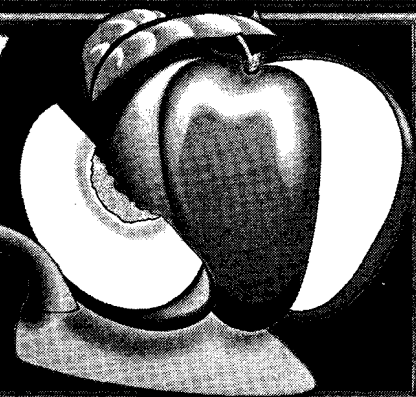
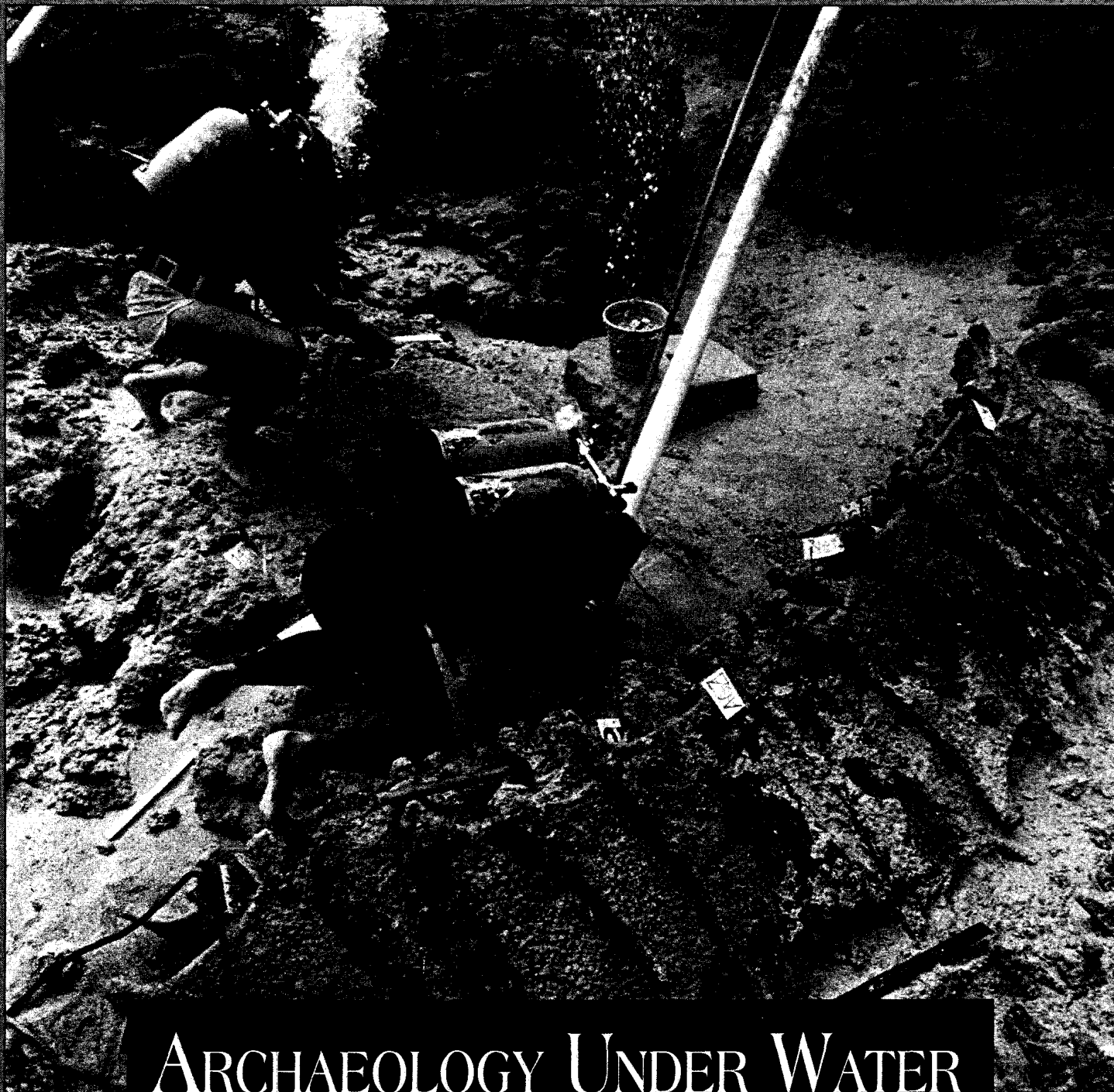


ARCHAEOLOGY AND PUBLIC EDUCATION



Society for American Archaeology, Public Education Committee

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ARCHAEOLOGY UNDER WATER

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The Public Education Committee exists to promote awareness about and concern for the study of past cultures, and to engage people in the preservation and protection of heritage resources. Our publication aims to aid educators, interpreters, archaeologists, and others who teach the public about the value of archaeological research and resources.

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Plumbing The Depths For Teaching Strategies

Underwater archaeologists study a variety of cultural resources, including the remains of boats and ships; submerged towns, ports, and features; inundated terrestrial sites; and, of course, artifacts associated with the human use of waterways.

They delve into such topics as ship construction and decoration; maritime history, tradition, and lore; cartography, navigation and seamanship; waterborne enterprise; population dynamics and resource exploitation; and artifact conservation and preservation. Their research may center on prehistoric or historic events, and they do not necessarily have to get wet to investigate the ways in which people have used aquatic resources to survive and to spread ideas, inventions, products, and themselves.

This issue of the newsletter presents a brief view of underwater archaeology not only to share information but also to inspire educators to recognize that submerged cultural resources can be used as effectively as land-based sites to teach the full range of precollegiate subjects and concepts. Granted, virtually all of the archaeology education strategies and materials that have emerged in recent years have been focused on terrestrial archaeology. Only a handful of programs exist in the U.S. that use shipwrecks and maritime history as a vehicle for instruction, despite the fact that watercraft have had global impacts throughout the course of human history.

We highlight two of these water-based programs in this issue. The Lake Champlain Maritime Museum in Vermont offers an innovative experience for visiting groups that demonstrates how underwater archaeology contributes to knowledge of local maritime history (see page 7). Educational activities associated with the excavation and study of the La Salle shipwreck in Texas include teacher in-service and lesson plans as well as public outreach using the latest technologies (see page 11).

Other programs are equally unique. In North Carolina, the state underwater archaeological unit has developed an extraordinarily rich, multicomponent program geared for secondary students, which has been shared through several museums, school systems, and summer camps. The Museum of Florida History in Tallahassee offers a week-long summer camp for teenagers that surveys state maritime heritage and involves fieldwork on shallow-water shipwreck sites. Museum staff presently are working on an educational unit that can be used in the classroom.

No doubt the common association between underwater archaeology and shipwrecks, and the perceived inaccessibility of the latter, has prevented teachers from incorporating the study of submerged cultural resources into their classroom strategies. But as any teacher knows, you do not have to go to Greece to study the Parthenon and its related culture. On the other hand, a teacher in Cheyenne, Wyoming, might wonder how submerged resources possibly could relate to required subject areas. As a rejoinder, one might inquire how prehistoric populations of the area used rivers and lakes, and whether any of their sites now are under water due to natural or human action. Moreover, we must remember that the European colonists of North America did not drop from the sky; at some point, they or their forebears arrived by ship and then continued to use waterways for sustenance and commerce.

Underwater archaeology has a great deal to offer to teachers who wish to plumb the depths for rich classroom information and experiences.

KCS

On the cover: Divers work on the Bronze Age shipwreck at Uluburun in Turkey. Photo by Donald A. Frey, courtesy of the Institute of Nautical Archaeology.

PUBLIC STEWARDSHIP OF SHIPWRECKS

AN EXAMPLE FROM FLORIDA

- 
- | | | | |
|--|-------------------|--------------------|-------------------------|
| 1. Stempost | 6. Guard | 11. Slide Valve | 16. Shifting Linkage |
| 2. Bulkhead | 7. Stanchion | 12. Condenser Pump | 17. Pitman Arm |
| 3. Fairlead | 8. Bricks | 13. Water Pump | 18. Rudders |
| 4. Boiler Room | 9. Condenser Pipe | 14. Shifting Lever | 19. Paddlewheel |
| 5. Front Boiler Bracket
with Fire Doors and Ash Pan | 10. Steam Engine | 15. Steam Pipes | 20. Hog Chain |
| | | | 21. Hawkinsville Plaque |

Roger C. Smith

As tools for historic preservation and public education, underwater archaeological preserves are a relatively new phenomenon in cultural resource management.

The concept of designating certain state-owned submerged sites of recognized maritime value as preserves has worked well in Florida, given the state's legacy of treasure hunting and shipwreck salvage. However, the success of "shipwreck parks" in Florida has depended on several key ingredients, the most important of which has been public participation at every step in their establishment.

Candidates for preserves are nominated by members of a local waterfront community for consideration by the Bureau of Archaeological Research (BAR), Florida Department of State, which responds by working with local divers, anglers, archaeologists, and historians to explore a site for its suitability to become a state preserve. Factors such as public accessibility, archaeological integrity, historical value, biological diversity, and recreational potential are used to evaluate a candidate during archival and field documentation of its past and present situation.

If the site meets these criteria, data from its evaluation are presented in a formal public proposal for the creation of a new preserve through a cooperative partnership between the public and private sectors. Input generated by the proposal helps to devise methods of site enhancement, interpretation, and protection that are appropriate for the new preserve, based on local needs and desires.

Interested organizations and individuals then work together with state and local government to prepare the site and to maintain it as a historical attraction. In this way, a publicly owned resource becomes part of a public process of education, interpretation, and preservation, and local residents assume stewardship of the new preserve with a fuller understanding of its place in their past and future.

An Experiment At The Onset

Florida's preserve program began as an experiment in 1987, with the designation of *Urca de Lima*, a Spanish galleon

cast ashore near Ft. Pierce during a hurricane in 1715, as the first State Underwater Archaeological Preserve. Salvaged soon after wrecking, and again by modern treasure hunters, the remains of the wooden sailing ship eventually became a popular destination for sport divers. Members of the St. Lucie County Historical Commission approached BAR to explore the possibility of giving the shipwreck a status that would both interpret and protect the site for future visitors.

Local waterfront businesses banded together with city, county, and state officials to place an official bronze plaque, embedded in a cement monument attached to a large mooring buoy. Interpretive brochures were distributed widely to encourage public visitation and participation in the preserve's maintenance. *Urca de Lima* thus was adopted by the local community as a new historical attraction. By placing the site in the public's trust, it became important for everyone to preserve.

From Sails To Steam

In 1989, a second preserve was established at *San Pedro*, another Spanish galleon that was part of a fleet that sank in the Florida Keys during a hurricane in 1733. A public proposal circulated by the Islamorada Chamber of Commerce had generated great interest and enthusiasm, resulting in the creation of a nonprofit San Pedro Trust to serve as a support organization for the preparation of the preserve.

An underwater plaque and monument, along with seven mooring buoys, were donated for placement on the site. In addition to interpretive brochures, a laminated underwater guide to the site was prepared to orient snorkelers and divers to the archaeological and natural features of the park. This second preserve has become a popular destination for thousands of visitors to Florida, who wish to see firsthand the coral-encrusted remains of a real Spanish treasure galleon, which also is one of the oldest artificial reefs in the U.S.

Continued on page 12

Above: Laminated site plans and interpretive guides of Florida's underwater preserves, including the USS Massachusetts, are available for divers to take under water to orient themselves to features on the wrecks.

The Site At Uluburun

Cemal Pulak

The Institute of Nautical Archaeology's shipwreck excavation between 1984 and 1994 at Uluburun, Kas, in Turkey brought to light the largest and wealthiest assemblage of Bronze Age trade items found in the Mediterranean. Built of cedar in the ancient shell-first tradition, with pegged tenon joints securing planks to each other and to the keel, the shipwreck was about 50 feet long. Tree-ring dating of firewood on board suggests that the ship sank in 1316 B.C. or sometime shortly thereafter.

A Wealthy Bronze Age Cargo

The ship's cargo, perhaps a royal one, was comprised mostly of raw materials, but manufactured goods also were present. The main cargo included 10 tons of Cypriot copper in the form of flat, four-handled rectangular ingots and smaller, discoid ingots. Also on board was a ton of tin ingots in similar shapes, which, when alloyed with the copper, would have produced 11 tons of bronze. Ongoing chemical analysis of these earliest known tin ingots may help to resolve the enigmatic source of Bronze Age tin.

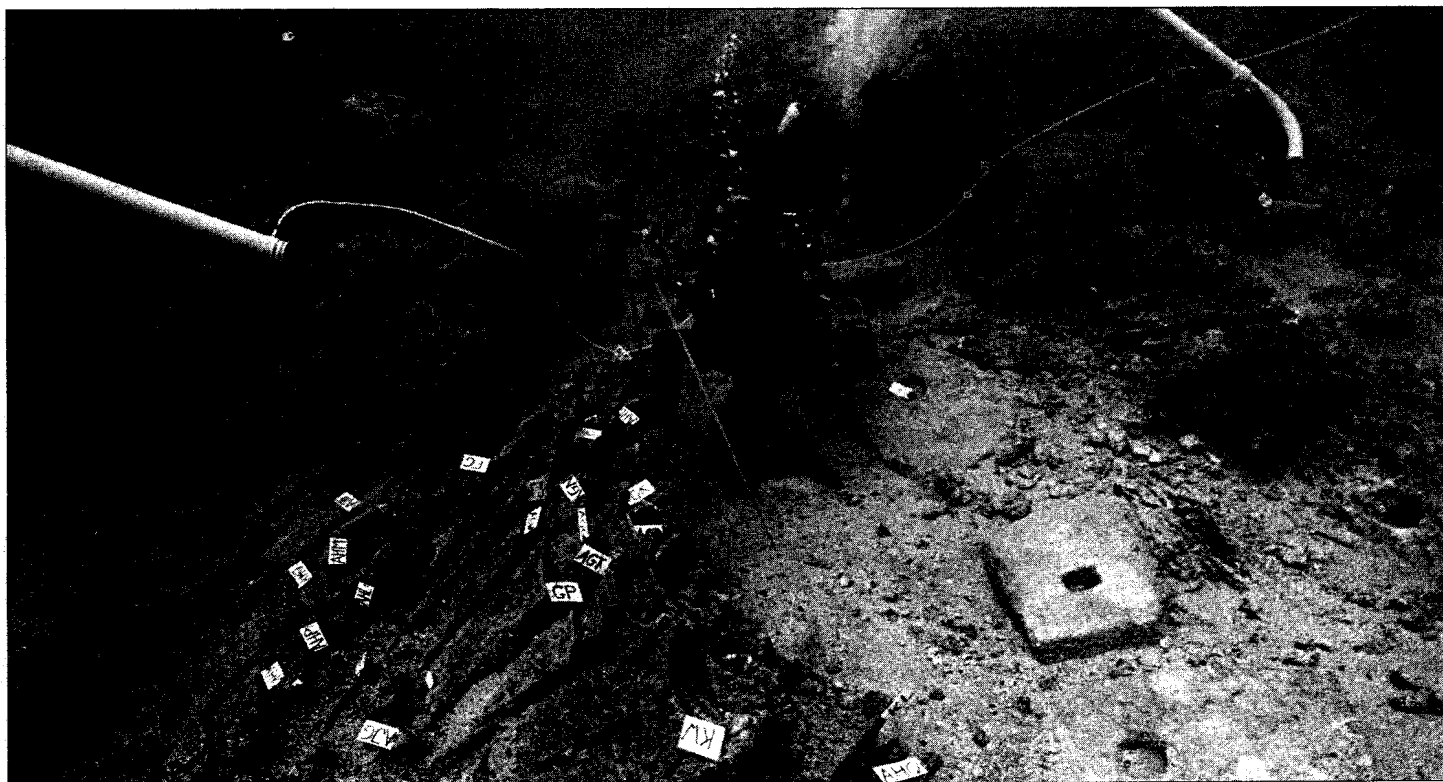
Approximately one ton of terebinth-tree resin, carried in Canaanite (Bronze Age Phoenician) jars, may be what the Egyptians termed "sntr," a commodity sometimes transported in Canaanite jars from the Near East to the pharaoh

for use as incense. The earliest known intact glass ingots in cobalt blue, turquoise, and lavender likely are the objects referred to as "mekku-stone" in Bronze Age tablets as items traded from the Syro-Palestinian coast. Logs of Egyptian ebony, ostrich eggshells (for use as containers or vases), and elephant and hippopotamus ivory also were recovered from the site.

The largest group of manufactured goods on the ship consisted of Cypriot pottery, including nine large storage jars. At least two of these contained Cypriot finewares, one contained pomegranates, and another probably held olive oil. Poorly preserved bronze caldrons and bowls suggest that these also must have been part of the manufactured cargo. Jewelry included Canaanite silver bracelets and gold pendants. On the other hand, a large gold chalice is of uncertain origin. Scrap gold and silver also were found in some quantity, with Egyptian objects among them, including the only gold scarab known bearing the name of Queen Nefertiti.

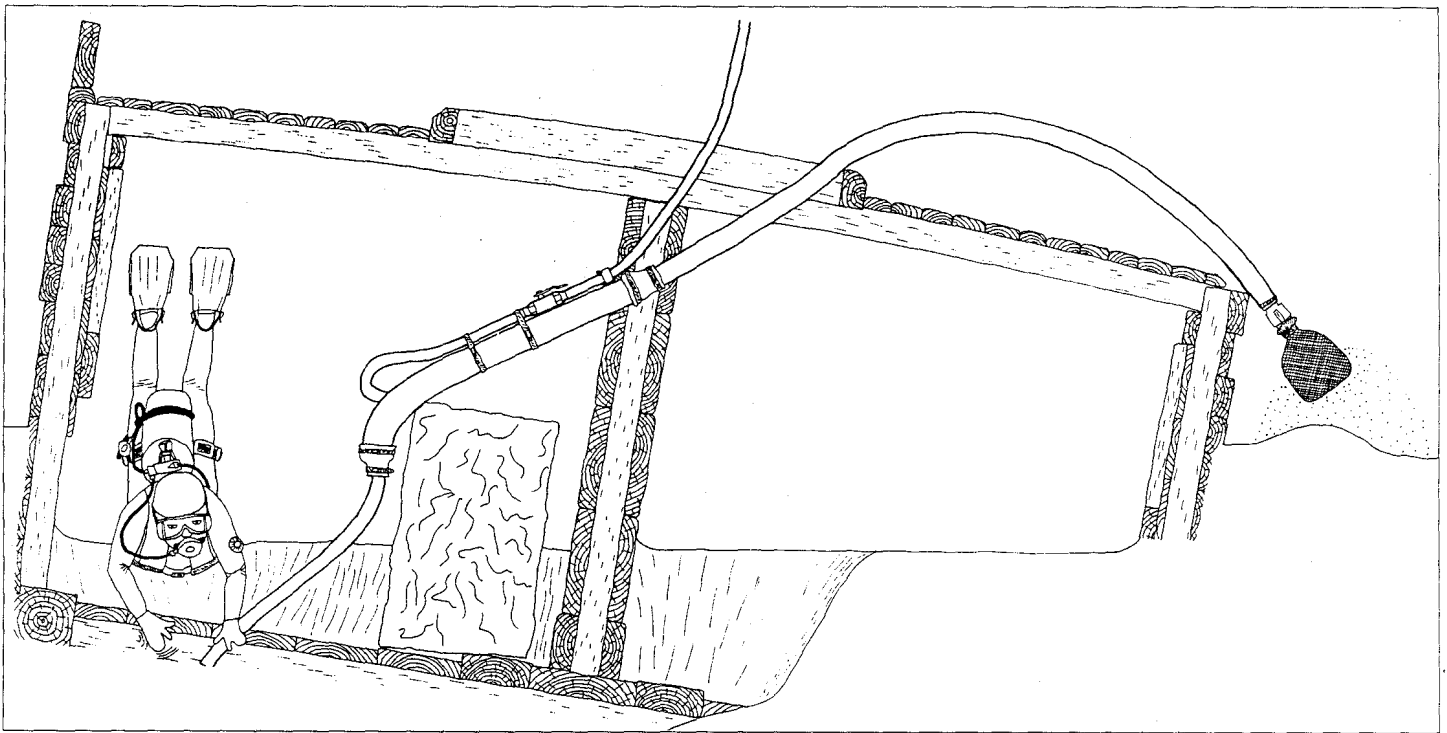
Thousands of beads are of glass, agate, carnelian, quartz, faience, ostrich eggshell, seashell, and amber. Other artifacts included two duck-shaped ivory cosmetic containers, an ivory trumpet, tortoise carapaces (sound-boxes for stringed musical instruments), and five tin vessels, more than previously

Continued on page 13



A diver measures the positions of four-handled metal ingots, which have been tagged with identifying markers, while other divers record features

on the Uluburun shipwreck in Turkey. Photo by Donald A. Frey, courtesy of the Institute of Nautical Archaeology.



Getting The Job Done

UNDERWATER ARCHAEOLOGICAL METHODS

J. "Coz" Cozzi

Underwater archaeology is a relatively new science that has grown considerably in the last decade. It will continue to expand as awareness of submerged cultural heritage increases and as governmental agencies in the United States develop management plans for resources under their purview. Underwater sites include shipwrecks, sunken harbors and cities, and submerged Paleoindian sites. Just as with sites on land, their features are surveyed, carefully excavated, meticulously recorded, thoroughly researched, and published for all to see. Nonetheless, underwater archaeologists have had to develop specialized techniques for the environment in which they work.

Archaeology under water is quite costly due to equipment requirements. Most sites require the use of a boat to transport crew and to serve as a platform from which to conduct diving activities. Boats can range from small inflatable craft to full-fledged research vessels dedicated to underwater projects. Getting to the site requires diving equipment such as scuba (an acronym for self-contained underwater breathing apparatus), where the diver's air is supplied from a tank on his or her back through a regulator with a mouthpiece.

Other essential equipment includes a mask, fins, snorkel, buoyancy-compensating system, and some form of body protection. Body protection may range from light clothing in warm tropical waters to prevent cuts and scrapes to thick neoprene suits that retain body heat in cold water. A crucial factor in safe diving operations is a thorough knowledge of diving procedures. A project divemaster ensures that these guidelines are followed.

Diving on a site provides certain benefits and has some drawbacks. Time under water is limited by air supply and, at deeper depths, by high pressure nitrogen absorbed through respiration, which can cause an ailment known as the "bends." One important advantage that diving archaeologists have is the ability to float weightlessly above the site to carry out their work.

To excavate under water, archaeologists employ a water-induced dredge or an air lift (illustrated above). Both are a form of underwater vacuum that lift sediments away in a column of water, enabling fragile organic materials such as leather, rope, and cloth to be revealed without damage. The discharge of the lift is screened to collect small finds.

Steel or plastic girds are placed over a site, and archaeologists triangulate (measure) from points on the grid to site features to establish the provenience (location) of artifacts and to create maps and plans of the site. Notes are made on mylar sheets instead of paper. Increasingly, site mapping is aided by computers and software that calculate and plot the positions of features. However, in drawing the lines of a vessel's hull, shipwreck archaeologists still prefer to rely on hand-drawn reconstructions since computer programs have difficulty with the complex curves associated with hull shapes.

Academic and research institutions conduct projects under water, as do some state agencies and many contract archaeology firms. Training in the United States is available at East Carolina University, Florida State University, Texas

Continued on page 12

Before Written History

Underwater Archaeology On Prehistoric Sites

Michael Faught

For many people, the term “underwater archaeology” brings to mind shipwrecks, history, and treasure. However, for a growing number of archaeologists, it conjures images of rising sea levels, ancient cultures, and hidden information.

This is because prehistoric sites, where human occupation or activity occurred before the time of written records, also are found in underwater settings. A growing cadre of researchers is focused on the discovery, analysis, and interpretation of prehistoric resources submerged in both freshwater and ocean environments.

Many examples of submerged prehistoric sites have been compiled over the past 40 years by English underwater archaeologist Nicholas C. Flemming. Some locations represent former terrestrial sites flooded by rising sea levels at the end of the Pleistocene geologic epoch (that is, the last ice age) between 18,000 and 8,000 years ago. One of the oldest is a 40,000-year-old Neanderthal site located in 60 feet of water in the channel between France and England.

Stone-age sites dating from 20,000 years ago to about 12,000 years ago have been reported on continental shelves off Italy and Israel. Neolithic- and Archaic-aged sites, dating from 10,000 to 5,000 years ago, are known from Denmark, Israel, Japan, and from both coasts of North America. My own dissertation research found submerged prehistoric sites three to six miles at sea in Apalachee Bay in northwest Florida, including two areas that exhibited evidence of human occupation at the end of the last ice age (Paleoindian and Early Archaic sites). Another site demonstrated that people camped around now-inundated river courses, known as “paleochannels,” some 5,000 to 6,000 years ago, just before the seas came up to modern levels.

Prehistoric sites also have been “drowned” by rising freshwater levels, such as in lakes and rivers. Such deposits have a long history of archaeological attention. Many have produced well-preserved organic remains and artifacts made of wood and fibers. Sites of this genre include 3,000- to 4,000-year-old (Neolithic to Bronze age) lakeside villages found at Lake Neuchatel in Switzerland and man-made islands in lakes in Scotland known as “crannogs.” Other well-known examples include Paleoindian and Early Archaic remains in the rivers and sinkholes of Florida. Several deposits also are known from submerged contexts in man-made lakes in the United States.

Prehistoric remains have become submerged by local geological processes like land subsidence or by modern shoreline erosion and wave action. Discarded refuse from nearby terrestrial sites also contributed to the formation of prehistoric underwater archaeological sites. Mayan ceremonial of-

ferings thrown in by inhabitants and later retrieved by divers in various lakes and *cenotes* (deep natural wells in limestone) of Mexico and the Yucatan peninsula are included in this list. Finally, dugout canoes were scuttled and sunk, just as historic ships and boats were.

Submerged prehistoric sites are not easy to find. Unlike historic remains, which often contain iron-based materials or are big enough to affect local magnetic polarity, prehistoric archaeological sites, features, and artifacts cannot be directly detected by modern remote sensing methods. Most examples have been found by accident by sport divers.

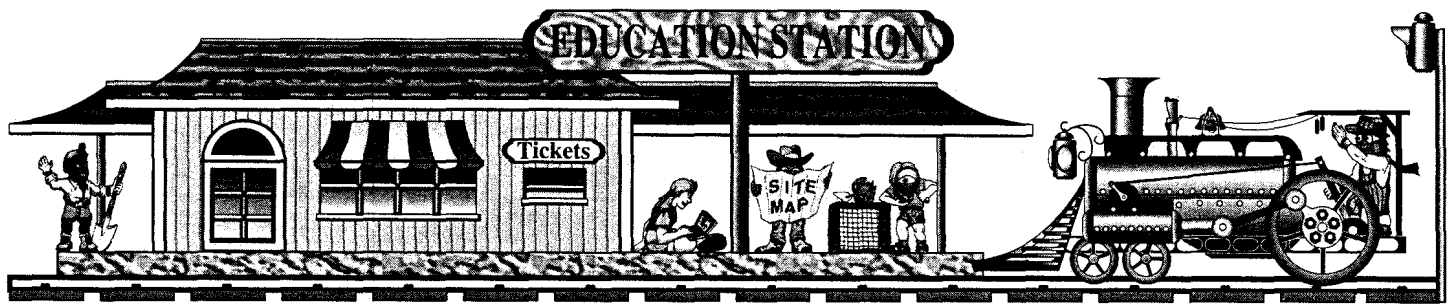
However, techniques for site discovery are emerging. Near-shore sites can be discovered and investigated by tracing areas eroding from onshore terrestrial margins into the waters of coastal or wetland settings. The intentional discovery of prehistoric sites located farther offshore can be accomplished by looking in underwater areas that represent places that were similar to those known in onshore settings.

Underwater archaeologists reconstruct the locations of submerged shorelines, relict (now submerged) topographic features, and the pathways of past river systems, and then look around those places for sites. These larger kinds of features can be identified by remote sensing equipment such as the subbottom profiler and sidescan sonar, as well as by coring and excavation.

While the preservation of organic remains in underwater prehistoric sites can be impressive, many of the processes of inundation can erase site signatures beyond immediate recognition. However, using modern research principles learned from sites on land affected by various intrusions (such as plowing), submerged prehistoric sites can be assessed, reconstructed, and interpreted. Furthermore, site surveys and research projects can be directed to locations that have better chances of survival, such as sediment banks, caves, sinkholes, and relict, quiet-water settings in estuarine areas. Searching for sites in high-energy beach or unprotected coastal situations likely will yield less robust evidence.

The archaeology of submerged prehistoric sites is an emerging frontier of underwater archaeology, with the potential to fill many gaps in our understanding of past human history and settlement. This research can identify early coastal and maritime activities and contribute to a better understanding of the timing and effects of recent sea level rise. The opportunities for important site discoveries and changing interpretations of the past are enormous.

Michael Faught recently was hired to establish an underwater archaeology program in the Department of Anthropology, Florida State University, Bellamy Hall, Tallahassee, Florida 32306; (904) 644-4281.



The Education Station is designed as a pull-out section of resources and information for archaeology educators

DIGGING, DIVING, AND DOCUMENTING

AT THE LAKE CHAMPLAIN MARITIME MUSEUM

Laurie T. Eddy

The study of historic shipwrecks is a mystery-laden experience that requires imagination, creativity, and logic. Students of all ages are fascinated by shipwrecks.

These sunken vessels enrich our body of knowledge about the past because each wreck is a time capsule. In the past, shipwrecks were raised from the water, but most did not survive the destabilizing transition from water to air, and they simply rotted away. Today, technology enables us to study historic shipwrecks under water (in situ).

The cold, fresh water of Lake Champlain contains one of the best-preserved

collections of historic wooden shipwrecks in North America. Vessels representing each era of the maritime history of the United States can be found at the lake's bottom, including Native American dugout canoes; military vessels from the French and Indian War, American Revolution, and the War of 1812; and commercial vessels of all descriptions.

Since 1980, the Lake Champlain Maritime Museum (LCMM) at Basin Harbor, Vt., has conducted research to locate and document submerged vessels. In 1993, LCMM developed an educational field trip program entitled "Digging, Diving, and Documenting: The Process of Nautical Archaeology." This two-and-a-half-hour, hands-on museum program teaches shipwreck documentation skills. It is a curriculum that uses nautical archaeology as a vehicle to engage students' interest and stimulate learning across content areas, including history, math, science, and art.

Teachers of grades four and higher are given pre- and post-visit materials focusing on the intriguing stories of Lake



Students plot artifact locations in the shipwreck simulator, a 16-foot wooden rowboat. Photo courtesy of the Lake Champlain Maritime Museum.

Champlain's shipwrecks. Pre-visit lessons prepare students by introducing basic technology used in shipwreck discovery and artifact recovery, as well as required mapping skills.

During their museum visit, student teams engage in a series of hands-on activities. They examine scuba gear and discuss the challenges of working and communicating under water, particularly in cold environments.

The "shipwreck simulator," a focal point of the program, consists of a 16-foot wooden rowboat in a sand bed, with a suspended grid. Wearing three-fingered neoprene mitts and working with

basic recording tools, student teams map assigned grid squares; gather information about artifacts and their locations; and document construction details for clues to the vessel's age, function, and demise. After the exercise, drawings from each grid are placed together to create a picture of the vessel and its contents. In a group discussion, students describe their findings, consider the significance of artifact distributions, and develop hypotheses about the shipwreck.

Teachers who use the study of submerged cultural resources in their curricula discover that it is not only a way to teach regional history, but also a tool for studying the consequences of human behavior and decision making. "Digging, Diving, and Documenting" helps participants to connect the unique regional history, and to become site stewards for these irreplaceable, nonrenewable resources.

Laurie T. Eddy is educational director of the Lake Champlain Maritime Museum, R.R. 3, Box 4092, Vergennes, VT 05491; (802) 475-2022.

HOW TO BECOME A Shipwreck Sleuth

Overview

Artifacts provide important clues to a shipwreck's identity, origin, and cause of sinking. Analysis of artifacts and the context in which they are found is an integral aspect of nautical archaeology.

Note: Although this lesson idea deals with a shipwreck in Vermont, teachers can adapt the concept and strategy to a site in their state or region.

Objectives

Students will

- recognize the importance of artifacts in interpreting history
- use artifacts to develop hypotheses about a past culture
- analyze a collection of artifacts from a Lake Champlain shipwreck
- determine the vessel's origin, purpose, and cause of sinking

Subjects/Skills

- social studies
- analysis, interpretation, deduction

Grade Level

Grades 4–12

Materials

- copies of the Mystery Shipwreck Artifact Collection sheet (page 9)

Time Required

Allow 30 minutes to prepare for this activity, and one class period to complete it.

Background

Read the "Mystery Shipwreck Artifact Collection: The True Story" insert on this page.

Preparation

Copy the Mystery Shipwreck Artifact Collection sheet for students to use in small groups.

Procedure

1. Ask students to imagine that they

are scuba divers who have discovered a shipwreck. Instruct them to create a list of questions about the site, e.g., How old is it? How did it sink? What was it used for? Who was on board?.

2. List some of the information and data that would help to answer these questions: What physical evidence is

Continued on page 10

Mystery Shipwreck Artifact Collection:

THE TRUE STORY

Artifacts shown on page 9 are from the *General Butler*, a canal boat that sailed on lakes and canals. Its design originated in 1823, simultaneous with the opening of the Champlain Canal.

On Saturday, December 9, 1876, the *General Butler* was bringing a load of marble from Isle la Motte to the marble works in Burlington, Vermont. There were five people aboard: Captain William Montgomery, his 15-year-old daughter and her girlfriend, an injured man being transported to the hospital, and one deck hand. As the boat approached Burlington, the lake was engulfed in a severe early winter gale—the kind that sailors talk about for years. The force of the storm caused the vessel's steering to break, and although the captain attempted to save the vessel by jury-rigging a tiller bar, the *General Butler* crashed into the Burlington breakwater. The vessel survived the pounding of the gale long enough for the five people to leap onto the ice-covered stones.

Captain Montgomery was the last to leave the ship. Immediately after he jumped at the crest of a large wave, the *General Butler* sank in 40 feet of water, its cargo propelling it downward. The survivors were not out of danger. The breakwater was 1,000 feet from shore, and waves were crashing over

them. The captain and his passengers surely would have died if not for the bravery of James Wakefield and his son, who rowed out in a 14-foot rowboat to rescue the freezing passengers.

Found by divers in 1980, the *General Butler* became the subject of an underwater archaeological project to document her construction and artifacts. A management plan was developed for the historic site, which now is one of five shipwrecks open to scuba divers as part of the Vermont Underwater Historic Shipwreck Preserve.

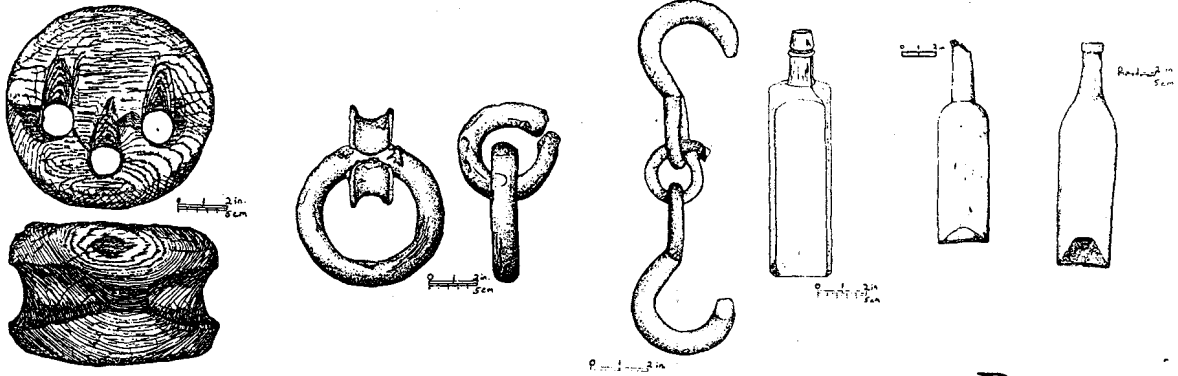
Artifacts found in the bow:

- wooden deadeye, used for rigging the sails
- iron ring and rope thimble
- iron hooks
- two brown glass bottles
- green glass bottle

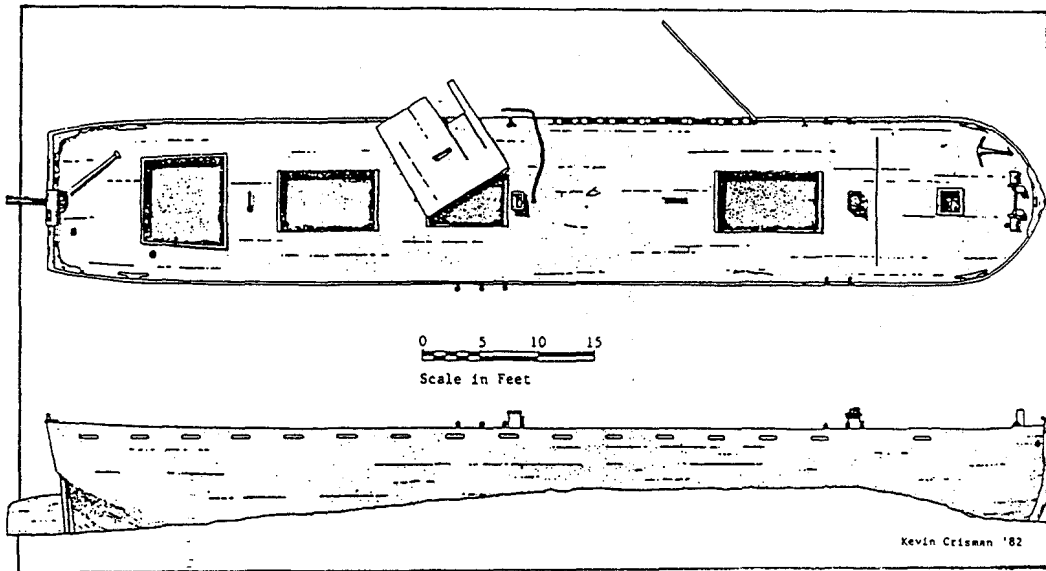
Artifacts found in the stern:

- stoneware jug
- nickel-plated copper spoons
- ceramic doll
- clear drinking glass
- man's leather boot
- ironstone plate
- woman's skirt
- ironstone chamber pot
- medicine bottle
- two-gallon stoneware crock

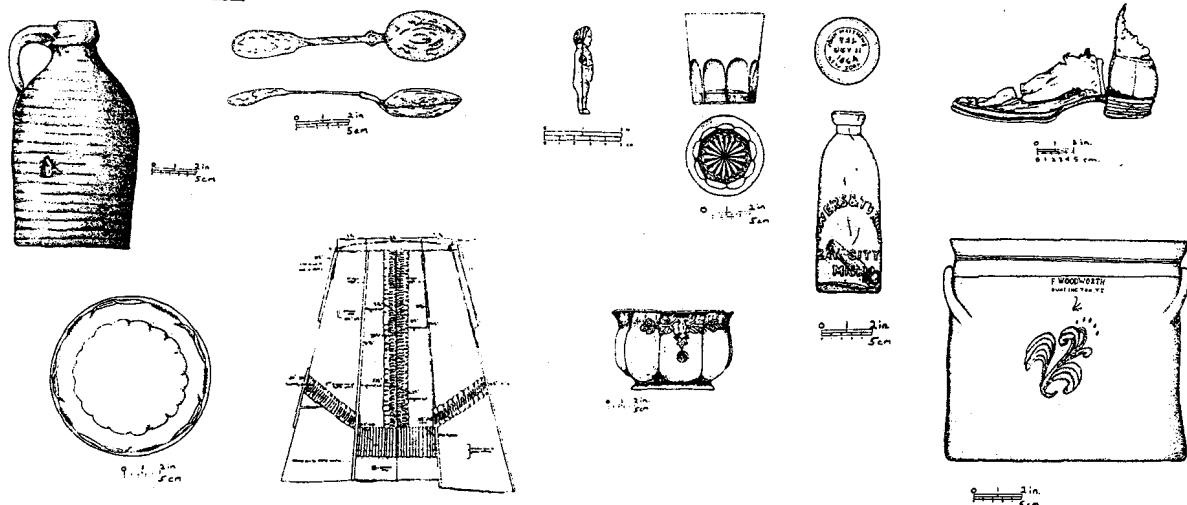
Mystery Shipwreck Artifact Collection



Bow



Stern



Continued from page 8

available? How was the ship constructed? What is the condition of materials found at the site?

3. Explain that shipwrecks reveal clues to their identity through structural materials and design. Artifacts found in the vessel and its debris field also help to tell the story of the people who lived, fought, or worked on board. The context (location) of the artifacts provides vital clues about how the ship worked and how it sank. Moving artifacts without first creating a site map can destroy valuable information.

4. Divide students into small groups and distribute copies of the artifact collection sheet. Ask students to

use clues from the artifacts to develop hypotheses for the following questions:

- What was the purpose of the ship?
- Into what time period on Lake Champlain does this vessel fit?
- What types of people probably were on board?
- When and why did the ship sink?

5. Reassemble the groups and allow each to share its hypotheses. Ask students to explain how they reached their conclusions and to cite the evidence used. (What facts determined the date of the vessel? What did they look at to determine how the vessel sank?)

6. Use background material to reveal the story of the wreck. Highlight details that match student hypotheses.

Extensions

- Create a diorama of the *General Butler*.

- Research the *General Butler* or another Lake Champlain shipwreck. Share your findings with other students in an oral report, art project, or written paper.

- Create a collection of objects that represent your life. What might a future archaeologist say about your culture based on these items?

This lesson plan was provided by the Lake Champlain Maritime Museum, R.R. 3, Box 4092, Vergennes, VT 05491. For more information, contact Laurie Eddy, (802) 475-2022.

RESOURCES FOR TEACHERS

Compiled by KC Smith

Ballard, Robert *Exploring the Titanic*. (Toronto: Madison Press Books, 1988).

This book captures the drama of the sinking of the ship and the discovery of her remains. It is amply illustrated, includes a glossary and timeline, and the inside of the dust jacket is a poster suitable for hanging. *Ages 8-12*

Ballard, Robert. *The Lost Wreck of the Isis*. (Toronto: Madison Press Books, 1990).

A team of researchers explores the remains of an ancient shipwreck in the Mediterranean, introducing not only 4th-century Roman life but also the process of investigating a shipwreck. *Upper elementary and secondary*

Bass, George. *Ships and Shipwrecks of the Americas*. (London: Thames and Hudson, 1988).

From dugout canoes to the USS *Arizona*, New World maritime history and shipwreck archaeology are presented in an authoritative and lavishly illustrated collection of essays by nautical archaeologists. *High school and older*

Bernier, Marc-André and Robert Grenier. *Les Archéologues aux Pieds Palmés*. (Quebec: Les Éditions Héritage, 1996).

Richly embellished with photographs and illustrations, this firsthand account relates the story of a 400-year-old Basque whaling vessel in Red Bay, Labrador. Written in French, the engaging and informative text discusses this ship's history, discovery, and archaeological excavation. *Secondary*

Hawcock, David. *Shipwrecks*. (London: Sadie Fields Productions, 1993).

Historic shipwrecks literally leap from the pages through pop-up and interactive elements

in this book. Colorful illustrations combined with brief but informative text enable readers to learn about six sites in the Old and New Worlds as well as the processes of underwater archaeology. *Elementary*

Macaulay, David. *Ship*. (New York: Houghton Mifflin Company, 1993).

Underwater archaeologists search for a ship in the Caribbean, dating to the time of Columbus. Based on research conducted by the Institute of Nautical Archaeology at Texas A&M University, the story describes the recovery of artifacts, archival research, and the reconstruction of the story of a fictitious vessel. *Secondary*

Tritton, Roger et al. *The Visual Dictionary of Ships and Sailing*. (New York: Dorling Kindersley, 1991).

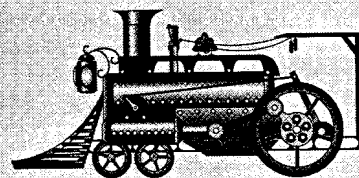
Any study of nautical history and underwater archaeology will benefit from this well-illustrated, easy-to-read compendium of ship and sailing terms. The inner workings of vessels, navigational tools, signals, charts, scuba equipment, and more are explained with exploded views and cutaway photos and illustrations. *Secondary*

Tuck, James A. and Robert Grenier. *Red Bay, Labrador. World Whaling Capital, A.D. 1550-1600*. (St. Johns, Newfoundland: Atlantic Archaeology, 1989).

Readers learn about the 16th-century Basque whaling tradition at Red Bay, Labrador, through discussion of terrestrial and underwater archaeological research conducted at the site. Illustrations and easy-to-read text provide an overview of the cultural, historical, environmental, and archaeological elements of an important research project. *Secondary and older*

Correction

In the last issue of *Archaeology and Public Education* (Vol. 7, No. 1), we included inaccurate information in the lesson idea, "Learning about Diets of Ancient Cultures." In the boxed "Example of Resource Handout" on page 9, the sweet potato, quinoa, and llama incorrectly are listed as traditional foods of the Aztec of Mesoamerica. These products were used by populations elsewhere in the hemisphere.



The Education Station invites examples of lesson plans and activity ideas, comments about useful resources, and articles about unique approaches to teaching archaeology. Please accompany text with illustrations or photographs. Black-and-white prints are preferred, although color slides and prints can be used. Do not send negatives.

Send material to Cathy MacDonald, 570 Walsh Drive, Port Perry, Ontario L9L 1K9, Canada; (905) 666-2010.



Public Outreach

On The La Salle Shipwreck

Pam Wheat

In summer 1995, when archaeologists from the Texas Historical Commission (THC) located the wreck of the *Belle*, the ship of Robert Cavelier, Sieur de La Salle, lost in 1684, they recognized the importance of the discovery. Not only did the site have tremendous research value, but it also provided an opportunity for public involvement.

Even before the excavation began, the communications division of the THC prepared fact sheets, photographs, and announcements to be used by the press and media. Trips to the site for reporters and photographers were coordinated and led by the communications staff. Local, national, and international representatives responded with enthusiasm. Articles appeared in newspapers in major cities, were circulated by news services, and proposed by significant periodicals. To ensure that reporters had access to the working archaeologists, careful scheduling was implemented.

Involving The Public

A visitors' platform was constructed as part of the cofferdam that enclosed the site and protected it from the waters of Matagorda Bay. This "viewing deck" enabled tourists to watch the excavation from above. Commercial boat captains ferried many onlookers—some on numerous occasions—to the site, which is located 15 miles offshore of Palacios, Texas. The THC recruited docents from the agency to relate the history, progress, and ongoing excavation to visitors. This meant greater involvement of nonarchaeological staff from the beginning. A local foundation arranged for volunteers from near and far to be transported to the site or lab to screen buckets of sandy mud as they were removed from the excavation. These volunteers saved the THC from hiring additional workers at the site, but more important, they invested some of themselves in the project.

Artifacts brought to the surface in 1995 were mounted in a traveling exhibit that was the Corpus Christi Museum of Science and History. This display toured communities along



Site visitors look down on the shipwreck excavation, which actually is below the water level outside the cofferdam. Photo courtesy of the Texas Historical Commission.

the Texas coast and showed viewers what can be learned from archaeological projects. The panels in the exhibit integrate historical documents with artifacts and present the importance of preservation. To maximize the exhibit's educational impact, educators and docents attended workshops presented by the project educational coordinator. Site-specific curriculum incorporated learning objectives already mandated by state educational documents.

Over The Internet

An Internet site begun by a volunteer was integrated into the THC home page (<http://www.thc.state.tx.us>). This connection to the World Wide Web provides information and photographs of the excavation to people around the world. Because educators and students were frequent users of the information, an electronic newsletter, *Journeys*, was designed. This newsletter also is located at the THC home page and provides thematic activities and resources for teachers and students, as well as an email address (journeys@thc.state.tx.us) for queries.

A Worthwhile Investment

The Texas legislature allocated \$1.7 million to initiate the project. Its continuing involvement validated the outlay of funds and staff. Site visitors number in the thousands. The local school district ferried all high school students to see this historically important happening. Viewers to the exhibit created new attendance records for area museums and historical societies. News articles brought thousands of unsolicited dollars to the project. But most of all, the public has a new awareness of the rich heritage that exists under water and an appreciation of the value of archaeology in recovering that story.

Pam Wheat is education coordinator for the La Salle Shipwreck Project, Division of Antiquities Protection, Texas Historical Commission, P.O. Box 12276, Austin, TX 78711-2276; (512) 463-7021.

Florida Preserves . . .

Continued from page 3

The steamboat *City of Hawkinsville*, lying on the bottom of the Suwannee River in north Florida, became the state's third shipwreck park in 1992. Nominated by a local high school principal whose students helped to map and evaluate the site, *Hawkinsville* is a surprisingly intact example of late-19th-century steamboat technology. The largest and the last steamboat to ply the Suwannee, she was forgotten until local divers found her near an old landing, with paddle wheel and steam machinery still in place.

In the following year, USS *Massachusetts* (BB-2), the nation's oldest surviving battleship, became a preserve. Scuttled as an artillery target off Pensacola in 1922, the antique warship has spent more than 70 of her 100 years as a giant artificial reef. The vessel was nominated by a local diver and sponsored by a citizen group, Friends of the USS *Massachusetts* (BB-2), who dedicated the new preserve amid much fanfare on the 100th anniversary of the battleship's launching. A fifth preserve, the English steamer *Copenhagen*, which wrecked off Pompano Beach in 1900, was created in 1994 after being nominated by a local boat captain. The steamer *Tarpon*, selected from five candidates nominated by Panama City's waterfront community, was dedicated as Florida's newest underwater archaeological preserve in May.

By placing these submerged cultural resources in a broader public perspective and in a shared trust, they be-



A diver poses by the plaque placed on the site of the SS *Copenhagen*. Each of Florida's preserves has a similar monument that describes details about the vessel. Photo courtesy of the Florida Division of Historical Resources.

come important to many people, who come to expect that, as historical, recreational, and ecological attractions, the shipwrecks will be preserved for future visitors to appreciate.

Roger C. Smith is the Florida state underwater archaeologist, Bureau of Archaeological Research, 500 S. Bronough St., Tallahassee, FL 32399-0250; (904) 487-2299.

Underwater Methods . . .



As co-field director on the *La Salle* shipwreck (see page 11), the author recently participated in a unique archaeological project. An enormous, water-tight barrier was constructed around the site that enabled researchers to excavate the wreck without scuba gear. Only one other shipwreck in the U.S. has been excavated in this manner. Photo courtesy of the Texas Historical Commission.

Continued from page 5

A&M University, and the University of West Florida, while overseas instruction is offered at the University of Haifa in Israel and St. Andrew's University in Scotland. Classroom instruction is supplemented by field schools that offer hands-on experience. Many states have a state underwater archaeologist, who develops and administers cultural resource management programs. Research organizations such as the Institute of Nautical Archaeology and Western Australia Museum sponsor projects worldwide.

Archaeology under water is both similar to and different from terrestrial work. Each requires a rigorous methodology to bring the heritage preserved beneath sediments to the light of day. Underwater archaeologists must develop a system specific to the environment in which they work, just as archaeologists working in Alaska develop a strategy that is different from researchers working in Central America. The key to good archaeology is to put together a professional team to manage, excavate, record, and analyze a site and to share its findings with the public.

J. "Coz" Cozzi is a nautical archaeologist with the University of West Florida Institute of Archaeology and Anthropology, 1000 University Pkwy., Pensacola, FL 32514; (904) 474-3015.

Uluburun . . .

Continued from page 4

had been found throughout the Bronze Age Mediterranean. Weapons, some of which must have been for the protection of the ship and its crew, and bronze tools also were found. Foodstuffs included almonds, pine nuts, figs, olives, grapes, pomegranates, black cumin, sumac, coriander, wheat, and barley. Lead net and line sinkers, needles for repairing nets, fishhooks, and a bronze trident attest to onboard fishing.

Although most of the cargo is of Cypriot and Syro-Palestinian origin, items in a cargo do not identify the nationality of the ship. Better evidence comes from the ship's stone anchors, which are of a type used on the Levantine coast but virtually unknown in the Aegean. Balance weights, most tools, a razor, amulets, and personal effects of those on board are strong clues to the ship's Syro-Palestinian or Cypriot origin.

A gold-clad bronze female figurine, also of Syro-Palestinian origin, may have served as the ship's protective deity. Among the galley wares are Syro-Palestinian oil lamps with charred wick nozzles, suggesting that they were used on the ship, while those of Cypriot origin are in pristine condition. The presence of at least two Mycenaean (Bronze Age Greek) merchants or envoys is indicated by pairs of seals, swords, and glass relief beads, as well as by knives, razors, chisels, amber beads, and pottery. A bronze pin, several spearheads, and a stone ceremonial scepter-mace suggest additional contacts with lands to the north of Greece.

Perhaps the ship's lading, along with information about its home port and destination, was included in the two ivory-hinged boxwood writing boards, with wax writing surfaces (now lost). These boards represent the earliest examples of their type and suggest that Bronze Age literacy was more common than previously thought.

Excavating In The Depths

The ship lay on a steep rocky slope at a depth of 145 to 170 feet, with artifacts scattered down to more than 200 feet. Uluburun was the deepest shipwreck to be completely excavated by archaeologists; the depths involved were well beyond safe diving limits for conventional air diving. Oxygen decompression and specially calculated diving tables allowed divers to optimize diving time and minimize risks. The excavation time for each diver was limited to 15 to 20 minutes per dive, two times a day.

A hyperbaric specialist was on duty at the site at all times, and a double-lock recompression chamber was kept ready for use on the research vessel in the event of diving accidents. In 11 seasons of diving at Uluburun, totaling some 22,500 dives and 6,600 hours of excavation time on the wreck, only two serious cases of decompression sickness (bends) were recorded, both of which were fully treated at the site. Civilian and military experts alike agree that this safety record is unparalleled anywhere!

Uluburun's Significance

The Uluburun shipwreck's significance for Late Bronze Age chronology is immense. The precise date for the sinking of the ship, obtained by tree-ring dating, provides a secure date for all of the artifacts and pottery carried on board. Some of this pottery represents types crucial to archaeologists in dating their own respective Late Bronze Age mate-



A diver examines an artifact lodged among copper ingots on the Bronze Age shipwreck at Kas. Photo by Donald A. Frey, courtesy of the Institute of Nautical Archaeology.

rial. Once the Uluburun pottery is fully studied and published, archaeologists should be able to obtain more accurate dates for assemblages that include pottery in the styles found at *Uluburun*.

Uluburun is considered one of the most important Bronze Age sites ever excavated in the eastern Mediterranean. Seldom does a single site reveal such unique and abundant new information for a host of studies including the history of trade, seafaring, international relations, glass technology, metallurgy, metrology, agriculture, art, religion, and ship construction.

The cargo of vital commodities, as well as the exotica and personal effects of those on board, represents items from at least seven ancient civilizations centered on the Mediterranean and beyond (Mycenaean, Eastern European, Cypriot, Canaanite, Kassite, Assyrian, Egyptian, and Nubian) that flourished more than 3,000 years ago. The items paint a colorful and remarkable portrait of an era symbolized by the reign of Egypt's Tutankhamun and the events eventually leading to the fall of Troy. They also emphasize the strong economic ties that existed among Bronze Age kingdoms of various racial and linguistic groups that were tightly interconnected by an extensive and sophisticated network of trade routes.

Equally exciting is the new information that the site is supplying to Homeric studies. For example, the discovery of waxed wooden writing boards, the first of their type from a Bronze Age context, supports Homer's reference to folding wooden tablets. Moreover, we have not known how shipwrights constructed seagoing vessels during the time of the semi-mythic Greek heroes. The discovery of hull remains at Uluburun not only has revealed a construction method much like that used in Greco-Roman ships of a millennium later, but also has helped us understand the construction used by Odysseus when he built a ship to escape from an island where he was held captive.

Cemal Pulak is the director of research in Turkey for the Institute for Nautical Archaeology, P.O. Drawer HG, College Station, TX, 77841-5137; (409) 845-6694.

Network News

Beverly Mitchum Chiarulli, Network Coordinator

The Society for American Archaeology has awarded grants to Minnesota and Montana for the second year of the Archaeology Education Coordinator pilot project. The grants are funded by a partnership between SAA and three federal agencies—the Bureau of Reclamation, Bureau of Land Management, and National Park Service. Each of the \$12,500 grants is for a one-year project extending from January to December 1997.

The idea behind the grants is to create incentives for states to develop model archaeology education programs in response to their local archaeological and educational settings. When these two state projects are completed, a report on the activities undertaken during this year, and by Pennsylvania during the first year, will serve as a resource guide for other states. It also is hoped that the results of this pilot project will encourage potential sponsors to see the effectiveness of pooling resources to support archaeology education programs.

The Minnesota pilot will develop a resource guide for

Minnesota archaeology, available in a hard copy version and through the World Wide Web; create state-specific lesson plans that will be distributed on the reverse side of Archaeology Week posters each year; and redesign existing teacher workshops and university course offerings to include this new material. For information, contact Phyllis Messenger or James Meyster in care of the Anthropology Department, Hamline University, 1536 Hewitt Ave., St. Paul, MN 55105; (612) 641-2800.

Montana's project, entitled the "Ancient Teachings Education Project," will create an inventory of existing curriculum materials, videos, speakers lists, videos, and other resources. The coordinators will use this inventory to create curriculum packages and to sponsor workshops for teachers and archaeologists. The final goal of the project is to use the pilot project to develop partnerships to sustain and expand this effort. For more information, contact Mark F. Baumler or Marcella Sherfy Walter at the Montana Historical Society, 225 N. Roberts, Helena, MT 59620; (406) 444-7721.

Archaeological Parks

Mary L. Kwas, Parks Column Editor

Many archaeological parks offer a variety of activities—including tours, classes, and special events—throughout the summer for families, scouts, day camps, and other groups. Give your local archaeological park a call to find out about forthcoming events.

Archaeological parks can send information to me at the Arkansas Archeological Survey, P.O. Box 1249, Fayetteville, AR 72702-1249; (501) 575-6560, (fax) 575-5453. I really would like to hear from archaeological parks in the West!

Dickson Mounds State Museum, Lewistown, Ill., opened dramatically new exhibits about two years ago; if you're in the area, be sure to see them. Recent and forthcoming hour-long workshops include "The Spirit of the Animals," which explores the relationship between animals and Native Americans; "Pottery—From Trash to Treasure," which focuses on the information that pottery can reveal about peoples' lives; and "In Search of the Past," a workshop on archaeological methods. Contact: (309) 547-3721.

Grand Mound Center, International Falls, Minn., has a variety of activities scheduled for the summer. Among them is an "Ancient Technologies Day" on June 22, during which visitors can learn about cordage, harpoons, and bow drills; and a "Kids' Day" on July 20, during which 7-to-14 year-olds can learn about archaeology and Native American history and culture. Contact: (218) 285-3332.

Wickliffe Mounds, Wickliffe, Ky., is in the second year of its volunteer program, adding six new docents to help with site interpretation. Upcoming programs include an archaeology weekend, June 28-29, and a basket making workshop, July 26-27. Contact: (502) 335-3681.

Spiro Mounds Archaeological Park, Spiro, Okla., will offer a "Summer Solstice Observance and Night Walk" on June 20-21. During the day on June 20, guided tours of the site will be held with discussions of the Spiro Mounds culture and environments. On both nights, an archaeologist-led night walk will be held. Contact: (918) 962-2062.

Toltec Mounds Archeological State Park, Scott, Ariz., has a slew of activities scheduled; here are some highlights. A "Primitive Skills and Games Youth Camp" will be held July 7-11 and a "Youth Archeology Camp" on July 21-26. Additional workshops will deal with feathered fans, the atlatl, and sand painting. Contact: (501) 961-2420.

Chucalissa Museum, Memphis, Tenn., has presented a variety of interesting events recently. In April and May, it featured a photographic exhibit of ancient Mid-South pottery and sponsored a Family Day with magic, storytelling, and music. In early summer a juried Native American fine art exhibition is planned. Contact: (901) 785-3160.

Continued on page 15

WORTH NOTING

Society For Primitive Technology

Are you looking for information on how stone tools were made, use of wild plants, making pottery, or any other kind of primitive technology? If so, you might be interested in the Society for Primitive Technology (SPT). This nonprofit organization was formed to promote the practice and teaching of aboriginal skills; to foster communication between teachers and practitioners; and to set standards for authenticity, ethics, and quality. The group publishes a bi-annual journal, *The Bulletin of Primitive Technology*, and bi-annual newsletters. Recent issues have included articles on projects and programs for kids, flutes, carving, cave art, pump-drill fires, cordage, and using wild plants. Membership is \$25.00 per year. Back issues of most of the journals can be ordered. Contact the SPT, P.O. Box 905, Rexburg, ID 83440.

Online-Offline!

Online-Offline! is a new publication designed to support student learning and assist K-8 teachers and librarians by linking classroom interdisciplinary themes with Web sites and other resources including videos, books, and magazine articles from school or community libraries. The first issue published in September 1996 focused on the theme of water; the second issue addressed "Life in Remote Places, Patterns, and Time." Information on the publication can be found at Rockhill Press's Web site: <http://www.rockhillpress.com>.

Shipwreck Museum Features Web Site

The New Jersey Historical Divers Association has set up a web site for the up-and-coming New Jersey Shipwreck Museum. The site, currently a work in progress, will contain information on the museum's archives and keep visitors

Parks . . .

Continued from page 14

Cahokia Mounds State Historic Site, Collinsville, Ill., had a busy spring agenda. In April it hosted Native American dancers on two weekends and sponsored a prehistoric lifeways program that featured ancient Indian craft and tool demonstrations. May also was a busy month, with Native American storytelling and music, a three-mile hike through archaeological and natural areas; and a kids' day that presented crafts, games, and dancing. Contact: (618) 346-5166.

updated on museum events and exhibits once the museum opens its doors. The Web site is intended to be used as a research tool and educational aid.

The Association invites archaeological, educators, historians and scuba divers to review the site for speed, format, usability, and usefulness. The web address is: <http://members.aol.com/aqualieb/index.html>. Feedback can be sent to Dan Lieb, association treasurer, at aqualieb@aol.com.

Virtual Visit To The "Reef of Heaven"

A virtual photo album has been created in order to expose more people to Nan Madol, the "Reef of Heaven" in the Carolina Islands. Designated by the U.S. Department of the Interior as a National Historic Landmark, Nan Madol is a complex covering nearly 150 acres in shallow water. Radiocarbon dates place the site as far back as A.D. 1200. Recent excavations below the tidal level indicate occupation may have been as early as 200 B.C. Visit the web site at http://www.artlook.com/Antiquities/Nan_Madol.

Public Outreach Grants

The Southeastern Archaeological Conference invites applications for 1997 for a program of small grants to finance public outreach. Proposed projects should promote public awareness of archaeology in the Southeast. Most grants will be for activities held in conjunction with the SEAC annual meeting. Funding for teacher workshops, public symposia, field trips for the public to archaeological sites, printed material, or Native American outreach programs is encouraged. Grants will not exceed \$1,000 per year. The deadline for submitting proposals is July 1. Notification of awards will be made by August 1. Proposals should be submitted to Dick Jefferies, Department of Anthropology, 211 Lafferty Hall, University of Kentucky, Lexington, KY 40506. For additional information, contact Jefferies at (606) 257-2710.

Position Announcement

The University of Arizona, Department of Anthropology, seeks a one-year, temporary, full-time archaeologist to teach three undergraduate courses per semester, beginning in the fall of 1997. The Ph.D. is required, and teaching experience is desired. Review of applications begins June 6, 1997, and continues until July 15, 1997.

Interested persons should send a letter of application, C.V., and the names and addresses of three references to the Archaeology Search Committee, Department of Anthropology, University of Arizona, P.O. Box 210030, Tucson, AZ 85721. Applications will be accepted no later than July 15, 1997. The University of Arizona is an EEO/AA employer and encourages applications from minorities, women, persons with disabilities, and veterans. M/W/D/V.

Email Addresses

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NEWS AND NOTES

Archaeology Merit Badge

The National Council of the Boy Scouts of America is introducing a new merit badge that scouts can earn by working with qualified archaeologists and fulfilling a specific set of requirements. A comprehensive pamphlet outlining requirements and explaining the subject for scouts has been distributed nationally.

Qualified counselors will be certified on a state-by-state basis so that they will be knowledgeable about archaeological standards in their respective states. Certification will be given by state historic preservation offices, state archaeologists, or another agency within each state.

To prepare archaeologists to respond to requests for the merit badge, the SAA Public Education Committee sponsored a workshop entitled "Implementing the Archaeology Merit Badge in Your Community" at the annual society meeting in Nashville in April. The workshop provided information about why the merit badge was adopted, requirements, and recruitment of counselors and qualified archaeologists. It also explored educational and practical implications of implementing the badge.

For more information, contact Alan Skinner at (214) 368-0478 or Pam Wheat at (512) 463-7021.

Summer Fieldwork

The Archaeological Institute of America (AIA) has published its 1997 "Archaeological Fieldwork Opportunities Bulletin." The Bulletin is a comprehensive guide to excavations, field schools, and special programs with openings for volunteers, students, and staff around the world. The price is \$9 for AIA members and \$11 for non-members, plus \$4.00 for shipping. All orders must be prepaid. To order by VISA or Mastercard, call (800) 228-0810. Send other orders and checks to Kendall/Hunt Publishing Co., Order Department, 4050 Westmark Dr., Dubuque, IA 52002. For more information, contact Susanna Burns, AIA publications man-

ager, (617) 353-8708; or email her at susannab@bu.edu.

The Society for California Archaeology lists field schools and fieldwork opportunities on its Web site (<http://www.scanet.org>).

The National Center for Preservation Technology and Training also is making available information on field school opportunities via its Web site (<http://www.cr.nps.gov/ncptt>) and fax-on-demand computer system at (318) 357-3214.

Education Award

The SAA has called for nominations for the 1998 Excellence in Public Education Award. Eligible candidates are individuals such as teachers, museum educators, administrators, and interpreters who have contributed substantially to public education through writ-

ing, speaking, or otherwise presenting information about archaeology to the public. Nominees will be evaluated according to their creativity, leadership, and public impact.


Nominations should consist of a letter identifying the nominee and explaining his or her contribution to public education. Letters may be accompanied by a vita, resume, and other supporting data. Send nominations by December 1 to Amy A. Douglass, Tempe Historical Museum, 809 E. Southern Ave., Tempe, AZ 85282. For information, contact Amy at (602) 350-5105.

**Deadline for fall
issue: June 23**

Theme: Rock Art



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