INA NEWSLETTER

Vol. 17 No. 3 Fall 1990

INSIDE: SURVEY OF A MAYA HARBOR

INA NEWSLETTER

Volume 17, Number 3 Fall 1990

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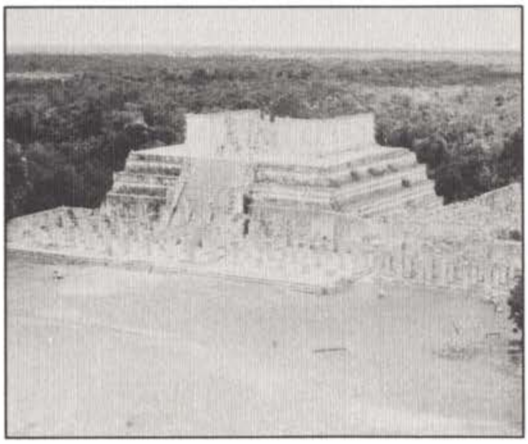
The INA Newsletter is published quarterly.
Editor: Cheryl Haldane
Publisher: Margaret Lynch

Below: *The Temple of the Warriors is a principal structure at Chichén Itzá. Several murals painted upon the temple walls (originally fragmented and since destroyed) depicted coastal scenes, warriors, and watercraft. Isla Cerritos is considered to have been the main port of Chichén Itzá. (Photo: M.E. Leshikar)*



On the Cover: *A scene from the Temple of the Warriors depicts a coastal village with three vessels in the foreground. Though the scene is peaceful, each canoe carries an oarsman and two armed warrior passengers. Saltwater creatures, including a turtle, stingray, crab, fish, and shellfish, underscore the fact that it is a coastal scene. (Reprinted from Morris et al. 1931, Plate 159)*

Clues From a Maya Harbor

RECONNAISSANCE SURVEY AT ISLA CERRITOS, YUCATÁN, MEXICO, PROVIDES INSIGHTS INTO SEAFARING AMONG THE PRE-COLUMBIAN MAYA

by Margaret E. Leshikar

An aerial view of Isla Cerritos reveals the presence of a seawall. The 200-meter-diameter island is surrounded by a shallow sea. (Photo: A.P. Andrews)

In pre-Columbian times, Maya peoples flourished throughout the Yucatán Peninsula and south to the Guatemala highlands, engaging in extensive long-distance trade over coastal as well as riverine avenues. By A.D. 1000, Maya seafarers navigated all the way from Central Mexico to Panama, implying the development of watercraft seaworthy enough to accommodate such prodigious distances. Isla Cerritos, a small island located 500 meters off the north coast of Yucatán, Mexico, near the modern village of San Felipe, was among the string of ports located along the coastal trading route. Although the site was inhabited between 100 B.C. and A.D. 1200, its most intensive occupation was between A.D. 750 and 1200 in the Terminal Classic and Early Postclassic Periods. Isla Cerritos is considered to have been the main coastal port of Chichén Itzá, the principal city of the northern peninsula during this era.

Sixteenth-century ethnohistoric sources document Maya use of single-log dugout canoes. The Maya traversed waters as diverse as lakes, rivers and the sea, and probably created different canoe types to cope with varied environments. In fact, several different canoe shapes appear in the iconography of the important Maya sites, Chichén Itzá and Tikal. Our earliest description of a Maya canoe dates to the dawn of the 16th century when Christopher Columbus encountered a freighted merchant canoe off the Bay Islands of Honduras. His son Ferdinand reported that it was eight

Boatsmen still maneuver between the seawall and shore of Isla Cerritos by poling. (Photo: M.E. Leshikar)

feet wide and as long as a galley, but modern scholars have discovered no detailed descriptions or archaeological finds that can provide substantial and concrete facts about Maya watercraft and seafaring capabilities. Today, hypotheses are based solely on indirect evidence, which must suffice until more proof is found.

In the last two decades, scholars have become intrigued by Maya seaborne trade and coastal trading ports. In 1984 and 1985, a team led by archaeologists Anthony P. Andrews and Tomás Gallareta Negrón conducted archaeological studies which focused principally on terrestrial evidence at the important port of Isla Cerritos and at Paso del Cerro, the corresponding mainland site. Their project, funded primarily by the National Geographic Society, also included basic mapping of coastal features and an artificial harbor wall which is unique in the Maya area. Andrews, Gallareta and their colleagues (1988) suggest that the artificial harbor wall and shoreline facilities attest to the importance of maritime activities at Isla Cerritos.

A Nautical Perspective

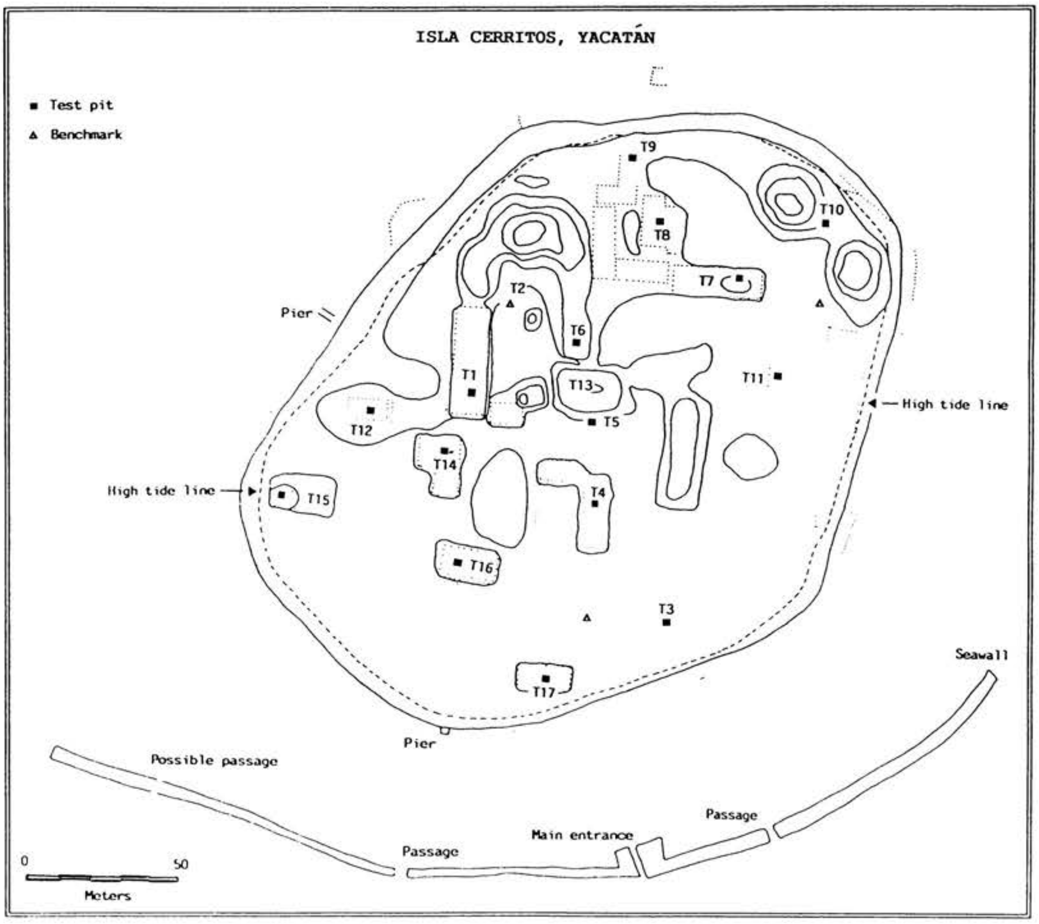
As a nautical archaeologist, I was fascinated by the suggestion of manmade harbor structures associated with an important pre-Hispanic Maya port complex. I wondered what could be learned about the harbor and the people and vessels that sheltered there by approaching the site from a nautical viewpoint. Andrews and Gallareta agreed that underwater work, and attention to such environmental factors as water depth, prevailing winds and currents, and the proximity of freshwater sources, could contribute to earlier studies of the site. I planned a preliminary investigation to answer basic questions and explore the feasibility of further documenting underwater features at Isla Cerritos. The survey would last for two weeks in June, 1990.

At the Centro Regional de Yucatán, INAH, Dennis Denton and I met with research associate Fernando Robles Castellanos, ceramicist for the original Isla Cerritos project, and examined artifacts recovered from earlier excavations on the island. Rafael Cobos, professor in anthropology at the Escuela de Ciencias Antropologicas de la Universidad Autonoma de Yucatán and a previous project member, acquainted us with the remote port of San Felipe where the project was based. He also introduced us to Don Beto Correa, official guardian of the Dźilam Reserva Ecológica and foreman for the Isla Cerritos terrestrial project, and his son Manuel Correa. Both men were particularly helpful as guides and informants, and provided boat transportation to the island and associated sites.

The Survey

On the first day Rafael Cobos and Don Beto Correa took us to Isla Cerritos to familiarize us with the site. The overgrown interior of the island was difficult to penetrate, but the perimeter had been scoured in 1988 when Hurricane Gilbert engulfed the site. Structure 21, located on the northeast tip of Isla Cerritos, and one of four small pyramidal mounds on the island, had been partially exposed during the storm. For that reason, architectural details were apparent, including large quarried stones in place around the borders of the building. According to Cobos, they probably came from Chinalco, located about four km inland from Paso del Cerro on the mainland. Their size implied to us that fairly large

An archaeological plan of Isla Cerritos includes remains of terraces, docks and piers, as well as an offshore seawall. (Plan after Andrews; reprinted courtesy of the Isla Cerritos Archaeological Project)



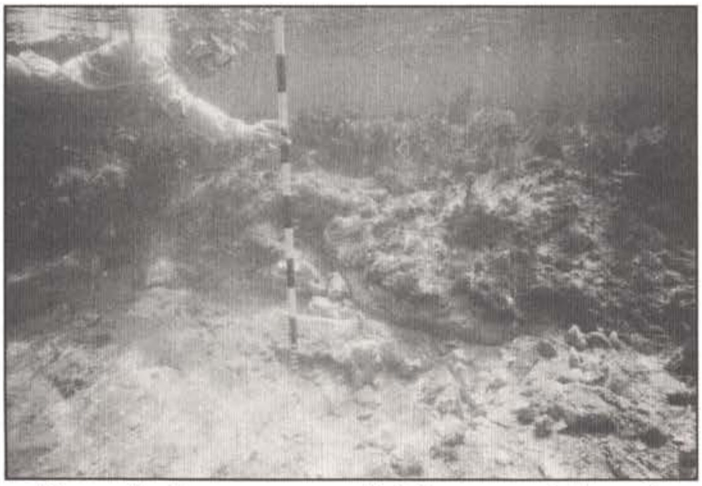
canoes or rafts must have been used to transport the stones over water to Isla Cerritos. Those vessels also must have been very shallow in draft, for the sea between Paso del Cerro and Isla Cerritos, and particularly the immediate area surrounding the island and its harbor, is not deep.

Ceramic sherds almost pave the surface of the island. According to Andrews and his colleagues, it is largely an artificial island which has been intensively occupied so that it resembles a Near Eastern tell in many ways. Their work, which included test excavations, led to the establishment of the first ceramics sequence, comprising five ceramic complexes, for eastern Yucatán.

Artifacts, particularly ceramics, are also present on the seabed within the harbor, but the abundance of sherds on shore, combined with erosion caused by storms like Hurricane Gilbert, suggested that we could not rely on the context of exposed finds. We hoped intact stratigraphic deposits might exist underwater as they do on land. If so, artifacts excavated from the harbor would indicate not only its chronology and perhaps length of use but also provide clues to nationalities of seafarers who had owned them or carried them as cargo.

We surveyed the harbor for intact stratigraphic deposits and recorded water depth as well as general seafloor topography to determine the maximum draft of vessels that could have sheltered there. We probed through the sediment at 10 meter intervals with a two millimeter stainless steel rod on six transects, working from the seawall to the island, beginning at the east end of the seawall. Other transects began at the east passage, the main channel, a potential passage 73 meters west of the main channel, an area of exposed stone 138 meters west of the main channel, and at the west end of the seawall.

The seabed consists of a flat, limestone, hardpan bottom with little variation. Seldom as much as 50 cm of sediment overburden exists, except very close to the island, and in some areas the seafloor was scoured down to the flat hardpan. Such shallow sediments rarely preserve intact archaeological deposits, but we did locate a few areas of more consolidated and somewhat deeper sediments next to the seawall and adjacent to Isla Cerritos. We also discovered what seems to be a 3.3 meter wide passage in the seawall. This important feature, about 73 meters west of the main entrance, is filled in with about a meter of sediment and vegetation and may also reveal some intact deposits.



The author's survey recorded features of the main passage through the seawall. Only two meters wide, the passage lies in waters just over a meter deep. (Photo: D.D. Denton)

Throughout the harbor, the limestone bottom is relatively even, ranging from about 0.8-1.15 meters from the surface at mid-tide. Tidal fluctuation is about half a meter, so if there were no sediment at all in the harbor, water depth would remain at about 1-1.4 meters at high tide. Only shallow draft vessels drawing less than that could have used the harbor at Isla Cerritos. Since canoes can be sizeable and still maintain minimal draft, the shallow harbor would not prevent the Maya from bringing relatively large vessels into the harbor either through the seawall entrances or around its ends. Even though the main entrance would only accommodate craft less than two meters in beam, canoes as wide as three meters could have entered through the passage located 73 meters west of the main entrance.

When we examined the seawall, we found that thick, dark green, broad-leaf vegetation masked its features. We followed its course by feeling the tops of large stones by hand and by probing with the stainless steel rod. The spongy, broad-leafed plants flourished on top of the wall and in patches elsewhere, while lighter colored eel grass, turtle grass and a branching plant grew in the thicker sediment beside the wall. In other places, particularly near the main entrance and east passage, the hardpan seafloor was scoured and stones from the wall were somewhat scattered. We observed that many sections of the seawall seemed to have been built of large stones piled together. But in other areas, particularly in the entrances, vertical slabs (though not uniformly quarried) created an edge backed by large stones. The seawall is currently less than one meter high and better preserved at its western end where several large stones often protrude above the surface.

A close examination of the two entrances was undertaken. The east passage, about 2.7 meters wide, was more disturbed than the main entrance, which is only about 1.1 meters deep and, even allowing for disturbed stones, is less than two meters wide. We surveyed a section of the main entrance's east wall, revealing two large vertical stones placed on top of what appeared to be a large horizontal slab. The edges of the three stones were flush and line the passage, supporting its interpretation as a planned feature rather than a natural cut made later during storm conditions or caused in modern times by "rock predators" from nearby villages seeking construction materials. We could not tell whether this part of the seawall was actually built directly atop the hardpan or constructed on an existing layer of sand and rubble already present on the seafloor. No artifacts were evident between or protruding from beneath the large stones we examined.

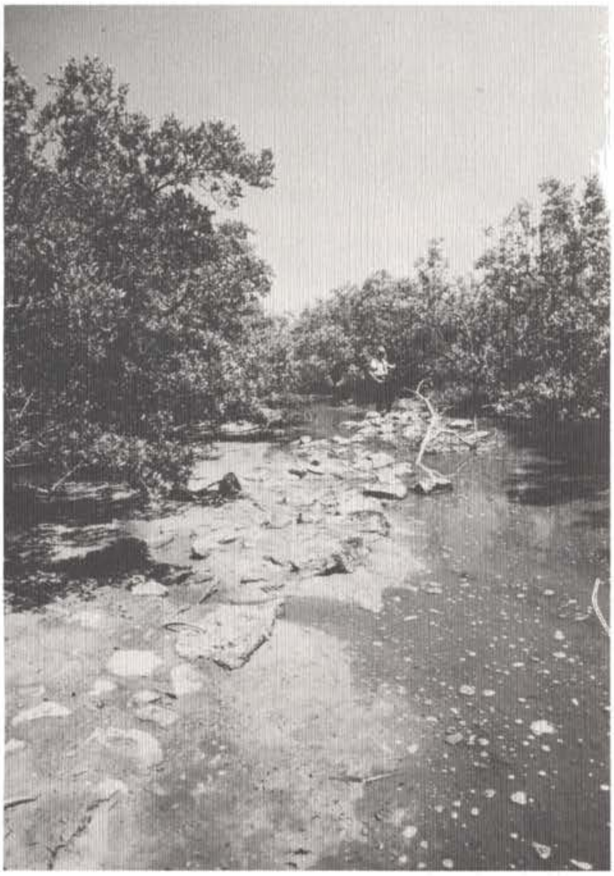
Our final task at Isla Cerritos involved surveying some of the offshore terrace and pier features that surround the island. During several circumnavigations of Isla Cerritos, we observed many features, usually composed of vertical slabs filled in with now-deflated stone rubble. Most of the vertical stones are eroded and do not seem to have ever been squared. If sediment were cleared beside some of these features, water depth would average about 0.7 meters, indicating the draft of vessels that could have approached them. Other features have not yet been mapped. In addition to forming terraces, docks and piers, some of the rock alignments may have protected structures on land.

During the survey, we also noted wind and ocean currents. Incoming tidal flow is towards the west, while the outgoing tide flows east. In June, the predominant trade winds spring from the E/NE. General currents are strongest when the tide is coming in, suggesting the reason for greater scouring in the harbor's eastern area and the collection of sediment along the western wall. According to Andrews, the harbor, protected by the island and a seawall which probably stood above high tide when new, remains calm when winter winds blow straight out of the north or from the northeast. Our guide made similar comments, but also noted that at times, when the wind is directly out of the east, the current flows through the harbor to the west, and during northwest winds it flows through strongly to the east. Perhaps when the seawall stood above high tide these currents were somewhat deflected. When Isla Cerritos harbor was affected by unfavorable winds or storms, shelter would have been sought elsewhere, perhaps up the Rio Lagartos if watercraft could not be pulled up onto the shore.

Paso del Cerro

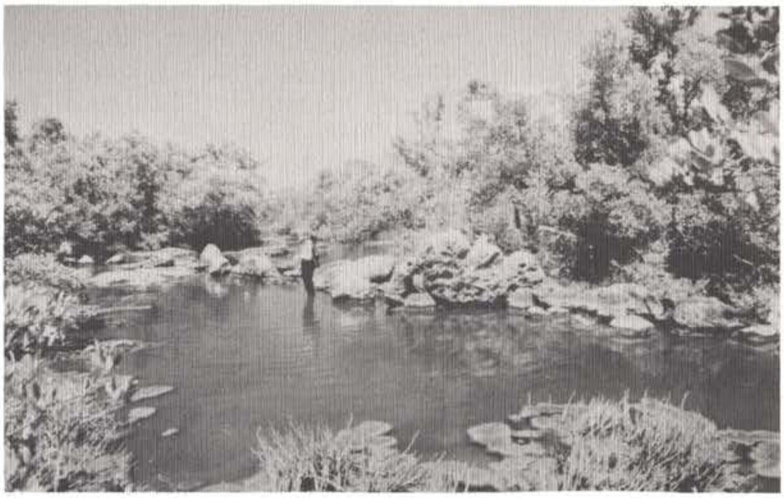
We travelled to Paso del Cerro, the mainland site across from Isla Cerritos. The water between the two sites is very shallow, and although poling from a canoe or raft is more likely, practical, and efficient, a person could actually walk from one to the other without resorting to swimming. The entrance to Paso del Cerro is along a protected mangrove channel which could have accommodated shallow draft vessels, and it probably was safer in stormy weather than the island. A hike through deep mud populated by ravenous mosquitoes brought us to the main site where we observed a small pyramid, a larger pyramid, and a small grass covered mound. We

Isla Cerritos is surrounded by remnants of offshore piers or terraces. Vertical slabs filled in with stone rubble delineate this example. (Photo: D.D. Denton) could see Isla Cerritos from the top of the large pyramid, and both auditory and visual signals could have been sent from one site to the other. An alignment of large vertical stones connected the pyramid area and the protected mangrove channel where we had disembarked. Their function is unknown. Leading from the pyramid area inland towards Chinalco and Chichén Itzá was a *sacbe,* or causeway, of horizontal stone slabs which ultimately disappeared under the mud. Channels of shallow water in the area included some which seemed cool, indicating the emergence of *manantials*, or freshwater springs. Some natural outcroppings of eroded and flat limestone protruded from the mud. They resembled some of the weathered, more irregularly shaped vertical slabs used at Isla Cerritos. Although freshwater resources have not been found on Isla Cerritos, there are several offshore springs which flow near the mainland, directly south/southwest of the island. Four km to the southwest of Isla Cerritos, near the mainland, there are two substantial *manantials* just offshore and one onshore. In fact, there are numerous freshwater springs in the vicinity whose emergence location occasionally changes. Freshwater was easily available in the area for transport by canoe to Isla Cerritos.



Conclusions and Recommendations

The nature of a reconnaissance is to acquire as much general information as possible in order to answer fundamental questions and to determine whether further archaeological work is warranted



The mainland site of Paso del Cerro is within sight and sound of Isla Cerritos. We disembarked near a curious alignment of large vertical stones (left) connecting this protected mangrove channel with the pyramid area. A sacbe *(above) leads inland towards Chinalco, a stone quarrying area, and Chichén Itzá. (Photos: D.D. Denton)* and feasible. The project at Isla Cerritos was undertaken in hopes of embellishing the scanty evidence currently available on Maya harbors, seafaring, and watercraft and assessing whether additional work would further the cause. The survey did provide basic information. We now know that Isla Cerritos' harbor and the area immediately surrounding it could have accommodated canoes with a draft up to about a meter, but an approach to the docks required a shallower draft. If the Maya used larger craft with a draft much deeper than a meter, those vessels must have anchored several hundred meters off the north shore where the depth increases to two or three meters and transported their cargo in smaller vessels directly up to the island. Canoes travelling between Paso del Cerro and Isla Cerritos could have been propelled easily the entire distance by poling, although paddling would be more efficient. The Maya probably used poles for their final approaches to the mainland and the island, just as San Felipe fishermen pole their shallow boats to the site today.

Isla Cerritos, as a known Maya harbor with manmade features, provides nautical archaeologists the opportunity to explore Maya seafaring. We gathered general information about the construction of the seawall and the docks and piers, but further work might establish dates for the features and clarify their architecture. Although sediment depth was not great in most parts of the harbor, several areas might yield intact deposits: within the probable passage 73 meters west of the main entrance; beside the seawall; and directly adjoining Isla Cerritos. Foreign artifacts found in place within the harbor would provide additional evidence for Maya use of Isla Cerritos. Such a study could also provide certain evidence of seaborne trade and might even suggest the nationalities of seafarers, a subject of speculation at present.

Acknowledgements

Sincere appreciation is extended to everyone who helped make the survey possible: Sigma Xi, The Scientific Research Society for a Grant-in-Aid of Research, the Institute of Nautical Archaeology, the Houston Underwater Club, A.P. Andrews, F. Robles Castellanos, R. Cobos Palma, T. Gallareta Negrón, B. Correa, M. Correa, G.F. Bass, H.S. Shafer, P. Luna and D. Denton.

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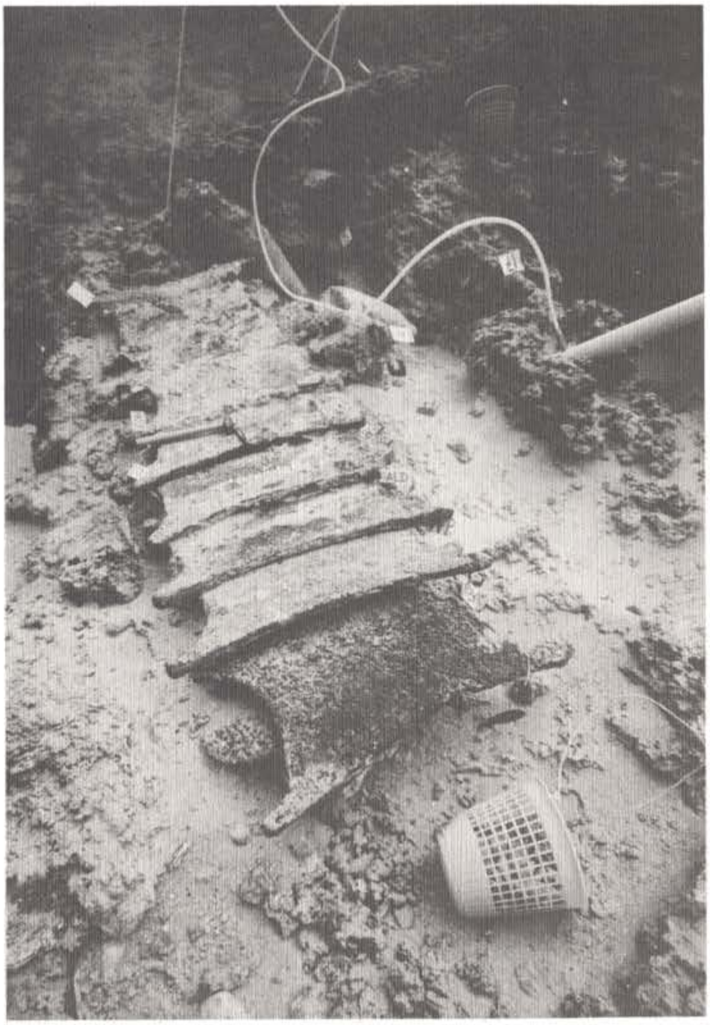
Taking Conservation Underwater at Ulu Burun

by Claire Peachey



Ingots from the wreck lie in deceptively neat rows. Excavators found that many of the ingots could not be chiselled free without damage and required consolidation underwater. (Photo: D. Frey)

The marine environment provides some of the most favorable conditions for the preservation of archaeological objects, as seen in many *INA Newsletter* issues. Appearances can be deceiving, however, and an object that seems intact when uncovered on the seabed can disintegrate before it can be lifted to the surface. In 1987, we faced just such a situation with some of the copper four-handled ingots from the Late Bronze Age shipwreck excavated by INA at Ulu Burun, Turkey.

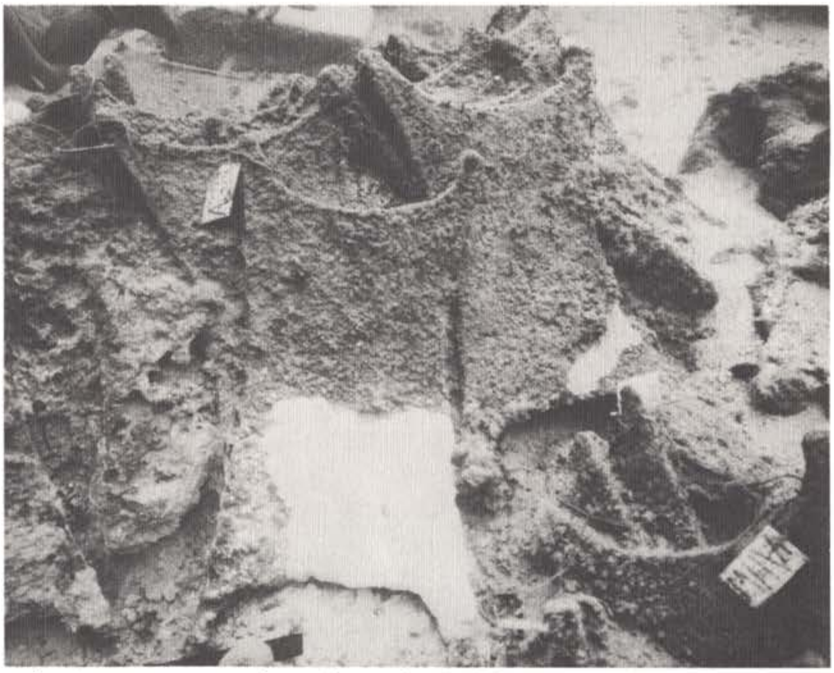
During the 1984 through 1987 excavation seasons, archaeologists raised 70 ingots on the upper part of the wreck intact and in excellent condition. But at the end of the 1987 season, we discovered that ingots in the middle rows were in a much poorer state of preservation, crumbling to bits as archaeologists chiselled them free from the seabed. Embedded in sand and a black, mushy, possibly organic substance, the lower ends of these ingots suffered an accelerated attack on the metallic copper. Affected areas now consist of a hard outer crust of marine concretion and copper corrosion products over a soft, black corroded copper interior. If the outer crust is broken--often the case, as rock-hard concretion surrounding each 25-kilogram ingot can require forceful chiselling--the inner corrosion floats away, leaving an empty, broken shell of concretion. In some cases, the outer crust is not even preserved, and only a discolored shadow suggests where metal once existed.

Because this deterioration was causing us to lose a considerable amount of information, we wanted both to protect these fragile ingots in place before chiselling them free and to somehow turn the "shadows" into solid casts that could be brought to the surface and studied. In other words, conservation of these ingots had to begin underwater, not on the surface in a laboratory.

In the spring of 1988 I took on this problem as a research project in Dr. Don L. Hamilton's Texas A&M University course, The Conservation of Materials from Underwater Sites. I tested various compounds in the laboratory in several ways. In addition to rating their ability to set and adhere in salt water (using aquarium salt solutions) and to create a detailed cast or provide a strong consolidating jacket--whichever each ingot required--I wanted to be able to remove the compounds without damaging the ancient artifact. Since few conservators or archaeologists have to deal with this problem, I had to seek appropriate compounds to test in reports from fields as diverse as medicine, plumbing, oil drilling and dentistry.

Archaeologists on the 16th-century A.D. Basque whaling ship in Red Bay, Labrador, Canada, successfully used polysulfide rubber to mold ship fastenings and other features of the hull. But its low viscosity made it unsuitable for the conditions of the Ulu Burun wreck: polysulfide rubber would easily run out of the nearly vertical ingot molds, many of which also require pouring "uphill." In addition, the great flexibility of the set compound prevented it from imparting any jacketing strength, so it was rejected.

Another material applied successfully both on land and underwater is a resin-impregnated bandage used in the medical profession for making limb casts. Both 3M and Johnson & Johnson make similar products, Scotchcast and Deltalite, respectively. Laboratory testing of Deltalite showed that it set to make a stiff, strong jacket that did not adhere to the object at all. This characteristic would be ideal for lifting pottery and complicated objects on land sites, but our conditions demand no gap between ingot and jacket. There must be intimate contact so that if any parts of the ingot should crumble during chiselling or lifting, they will be held in place by the jacket. Deltalite and Scotchcast are also expensive and somewhat messy to use.



An ingot conserved on the seabed. The materials used underwater had to adhere well to the sloping surfaces of the ingots. (Photo: D. Frey)

Some low-viscosity epoxies were tried in the lab, but these either dispersed too easily, were not viscous enough to stay on a sloping or underside surface, or did not set in a reasonable amount of time (or at all), and so were unsuitable for the task. I also experimented with a thick, fiberglass car body filler, but it did not adhere well underwater and was messy to work with.

Regular gypsum plaster of the type used in building construction or a finer type used in dental casting was one of the most promising candidates, not least of all because it is inexpensive and easily available in Turkey. Lab results were excellent: to the disbelief of many, plaster does set fully underwater to form a strong, adherent coating which can be removed easily when necessary by careful chiselling. Plaster-coated gauze bandages are often used to lift fragile objects on land sites, and this seemed most appropriate for the Ulu Burun ingots.

Although plaster seems the ideal compound to use underwater, it is also brittle and slowly dissolves in water after setting. I feared that if used alone as either a molding or jacketing material, it could break apart during chiselling even if strengthened with gauze bandages. So I continued my search for a strong, more resilient compound.

A telephone assistant at the major conservation supplier, Conservation Materials Limited in Sparks, Nevada, provided me with an excellent suggestion: a two-part underwater repair putty made by the Devcon Corporation (Danvers, MA). Devcon's Wet-Surface Repair Putty turned out to be the best material tested. It adheres well to the ingot surface for jacketing, is viscous enough to manipulate easily and stay in place either on the surface or particularly in difficult-to-reach corroded cavities, has a long working time, and produces a detailed cast.

Other epoxy putties--Milliput, Sylmasta, Brookstone, Pliacre--either did not adhere at all, were not easily worked, or set to a rock-hard consistency that would have been impossible to remove from the ingot without damaging it.

Since the Devcon epoxy putty and the plaster performed most successfully in the lab, we tested their application in actual field conditions at Ulu Burun in 1988. I found the Devcon to be a pleasure to work with underwater. It can be pushed into uphill cavities and spread over surfaces very easily. Its only disadvantage is stickiness, which can be partially overcome by mixing five to ten minutes before diving so that it reaches a more viscous, less sticky consistency, and also by applying with quick pressing motions, using minimal finger contact. We used the epoxy to fill a corroded cavity on one four-handled ingot, left on the seabed over the winter to be inspected a year later.

Trials with the plaster in 1988 were less successful initially, but infinitely more humorous. Despite trying several different ways to get the plaster to the seabed, I remained frustrated by results. Plaster mixed on deck and taken down in polythene bags set by the time I reached the bottom. Plaster mixed underwater in the telephone booth--our air-filled dome anchored on the bottom for safety--set almost instantaneously. Gauze bandages dipped in plaster prepared on deck were difficult to work with underwater and often set before I got to the bottom, particularly if the dive was delayed at the last minute because of a blown O-ring or forgotten weight belt.

Finally, the most successful method found was to take the plaster down as a dry powder in two well-sealed polythene bags. On the bottom, the bag of plaster remained dry although the high pressure caused it to feel rock hard. When ready, I cut open the bags with my dive knife, and the plaster mixed immediately with seawater to form a warm, powdery mush I could spread on the ingot surface with my hands. When there was no current, visibility all around me was reduced to nearly zero; being both blinded and affected by nitrogen narcosis, I was continually amazed that the plaster made it onto the intended ingot surface at all.

The 1988 season was primarily one of experimentation. Over the winter, 50 pounds of the Wet-Surface Repair Putty were purchased from Devcon, with a generous reduction in its cost made possible by Mr. John Pence. In 1989, underwater application began in earnest. It was still another season of experimentation in many respects as I worked to refine the technique of applying the epoxy and plaster in appropriate combinations depending on the problems presented by each ingot.

The best methods of use for different situations have been determined, but we are continuing to evaluate our techniques. For ingots missing large areas or with areas surviving only as crusts and shadows, I fill the open molds or shadows with Devcon, building it up to replicate the shape and thickness of the lost metal. The molded area adheres well to the crust and to the remaining metal of the ingot if all of the corrosion is completely cleaned out; this is the most time-consuming aspect of the work.

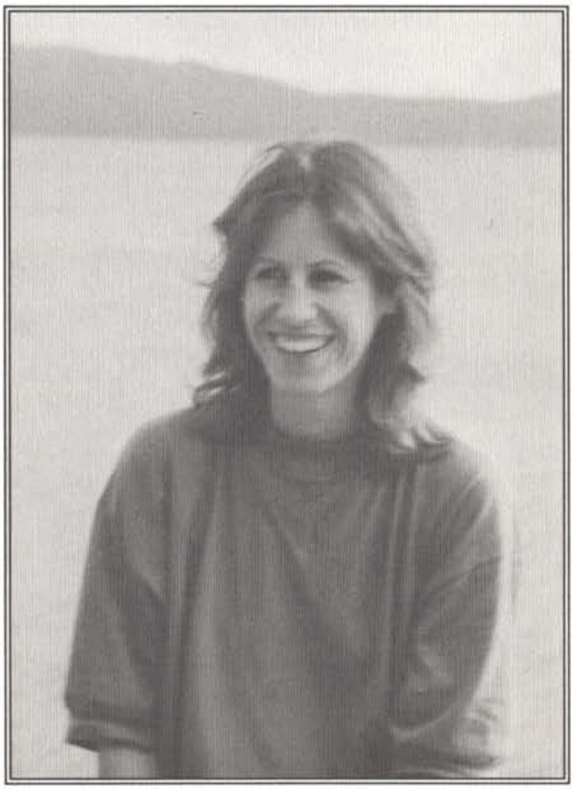
The repaired section and a large part of the solid metal is then coated in a thick layer of plaster, and more epoxy if necessary, to ensure that the join between the epoxy and the metal does not fail as the ingot is chiselled free. Chiselling is done as carefully as possible, using both short, thick cold chisels for the edges, and long, thin, specially made chisels to reach into the very narrow space--often less than one centimeter--between overlapping ingots. Once the ingot is raised and stored, its plaster can be checked regularly for dissolution and reapplied if necessary.

A different process had to be devised for ingots missing small areas such as the protruding handles or "ears." I had originally filled these cavities with Devcon putty but found that cleaning out all the corrosion underwater used up a great deal of precious bottom time. Coating the thin and fragile edges with a layer of epoxy without filling the cavity permitted the ingots to be raised without damage to the surface. Once there, mushy corrosion was cleaned out more completely and a much safer bond formed with the epoxy. Also, the cavity could be filled with more aesthetic, more stable over time, and less expensive clear Araldite epoxy resin or clear Paraloid acrylic resin.

We hope to raise most of the four-handled copper ingots over the next two seasons. Although the underwater conservation work is time-consuming, it allows us to retrieve the maximum amount of information from even the most deteriorated ingots. Over the next two years I plan to experiment with other underwater-setting compounds, such as silicone rubber, that can be used on extremely fragile materials such as faience, ivory and basketry, whose intact appearance disguises a tendency to disintegrate with the gentlest handling. By taking conservation materials and methods underwater, it is possible to keep objects intact as soon as they are uncovered on the seabed, thus minimizing the risks of damage by excavation, lifting, storage and transportation.

In the laboratory at Ulu Burun, Claire Peachey and Cemal Pulak check the condition of an ingot (right). Plaster applied underwater, visible on the back of the ingot (photo on left page), may be reapplied, if necessary, or removed for further conservation and study of the ingot. (Photos: B. Neyland)

Profile



Sheila Matthews: INA Hull Reconstructor

Sheila Matthews probably could close her eyes and give and inch by inch description of the reconstructed Serçe Limani hull. Work on the 11th-century ship remains has dominated her career with INA, which began in 1976 when she became one of the first eight graduate students in the new nautical archaeology program at Texas A&M. Earlier work on underwater projects at Padre Island in south Texas and Little Salt Springs in Florida had stimulated her interest in nautical archaeology. Sheila's participation on INA field projects began when she worked on the excavation of the Revolutionary War privateer *Defence* in Maine during the summer of 1977 and on the Mombasa Wreck excavation in Kenya the following year.

In the fall of 1977, Sheila became Richard Steffy's first assistant in the new ship research laboratory where one of her tasks was to help him prepare for an initial recording of hull remains from Serçe Limani in Turkey. After playing a major role in the mapping and raising of these remains the following summer--and showing herself to be a superb diver, excavator and draftsman as well--she stayed on in Turkey to assist in the recording and conservation of the hundreds of fragmentary and eroded hull members transported to the Bodrum Museum of Underwater Archaeology and temporarily stored in concrete water tanks.

Richard Steffy and Sheila spent two months conducting a preliminary recording of the hull, an examination of about 50 key hull members that provided basic information needed to plan a program of hull research and conservation and to design a new museum building for the reconstructed hull. Then Sheila began the thankless task of removing concretion deposits from and then making full-sized drawings of every surface of each surviving hull remnant. INA did not yet have a conservation facility, so it was a particularly difficult task, especially during the winter when the damp cold of the castle was intensified by the constant need to keep the wood wet or to fish yet another hull timber from the depths of a storage tank. The work continued for more than a year and resumed for nine months in 1981.

During the next two years, while the hull remains were being conserved in polyethylene glycol, Sheila worked as a technician in the hyperbaric laboratory at Texas A&M and completed her M.A. thesis, *The Rig of the Eleventh-Century Ship at Serçe Liman, Turkey*, in 1983.

Sheila returned to Turkey to work on the reconstruction of the hull, and although many other people have contributed to the Serçe Limani project, she did the lion's share of the work, often spending months virtually without assistance and becoming confidently in charge of the project. The reconstructed hull, now much admired by visitors to the Bodrum Museum, gives eloquent testimony to her high level of professional devotion and competence.

Over the years, Sheila has found time for other projects, such as assisting in the conservation of glassware and pottery and the replication and drawing of iron anchors from the Serçe Limani ship. She also participates in INA shipwreck surveys and has worked on the excavation of the Bronze Age wreck at Ulu Burun. Sheila has now joined the Mombasa Wreck Excavation publication project and will soon begin conserving timbers from the 16th-century Ottoman shipwreck at Yassi Ada using sugar. She is also writing the chapter on the ship's rigging and contributing to another on the reconstruction of the hull for the Serçe Limani Wreck final publication.

Devoted to Bodrum and to her Bodrum friends since first living there in 1978, Sheila was one of the very first members of the INA staff to acquire her own home there. This past summer, she gave further evidence of her commitment to living in Turkey by taking an intensive course in Turkish at the University of Istanbul.

— Frederick H. van Doorninck, Jr. & J. Richard Steffy