwiched between darker rings of late growth. They are not as dense with resin as late wood and, when a board has fewer late-wood in it, there is less inherent rot-resistance. fastener holding ability, and durability. Thus, much of the older southern yellow pine, raised in natural forests and allowed to mature for centuries, was cut into lumber superior to most of that available to us today.



A constant duty for archaeologists at the Spring Break Wreck was public interpretation. Here, the author describes the site while LAMP archaeologists record the hull remains.



Trussed like a Christmas turkey, the site was immobilized after heavy equipment could not reach it to move it out of the tidal zone. Multiple straps shared the load over the remains, which acted like a fabric made of timbers and flexed easily when washed by waves.



Volunteers Ken Adams (kneeling), Silvana Kreines (at drawing board), and Bill Sarto (right) take offsets to record the outer perimeter of the Spring Break Wreck. In the background the author answers audience questions about the site. All photos courtesy of St. Augustine Lighthouse Museum and Maritime Program

White oak was found only in treenails (wooden pegs used as fasteners), which is a maritime oddity of sorts. The presence of white oak defies shipbuilding tradition in its placement. While a suitable treenail material, white oak would be expected in futtocks (frame members), outer planking, and other structural shipboard architecture. Analysis of the white oak sampled from the Spring Break Wreck indicates that both mature and juvenile trees were used. This may point to overexploitation of oak reserves in the vicinity of the shipbuilder and a need to source juvenile trees from which to make treenails.

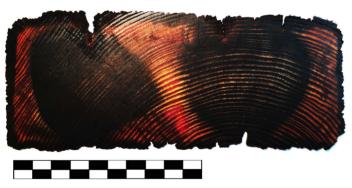
Along with the ship's frames and outer hull planking, internal planks called "ceiling," creates a strong wooden fabric; together they form a sort of "warp and weft." White pine and spruce were used for ceiling planks, although we do not yet know which of the spruce family was used. Visual analysis of spruce cell structure can only distinguish Sitka from the other varieties, so it will take the skill of a wood geneticist to identify which one is present. Most spruce trees, such as white and black spruce, are boreal in nature and inhabit northern latitudes. However, the red spruce is found as far south as North Carolina in the Appa-



This futtock was cut from beech. The upper (outside) surface faced the interior of the ship; the lower surface rested against the outer hull planking. By studying the annular ring curvature on the end of frame and noting the bark-edge remaining on the outside, LAMP archaeologists determined that this timber, like others on the wreck, was cut from a small-diameter tree. This suggested that it may have been harvested from an area in which more ideal resources had been overexploited.



White pine was used for this frame member, located at the waterline of the ship. While this species is typified as being knotty, the white pine in this vessel was knot-pervasive, with many juvenile knots. The two "eyes" indicate that it was cut from the crotch of a tree, which made it weak and unstable. In addition, the uneven growth of the tree created compression wood, a feature of coniferous trees indicative of tree curvature. In this case, the trunk leaned to the right (as oriented in the photo), toward a smaller offshoot.

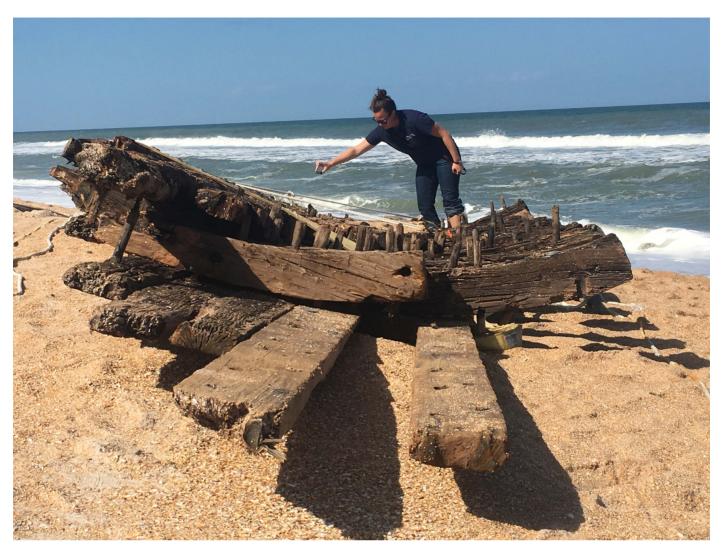


A thin section taken from an outer hull plank shows the beauty of southern yellow pine. Two blackened areas reveal iron leaching from fasteners located nearby. In this species, the annular rings are easily distinguished, and they are divided into early- and late-growth wood. Early (spring) wood is seen here as translucent, while late (summer) wood is opaque. This sample contains more than sixty rings. Also evident are at least four "false rings," which are formed during abrupt weather changes and indicate unique climate patterns that are useful to dendroarchaeologists. All photos courtesy of St. Augustine Lighthouse Museum and Maritime Program

lachian highlands. This was an important next step in narrowing down the ship's origin.

Processing wood from trees into ships is a laborious enterprise that invariably leaves its marks on ship timbers. Unlike fine furniture, where saw marks are sanded away, rough sawn or hewn timbers find their way into a ship's architecture. Fortunately, relatively accurate chronological sequences are available for wood processing machines and their marks. First, we addressed rough processing from log status to a boards, timbers, or flitches, the slabs of trees from which

curved timbers, such as futtocks, are cut. Two types of sawmills were identified from cut marks on Spring Break Wreck wood. The first, marks from a circular sawmill, are from the most common nineteenth-century sawmill. These were identified on the southern yellow pine hull planks. Circular sawmills proliferated during the mid-century, and by the second half of the century, just about every county in the nation with a courthouse hosted a steam-powered circular sawmill. The second type of sawmill marks on the wreck were made by a band sawmill. While this type of saw has patent dates from the early nineteenth century, it



LAMP Archaeologist Allyson Ropp collects images of the wreck for 3D imaging of the site. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program

was not developed into a reliable technology until the 1880s. Band sawmills offered sawyers additional flexibility in cutting large timber as well as creating less waste by using a thinner blade.

Other processing marks indicate hand hewing, and these were visible on the moulded faces of frame members. This is an interesting feature that tells us the builder did not have access to a local sawmill to custom mill trees into thick flitches from which futtocks could be cut. Instead, logs were hewn into flitches and then run through a bandsaw to cut out the curved frame members. Bandsaw marks on the upper surfaces of futtocks indicate the presence of this tool at the yard. A bandsaw is different from a band sawmill; the former is a smaller version of the latter and is used for processing lumber into curved pieces of wood. The presence of a bandsaw here indicates that the Spring Break Wreck builder had some access to technology and power, but still was alienated from the ability to custom saw logs.

Framing wood used throughout the wrecked remains included lots of smaller trees and trees full of knots. The poor quality of timbers, combined with the use of juvenile white oak for treenails, suggests the shipbuilder was located in an area heavily timbered with hardwood resources. Not only was an inferior grade of wood employed in the vessel's framing and ceiling, but the size and knotty nature of the wood indicated trees that grew in more open areas and with more limbs. Trees harvested from mature forests self-prune lower limbs as they grow upwards. The old limb locations become knots that slowly tighten and begin to disappear as the tree matures. The beech in the Spring Break Wreck showed evidence of active limbs on selected logs used for frame members.

Outer surfaces of the hull planking, visible after the remains were moved from the beach, indicated a typical pattern of tack holes, even some remaining copper tacks. Wooden ships, even the mightiest ship of the line, quickly will succumb to wood-boring marine worms. We know of them as "shipworms" and they come in several

species but all do the same thing-eat away the structure of a ship. Solid wood can be reduced to mush in only months. Marine growth in the form of slime, algae, seaweed, and barnacles all readily will grow on a wooden hull. This hairy coating on a ship's bottom robs speed and can render a sailing vessel impossible to handle. During the eighteenth century, the practice of covering ships with copper below the waterline was introduced. While expensive, copper sheathing was cheaper than replacing planking and major structural repairs. As copper oxidizes, it creates a natural biocide. Oysters, barnacles, and seaweed find copper too toxic, and shipworms cannot penetrate it. The Spring Break Wreck appeared to have carried only one sheathing of copper. Older vessels often are found with multiple tack holes, indicating replacement of copper sheets as they wear out. This indicated to us that the ship was fairly young when it sank or came apart at sea.

Combining clues from the wood selection, wood quality, coppering, and processing reveals an interesting story behind the Spring Break Wreck vessel construction. Built using traditional methods, the ship would have seemed normal, but below its skin of copper and wood lay a host of problems. The wood selection speaks to an overexploited environment in the shipbuilder's area. The mix of sawmill marks on pine suggests the inability to sole-source sufficient southern yellow pine for planking. American shipbuilding during the late nineteenth century was by no means in its infancy. Wooden shipyards were scattered throughout both coasts and interior waterways, but with a core shipbuilding center in the northeastern states. Inspection of hulls for classification with American Lloyds Register listed rules that shipbuilders had to follow. Among these was a stipulation that, if a ship's planking was fastened with iron and sheathed over with copper, the iron plank fasteners had to be countersunk one inch and plugged with yellow pine to create a zone of separation. A shipbuilder ignoring this practice and rule either was ignorant of electrolysis or did not care that the copper sheathing would make the vessel iron-sick. The Spring Break Wreck vessel was iron fastened without countersinking and then sheathed over with copper. This one practice, by itself, may have prevented classification for registry or was passed by an inspector under cloud of suspect obfuscation. Regardless of intent, the outcome was that the very copper sheathing attempting to protect the wood hull from shipworms may have contributed to its own demise by weakening fasteners. Dissimilar woods used in framing, especially a species (beech) with a high degree of shrinking or swelling, likewise may have contributed to the failure of fasteners.



About four weeks after coming ashore, the wreck was moved to GTM Research Reserve. Keeping the wreck intact during lifting and transporting was a challenge during the process. A large spreader bar was used to distribute the load evenly along hull structure. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program



A large, rubber-tire loader was required to relocate the wreck, and it was a slow process to prevent sudden movement to the hull structure. This section of coastline has a steeply shelved beach with coarse sand that doesn't pack underfoot, or under tire, and was challenging for the heavy equipment. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program

We may never know what happened to the Spring Break Wreck vessel, but its secrets slowly are being revealed in the lab as a vessel never meant to live a long life at sea. Whether or not the shipbuilders knew its shortcomings, her crew certainly learned them the hard way. Scantlings (dimensions of the frames) indicate a vessel of 200 to 300 tons, which would place it in the role of a coastwise trader. Likely a schooner, perhaps it sailed with a cargo of lumber in its hold. We know that in about 1918, a load of lumber washed up on Vilano Beach. The Usina family, local landowners, salvaged much of it and built one of St. Augustine's longest-serving sightseeing boats,

Victory II. Could this mysterious lumber have washed up from a foundered schooner? Whatever happened to the Spring Break Wreck, it happened fast. There is no evidence of the hull section drifting for any period of time since there was no pervasive worm damage or marine growth. Worm damage was only apparent along a segment of the hull that was exposed above the sand line when the wreck was buried. Once the vessel was freed of its watery tomb, deposition on the beach was rapid; there simply wasn't time for worms or barnacles to establish a footing.

So, what do we know about the Spring Break Wreck? The vessel likely was a coastal merchant schooner constructed by a builder using pastiche rather than formal architecture and who had limited access to shipbuilding timbers. It was built between 1880 and 1920 and possibly in the mid-Atlantic region, based on wood selection. When the vessel sank, it sank quickly; when it came ashore the ship began to speak using the language of wood and craft. As we continue to piece together the wreck, we hope to learn its true identity and to develop a better understanding of wooden shipbuilding practices during a period of great transition.

Wooden shipbuilding carried on well into the twentieth century, as evident from the hundreds of wooden ships built during World War I for the Emergency Fleet Corporation, by the dozens of wooden mine-sweeping vessels in service, yard patrol vessels, tugboats, and thousands of shrimp trawlers built from wood right here in St. Augustine. However, the age of wooden sailing ships, as part of our commerce, died away during the first half of the century. This vessel likely may have been part of that huge wind-driven fleet-among the thousands of coastal schooners that plowed the seas, like so many transfer trucks that roll down today's interstate highways. Aboard the vessel worked our ancestors, aloft in howling gales, beaten by an unrelenting sun on the Sargasso Sea, perhaps freed from the binds of land, or simply tramping for port to port as a gearcog in the American industrial machine. The vessel's sudden demise raises intrigue and provides a moment to think of the people who built her, sailed her, owned her, and provided the real soul of the vessel. That she washed upon the beach so suddenly speaks to the power of the ocean, to our recent spate of storms, to a world in flux at all times, and to challenges that we as archaeologists have with rapid coastal change impacting buried or submerged sites.

As our world changes, we too must change with it. The sage Mark Twain said of change, "The altar cloth

of one eon is the doormat of the next." Increased numbers of eroded coastal sites, more beached historic wreckage, and increased damage to shallow water sites is a pattern widely recognized throughout the archaeological community. It is a grand change and a daunting challenge. A central driving force in this pattern is climate change; this is a prototypic reaction of our environment on a grand scale to anthropogenic rebalancing of our oceans' chemistry and the composition of our atmosphere. The Spring Break Wreck speaks to an earlier chapter in human manipulation of environment, and a subsequent and directly related calamity. While the zeal for anchors, cannon, and sextants is powerful, the Spring Break Wreck reminds us of our duty to consider the larger picture. The story contained within this wreck is not isolated or unrelated to us: it is our story and an archaeological allegory with modern meaning.

Brendan Burke has been associate director of archaeology with the St. Augustine Lighthouse Archaeological Maritime Program since 2007.

Acknowledgments: The author thanks the following entities and individuals for their support of the project: Florida BAR, GTM Research Reserve, Florida Public Archaeology Network, John Valdes & Associates, Construction Debris Removal Inc., many Lighthouse volunteers, and Dr. Lee Newsom for her assistance with identifying wood samples from the site.

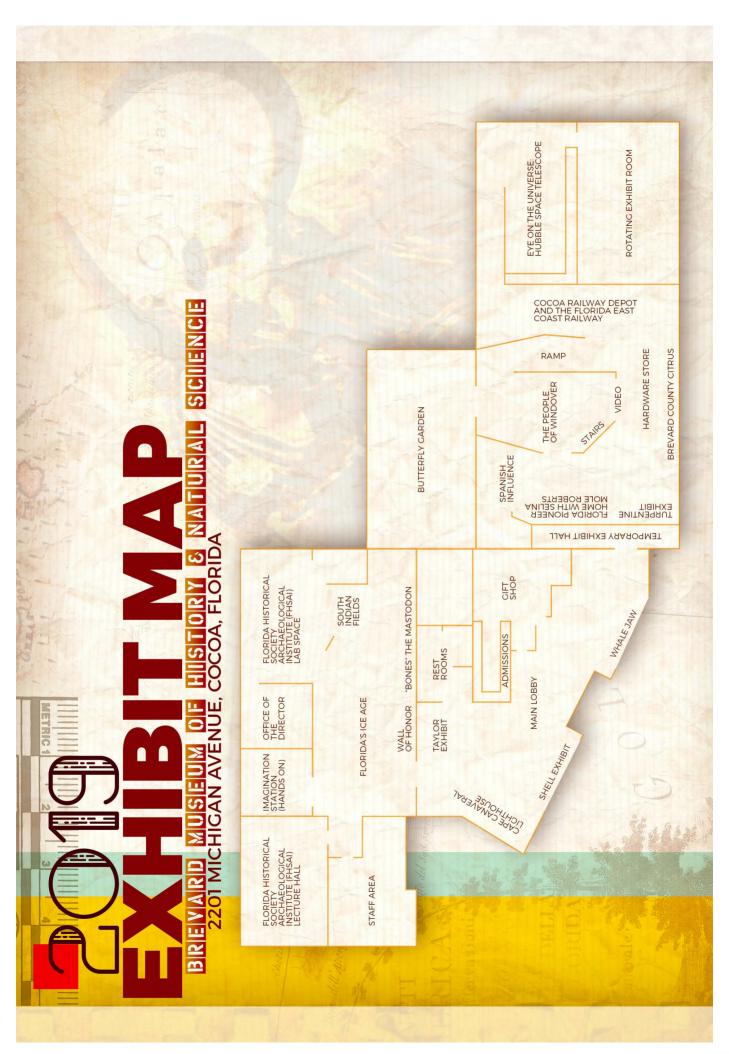
BIBLIOGRAPHY

Wilde-Ramsing, Mark U., Wilson Angley, Richard W. Lawrence, and Geoffrey J. Scofield. 1992. The Rose Hill Wreck: Historical and Archaeological Investigations of an Eighteenth Century Vessel at a Colonial River Landing near Wilmington, North Carolina. Underwater Archaeology Branch, Division of Archives and History. North Carolina Department of Cultural Resources, Kure Beach, North Carolina.



Today, the Spring Break Wreck resides at the trail head on Guana Dam within the GTM Research Reserve. It now is surrounded by a fence and enhanced by interpretive signage. Photo courtesy of St. Augustine Lighthouse Museum and Maritime Program





DIGGING IN CIRCLES

PREHISTORIC ARCHITECTURE ON THE MIAMI RIVER

Robert S. Carr and Ryan Franklin



An eye-shaped basin was cut into the limestone bedrock with a stone set in the middle as a 'pupil'. Photo courtesy of the AHC

INTRODUCTION

n 1998, the unexpected discovery of the Miami Circle at the mouth of the Miami River surprised archaeologists. It also stunned Floridians, who were shocked by the possibility that modern-day Miami, founded in 1896, could be situated on top of an ancient landscape that included structures more than 1,500 years old, with postholes cut and preserved in the limestone bedrock. The discovery of the Miami Circle set off a controversy that polarized Florida archaeologistssome accepting the apparent evidence of a remarkable prehistoric structure, and a few who believed it was a modern feature and little more than an inglorious septic tank system. That controversy became national news and stopped Governor Jeb Bush's approval of a special acquisitions bill to preserve the two-acre parcel encompassing the site as an archaeological park in the heart of downtown Miami.

The controversy resulted in additional scientific and archaeological scrutiny of the site, including independent analyses by the Florida Bureau of Archaeological Research, Florida Geological Survey, and independent scholars, each providing decisive evidence of the Circle's antiquity and significance (Means and Scott 2000; Weisman, Shepard, and Luer 2000; Wheeler 2000). Research continued for years after the discovery (Carr 2006; Carr and Ricisak 2000; Collins, Doering, and Carr 2006; Widmer 2004).

This article describes the discovery and significance of the Miami Circle, and the subsequent discovery of eleven other circles during a separate project on the north bank of the Miami River, between 2007 and 2013. These discoveries confirm the significance of these sites, demonstrating a previously unknown architectural feature of the Tequesta Native Americans. Rather than being nomadic, circulating between the Everglades and the coast (as European writers had reported during the contact period), the Tequesta were living in permanent towns with substantial structures.

DISCOVERY

The Miami Circle was discovered in June 1998 during archaeological testing required by the City of Miami for a new development within the city's archaeologically sensitive area located adjacent to Biscayne Bay and the mouth of Miami River. The county archaeologist initially discovered the feature during shovel test-

ing after demolition of the Brickell Apartments built atop the site in 1948. Surprisingly, he discovered that much of the site had survived intact beneath the fill.

The Circle, 38 ft in diameter, was characterized by a circumference of basins cut into the limestone bedrock. Each of the twenty-four basins averaged about 3 ft wide and roughly 2 ft deep. All had circular postholes cut into the bottom of the basin, with many of the holes surrounded by piles of concreted rocks that were thought to have been used to prop up and anchor wood posts. No central posthole was found, indicating that the roof had no central support and that it likely had a thatched roof open at its center apex. The structure's complex construction appeared to represent a community effort on what likely was a council house or elite structure.

At the Circle's eastern circumference, a unique hole in the shape of an eye was cut into the bedrock. Reinforcing the interpretation of the eye was a large rock set like a pupil into the eye. A short distance from the "eye," a beautiful stone axe (celt) had been placed in a posthole. The celt was made of basaltic stone, and spectrographic testing revealed that the rock had been quarried from the Appalachian Mountains in Georgia or the Carolinas (Dixon et al. 2000). This axe had no signs of use and was likely a ceremonial or dedicatory offering marking the construction of the structure.

Other non-local exotic artifacts included galena from Missouri and copper from Michigan. These exotic artifacts were associated with ceramic potsherds that included Deptford Stamped, a design more typical of pottery from northern Florida, as well as ceramic types from the Gulf coast. Other exotic goods included Belle Glade ceramic pipes from the Lake Okeechobee area, and hundreds of chert fragments from central Florida.

Three animal offerings also were uncovered within the Circle (Elgart 2006). A lemon shark was buried along an east-west alignment, with the head facing west. The carapace of a sea turtle and the cranium of a bottlenose dolphin, all aligned east to west, were uncovered a short distance from the shark. Although radiocarbon dates later revealed that these animals were buried many centuries after the construction of the Circle, their association with the site suggests



A lemon shark was intentionally buried within the circle along an east-west alignment. Photo courtesy of the AHC

continued use of the location as a sacred space.

These discoveries strengthened the community's desire to preserve the site and fueled an ongoing media blitz and email barrage to the Governor. The County soon filed an eminent domain suit to seize the land—only the second time in the history of the United States that eminent domain was used to acquire an archaeological site. In 1999, the parcel's acquisition as a public park was completed with an expenditure of \$26.7 million. The price was the result of intense wrangling between the property owner and the State and County, both joining forces to preserve the site by providing funds and expertise. Additional support came from the Trust for Public Lands and Dade Heritage Trust.

In 2009, the site was declared a National Historic Landmark. Subsequently, the park was managed for several years by History Miami, which abandoned the lease agreement in 2010 due to the high cost of maintenance. The park quickly declined in appearance and became the de facto dog park for the newly constructed Icon Brickell condominiums. Increased efforts to maintain the park and interpret its history are ongoing and conditions steadily have improved.

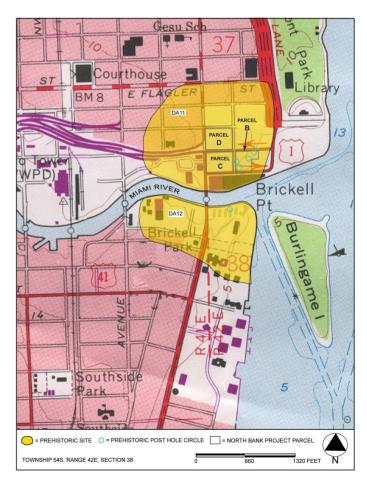
MORE CIRCLES

In 2002, three square blocks of vacant land still existed in the heart of downtown Miami near the north bank of the Miami River. These three lots formerly were the property of the Royal Palm Hotel owned by Flagler Properties and used for commercial parking after the hotel's demolition in 1935. The building had been vacated after it was severely damaged in the 1926 hurricane, and eventually it was burned by Mi-

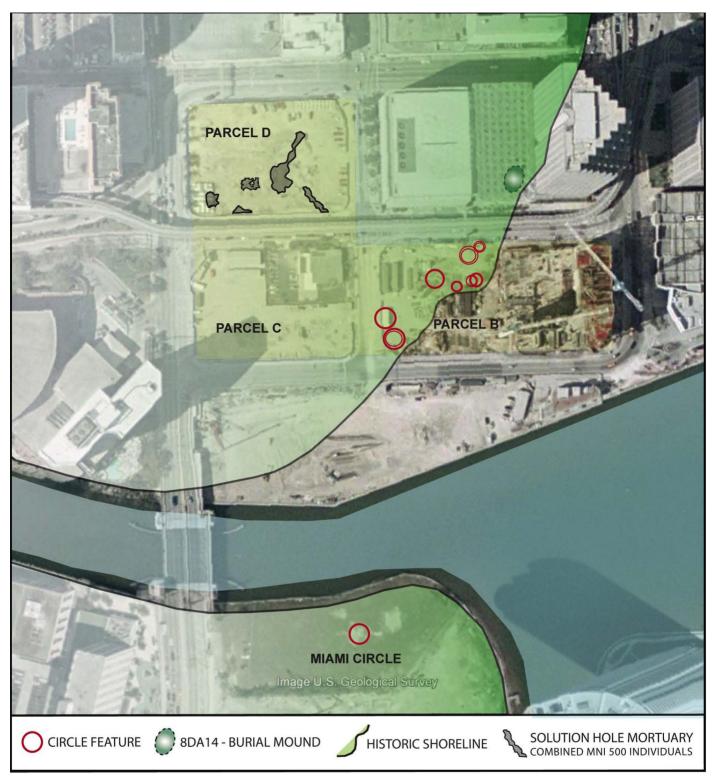
ami firemen as a controlled fire exercise.

The author (Carr) led a team of archaeologists from the Archaeological and Historical Conservancy (AHC) with historian Arva Parks to assess the parcel for potential archaeological deposits. Those studies set the stage for subsequent archaeological documentation of the parcels from 2004 to 2013. The lots were referred to as Parcels B, C, and D. The investigations were preceded by a stern warning from the city mayor that, no matter what was discovered, there would be no more archaeological parks through public acquisition in downtown Miami.

Excavations began in Parcel D (Carr et al. 2012), but were concurrent with excavations in the B and C parcels. Area D encompassed the northwestern foundations of the Royal Palm Hotel that were preserved below the parking lot asphalt. Hotel room keys were found still preserved on the key room floor, and prehistoric human burials were found abutting the hotel's foundations, a short distance from the key room. Surprisingly, human remains also were found within



Prehistoric circles have been found on both the north and south banks of the Miami River. Image courtesy of the AHC



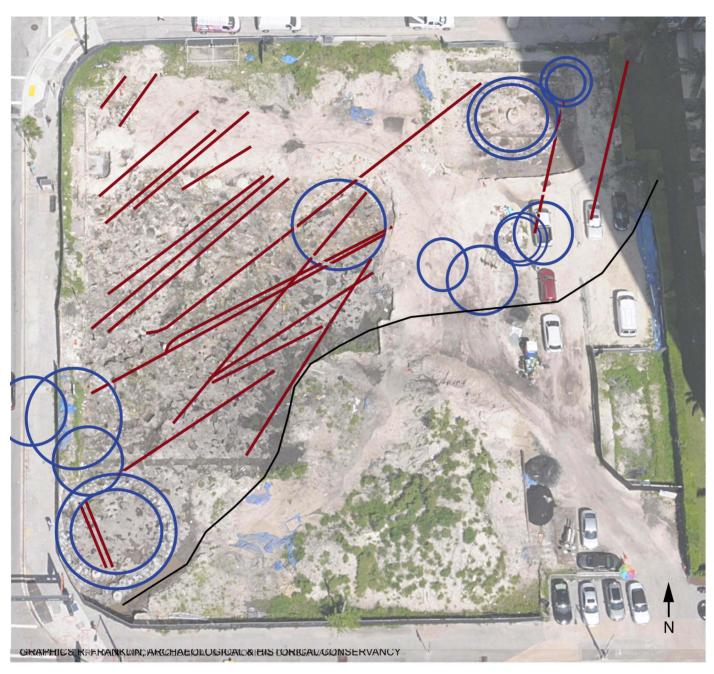
This 2005 aerial photograph of the Met Square property at the mouth of the Miami River depicts the historic shoreline and prehistoric features. Image courtesy of the AHC

the southwest corner of the parcel; more than 500 individuals were mostly comingled within five large solution-hole ossuaries. This discovery of the principal Tequesta cemetery demonstrated that the reported burial mound, 8DA15, destroyed during the construction of the hotel to provide an open view of the bay for hotel guests, was only one component of the site's mortuary complex, and that the solution hole ossuary features were older than the burial mound graves.

While the solution hole burials were largely second-

ary, comingled and with few grave goods, several primary graves were found. One particular grave likely represented an elite male who had two bone daggers at his feet and two horse conch (Triplofusus papillosus) artifacts positioned above each knee. Another flexed burial of a female had a cowrie shell placed at her side. The cowrie shell was radiocarbon dated to AD 240-430.

Caches of shell axes and stone abraders also were found



The alignment of post holes along the north bank may indicate where raised boardwalks or other features were located. Image courtesy of the AHC

within and near the solution holes. Eventually, all of the human remains were reburied a short distance from the discovery on property owned by MDM Corporation. Today, a tower looms over the site. On the ground floor, shoppers at Whole Foods browse the aisles unaware of the 500 burials that once rested below.

One of the solution holes later was used as source of fresh water by US soldiers when the site was occupied by Fort Dallas between 1838 and 1858. The soldiers unknowingly had pushed the bones out of their way, chipping a deeper hole into the limestone to access the fresh water below.

Excavations at Parcel C, previously encompassing the Royal Palm Hotel's southern gardens, found the area to be disturbed with redeposited midden. The first Spanish artifact, a glass trade bead, was excavated at this parcel's southwest corner, abutting Southeast 2nd Avenue near the Brickell Bridge.

Parcel B—i.e., Met Square, the southeastern of the three lots—yielded some of the most significant discoveries. It was within this parcel that the historic bay shore once merged with the river's mouth. Below the fill was an extensive record of Miami's earliest occupation, dating back at least 2,500 years and continuing to the historic beginning of Miami.

Archaeologists ultimately uncovered more than 2,000 postholes cut into the limestone bedrock and, as with the south bank site, many postholes were characterized as circles eleven in total. None were as complex as the



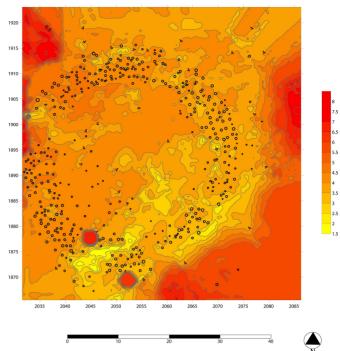
This aerial view along 3rd Avenue circle shows the concentric posthole alignments. Photo courtesy of the AHC

Miami Circle, but several had concentric rings, possibly suggesting inner and outer walls or multiple construction episodes. Unexpectedly, many of the postholes formed parts of parallel linear features, suggesting boardwalks or raised scaffolds. Radiocarbon dates of materials within the postholes, including possible shell digging tools used to create the holes, indicated a chronology of ca. AD 600 to 900.

While these features in south Florida are unique to these two sites, remarkably similar patterns of postholes carved into bedrock to form circular structures have been documented in the Caribbean, including Cuba (Hernandez de Lara and Rodríguez Tápanes 2008) and the Dominican Republic (Samson 2010). Samson et al. (2015) note that the coastal setting of the sites and their overlapping, circular structures with postholes cut into limestone bedrock are consistent with the tradition of the bedrock architecture of the islands.

In 2002, after a public outcry about the loss of this significant site and its eleven circles, arbitration between the City of Miami, MDM Corporation, and Dade Heritage Trust resulted in the preservation of two of the most significant circles within the newly constructed Met Square building.

Robert S. Carr has worked as an archaeologist with the Florida Department of State, Division of Historical Resources, and the National Park Service. He co-founded the Archaeological and Historical Conservancy Inc. and has served as its full-time executive director since 1999. He has MS and BA degrees in anthropology from Florida State University.



A contour map of postholes cut into the bedrock clearly show the layout of the prehistoric circle at the Met Square property in Miami. Measurements are in feet. Map courtesy of Biscayne Engineering

Ryan Franklin has worked with the Archaeological and Historical Conservancy Inc. since 2006 and was named assistant director in 2017. Ryan holds a BA in anthropology from Florida Atlantic University and a Ph.D. in palaeoanthropology from the University of the Witwatersrand in South Africa. He has led numerous field projects in Florida and South Africa.

Acknowledgments: Firstly, the authors would like to thank Raymond Skinner and the entire field crew for their tireless efforts and enthusiasm throughout the project. Additionally, the survey of the over 2000 postholes and features would not have been possible without the generous and continued support of Biscayne Engineering.

BIBLIOGRAPHY

Carr, Robert S. 2006. "Analysis of Ceramics from Brickell Point, 8DA12." The Florida Anthropologist 59 (3-4):133-59.

Carr, Robert S., and John Ricisak. 2000. "Preliminary Report on Salvage Archaeological Investigations of the Brickell Point Site (8DA12), including the Miami Circle." The Florida Anthropologist 53 (4):260-84.

Carr, Robert S., William Shaffer, Bradley M. Mueller, Ashley Gelman, Shannon D. Iverson, William F. Rombola, Ryan Franklin, and Timothy A Harrington. 2012. "Phase III Archaeological Investigations of Parcel D, MDM, Miami, Florida." AHC Technical Report, no. 933. Davie, Florida: Archaeological and Historical Conservancy, Inc.

Collins, Lori, Travis Doering, and Robert S. Carr. 2006. "Integrated Spatial Technologies: High Definition Documentation of the Miami Circle and Royal Palm Circles." *The Florida Anthropologist* 59 (3-4):161-77.

Dixon, Jacqueline Eaby, Kyla Simons, Loretta Leist, Christopher Eck, John Ricisak, John Gifford, and Jeff Ryan. 2000. "Provenance of Stone Celts from the Miami Circle Archaeological Site." *The Florida Anthropologist* 53 (4):328–41.

Elgart, Alison A. 2006. "The Animal Interments at the Miami Circle at Brickell Point Site (8DA12)." The Florida Anthropologist 59 (3-4):179-89.

Hernandez de Lara, Odlanyer, and Boris E. Rodríguez Tápanes. 2008. "Consideraciones En Torno a Una Posible Estructura de Vivienda En El Asentamiento Aborigen El Morrillo, Matanzas, Cuba." Comechingoniα 1:24-42.

Means, Guy H., and Thomas Scott. 2000. "A Geological Assessment of the Miami Circle." The Florida Anthropologist 53 (4):324-26.

Samson, A. V. M. 2010. Renewing the House. Trajectories of Social Life in the Yucayeque (Community) of El Cabo, Higüey, Dominican Republic, AD 800 to 1504. Leiden: Sidestone Press.

Samson, A. V. M., C. A. Crawford, M. L. P. Hoogland, and C. L. Hofman. 2015. "Resilience in Pre-Columbian Caribbean House-Building: Dialogue between Archaeology and Humanitarian Shelter." *Human Ecology* 43 (2):323–37. doi:10.1007/s10745-015-9741-5.

Weisman, Brent R., Herschel E. Shepard, and George M. Luer. 2000. "The Origin and Significance of the Brickell Point Site (8DA12), Also Known as the Miami Circle." *The Florida Anthropologist* 53 (4):342–46.

Wheeler, Ryan J. 2000. "The Archaeology of Brickell Point and the Miami Circle." The Florida Anthropologist 53 (4):294–322.

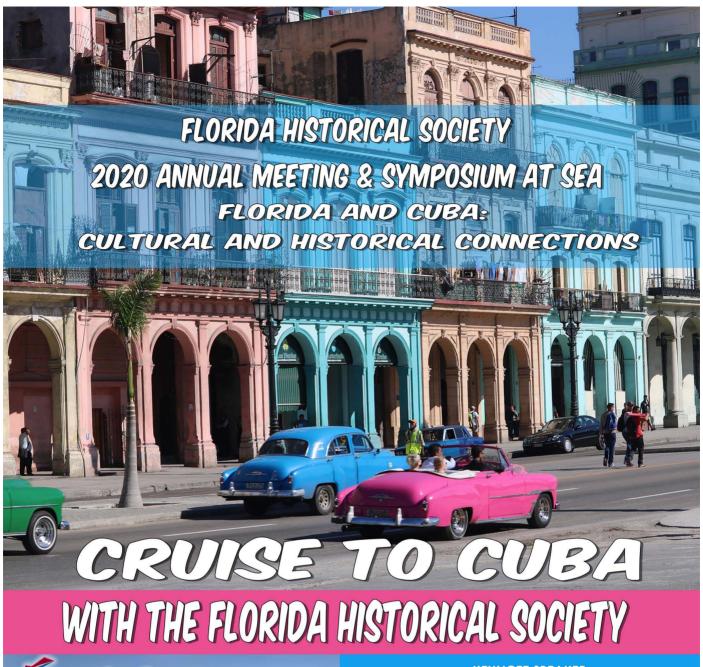
Widmer, Randolph J. 2004. "Archaeological Investigations at the Brickell Point Site, 8DA12, Operation 3." The Florida Anthropologist 57 (1–2):11–57.



The Miami Circle



An owl head ceramic effigy pipe bowl was found at Met Square. Photo courtesy of AHC





Itinerary:

Sat., May 9 Depart Tampa (4:00 pm)

Sun., May 10 Key West

Mon., May 11 Havana (Full day/Overnight)
Tues., May 12 Conference at Sea

Wed., May 13 Conference at Sea
Thur., May 14 Arrive Tampa (8:00 am)

KEYNOTE SPEAKER

Dr. Sherry Johnson

"Florida and Cuba:

Five Centuries of Shared History and Culture"

Paper presentations Round table discussions Tours in Key West and Havana Awards luncheon...and more!

All inclusive price includes:
Cruise * Port Charges & Taxes
Tours in Key West & Havana
Tourist Visa * Conference registration
On-board Meals & Select Beverages
STARTING AT \$1,075 PER PERSON!

FOR MORE INFORMATION AND TO RESERVE YOUR CABIN, PLEASE VISIT
WWW.MYFLORIDAHISTORY.ORG/CRUISE

RIBAULT'S LOST FLAGSHIP

A UNIQUE ARCHAEOLOGICAL OPPORTUNITY FOR FLORIDA

James Delgado



The Floridians worship the Column erected by the Commander on his first voyage. Colorized engraving by Theodor de Bry, based on images by Jacques Le Moyne de Morgues. Originally published in La Floride française, scène de la vie indienne, peintes en 1564, by Charles de la Roncière, Les Éditions nationales, 1928; reprinted in French Florida by Charles de La Roncière, edited by Benjamin S. DiBiase, FHS Press, 2014.

HISTORICAL PERSPECTIVE

wo epic clashes, one by force of arms and the other a legal battle fought in court, speak to key events in Florida history when France and Spain fought to determine the peninsula's future as a French or Spanish colony. The events of 1565 resurfaced fig-

uratively and literally 451 years later, sparking a legal challenge to protect a pivotal archaeological site, the ill-fated $L\alpha$ *Trinité*, flagship of a doomed French expedition led by Huguenot Jean Ribault.

The buried archaeological remains of an early sixteenth-century shipwreck off Cape Canaveral, Florida, were discovered in 2016 by a commercial firm, Global Marine Exploration (GME), operating under an exploration permit issued by the Florida Division

of Historical Resources (DHR). GME conducted an excavation that exposed inscribed bronze cannon and a stone monument that are French in origin. However, GME violated terms of its permit by conducting the excavation and recovering some artifacts.

In response to being notified that France did not consent to salvage of the wreck and DHR cancelling its permit, GME filed a claim in federal court to gain control of the wreck to excavate it and sell most of the finds. A legal battle ensued. On June 29, 2018, a federal judge ruled in favor of France, based on long-standing aspects of international law and legal decisions in similar cases. The decision confirmed France's ownership of the wreck because it likely was Ribault's flagship. As such, it was a royal warship sailing under official orders and—like all warships, including American vessels—remains the property of that nation regardless of whether it sinks and settles at the bottom of the sea. This key legal principle protects such sites as USS Arizona at Pearl Harbor.

The wreck reportedly consists of a wooden vessel that grounded and broke apart after violent weather transported it into shallow water. Artifacts on the site, French in origin and ownership, as well as site characteristics and location, indicate that the wreck is La Trinité.

Ribault's flagship led a royal fleet dispatched to La Florida to resupply and reinforce La Caroline, a fortified French colony on the St. Johns River (known to the French as the River of May) near modern-day Jacksonville. This period was a critical juncture in the colonization of North America and, ultimately, the United States. Spain claimed ownership of North America from the north Atlantic seaboard to Mexico and attempted three times to establish a foothold, including an ill-fated colony at Pensacola Bay in 1559. However, a permanent Spanish presence in Florida did not begin until September 1565, when Pedro Menéndez de Avilés, whom King Philip II of Spain designated as adelantado (governor and commander) of La Florida, founded St. Augustine in response to the establishment of Fort Caroline.

Despite Spain's failure to colonize La Florida, keeping European rivals out of the area and having a base to support Spanish commercial enterprise between Cuba and Spain was of strategic importance. The annual route of Spanish ships returning to Spain with gold, silver, and other New World commodities followed the Atlantic Gulf Stream north along Florida's east coast, close to shore and in sight of land. Spanish

ships were vulnerable to interception and capture by enemy vessels along this route. A Spanish nobleman, Menéndez de Avilés was appointed captain general of the Spanish treasure fleet, a duty he fulfilled successfully. In March 1565, King Philip II gave Menéndez a commission to lead a renewed and larger effort to establish permanent Spanish occupation of La Florida, a mission that Menéndez supported. However, the Menéndez mission became more urgent when Spanish authorities in Havana learned that French Huguenots—Protestants rather than Catholics—had established Fort Caroline.

Aboard the flagship San Pelayo, Menéndez commanded a fleet of nineteen ships and more than 900 soldiers and sailors. San Pelayo and ten other ships left Cadiz, Spain, in June 1565, but the fleet suffered severe storm damage in the Atlantic. Eight ships that were expected to join the Adelantado in the Canary Islands did not arrive. On arrival in Florida, Menéndez's force had been reduced by two-thirds. On August 28, 1565, Menéndez made landfall near present-day St. Augustine, then sailed north in search of Fort Caroline and the French interlopers.

While the Spanish captain was gathering his forces in Cadiz, Ribault was assembling a fleet at Dieppe, France, that consisted of seven ships, with $L\alpha$ *Trinité* as flagship. His fleet sailed in May 1565, but was delayed by weather at the Isle of Wight until June. The fleet finally made landfall off the River of May, south of Fort Caroline, on August 28, 1565—coincidentally, the same day that Menéndez arrived at present-day St. Augustine Inlet. Three of Ribault's lighter ships were able to cross the bar at the river mouth and sail upriver to anchor near Fort Caroline to unload, but $L\alpha$ *Trinité* and three other ships with deeper draft had to anchor offshore.

On the night of September 4, the Menéndez warships approached the Ribault ships at anchor, but the French vessels cut their anchor cables and sailed away. The next day, the Spanish fleet headed south to St. Augustine Inlet; however, one or more of Ribault's ships followed and saw that Menéndez had anchored and was establishing a base. This detail was reported to Ribault, who had come ashore at Fort Caroline. The Frenchman decided to attack Menéndez at St. Augustine and prepared to sail with La Trinité, three of his other larger ships, and an extra complement of soldiers from Fort Caroline. On September 8, the Ribault warships left their anchorage and sailed south to attack the Spanish fleet at St. Augustine Inlet. Captain René de Laudonnière and approximately 150 sol-

diers and settlers remained at the fort. According to his account, after Ribault had sailed for St. Augustine, "a great storm came up, with such heavy winds, that the Indians assured me that it was the worst that had ever come to the coast."

There was no further news until September 21, when Spanish forces approached Fort Caroline and its diminished garrison and quickly stormed and captured it. Two of the three ships still there evaded capture, picked up about twenty Frenchmen who had escaped, and sailed for France. Laudonnière was among those who escaped and reached one of the ships. After that vessel made landfall in Britain, Laudonnière returned to France and prepared an account of the events. However, his last information about the Ribault warships was as of September 8, when they had sailed to attack the Menéndez forces.

The earliest known report to the French court that the Ribault ships had been destroyed and their crews killed is a letter dated January 22, 1566. Correspondence from Baron Raymond de Fourquevaux, the French ambassador to the Spanish court of Philip II, reported that the "French who went there were defeated." In mid-February, Fourquevaux reported in greater detail that both a cousin of Pedro Menéndez and a French survivor of the Ribault fleet had arrived in Madrid with news that Fort Caroline had been captured, all of the soldiers had been killed, and there had been a storm "so violent that the four [French] ships sank and the men made it to shore and assembled in two groups...."

After learning the French ships' fate, Menéndez and his soldiers located and killed a group of 200 French survivors. After killing the first group, "[Menéndez] went to where Jean Ribault was...beyond a small river with approximately four hundred men...." Ribault "sent one of his men on a small boat to meet [Menéndez and his soldiers], asking to treat them well as subjects and soldiers of the King of France, friend and brother-in-law of the King of Spain...." Regardless, Ribault was "beheaded and all of his comrades killed in various ways, except for a drummer boy, a fife, and a carpenter." Fourquevaux reported that "as a reward for this massacre, Florida will be elevated to a marquisate and [Menéndez] will be made marquis of it." In addition to occupying and garrisoning Fort Caroline as a Spanish fort, Menéndez established a colony at the river's mouth, which he named San Augustín.

Today, that settlement—the city of St. Augustine—is the oldest continually occupied European town in the United States. Were it not for the 1565 hurricane and the loss

of Ribault's fleet, and the subsequent massacre of Ribault and most of his contingent, the colonial history of Florida would have taken a much different tack.

THE WRECKING OF LA TRINITÉ

Contemporary Spanish documents, two letters from Menéndez dated October 15 and December 15, 1565, and a Memorial to the Spanish Court make it clear that La Trinité was wrecked off Cape Canaveral. The October 15 letter reports that La Trinité was dismasted and at anchor in the shoals a considerable distance south of where the three other Ribault fleet ships had wrecked. The December 15 letter expressly identifies Cape Canaveral as where seventy to eighty La Trinité survivors were building a fortification with artillery from the ship and were building a vessel to sail to safety. These activities would have involved moving heavy objects from the wreck, which could not have been transported far by castaways. It also should be noted that, because Cape Canaveral projects eastward into the Atlantic, a sailing ship being driven south by hurricane winds from the north or northeast—as we know was the case for La Trinité-would have extreme difficulty weathering Cape Canaveral. As noted previously, contemporary records demonstrate that Lα Trinité wrecked at Cape Canaveral on or about September 11, 1565. That is exactly where GME discovered the sixteenth-century wreck with diagnostic French artifacts-specifically, a royal French stone monument and three bronze cannon with the arms of Henry II, King of France.

The stone monument is identical to monuments depicted in contemporary engravings of the French voyages and settlements in La Floride. These monuments were emplaced as territorial markers by Jean Ribault on a 1562 voyage to the coast. A January 19, 1566, letter to King Philip II by Don Frances de Alva, the Spanish ambassador to King Charles IX of France, reported that the French Royal Court had received word that the Ribault fleet had been lost. The eleven-page de Alva letter, written in code, recounts dismay at Charles IX's court at the fact that six territorial markers were on board and lost with the Ribault fleet. The decoded passage concerning the marble columns states:

Of the captain [Ribault] who went from Bordeaux in the small ship of which I have written your majesty, to Florida, it is also understood here that a Spanish ship sent it to the bottom and they felt this keenly because it carried six marble columns with the arms of this king and many epitaphs to put them in the fort of La Florida.

The contemporary historical record thus corresponds with the royal French stone monument uncovered by Global Marine Exploration and reported in its "Final Dig and Identity Report" of June 2016.

The same report includes photographs of three bronze cannon, clearly identifiable as French culverins, which corresponds to the Register of Artillery issued by the Royal Navy to La Trinité in May 1565 for the Ribault fleet mission. The presence of ballast stones at the same site provided further evidence of the presence of a shipwreck. The excavation conducted by GME was not extensive, and these artifacts were not recovered. Nonetheless, the in situ documentation of them was instructive, because as noted, they are unique and exceptionally diagnostic in archaeological terms. The historical record concerning La Trinité, the present-day record of highly distinctive cannon of King Henry II of France, and the unique stone monument known to have been lost with the Ribault fleet all helped to identify the wreck as La Trinité, lost at Cape Canaveral in the September 1565 hurricane. After a lengthy court battle, U.S. Magistrate Karla Spaulding of the Middle District Court in Orlando ruled in June 2018 that the wreck is La Trinité, based on "a preponderance of evidence" and is the property of France. That was followed by France and Florida agreeing to and signing a declaration of intent to "research, protect and preserve the Trinité shipwreck" in December 2018.

WHAT'S NEXT?

Discovery of the wreck provides a direct archaeological tie to these events. In addition, the loss of the flagship and other expedition vessels was a causative factor in the French defeat, thus making La Trinité a significant archaeological entity as defined by Critera A and D of the National Register of Historic Places. Early colonial-period shipwrecks are rare in the American archaeological record and are highly significant and irreplaceable. Recent examples include the 1992 and 2006 discovery and excavation of two sixteenth-century Spanish wrecks in Pensacola Bay, associated with Spain's failed attempt to establish a settlement in Florida in 1559, and the 1686 wreck of Lα Belle, a vessel that sank in Matagorda Bay, Texas, while on a mission to establish a French settlement at the Mississippi River.

Careful, scientific excavation of these sites has yielded considerable archaeological information about early colonial efforts, the character of early vessels, ships' equipment and armament, life on board, and the circumstances of their loss. Detailed archival

work that accompanied these projects provided new insights and added to the historical interpretation of colonial efforts, voyages, and vessels. Byproducts have included popular publications, teacher's guides, and major scholarly treatises.

In addition, archaeological evidence from these colonial shipwrecks offers a clear set of comparative examples that will be useful in assessing the types and range of finds that careful excavation of $L\alpha$ *Trinité* may yield. As the oldest French shipwreck located to date in U.S. waters, this is a nationally significant site. The events of August and September 1565 in Florida also are of national significance because of their role in the colonial development of America.

At the least, the site will help modern generations appreciate the pivotal events associated with La Trinité, the expedition of Pedro Menéndez de Avilés, and the ill-fated expedition of Jean Ribault, which forever changed the destiny of Florida and the United States.

Now that French ownership is recognized, the wreck site, located in state-controlled waters, will not be available for salvage and sale, but, rather, for careful and complete archaeological recovery. That process will extract every piece of evidence from the site, and the recovered artifacts will be priceless in relating the historical events of September 1565—the clash of colonial powers and the end of dreams of empireand in providing tangible connections to the people who were caught up in these events. As evidenced by the aftermath of the Pensacola and Matagorda shipwrecks-for example, museum exhibits, public lectures and events, and precollegiate educational resources—the potential of the Lα Trinité excavation is substantial. The opportunity is at hand for Florida to host the one of the largest and most significant shipwreck archaeological projects of the early twenty-first century in North America.

Dr. James Delgado is senior vice president of SEARCH, Inc., Jacksonville, Florida, and the former Director of Maritime Heritage in the Office of National Marine Sanctuaries for NOAA.

HURRICANE IRMA CANOE

THE REST OF THE STORY

KC Smith



The dugout underwent desalinization and testing in the State of Florida conservation lab in Tallahassee before being returned to Brevard County for permanent display. Photo by Ben Brotemarkle

n the 2018 issue of Adventures in Florida Archaeology, readers were introduced to a logboat washed ashore by Hurricane Irma in September 2017 in Cocoa, Florida. The morning after the storm, local resident Randy Lathrop discovered the canoe, recognized its possible significance, and contacted the Florida Division of Historical Resources (DHR). After assessing the find, state archaeologists transported the boat to a conservation lab in Tallahassee for preservation and analysis. However, by this time, the watercraft had become an international media sensation because of its uncommon arrival, unusual appearance, and enigmatic age, origin, and function.

DHR has a database of 423 recorded logboats, dating from 7,000 years ago to modern times. Recovered on land and underwater, from all corners of the state, these vessels were constructed of different materials, by an array cultures, in various shapes, lengths, and configurations, and apparently for numerous purposes. In short, they provide a set of diagnostic and predictive characteristics that help archaeologists to understand prehistoric and historic watercraft. In the case of the Irma canoe, a team of seven researchers with various expertise worked collaboratively for nearly a year to determine when, why, and how the vessel was manufactured.

Soon after its discovery, DHR archaeologists took wood samples to conduct radiocarbon dating, the process used to establish an approximate time frame for the demise of organic materials based on residual carbon levels. The resulting dates were all over the map, suggesting a 50 percent probability that the wood died or was cut down between 1640 and 1680; a 37.2 percent probability that it dated between 1760 and 1818; and an 8.6 percent chance that it dated to 1930 or later. In addition, the Irma canoe exhibited a suite of features—several types of nails, paint, compartments, and a possibly a sitting platform-not typically found together on historic watercraft. It also had barnacles on the interior but not the exterior, suggesting that it was exposed to saltwater, but not necessarily stored on or submerged in it.

Some of the logboat's features provided temporal clues about its manufacture. No evidence was found of burning or scraping, the traditional prehistoric means of canoe construction. Rather, some of the tool marks implicated a straight-edged, metal device such as an axe or adze, and circular marks likely were left by a type of saw patented in 1924 and used through

the mid-twentieth century. Both wrought and cut nails were found in the vessel, and variations in their shape and gauge indicated that watercraft was used and modified over a period of time.

The team also attempted to date the canoe with dendrochronology, in which the pattern of growth rings in wood are analyzed to determine when a tree was cut down. This process involves cross-dating a specimen with other items of the same species or region for which a chronology is known. However, the Irma canoe was made of southern red cedar-Florida's first example of a craft constructed of this wood, and no regional chronologies for cedar exist in the area to make a calendric comparison. Red cedar occurs naturally in the Cocoa area, and it once was important economically in Florida for home and furniture construction and, especially, the manufacture of pencils. In the early days of electrification, cedar commonly was used to fabricate utility poles because of its properties of strength and durability. To the researchers' initial surprise, the boat's average width matched the standard specifications for utility poles in the early 1900s.



Laura Smith cuts a sample of wood from the stern to use for dendrochronology testing. Photo courtesy of the Florida Division of Historical Resources

They also used a technique called portable X-ray fluorescence, commonly known as XRF, which identifies the elemental composition of materials. Initial tests on a sample of blue paint from the canoe showed high levels of titanium, a component dated the paint to after 1920-21. A more intensive XRF study of the entire canoe revealed evidence of red paint that no longer was visible, but was seen in cracks on the interior of the boat and in cracks on the exterior. This suggested that, after the canoe had weathered and cracked from being outdoors, it was painted red and later was painted blue after the 1920s.



Steve Karacic documents a few details before the canoe is transported to Cape Canaveral. Photo courtesy of PaleoWest

The creation of a detailed 3D model of the canoe enabled other diagnostic features to be identified and analyzed. For example, four large holes on the starboard side had been made from the outside to the inside, and one hole contained the residue of caulk. By measuring the negative impressions of the holes, researchers inferred they likely were made by stakes, as were used as footholds for climbing a utility pole. The caulk likely was inserted after a stake was removed to protect the pole. The 3D model also revealed a negative impression from a round, flat object and a nail—possibly left by a marker that



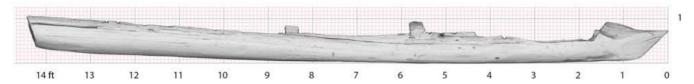
(I to r) Julie Duggins, Randy Lathrop, Steve Karacic, and MollyThomas gather in front of the canoe and exhibit at the Cape Canaveral City Hall. Photo by Josh Surprenant

identified the pole. Additional marks on the vessel's stern likely were made by equipment that steadied the original log as it was being debarked and transformed into a pole.

The researchers also concluded that features on the starboard side of the vessel-including a row of wire nails and nail holes at the same height, wood discoloration, and a notch-probably were attachment points for an outrigger or possibly allowed the Irma canoe to be the outrigger on another boat. Use-wear at the bow support this idea. The port bow was laden with small, deep nicks, while the starboard bow showd very little wear. The latter side would have been protected by an outrigger or the primary vessel, if the Irma dugout served that purpose. In addition, wood on the starboard side was thicker than on the port, where it was eroded along the gunwale and deteriorated at the bow. Consequently, the logboat listed to port when it was placed in water at the conservation lab. Whether this difference was a construction feature or caused by weathering, the dugout would not have floated evenly unless it was attached to another vessel.

Julie Duggins, who was the first DHR archaeologist to view and work with the dugout and also was a primary research member, says that the vessel called the Hurricane Irma canoe likely was an outrigger made in the early to mid-twentieth century from a former utility pole. Despite this humble beginning, it is now the most thoroughly documented and scientifically studied logboat in Florida. It also has become part of a public exhibit that debuted during a ceremony on September 28, 2018, at the Cape Canaveral City Hall. This actually is a temporary location.

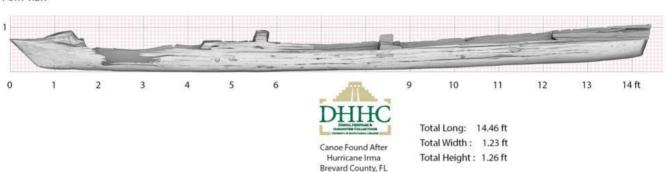
STARBOARD VIEW



TOP VIEW



PORT VIEW



Working with state and local archaeologists, staff at the University of South Florida Libraries used 3D and specialized imaging to document the Cocoa canoe. This image shows starboard, top, and port views. Image courtesy of the Digital Humanities and Heritage Collection, USF Libraries, https://sketchfab.com/models/2dd54a47268142928f576c6ffdaf10fd

The city is constructing a Cultural Arts Preservation and Enrichment (CAPE) Center, and when DHR learned this, it offered the city an indefinite loan of the vessel. To learn more about the exhibit, call (321) 868-1226.

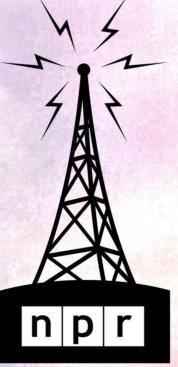
Special thanks to Julie Duggins for providing information about this project.

KC Smith is a member of the Florida Historical Society board of directors and formerly was the curator of education at the Museum of Florida History, Tallahassee.



FLORIDA FRONTIERS

THE
WEEKLY
RADIO
MAGAZINE
OF



THE FLORIDA HISTORICAL SOCIETY



CHECK YOUR LOCAL NPR SCHEDULE LISTEN AS A PODCAST. OR ONLINE AT WWW.MYFLORIDAHISTORY.ORG



FEATURING ARCHAEOLOGY!



The Windover Dig



The Luna Settlement Excavation

- CANOE ARCHAEOLOGY
 - MISSISSIPPIAN TRADE NETWORKS
 - **THE BULOW PLANTATION**
 - FORT MOSE
 - INDIGENOUS PEOPLE



The Key Marco Cat



CHECK YOUR LOCAL PBS SCHEDULE
OR WATCH ANYTIME AT
WWW.MYFLORIDAHISTORY.ORG

