

# THE INA QUARTERLY



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**On the cover:** *The Chapel in the Castle of St. Peter, Bodrum.* (Print: C.T. Newton, *A History of Discoveries at Halicarnassus, Cnidus, and Branchidae*, Pl. 36 London, 1862).

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David J. Stewart

# Beneath the Knights' Chapel:

## INA's Excavation in the Castle of St. Peter

by Stefan Hans Claesson and Frederick M. Hocker, Sarah W. & George O. Yamini Faculty Fellow

*The Bodrum Museum of Underwater Archaeology, located in the 15th-century Castle of St. Peter, will open a new exhibition hall in the autumn of 1995. Prepared in collaboration with the Institute of Nautical Archaeology, the new display will feature artifacts from the seventh-century Byzantine trading vessel excavated at Yassiada under the direction of George Bass. The exhibit will be housed in the castle's chapel, originally built by the Knights of St. John in the first half of the 15th century A.D. and restored by Spanish knights in 1519-20.*

*During the summer months, up to 1,800 visitors tour the Bodrum Museum every day. Tourists come from all walks of life, from archaeologists to fishermen, engineers to shepherds. The Yassiada exhibit has been designed to give this diverse audience a clear understanding of the meaning of the archaeological remains. To this end, it will portray the vessel anchored in a harbor, with the bottom part of the ship shown under water. Visitors should receive the impression that the ship did not wreck on the reef at Yassiada, but continued on to make port in Halikarnassos (the ancient name of Bodrum). Sound and light effects will be used to transport visitors into the atmosphere of a seventh-century harbor.*

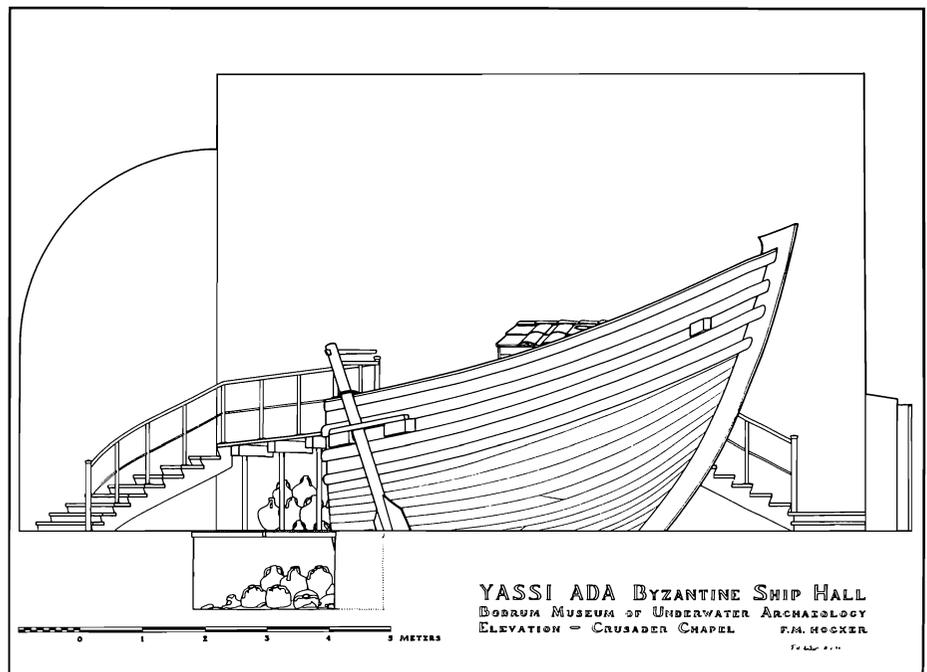
*Immediately upon entering the hall, visitors will encounter a full-size reconstruction of the vessel's stern, designed by INA ship reconstruction specialist Fred Hocker and built by a team of Nautical Archaeology Program and Turkish students (fig. 1). To the left of the replica, a 1:10 scale model will allow visitors to see how the ship would have appeared during its working life. Cabinets along the wall will hold finds from the ship's galley and storage lockers, including the large steelyard inscribed "Georgios Presbyteros Naukleros," indicating the name of the vessel's captain. The artifacts in the showcases will be exhibited as goods are presented for sale in harbor shops.*

*Next, guests will climb a staircase to the ship's deck, from which they can view the harbor scene. A museum staff member dressed as Captain Georgios will meet the visitors in the galley and provide information about shipboard life. He will also demonstrate the uses of various galley objects, such as drawing wine from an amphora with a wine thief. Visitors can then step down to the harbor and walk across the "sea" to a special glass platform. Under the platform, a sea-bottom scene with an arrangement of amphoras will recreate the wreck site. Showcases will display additional artifacts from the vessel, including several large anchors. The whole experience is designed to appeal to the five senses and correspond to our concept of a living museum.*

*-- Oğuz Alpözen, Director, Bodrum Museum of Underwater Archaeology*

The crowd that gathered along the edge of the excavation pit quieted suddenly as the western-most cover slab was removed from the tomb. Diffuse light coming in the chapel door filtered into the pit below and revealed five skulls stacked in a row against the end of a rectangular chamber. Three had collapsed, one lay on its left side, and one, robust with heavy brow ridges, stared straight up out of the pit. A slightly sour smell drifted up from the dark earth beneath the top layer of bones. As we took pictures and began the delicate cleaning process, we wondered how a group of nautical archaeologists had ended up excavating INA's first conventional land site.

Four of us (Nautical Archaeology Program students Taras Pevny and Tommi Mäkelä along with the authors) came to Bodrum late in May to



Drawing: F. Hocker

Fig. 1. Full-scale replica of the seventh-century Yassiada vessel in the Knights' Chapel.

begin construction of the Yassiada replica in the Knights' Chapel. When we arrived, the Museum had already purchased the wood for the replica, many cubic meters of pine and elm, some of which had been delivered and stacked in the chapel. The rest arrived later in the summer, several tons at a time, and each piece had to be carried up the medieval stairways and narrow passages of the outer baileys to reach the courtyard. With the help of several Kurdish workmen, we carried pieces of wood weighing hundreds of pounds each up to the chapel at a run (it makes the unevenness of the stairs easier to take), much to the amusement of tourists using the same stairways. After resurrecting the same 40-year-old German bandsaw that had been used to build the Serçe Limanı sectional replica in 1986-87 (see *INA Newsletter* 15.3: 14-21), we began to cut large balks of elm and pine into frames and a sternpost. By this time, we had been joined by Çağdaş Oralkan, a Turkish student from Bilkent University in Ankara, and Özlem Buyuran, a student from Bosphorus University.

The sternpost, which consists of two large, curved pine pieces fastened together in what is often called a "thunderbolt of Jupiter" scarf, plus an inner post and elm false post, took over a week to fashion. Too large to fit easily through the bandsaw, it required several days of steady work with handsaw and adzes to shape (fig. 2). The scarf itself, with faces that had to be fit together in several different planes, took nearly a day to finish. An ancient shipwright would no doubt have laughed at our slow progress.

The working plan was to rough out all of the primary internal timbers before beginning any assembly. Taras had carefully measured frame shapes off of the detailed plans and transferred these to balks of timber for sawing, so we were relatively confident that there would be a minimum of fairing after setting things up. Guiding four-meter frames through the bandsaw sometimes took four people and good teamwork, and often involved shouting in two languages (three, if Tommi decided to curse in his native

Finnish). By the end of June, all of the floor timbers and most of the futtocks had been sawn out as well as the keel and sternpost, and it was time to prepare the chapel for the assembly of the ship.

Because the ship had to look as if it were floating in the floor, we needed a roughly trapezoidal hole about three meters long, five meters wide, and one and a half meters deep. We were a bit reluctant to cut into the floor of a 500-year-old building, but soon realized that the floor was concrete, poured during a restoration in 1964. Underneath 10 cm of concrete was a layer of rubble, also from the 1964 restoration. Beneath that lay plain brown dirt.

We had not dug far into the dirt when we discovered the first archaeological remains. The tops of two stone piers appeared near the east end of the pit, and the dirt was full of potsherds and broken glass. The potsherds dated from the 20th century back to Hellenistic times (c. 330 to 31 B.C.), and were typical of fill dirt from anywhere in Bodrum. As we dug further, more walls came to light, and we decided that the removal of the fill needed to proceed more archaeologically. We had been concerned before digging that we would encounter remains of some sort in such a prominent location, and had actually discussed the possibility of finding graves associated with the chapel, but we were unprepared for the richness of the finds or the complexity of structures in the small hole we had opened. Danish excavations in the Museum had revealed remains of earlier structures, from Hellenistic walls to Byzantine mosaics, so our discoveries should not have presented such a surprise.

### The Chapel

The building in which we were digging, the Chapel, was built when the Knights Hospitalers of St. John of Jerusalem (a chivalrous order of European knights founded during the Crusades) began their work on the Bodrum castle early in the 15th century. In the early 16th century, the chapel was rebuilt or improved by the Spanish knights of the order, but it is uncertain how much of the 15th-century structure was retained. Damage from French shelling during World War I has further confused the issue, and little remains now of the original floor. If the current chapel stands on the same foundations as the 15th-century building, then nothing we found in the pit can be conclusively associated with the period of occupation by the Knights, as none of the walls or pier foundations we discovered is exactly aligned with the current walls. The Zephyrion promontory was occupied by Selcuk Turks before the Knights arrived (much of the inner defense works of the castle dates from the medieval Turkish occupation), so some of the remains beneath the floor may date from that period, but the later Turkish occupants of the castle left the chapel standing and converted it into a mosque.

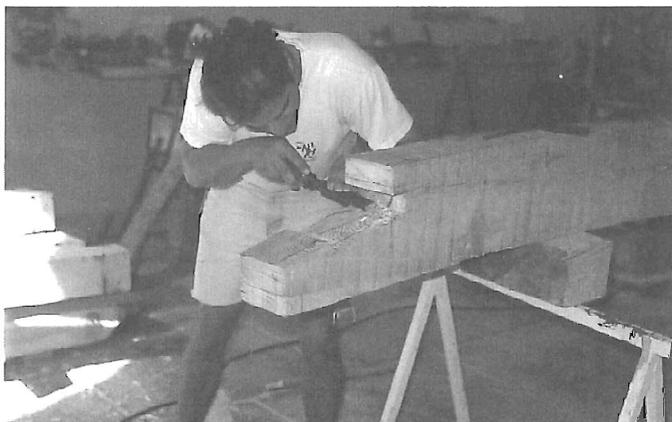


Photo: F. Hocker

Fig. 2. Stefan Claesson carefully shapes the sternpost scarf of the replica with a chisel.

Fig. 3. *Tomb 1 in which 12 adults and several infants were stacked. Five skulls can be seen at the western end of the chamber (photo: T. Pevny).*



### The Medieval Remains

Many of the walls we found in the pit were built of mortared rubble, often of reused stone. Such masonry is a common feature of later Roman and Byzantine architecture in Asia Minor, and also can be seen in Turkish building. Many of the fragments incorporated into the standing walls of the castle, as well as those in the excavation, date to the Hellenistic period, and many of the later remains are built around large blocks of Hellenistic masonry. Although nothing conclusively dates these walls, the lowest layers of old fill around them contained Byzantine pottery. The mortared rubble walls seem to be approximately contemporaneous with each other, and may all belong to the same, larger structure, although this structure cannot be identified from our small excavation.

Two main foundation walls were exposed. Wall A, oriented north-south, is abutted by wall B in the southeast corner of the excavation. Wall B, while of the same general type of construction, is faced with squared stones and extends down to bedrock, 1.6 m below the current chapel floor. In places it stands 1.3 m high and is built over a Hellenistic wall foundation stone. Included in this wall is a faced ashlar stone that forms the west end of the wall and one edge of a drain floored with reused roof tiles.

Along the north side of the excavation pit, three tombs were uncovered (figs. 3, 4). The first of these, tomb 1, was discovered when a small hole was broken through its south side early in the excavation. Clearing the edges of the hole, originally mistaken for a cistern, revealed bones. We entertained visions of armor-clad skeletons clutching rusty longwords, although we knew that medieval knights were not usually buried in their armor. Removal of the five cover slabs, all reused stones (one is a marble roof tile, probably from a Greek or Roman temple), revealed instead a grave that had been in use for some time. Twelve adults were stacked one on top of another in the plastered chamber, as well as several infants. The chamber is only 1.96 m long,

0.60 m wide, and 1.00 m deep, so it was fairly crowded. All of the dead seem to have been originally buried with their heads to the west and their arms crossed over their abdomens, but several of the skeletons had been disturbed and some of the bones swept down to the eastern end of the chamber. In all likelihood, this tomb had been in use for several generations, with new burials being laid directly on top of the bones of earlier interments. The last burial was a single individual, but others were almost certainly groups; the first interment probably consisted of three adults buried simultaneously. The central individual lay on his or her back, and the other two lay on their sides facing the opposite walls. Aside from the bones, little in the way of grave goods was found: a pendant, made of bits of copper sheet, some gilt rings sewn to cloth backing, a fragment of gold thread, a bone die, and a few scraps of leather.

Tombs 2 and 3, directly to the west of tomb 1, were of similar construction-- mortar or plaster over mortared rubble walls-- and shared a common side wall, made from a reused Hellenistic ashlar block. Tomb 2 contains a similar thick deposit of burials, but it was decided not to excavate this tomb, as it was not in the way of the exhibit construction. The cover slabs, which were cracked in places and might not protect the site, were removed and the tomb filled with sand. Tomb 3 had been emptied at some time in the past, and contained only a few bone fragments mixed with fill dirt. Interestingly, one of the artifacts in the fill dirt was a roof tile of the 19th or 20th century, so this area must have been exposed relatively recently.

The style of these burials is fairly typical Byzantine Greek Christian, and similar tombs have been found elsewhere in Bodrum. Newton, the original excavator of the Mausoleion site in the 1860s, reported nearly identical burials in eastern Bodrum. These too were close to the surface of the ground and contained jewelry made from copper sheet. Due to the scarcity of grave goods and confusing

stratigraphy in our excavation, it is difficult to date the burials. They may be as early as the fifth or sixth century A.D., or as late as the 12th century. Several bone samples are currently being radiocarbon dated by Odense University in Denmark, and it is hoped that these dates will help to clarify much of the stratigraphy in the excavation.

At present, it is difficult to say whether the tombs lay inside or outside of a structure, although a later building, which included the bases for two large columns or piers, was built adjacent to tomb 1. Byzantine Christians buried their dead inside churches on occasion, just as western Christians did throughout the Middle Ages, and it is possible that the adjacent walls belong to a church. It is also possible that the Knights of St. John chose the site of a ruined Byzantine church for the erection of their chapel; the general alignment of many of the medieval wall remains is close to that of the current building. If these tombs did lie inside a church, it suggests that the occupants were people of some importance.

The promontory is known to have been occupied in the Byzantine period, and visitors to the castle can already see an early Byzantine (fifth or sixth century) mosaic pavement to the northeast of the chapel. Although Halikarnassos was not near the Byzantine frontier until the Selcuk conquest of the 11th and 12th centuries, it still provided a large, sheltered, defensible harbor along the coastal sailing route from Constantinople to the southern shore of Asia Minor. Unfortunately, although there is frequent mention of Strobilos, a nearby port and naval station, in Byzantine sources dating from the 8th-13th centuries, there is little if any reference to Halikarnassos, suggesting that it did not hold the same prominence it had in Hellenistic times.

### The Ancient Remains

Much of the Byzantine-style rubble masonry is built over and around older structures composed of large, dressed stone. This type of masonry is typical of ancient Halikarnassos and can still be seen in the few surviving ancient structures in the town, notably the city wall adjoining the INA headquarters. In the Hellenistic period, Halikarnassos was the capital of the kingdom of Caria; before that it had been the seat of one of the Persian satraps governing Asia Minor. It was a large, prosperous city and home of one of the seven wonders of the ancient world, the Mausoleion, the elaborate tomb of King Mausolos. Mausolos is thought to have had his palace on the island where the castle of St. Peter now stands, and



Drawing: S. Claesson and F. Hocker

Fig. 4. Plan of the excavation area within the Chapel.

Danish archaeologists excavating in the castle and elsewhere in Bodrum believe it lay close to the present chapel. A small section of dressed ashlar wall is visible behind the Glass Wreck exhibit hall to the north of the chapel, and other Hellenistic remains have been found behind the chapel, to the northeast.

The Hellenistic remains discovered in the chapel consist of the base of a fortification wall, a level stone platform extending to the east beyond the excavation area, and several ashlar stones incorporated into the Byzantine masonry, including the large stone dividing tombs 2 and 3 (fig. 4). The wall itself is actually two fitted stone walls with rubble fill between, although most of the western side of the wall is missing. Surviving elements indicate that the western side was finished, but the eastern face of the wall was quarry faced, or only roughly dressed, and was probably above ground level. Two courses of large stones survive, and the absence of "pry holes" (which serve to key the stones of two courses together) in the top of the upper course suggests that this is the top of the wall. Normally, such keying of stones is used in terrace or retaining walls to resist the outward pressure of the earth, but there seems to be no evidence of an associated terrace here. Although it may have been obliterated by later construction (in this case, walls A and B), the low height of the stones

relative to the bedrock and surrounding terrain suggests that these stones are probably not a true wall, but a socle (or foundation) for a brick wall (fig. 5). The leveled upper surface of the rubble fill also suggests a base for a brick wall. The upper surface is covered by a thin layer of hard, pink granular mortar, which is not usually found before the Roman period, but may have been used in Hellenistic foundation work. Vitruvius wrote in the first century B.C. that Halikarnassos was famous for its brick masonry covered in stucco, and mudbrick walls on stone socles are a common form of ancient Greek construction in Asia Minor. Stone socles were used to protect mudbrick from groundwater, and a deep drain on the east side of our socle is further evidence for this construction.

Ancient authors report that the mouth of the main harbor of Halikarnassos was guarded by two fortifications, one on the Zephyrion promontory and another across the bay, and that the promontory guarded the "secret harbor" used by Carian warships (parts of this harbor were investigated in the early 1980s by INA divers during waterfront renovation work carried out by the town of Bodrum). The wall beneath the chapel may be part of one of these forts, but it is difficult to say how it fits in with the other bits of



Photo: S. Claesson

Fig. 5. A view of the western half of the excavation; tomb 3 is in the foreground, and the lowest course of the Hellenistic socle runs off to the south.

Hellenistic walls found to the north and northeast, or if it relates to the palace of Mausolos.

### Conclusions

Although the remains excavated in the summer of 1994 may seem more enigmatic than informative, they do suggest the wealth of valuable information buried beneath the walls and courtyards of the castle of St. Peter. This stronghold is merely the successor to a series of fortifications built on the commanding Zephyrion promontory since ancient times. The tombs point to the proximity of a Byzantine church, and the discovery of the Hellenistic walls may contribute to the eventual location of the palace of Mausolos. Part of the difficulty in interpreting these remains lies in the small size of the area investigated. In many respects, our little excavation is more of a sounding or test trench, providing a glimpse of the many people who have used the rocky island at the mouth of Bodrum harbor over the last two and a half millennia and a guidepost for future work in the castle.

Further excavations in the castle and its environs are being conducted by Odense University, as an outgrowth of their work at the site of the Mausoleion. In the coming year, we hope that detailed study of the skeletal remains will begin; physical anthropologists at Texas A&M University are excited by the prospect of comparing the evidence from so large a sample, especially when there is the possibility that the individuals may be related. We also hope to make some headway in cataloguing the large variety of potsherds and roof tile fragments, as these may be important indicators of the date and function of the structures. The results of this research will be published in a new journal, *Halikarnassian Studies*, and will be an important aspect of the broader picture of ancient and medieval Bodrum/Halikarnassos.

*Acknowledgements.* We would like to thank, first of all, the Director, Oğuz Alpözen, and staff of the Bodrum Museum of Underwater Archaeology, who were more than generous in providing equipment and materials for the excavation. We also offer thanks to Dr. Poul Pedersen and Odense University for friendly advice, assistance with radiocarbon dating, and the opportunity to publish in their journal. Conservation help was provided by Dr. Claire Dean.

### Suggested Reading

- Newton, C.T.  
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1990 *History and Archaeology of Byzantine Asia Minor*. Hampshire.
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# 1994 Excavation at Uluburun: The Final Campaign

by Cemal M. Pulak, Mr. and Mrs. Ray H.  
Siegfried II Graduate Fellow

Between June 15th and September 7th, 1994, INA completed its 11th and final excavation campaign on the Late Bronze Age shipwreck at Uluburun, near Kaş in southern Turkey. During the campaign we made 1,857 dives totaling some 607 hours of excavation time under water. This brings the number of dives to 22,413, for a total of 6,613 hours of excavation time on the wreck, and makes the project the longest and deepest excavation yet conducted by INA.

During the 1993 excavation campaign, it was expected that the removal of the remaining bulky artifacts from the site, comprising two stone anchors, 15 copper oxhide ingots, and a large storage jar or pithos, as well as the completion of the few unexcavated areas could be accomplished within a short period of only two months. When the last layer of copper ingots was raised, however, additional hull remains were exposed. Due to the poor preservation of these remains, coupled with the realization that what was deemed to be a shallow deposit directly upslope of the large boulder-like rock outcrop located centrally on the site, was in reality a deep gully densely packed with artifacts and organic materials, it became apparent that work on the site could not be completed during the allotted time. In 1994, it was thought that a campaign of two months' duration would be sufficient for a full study and excavation of these remains. But the depth of the deposit foiled our estimates again, and the season had to be extended by three weeks in order for the site to be completely cleared. Our toil and frustration did not go unrewarded, as many of the 1994 campaign's important discoveries were made in this very deposit.

Fieldwork at Uluburun in 1994 may be summarized in the following four categories: the complete excavation of a deep deposit in the central part of the site; probing and excavation in a large area just upslope of the designated wreck boundaries; excavation, mapping, and recovery of all hull remains; and the production of a three-dimensional, computerized topographic map of the entire site.

As during the previous season, much of the excavation in 1994 was centered in the area just northwest of the

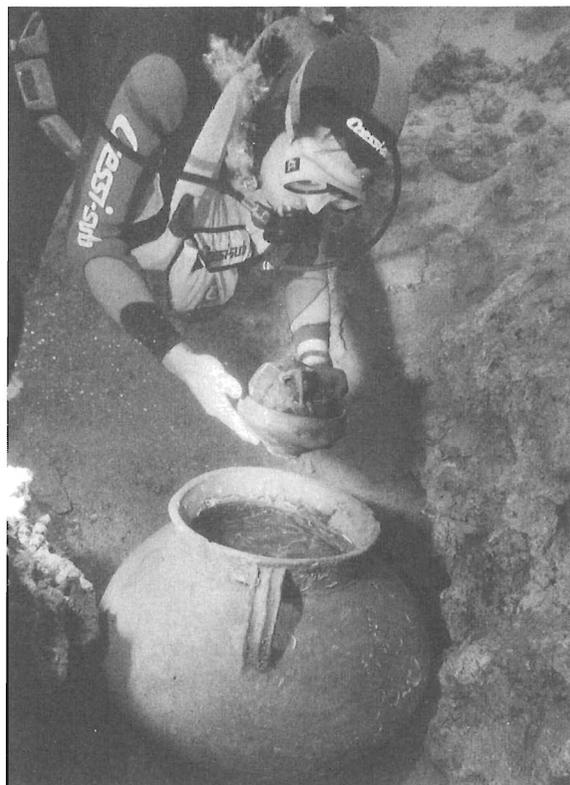


Photo: R. Piercy

Fig 1. Cemal Pulak removes two Cypriot milk bowls (KW 5734, 5735) and a carinated bowl (KW 5736) from the base of a large pithos (KW 5833: maximum diameter 65.5 cm).

large rock outcrop (grid squares K-P 15, L-P 16, N-P 17-19, fig. 4, p. 10). Work here was devoted not only to the completion of previously unexcavated areas, but also to the study, documentation, and recovery of the portions of the ship's hull discovered in 1993. After the hull remains were removed, the areas under them were excavated down to bedrock so as not to miss artifacts that might have slid under the ship's planking.

The area roughly within grid squares L-N 15-16 again yielded a nearly complete assemblage of the general artifact types found on the wreck during earlier campaigns. Excavation progress in these areas was painfully slow due to the profusion of beads, other small finds, and a dense layer of organic deposits, all of which required great care to excavate. In view of the ship's east-west orientation and that the hull came to rest on and listing against the northern side of the large rock outcrop, it is apparent that the area in question acted as a natural catchment basin for objects sliding down the slope. This may be especially likely if part of the hull, including the turn of the bilge, broke away and came to rest downslope, against the western perimeter of the large rock outcrop. The starboard turn of the bilge might have acted as a primary catchment that, later in wreck formation, dropped down to the base of the rock outcrop. The dense concentration of organic materials found in the lower levels of the area do not contradict

this idea. The presence of two near-certain hull planking fragments found here also makes it quite reasonable to imagine that some portion of hull planking ultimately came to rest against or near the large rock outcrop's western perimeter. Both pieces, oriented parallel to the ship's keel-plank axis, clearly display tenons and tenon pegs consistent with those found earlier on the portion of the hull raised in 1993.

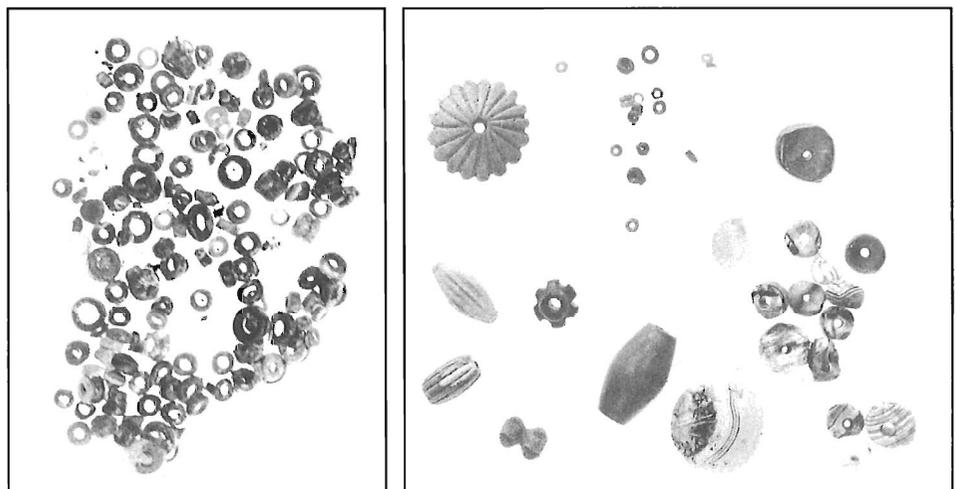
Because of the richness of deposits in this area, both in organic and artifactual material, much of the sand was bagged and tagged for sieving on the surface. This facilitated the recovery of vast quantities of seeds (pomegranate, fig, grape, olive, coriander, sumac, various grass and weed seeds, and pulses), nuts (almond and pine), and other organic materials, and many faience and agate beads (figs. 2, 3). The sievings also yielded a profusion of fish bones, but it is not known whether these bones represent the remains of shipboard food or of fish that made the wreck their home before their death.

The area just to the northwest of the large rock outcrop (grid square M-16), where the southern end of the second row of copper ingots originally lay, was riddled with wood fragments. These pieces, seemingly deposited in two distinct layers, were not oriented in any specific direction. They comprised a variety of shapes and profiles, none of which resembled hull planking. Although too poorly preserved to be positively identified, it is possible that they were parts of some superstructure or wooden object carried on the ship. Under this jumble of wood were more Cypriot export ceramics, almost certainly spilled from one of the pithoi found in this general area. Cypriot ceramics recovered here included milk bowls (White Slip II), oil lamps, and several White Shaved juglets, making the last type by far the most common example of Cypriot ware to be carried aboard the ship. The largest of the ten pithoi on the wreck, which was removed from this precise location during our first campaign in 1984, contained 18 pieces of Cypriot ware, neatly nestled inside the jar.

Also in this area was a pithos unlike any found on the site (KW 5833: fig. 1). Not only is this jar the shortest of the ten recovered, but it also has a pair of ribbed handles attached to its rim, terminating on its upper shoulder zone. As with the other pithoi, the newly discovered jar appears to be Cypriot in origin. It was with great anticipation, therefore, that we awaited its full excavation to learn what the jar

contained. Had it originally held some liquid, such as olive oil or water, or did it serve as a china barrel, as did at least three of its counterparts found earlier on the wreck?

The sediment inside the jar was carefully decanted and placed in marked polyethylene bags for sieving ashore to recover small artifacts and organic material, which otherwise may have been missed. The jar was virtually packed with nearly every organic material recovered elsewhere on the site. We were surprised to find two short lengths of rope, our first from the site, and bits of twine. The first significant artifact to appear from the jar was a beautifully crafted and preserved wooden (probably boxwood) lid of an oval container. That some luxury objects carried on the ship were of perishable nature is clearly demonstrated by the chance survival of this lid, which must have fallen in the jar accidentally, and another wooden piece in the form of a circular base for a cylindrical container found next to the pithos. The latter piece is similar in shape to the base of lidded ivory containers (pyxides), well known from this period. At the base of the pithos were two Cypriot milk bowls nestled inside a carinated bowl (KW 5734, 5735, 5736: fig. 1). In addition to the complete bowls, several milk-bowl and White Shaved juglet sherds surfaced. It seems that this pithos also was used for transporting Cypriot export wares, and that a specific storage jar type or size was not reserved exclusively for this function. As the shape of the pithos does not appear to specify the nature of its contents, it is more likely that the jars themselves comprised a part of the ship's ceramic cargo, and were not intended as permanent shipboard storage containers. The practice of storing more delicate ceramic vessels in larger jars is conducted even in modern times during the



Photos: L. Ray Martin

*Thousands of beads were discovered among the organic sediments. Fig. 2 (left) shows tiny faience beads measuring less than 0.25 cm in diameter. Fig. 3 (right) depicts beads of faience, agate, ostrich eggshell, quartz, steatite, amber, and chalcedony in an assortment of sizes.*

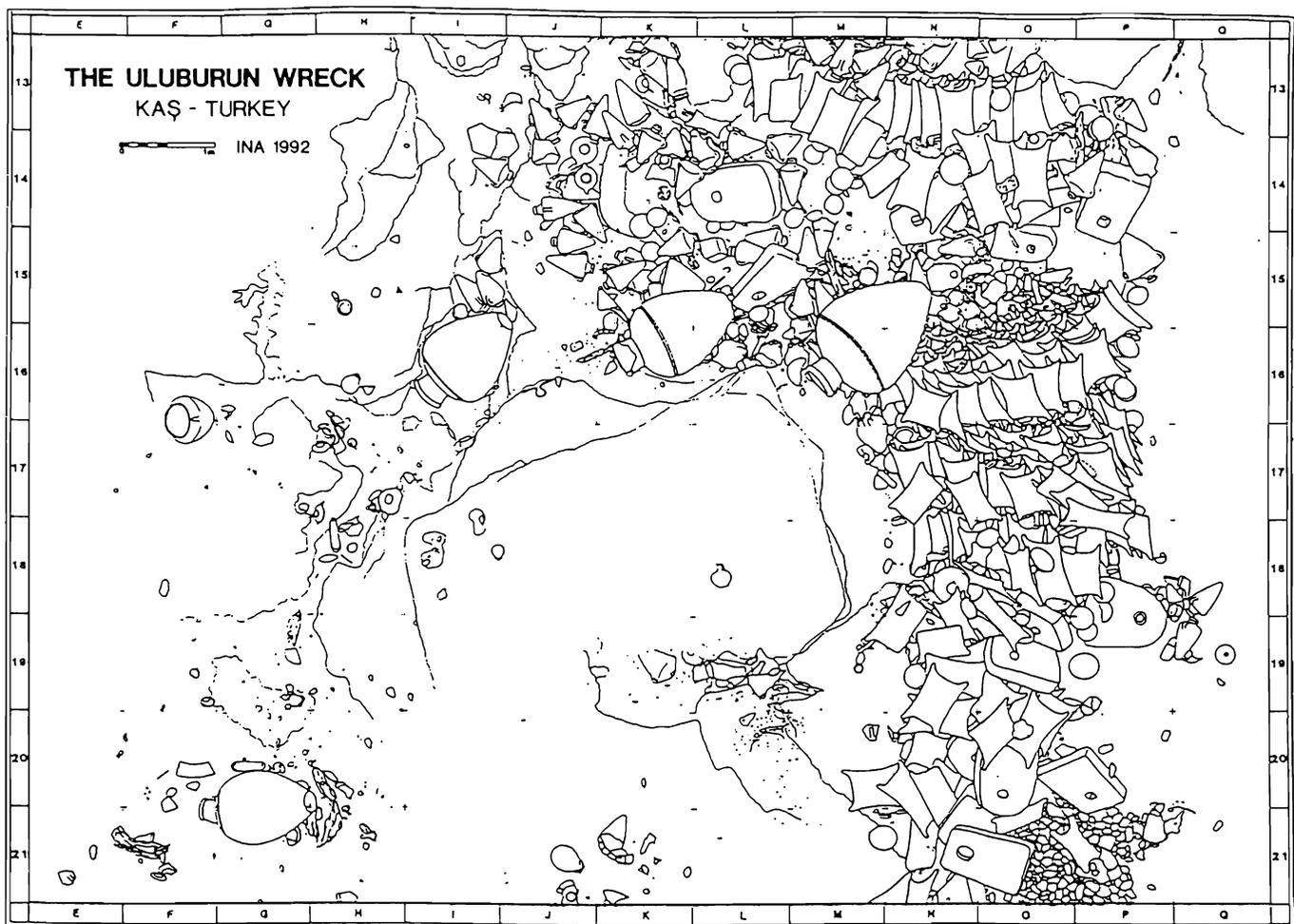


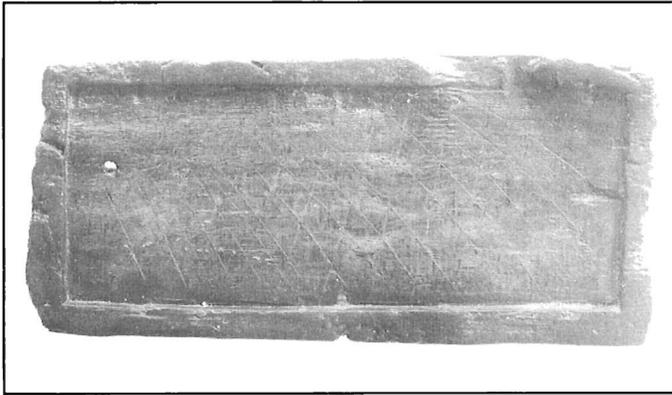
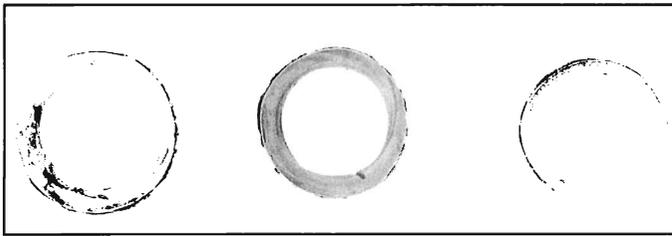
Fig. 4. Partial plan of the Uluburun wreck site. Excavation work in the 1994 season was centered in grid squares K-P 15, L-P 16, and N-P 17-19, the area just northwest of the large, boulder-like rock outcrop.

portage of these wares from production centers to markets.

In addition to hull related items such as planking, dunnage and ballast stones, finds here include shipboard materials comprising fish hooks, fish-net sinkers, sewing needles possibly for repairing sails, drill bits, and a bow drill. Artifacts from the ship's cargo include raw materials in the form of quarter oxhide tin ingots, a complete copper bun ingot and several fragments thereof, glass ingots of two colors, a hippopotamus tusk, and ostrich eggshell fragments. Manufactured goods comprise Syro-Palestinian (pilgrim flasks and amphora sherds) and Cypriot export wares (oil lamps, milk bowls, White Shaved juglets), fragments of metal vessels, seashell rings (KW 4852, 4877, 5036: fig. 5), tortoise carapace fragments (almost certainly sound boxes of musical instruments), and some beads. Personal effects of the ship's crew and that of the merchants aboard, on the other hand, include pan-balance weights (complementing the two pans in a wooden case found in 1993), a spearhead (KW 4885: fig. 14, p. 15) and projectile point, a whetstone, pottery (two Mycenaean transport stirrup jars), an astragal, an ivory finial in the shape of an

opium capsule (KW 5156: fig. 10, p. 13), beads (faience, glass, agate, quartz, steatite, and amber), many fossil sea shells, and beach-polished lips from helmet (*Cassidae*) shells for use as necklace pendants or some other form of adornment. Highly regular and polished beach pebbles found in this area probably were collected for their attractiveness rather than simply representing ballast accidentally shoveled into the ship's hold along with the larger cobbles. One such pebble was modified partially at one end by grinding to a V-shaped section.

To the list of personal possessions, we may add a steatite lentoid seal blank or bead, and two cylinder seals. The smaller of the seals is of a soft, black stone, probably steatite. Because the seal is worn extensively, it is nearly impossible to make out the nature of the carved designs on its surface, although one may depict an outline of a human form. The second seal (KW 5084), recovered in several fragments, is of faience. Its design of three parading stags with a plant (one resembles an opium poppy) separating each register, is clearly preserved. According to Dominique Collon of the Department of Western Asiatic Antiquities of the British Museum, the representations



Photos: L. Ray Martin

Fig. 5 (upper photo). Shell rings (upper photo: KW 4852, 4877, 5036, avg. diam. 2.15 cm) comprised some of the manufactured goods on board.

Fig. 6 (lower photo). A leaf of a diptych (KW 4863, 12.4x5.7 cm).

of stags are in the traditional Mittannian style, with numerous examples found at Alalakh (on the Syrian border of southern Turkey) and Beth Shan in Israel, although the antlers on the Uluburun seal are executed somewhat differently. She notes also that the type is most common in Palestine and probably spread to Syria from there.

What may be the season's most important find also was made here. At the level of the wood, and resting on the shoulder of the pithos described above, was a leaf from a diptych (KW 4863: fig. 6), the second such item to have come from the site. Recovered intact, the leaf is narrower and taller, but otherwise identical in appearance to the one found in 1986. Unfortunately, its three-piece hinge, probably of ivory as in the first example, was detached and missing. One of the two ivory hinge sections found during earlier campaigns may belong to this diptych.

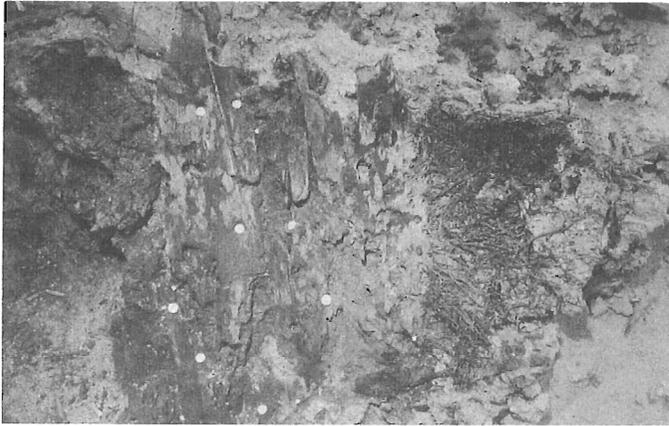
Beneath the pieces of scattered hull planking in this area lay several sections of wood that at first were puzzling. They measured only 8-11 cm wide and 2-3 cm at their thickest point, but one was preserved for about 90 cm of its length, making them too light to serve as structural members of the hull. Because of their proximity to the latticework fencing discovered during the 1993 season, at first we wondered if they might be related, or whether the former pieces represented a separate feature also situated at deck level. That they were found at a

deeper level than the planking suggests that they may have originated high up on the ship structure. Presumably, they would have fallen down before the heavier hull planking was deposited on top of them. Although most pieces were poorly preserved, our examination of the largest piece suggests that they may be blades from the ship's sweeps or the oars of the ship's tender, because they are too light to have served as the ship's quarter rudders. The rounded end of the best preserved piece, which tapers to an edge in section view, and its hydrodynamic foil shape, appear to strengthen our interpretation.

We spent much of the 1994 field time recording and removing hull wood preserved in areas corresponding to the starboard section of the hold laden with the third (grid squares N-O 17) and fourth rows (N-O 18) of copper ingots (figs 7, 8, 9, p. 12). Each section of hull is somewhat disarticulated, crushed, and distorted, making the identification and association of some of the poorly preserved planking in these areas difficult and arbitrary. Furthermore, the parts of the keel-plank preserved in the deepest section of the site are slightly askew (to the south) of direct alignment with the 1.7 m long section of keel-plank preserved higher up on the slope, and removed in 1993.

Unlike the hull remains at the deepest end of the site, much of the wood under the third row of copper ingots was badly eroded and had shifted a little after settling on the sea bed. Therefore, the identification of strake numbers and their specific association with the remaining hull timbers was more problematic. The force of dispersal appears to have been more violent here than at the upper or lower hull areas. This probably was due to the steepness of the seabed gradient in this area, which, compounded by the weight of the copper ingots, caused the hull to snap off at this point, leaving the forwardmost section of hull to settle on the seabed with less distortion. The planks appear to have slid a little to the south, becoming slightly out of alignment with the preserved hull section just downslope of them. Strake number three (the third strake from the keel) overlaps strake four, while strakes five and six meet at an angle. Fragments of planking were wedged or forced under the upper end of strake six. Organic sediment, artifacts, and wood fragments settled underneath the upper edges of this section of hull wood.

Although only partially preserved and in poor condition, this section of hull includes an important construction feature not found elsewhere on the wreck. As the hull remains have yet to be studied in detail, the purpose of this feature is not fully understood. It is possible that we have here a flat scarf (a joining of two planks whose diagonal ends were cut off perpendicular to their lengths), or a drop strake (a strake of planking discontinued near the bow or stern because of decreasing hull surface area), indicating that we are approaching the ship's bow. Support for these options comes from the slight tapering of



the garboard towards the bow, which is especially pronounced at the deepest or easternmost section of hull remains. There is one well-preserved mortise-and-tenon joint at the scarf, and vestiges of a second. All mortise-and-tenon joints on the planking are pegged with a c. 2 cm diameter peg driven into the tenon on each strake. Not all the peg pairs could be located due to the poor state of plank preservation in some areas, but spacing between adjacent pegs on the same plank averages 23 cm. A large preserved patch of thorny burnet, a kind of brushwood placed under the ingots to provide a cushioning effect on the planking, indicated the exact position of ingot placement on the wood. Additional dunnage under the layer of thorny burnet is represented by only a single large branch at the lower (east) edge of the hull remains. In some places the planks were partially impregnated with copper, causing a slight "petrification" of the wood, a feature particularly noticeable on the sixth strake.

Many artifacts had found their way under the wood, including pan-balance weights, ivory finials, parts of ivory scepters (KW 4751, 5169: fig. 10) and a finial for a scepter in the shape of a pomegranate (KW 4806: fig. 10), an ivory figurine in the shape of an acrobat that may have served as a handle for some unknown object (KW 5754: fig. 11), crescentic pendants visually identified as a tin-lead alloy, a blank amethyst scarab (KW 4851: fig. 13, p. 15), a possible scarab blank of a gray stone (KW 4860: fig. 13, p. 15), amphora stoppers or bungs, thousands of faience beads, and ceramic vessels. The entire area was thick with organic materials; under the patch of thorny burnet were heavy concentrations of murex opercula, probably thicker than anywhere else on the site. The last item may be an ingredient used in making incense, a practice still alive today in many Arab countries.

The remaining section of hull at the deepest end of the site, or the area corresponding to the fourth row of copper ingots (N-O 18, fig. 9), is approximately one square meter and comprises a section of the keel-plank and portions of the first six starboard strakes. Because part of the keel-plank was preserved here, the starboard garboard and most of the subsequent starboard strakes could be identified and numbered. The planks followed the same width-pattern observed in the upper hull area removed in 1993. Starting with the garboard (c. 15-16 cm wide), a narrow strake alternates with a wide (c. 25 cm) strake. This pattern is ap-

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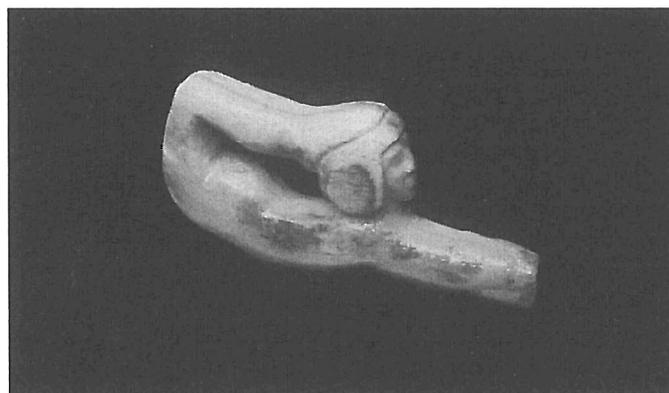
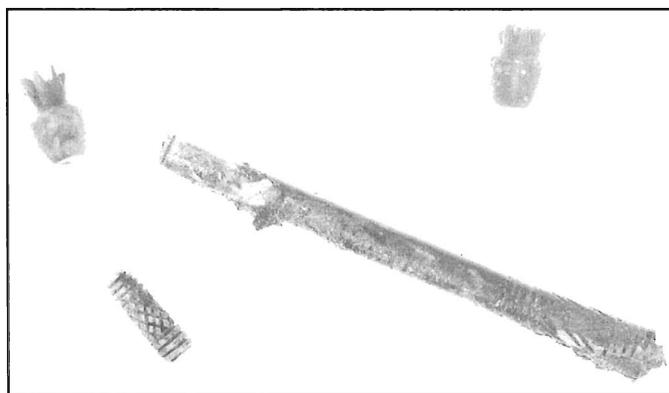
Figs. 7, 8, 9 (top to bottom). Divers carefully measured and mapped the hull remains found beneath the third and fourth ingot rows (central photo). The area beneath the third row includes a scarf or drop strake, a construction feature not found elsewhere on the wreck (upper photo). The lowest photograph details the wood found beneath the fourth ingot row (Central photo, L. Ray Martin; upper and lower photos: D. Frey).

parent in all three preserved sections of hull wood, and appears to have been a regular feature of the hull. The orientation of the keel-plank in this section does not directly conform to that of the hull section removed in 1993. The slight difference is probably due to the shifting of this section to the south, against the large boulder-like rock outcrop, as it settled onto the seabed. Strakes three through six roughly correspond to four of the remaining five strakes in the hull section preserved under the third row of copper ingots, but this relationship is not very clear due to the poor state of preservation of the hull wood in that area.

Overlying the hull wood was considerable dunnage comprising heavy branches lying perpendicular to the strakes and keel-plank. Partially overlying and compressed into the branches from the weight of the ingots above was a thick layer of thorny burnet. Most of the dunnage was found on the upper half of this section of hull, and was presumably meant to cushion the heavy row of ingots placed directly on top of it. The position of the ingots, however, corresponds to the entire section of hull preserved, not just its upper half. It is likely, therefore, that the ingots were originally centered on a swath of dunnage, and that the entire row slipped slightly downslope when the ship settled on the seabed.

Once mapped, the dunnage was removed to expose the hull remains for further study and detailed recording. The planking revealed a total of 27 pegs, but no construction features such as scarfs. There is only one peg preserved securing a joint between the garboard and the keel-plank, the latter extensively eroded on the underside. The garboard itself is also poorly preserved and lies somewhat askew to the main section of planking. Strakes two and three are the best preserved with strakes four, five, and six progressively less well preserved. The seabed slopes toward the large rock outcrop in this area, and apparently as the periphery of this section of hull eroded away, the preserved section listed to the south and slipped toward the rock outcrop. Additionally, the planks display a pronounced concave curvature, like a slide, from top to bottom, almost certainly caused by the weight of the ingots pressing on the wood as it softened over time. During deformation in both directions, the upper (or eastern) plank ends curved up and over to the south as they were pressed into the sea bed. Strakes one, two, and three have tight seam lines preserved. At strake three, they begin to pull away from each other and tenons could be seen between planks. In strake six, the tenons are broken. Certainly, the curvature does not represent the ship's original shape, nor does it conform fully to the contour of the seabed beneath it. There is no visible evidence for frames in any of the preserved sections.

The season's greatest concentration of organic material and artifacts was found under planks four, five, and six, caught in the deep "V" formed between the southerly



Photos: L. Ray Martin

Fig. 10 (upper photo). Ivory finials, including one in the shape of a pomegranate (KW 4806), and another in the shape of an opium capsule (KW 5156), and pieces of ivory scepters (KW 4751, 14.2 cm in length, and KW 5169).

Fig. 11 (lower photo). An ivory figurine in the shape of an acrobat (KW 5754, 7.4 cm in length) may have served as a handle for an unknown object.

slope of the seabed and the large rock outcrop. The deep, densely packed layer of organic material (12 cm thick in some places) seems to be a compressed matrix of the eroded outer side of the planking and the usual murex opercula, olive pits, fish bones, etc., which percolated under the planks. Many glass and faience beads that had slid down the slope also were found here, along with a steatite lentoid seal of a Mycenaean merchant (KW 4855: fig. 16, p. 16), the second such seal found on the wreck.

With the hope of discovering several obviously missing artifacts from the site, such as the pommels of the two Mycenaean swords found earlier, and the base half for a Mycenaean flask, we incorporated into our excavation area some 50 m<sup>2</sup> of seabed located directly upslope of the site proper. Because it became apparent after several years of excavation that the Uluburun ship originally had struck the seabed at some higher point on the slope before sliding a little and eventually settling in its present location,

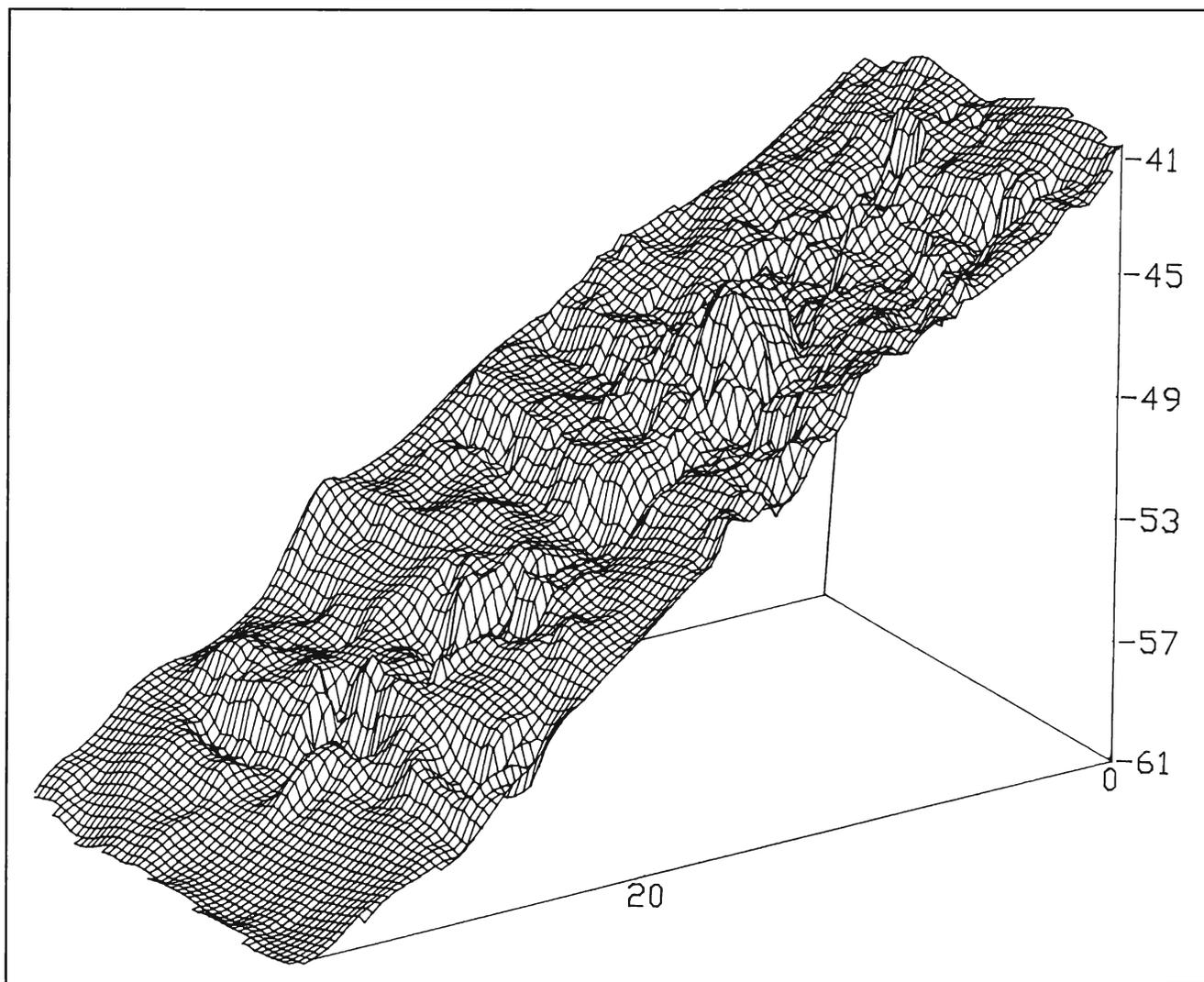


Image: M. Smith

Fig. 12. Parallel projection view of the wreck site from the northeast. This computer generated map indicates the contour of the seabed on which the Uluburun vessel was excavated. The slope includes a depth of c. 21m along a horizontal span of c. 33 m.

we thought that some of these missing items might be found there. Although a thorough excavation of this area did not yield any artifacts, we left the site with the knowledge that the only previously unexcavated area of seabed suspected of containing these artifacts was sterile.

To learn what may have remained of the original hull profile, cross-sectional views were made at three stations, one on the hull section under the third ingot row, and two on the section under the fourth ingot row. While these views help us to understand better the hull and the process of wreck formation, for the most part they revealed that the surviving portions of the hull had deformed to conform to the shape of the seabed at those locations. An additional mapping scheme included a three-dimensional contour map of the entire seabed under excavation. The purpose of such a map is to illustrate the irregularity and pronounced slope of the sea bed at Uluburun, and to enable us to comprehend the natural forces that affected the dispersion of the ship and its cargo. While this project

was high on our agenda, it defied our attempts until this year for a variety of reasons. In 1994, it was realized only through the diligence of three expedition members who spent their entire season taking some 7,000 measurements under water. Mark Smith processed this data on a computer to obtain the map reproduced here (fig. 12).

After 11 seasons of excavation, we now can proceed at full pace with a meaningful study of the Uluburun ship's hull remains, cargo, and the personal effects of those who sailed on her either as crew or passengers. Already, preliminary examination of the finds has suggested to us that the ship had set sail from either the Syrian coast or Cyprus, or both, and was sailing for a destination somewhere west of Uluburun before its demise on the rocky promontory. Much of the material from the site provides important new information about the history of interregional contacts in the eastern Mediterranean and beyond. Before these objects may be taken at face value and integrated into our

expanding knowledge of Late Bronze Age trade, the establishment of a precise date for the wreck is a primary concern.

Stylistic considerations of the pottery from the wreck, especially that of Mycenaean origin, suggest a broad date in the last three quarters of the 14th century B.C. In 1986, this date was somewhat refined by the discovery of a gold scarab bearing Nefertiti's name. Jim Weinstein's study offers maximum dates for this unique scarab as high as about 1376-1358 B.C., or as low as approximately 1339-1317 B.C., depending on which chronology is used. Therefore, the Uluburun ship must have sunk sometime during the range of dates suggested for the scarab or, considering the signs of extensive wear on the scarab, somewhat later. Recent tree-ring counts of cedar logs from the ship by Peter Kuniholm of Cornell University have given us a date of 1356±37 B.C. for the last preserved ring in the logs. The ship must have sunk sometime after that date as the logs do not include bark. Due to the floating nature of the Bronze Age Mediterranean conifer tree-ring sequence, this date appears somewhat vague. However, Peter Kuniholm informs us that some refinement may now be possible, allowing for the placement of our date at the lower end of this range, or sometime in the last quarter of the 14th century B.C. We hope to fine-tune this date with additional samples that include the ship's keel-plank. As it stands, this absolute date has considerable implications for cross-dating pottery and other artifacts from the Aegean, Syria-Palestine, and Cyprus.

Again, our preliminary work has shown that the ship itself was probably Levantine or Cypriot in origin, as evidenced by the type of stone anchors carried aboard (petrological work on the anchors is currently being undertaken), Syrian oil lamps with wick-charring at their nozzles (Cypriot lamps, quite distinct in shape and fabric from the Syrian lamps, carried as cargo are in pristine condition), the Syro-Palestinian origin of a few bowls and other ves-

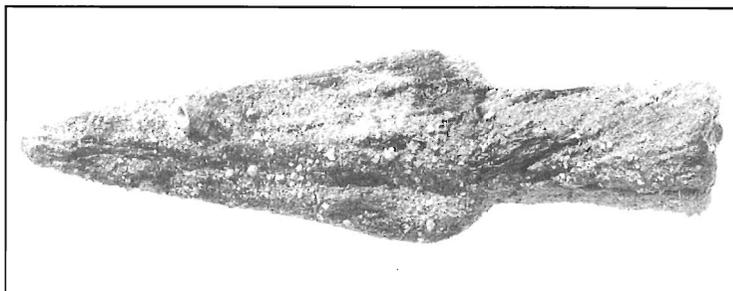
sels probably comprising a part of the ship's galley wares, and the Near Eastern weight standards represented by the more than 130 pan-balance weights found on the site (fig. 15, p. 16). To these considerations we also should add the predominantly Syro-Palestinian origin of most shipboard tools, weapons, and personal effects of those aboard.

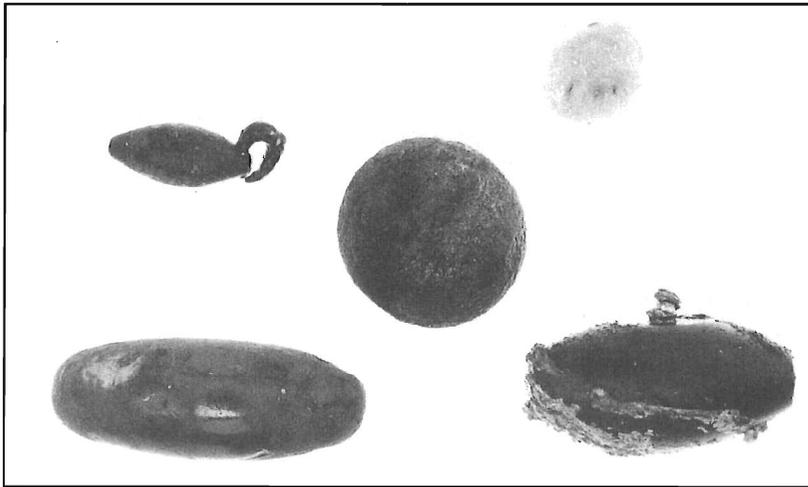
That the ship included among its passengers at least one, and more likely two, wealthy Mycenaean merchants, envoys, or individuals of some rank is clearly shown by the several knives, spears, chisels, jewelry (primarily in the form of quartz, faience, amber, and glass pendant beads), a cloak pin, and, more importantly, two Mycenaean swords, and a pair of lentoid seals, one of which was found only this season. Moreover, Jeremy Rutter of Dartmouth College, who is studying the Mycenaean pottery from the wreck, informs us that most of the two dozen or so pots from the wreck are types not common among the repertoire of trade goods in the Levant. Probably these represent personal wares of the merchants aboard. Half a dozen socketed-spear heads, including one from 1994 (KW 4885: fig. 14), of a type presumed to be introduced to Greece from neighboring regions to its north, along with a stone ceremonial mace-axe or scepter of a type found only in the northwestern and western Black Sea regions, with the best parallel coming from Rumania, suggest connections that reach far beyond the boundaries of Greece. The nature of this connection, its development, and its socioeconomic implications for the Late Bronze Age cosmopolitan world will be the focus of future studies. We now will embark on a new avenue of investigation: a quest for knowledge through the systematic and careful interpretation of the material we have so painstakingly excavated over the past 11 years.

With the fieldwork behind us, we already have begun directing our energy and resources to the conservation, restoration and documentation of the Uluburun finds. A positive move in that direction has been launched through

Fig. 13 (below left). A possible scarab blank of gray stone (KW 4860) and a blank amethyst scarab (KW 4851, 1.92 cm in length).

Fig. 14 (below right). A bronze socketed spearhead (KW 4885, 16.0 cm in length) of a type believed to have been introduced to Greece from neighboring regions to the north. (Photos: L. Ray Martin).





Pan-balance weights of Near Eastern standards (fig. 15, above left, clockwise from left: KW 5143, 5151, 5130, 5215, 4964; the round weight has a diameter of 3.65 cm) and a steatite Mycenaean seal, (fig. 16, above right: KW 4855, 2.19 cm in diameter) give clues to the nationalities of sailors on the ship (photos: L. Ray Martin).

the efforts of Jack Kelley, chair of INA's Board of Directors. As a direct result of this effort, Claire Peachey, INA's second full-time conservator, already has begun work exclusively on the conservation of Uluburun material in the Bodrum Museum of Underwater Archaeology.

*Acknowledgements.* The final excavation campaign at Uluburun was generously funded by the INA Board of Directors, Texas A&M University, the National Endowment for the Humanities, and the Institute for Aegean Prehistory without whose unwavering help over the years, the project could not have been brought to such a successful conclusion. As in previous years, Cressi-sub of Italy continued to give us a significant concession on the purchase of their diving equipment. The National Geographic Society recently awarded us a conservation grant to help fund six conservation assistants for seven months and to buy much-needed equipment and chemicals.

Under the overall directorship of George F. Bass, the 1994 team comprised Cemal Pulak, co-director; INA staff Dr. Donald A. Frey, Robin C.M. Piercy, Tufan Turanlı; INA staff archaeologist Sheila Matthews; INA counsel James Goold; hyperbaric specialists David Perlman, M.D., and Tom Sutton, P.A. The excavation again was made possible by the participation of veterans, who embraced the final campaign enthusiastically, and put on hold other commitments and responsibilities to show up at Uluburun for one last time. The field participants included archaeologists Dr. Faith Hentschel, Dr. Patricia Sibella, Michael Fitzgerald, Nicolle Hirschfeld, Christopher Monroe, Lillian Ray Martin, Osman Ünsal; Texas A&M Nautical Archaeology Program graduate students Brendan McDermott, Stephen Paris, Edward Rogers, and Mark Smith. Harun

Özdaş of the Bodrum Museum of Underwater Archaeology represented the General Directorate for Monuments and Museums of the Turkish Ministry of Culture. In Bodrum, Uluburun finds continued to be conserved under the guidance of INA staff conservator Jane Pannell by Güneş Özbay and Gülser Sınacı, and volunteers Wadea Boutros, Franca Cole, Margot Healey, Mohammed Moselhy, and Emily Williams. The Uluburun project also benefitted from a summer school for advanced conservation organized by INA and funded by the National Endowment for the Humanities. The training program, headed by Dr. Claire Dean and assisted by Claire Peachey, included Paula Artal-Isbrand, Norine Carroll, Catherine Magee, Won Ng, and Asaf Oron as participants. INA staff illustrator Sema Pulak continued to prepare object drawings for final publication.

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# The 1993-1994 Turkish Shipwreck Surveys

by Cemal Pulak and Edward Rogers

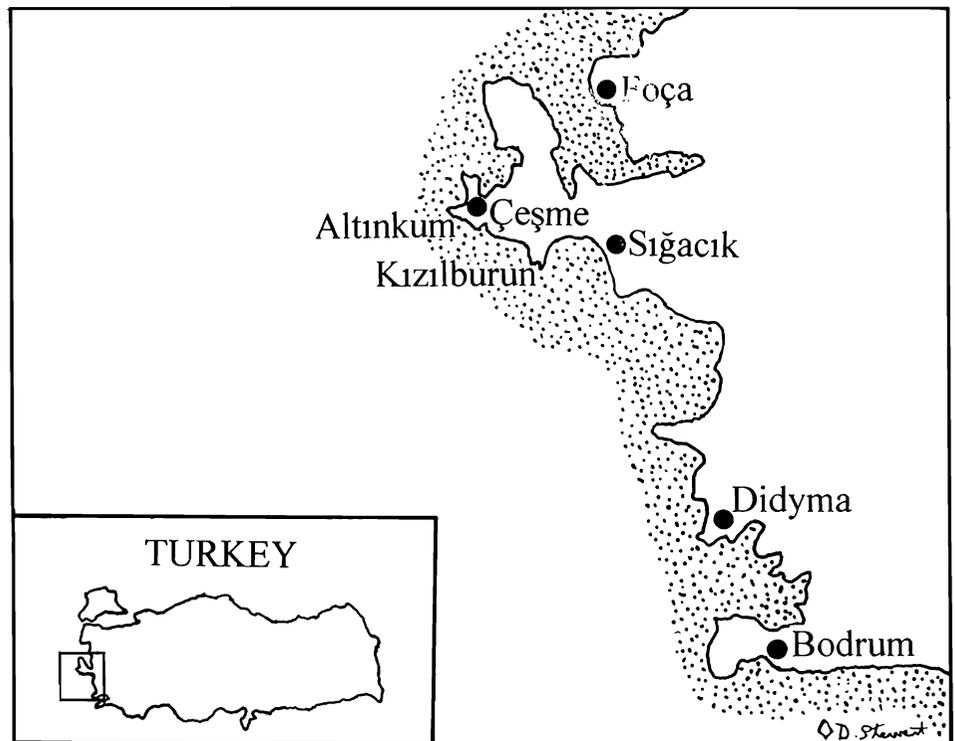
Thousands of years of maritime history lie hidden beneath the waves off the Turkish coast. Bronze Age merchantmen, Byzantine dromons, and Venetian and Ottoman galleys are among the hundreds of vessel types that plied the waters around Turkey in the past. Some of these vessels succumbed to the dangers of the coast, to sink into obscurity in the deep. Discovering and documenting Turkey's nautical heritage is one of INA's long-term goals. To this end, INA has been conducting shipwreck surveys since 1973, and annually since 1980.

## The 1993 Survey

The 1993 survey was conducted between September 10th and October 7th under the direction of Cemal Pulak and Donald Frey. Two different teams, one on the INA survey vessel *Virazon* and the other aboard a Turkish trawler, combed the shores of the provinces of Izmir, Aydın, and Muğla (fig. 1). Violent storms in the Aegean Sea prevented us from investigating the Strait of Samos, where old reports claim a Bronze Age wreck lies. The *Virazon* waited for the weather to improve for almost a week in the protected waters around Çeşme, but when the storm failed to abate the search was canceled in that area. Instead, the *Virazon* sailed southward to begin the survey on the Mediterranean coast. Engine failure, however, put an end to that phase of the survey on September 28th.

Nevertheless, in that short time we located six exciting wrecks. Five are near the rocky promontory called either Kızılburun or Inceburun, a dangerous cape just to the west of Teke Burnu. Northwest of this promontory lies the wreck of a steel ship said to have sunk 50 or 60 years ago, which demonstrates how dangerous sailing continues to be in this area.

The most interesting of the five wrecks at Kızılburun is a Byzantine wreck lying at a depth of 39-40 m and laden with marble architectural elements. From the distribution of these elements and other remnants over an area only 14 m long by 4.8 m wide, it is clear that the ship came to rest on its keel without being scattered over the seabed. Spiral-fluted columns of different sizes, slabs of white and red marble, a column capital, and a double column of a type used as a partition between windows and naves in churches are among the items on the wreck. It has not been possible to confirm the exact nature of these marble elements which, for the most part, have been partly eroded by the sea and largely covered by encrustation, but the fact that among them are pieces used in churches or other monumental structures suggested at first that the ship was carrying an order of materials to be used in a specific construction.



Map: D. Stewart

Fig. 1. The 1993-94 surveys were conducted off the southwest coast of Turkey.

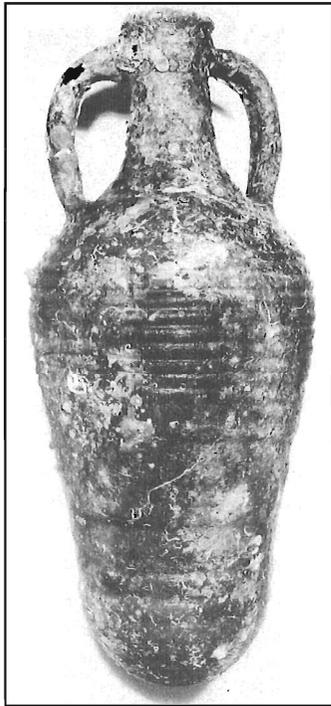


Photo: D. Frey

Fig. 2. One of approximately 20 amphoras recovered from a wreck laden with marble architectural elements.

among and around the marble pieces. Iron anchors and single- and double-handled galley pots in the sand at the deep end of the site provided evidence of the ship's bow.

A similar cargo was discovered some years ago in a wreck dated to the second quarter of the sixth century A.D. off the harbor of Marzamemi in south-east Sicily. The Marzame-mi ship was dubbed the "Church Wreck" because its cargo consisted mostly of Marmara (Proconnesian) marble architectural pieces, probably for a basilica under construction in North Africa. By shipping "prefabricated" elements from the center to every corner of the empire, the Byzantines achieved an important standardization in church construction. Such shipments also resulted in great savings in shipping and fabrication costs.

At Kızılburun, 15 to 20 amphoras of a single type, half in good condition (fig. 2), were found

The anchors and amphoras suggest that the ship sank in the 10th century. However, the architectural elements show peculiarities of the sixth century, and, with the exception of the fluted columns, the majority of them are only one of a kind. In addition, they appear to be finely finished, rather than left in a rough state for transportation purposes. We therefore believe that they probably represent a collection of elements dismantled from an older building for reuse.

Seventeen meters northwest of the Byzantine marble wreck, toward shore, at a depth of 36 m, we encountered the remains of a shipment of millstones (fig. 3). Seventeen large millstones approximately one meter in diameter, and a smaller one only half a meter in diameter, were recorded. Each stone has a central hole 10 cm in diameter for the securement of a driveshaft or an axle. The shapes of three Byzantine-type iron anchors found in the northern part of the wreck area could not clearly be determined because they were poorly preserved and partially buried in the sand. It was not possible to ascertain whether these anchors belong to the millstone wreck or to another wreck lying just upslope (see below). The absence of other artifacts around the millstones makes their dating difficult. A photograph of an anchor resting on one of the millstones, however, shows the anchor arm joining the anchor shank at an obtuse angle. If this is not a matter of a break in the anchor's arm, we can date this anchor, and probably the wreck, to the 10th to 12th centuries A.D.

Although the first-century B.C. Roman architect Vitruvius stated that large wheel-shaped stones of the type seen on this wreck were operated by water power, the earliest known archaeological examples belong to a Late Roman period water mill. It is believed that olive oil presses utilizing large circular stones came into use in the 12th century, and windmills were first used in that or the following century. However, little has been learned from archaeological excavations about medieval millstones with the exception of those found in Greece on a 12th-century wreck near Alonnisos in the northern Sporades. If the new wreck proves to belong to the 10th to 12th centuries, it will be of substantial significance insofar as it will provide new information concerning the millstone trade, which played a very important role in the Middle Ages.

Directly north of the millstone wreck, on a steep rocky slope 28 to 36 m deep, fragments of the spherical amphora types well-



Photo: D. Frey

Fig. 3. A shipment of medieval millstones at Kızılburun.

known from the Yassiada seventh-century wreck were discovered. It is not known if two small marble slabs found at the deep end of the site belong to this wreck or if they fell from the shipment of marble elements that lies in deeper water to the southeast. Presumably, the ship crashed into Kızılburun, splintered into pieces, and spilled its cargo of amphoras over the rocky slope. The scattered nature of the wreckage makes it extremely difficult to define the boundaries of this wreck site, and probing the core will undoubtedly reveal additional amphoras.

At the extreme southern point of Kızılburun, hundreds of amphoras lie scattered on a rocky slope at a depth of 28 to 37 m. Many are broken, but intact amphoras also were encountered, particularly in sand pockets at the deep end of the site and at the base of the rocky slope where it merged with a flat, sandy seabed (fig. 4). The occurrence on the slope of large stones and seabed rubble mixed with the amphoras indicates that after the ship sank part of the slope slid downward. No other artifacts were discovered during our survey of the immediate area. The amphoras are all of the same type, and allow this wreck to be dated to the 10th to 12th centuries A.D.

South of the above mentioned Byzantine wreck, we found a wreck of uncertain date at a depth of 45 to 48 m. In the assemblage are nine column drums (1.75 m in diameter and 0.95 m high), a large marble slab (1.75 by 1.15 by 0.32 m), and an element that cannot yet be identified with certainty because of covering seagrowth and heavy encrustation, but which may be a column capital of the Doric order. Additionally, one or two marble slabs were seen on the rocks in the northern part of the wreck. If we assume that all the pieces are drums comprising a single column, then the column, with a total height of 9.3 m, must have belonged to an impressive structure. If we are right in believing that the capital is Doric, then the ship may be dated to the Classical period. However, bearing in mind that monumental Doric structures are rare in Anatolia, and that the few known examples are mostly situated to the north of Kızılburun, we may assume that the column was either lost while being shipped to Greece or being sent north along the Anatolian coast. On the other hand, it is also possible that the so-called capital is not a Doric element, but the base for an Ionic or Corinthian column. To better assess the nature of the site, additional visits to the area are needed, to clean the "capital" element and determine its true function and shape. No other artifacts were found except for a seemingly intrusive intact first-century B.C. amphora next to the column drums.

South of Çeşme at Altinkum (Golden Sand) lies a wreck approximately 60

m from shore and 4 to 5 m deep. The vessel's cargo consisted of 40 architectural elements including Corinthian column capitals, each 1.3 m square and 0.90 m high, and 25 column bases that vary between 1.15 and 1.35 m on a side with a height of 0.45 m. The artifacts lying closest to shore have shifted little because they rest on a sandstone seabed, whereas the pieces to the south lie on a sandy bottom and have been much more scattered by the waves. All the pieces were roughly shaped, possibly to be finished after arrival at their destination. From the shape of the capitals we can date this wreck to the fifth or sixth century A.D.

Among the materials recovered during the 1993 survey and presented to the Bodrum Museum of Underwater Archaeology was a small lead anchor stock of Roman type, 0.65 m long, found off Teke Burnu (fig. 5). Raised from a depth of 37 m, it has at its center a square hole for the anchor stock. This type of stock was used roughly from the middle of the second century B.C. until the fourth century A.D. Its most widespread use, however, was in the second quarter of the second century B.C. All lead items seen during our surveys have been retrieved for the Bodrum Museum. Recovery of such artifacts, which have a high scrap value, prevents them from being looted and destroyed by divers.

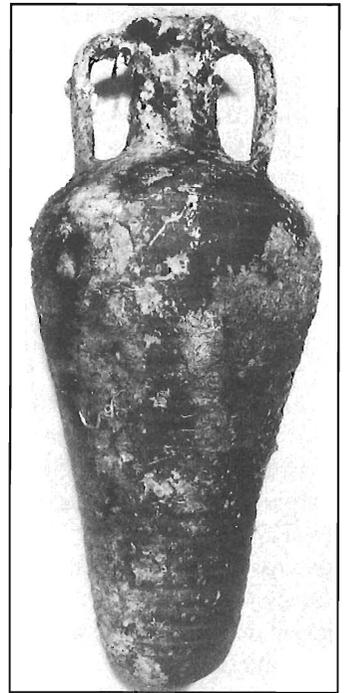


Photo: D. Frey

Fig. 4. Intact amphora from a 10th-12th century A.D. shipwreck near Kızılburun.

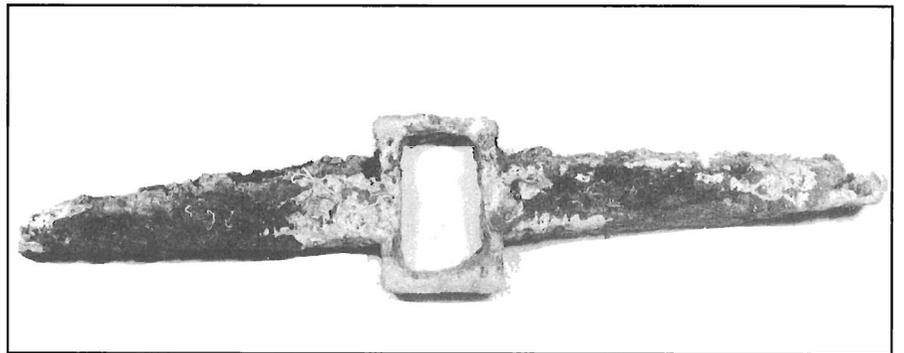


Photo: D. Frey

Fig. 5. Roman-type lead anchor stock from Teke Burnu (overall length 0.65 m).

### The Foça Sonar Survey

Meanwhile, aboard the trawler, the second team sought the wreck of a ship that had carried the Late Hellenistic bronze statue of a naked athlete and a larger than life bronze arm of a second statue, both now in the Izmir Archaeological Museum. The bronzes had been raised in trawler nets some years earlier off Foça. In order to survey the large area in a detailed and systematic manner, we used a prototype side-scan sonar coupled to a computer and Global Positioning System developed specifically for this type of work by INA Director Martin Wilcox. Because of the water depth in the search area, a remotely operated vehicle (ROV) was used in place of divers for identification of sonar targets. The largest and most striking of these targets, with some additional scattered ones that resembled shipwrecks, were scanned with the television camera of the ROV, but all proved to be submarine rocks or scattered groups of stones lying on the otherwise generally flat and sandy bottom. Other sonar targets could not be investigated due to particularly rough seas. Thus, our attempt to find the shipwreck that had yielded the bronze statues remains inconclusive, but one target, enhanced later by Marty Wilcox, appears to be extremely promising. We hope to be able to investigate this target in the near future. On the other hand, a wreck with a cargo of lead ingots at a depth of 50 m off Eski Foça, reported to us during our 1992 survey, was located by the sonar. Unfortunately, however, bad weather prevented visual inspection of the wreck by either divers or the ROV.

--Cemal Pulak

### The 1994 Survey

The 1994 survey was conducted in two phases. The first part began on June 3rd, two weeks prior to the final season of the Uluburun excavation. The purpose of this phase was to visit the Bozburun site to plan for next summer's excavation, to continue the examination of the Cape Gelidonya wreck site, and to investigate several possible wreck sites.

A wreck near Dalyan that was first investigated in 1986 was reexamined. Discovered by sponge diver Ahmet Güntaş, the wreck assemblage included 18 amphoras in three sizes, all of which have flat bases. An amphora of the largest size was recovered from the wreck (fig. 6). This material, along with amphoras from a second wreck discovered during our survey, plus a collection of similar jars in the Bodrum Museum of Underwater Archaeology, comprise a

series of flat-bottomed amphoras with small lug-shaped handles on their rounded shoulders, and narrow mouths. Although stylistically they appear to be of the late Medieval period, we have been unable to find any conclusive evidence for their dating.

Five days were spent at Cape Gelidonya. One of the objectives of the visit was to search for the ship's anchors around a pinnacle of rock on which the ship probably ripped out its bottom. Underwater scooters were used to cover maximum area during this search. While investigating east of the pinnacle Murat Tilev stopped to examine a Byzantine anchor, placing his scooter on a large rock nearby. Upon retrieving his scooter he discovered that the "rock" was actually a stone anchor. A thick layer of seaweed had camouflaged it, rendering it invisible to cursory observation. Examination showed that the hawser hole was aligned toward the rock pinnacle. This, taken together with the anchor's position relative to the area of the shipwreck, suggests that the crew had cast it off as a last resort to prevent the ship from hitting the island. Raising and cleaning the anchor revealed it to be similar to the ones found on the Uluburun wreck (fig. 7). At 219 kg (c. 480 lb), it is heavier than any of the stone anchors from that wreck that have been weighed to date. Like the Uluburun anchors, the example found at Gelidonya was made of sandstone, though of a coarser variety. The lack of any anchors at Cape Gelidonya had always baffled its investigators, but this fortuitous discovery has solved that long-standing mystery.

Additional time was spent trying to free a heavily concreted pithos base, seemingly of Cypriot origin and similar to those at Uluburun, that had frustrated all previous attempts. Several days of chiseling revealed the base to be much larger than expected, and it still could not be removed. The retrieval of this artifact will have to wait for another year.

On October 3rd, three weeks after returning from Uluburun, INA staff members left for the second phase of the survey. Joining us was Cumhur Ilik, a veteran sponge diver who originally discovered the Sheytan Deresi wreck (see *AINA Newsletter* 1.1: 3-4 and 2.3: 1-5). His knowledge of the coast and diving conditions proved invaluable to our search.

For the first time, INA divers began carrying small cylinders of oxygen strapped to their air tanks during survey dives. Previously, divers had to return to the *Virazon* or be located by the tender boat so that an oxygen hose could

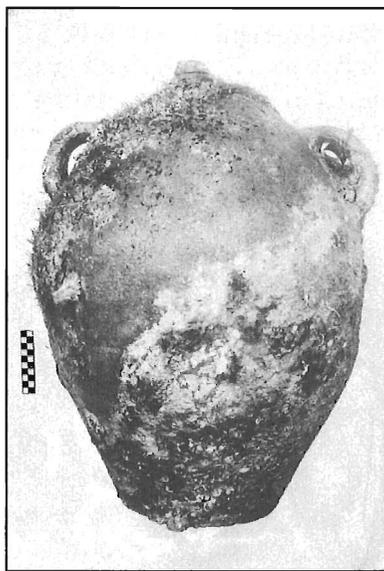


Photo: D. Frey

Fig. 6. Flat-bottomed amphora from a wreck near Dalyan, possibly dating to the late Medieval period.

be lowered to them for decompression. Now divers could decompress anywhere on oxygen, increasing the safety factor and permitting longer dives.

Near the town of Sığacık at Teke Burnu, we located the scattered remains of two small Byzantine wrecks. One wreck, containing small piriform amphoras probably intended for wine, lay smashed on a rocky slope. The debris continued down to a depth of 37 m, where the rocky slope merged with a nearby flat sandy seabed. At the base of the slope, on the sand, were two complete amphoras along with sherds of others. One of the intact jars was raised for identification purposes and deposited at the Bodrum Museum. Probing in the sand may reveal additional wreck material, but all that was readily visible amounted to less than 20 amphoras found among the rocks in groups of four to five jars. Cumhuriyet, the site's original discoverer, reminded us, however, of old local rumors that many amphoras from this wreck had been removed for sale in Izmir markets. Based on the sole example recovered from the site, the wreck should be dated to the 11th century A.D.

A second scatter of jumbled amphora sherds nearby appears to contain amphoras of similar size, but differs from them in having wider and longer necks. Because of the shallow depth of this wreck, all amphoras are extensively damaged from pounding waves and concreted to the rocky seabed, a factor that prevented us from collecting examples for later study. Also visible among the wreckage were parts of two y-shaped iron anchors. If contemporary with the amphoras, the anchors are clear indicators of a 10th to 12th century A.D. date for the assemblage. It is possible that the material found here may in fact be from the wreck discussed immediately above. Further investigation in the area may elucidate this possibility.

Our search next took us to Papaz Adası near the ancient city of Didyma. Ilik had heard of an amphora wreck there that had been discovered 20 years ago and had been impressive enough for foreign divers to photograph. When we located the wreck the only things evident were a few amphoras lying half buried in the sand and numerous fragments strewn about the area. Unfortunately, the wreck obviously had been looted. Those amphoras that we examined had the characteristic double handles of jars made on the island of Kos during the first century A.D. for the export of their famed wines. We are hopeful that much of the wreck is still buried and protected.

In 20 years of surveying, INA has discovered approximately 100 wrecks while searching hundreds of kilometers of the Turkish coast. Future plans call for continuing eastward into the provinces of İçel, Adana, Antakya, and Iskenderun. In time, we hope to cover the entire Mediterranean coast of Turkey. The experience gained in the surveys is also being put to use in such places as Bulgaria,

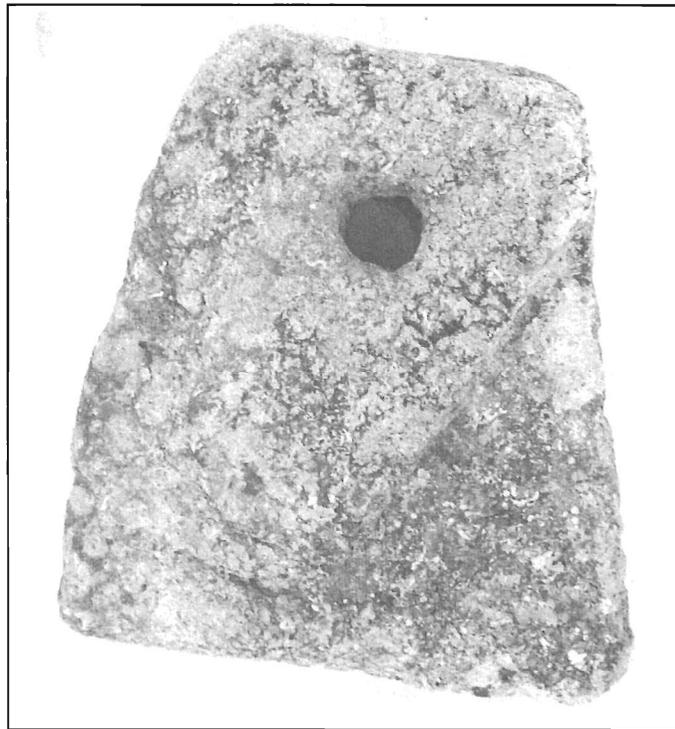


Photo: L. Ray Martin

Fig. 7. In 1994, INA divers discovered the first Bronze Age stone anchor from the Cape Gelidonya wreck (weight 219 kg). This anchor is heavier than any of the anchors from the Bronze Age shipwreck at Uluburun.

Egypt, and Bahrain. In all of these places, INA surveys are aimed at locating vessels that can provide us with information about maritime trade, ship construction, and the history of seafaring.

--Edward Rogers

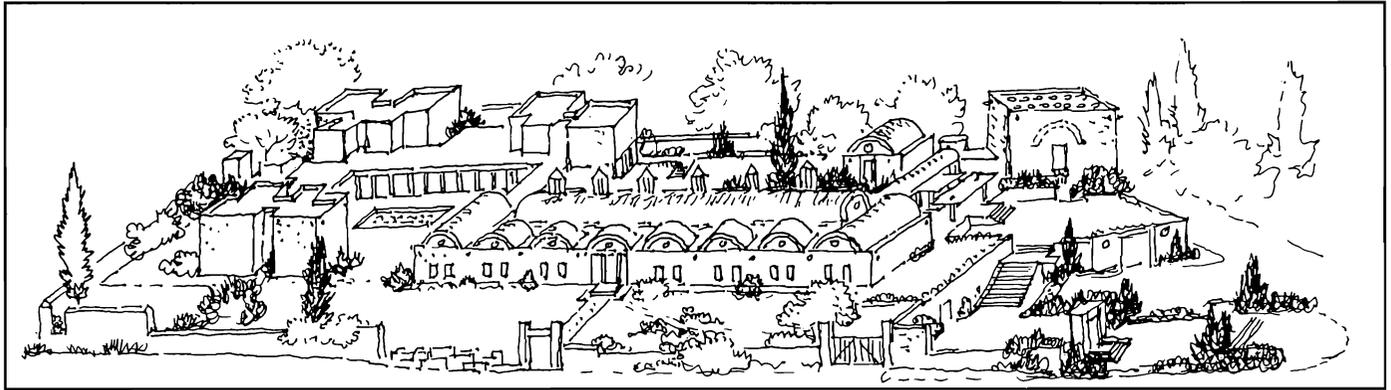
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# INA's Bodrum Campus

by George F. Bass

George T. & Gladys H. Abell Professor of Nautical Archaeology / Yamini Family Professor of Liberal Arts



Drawing: T. Cansever, Ltd.

*Architect's rendering of INA's Bodrum campus. The main building and two of the dormitory buildings are complete.*

For those of us who have used Bodrum, Turkey, as a base of operations since 1960, the new INA facilities there can only be described as far beyond any dreams we might ever have had. Over the decades we moved repeatedly from one rented house to another. One building was so crowded that some of the staff lived in tents outside, and 18 of us shared a single bathroom. There were no offices. Drafting surfaces were often boards laid across empty oil drums, or a dining table cleared of dishes three times a day. Machines and diving equipment were repaired in open air.

As INA acquired a permanent Bodrum staff, they worked from their homes, scattered over the town, while seasonal staff continued to look for rented apartments and houses. With no central location, and with multi-year waiting periods to acquire telephones, we wasted hours each day walking between homes, looking for one another, too often finding that the person we wanted to consult was somewhere else.

Under Don Frey's presidency, INA made a serious effort to establish a permanent center that would allow us to work more efficiently. On the crest of a hill overlooking the town, just outside the Hellenistic city wall of ancient Halikarnassos, Tufan Turanlı found a reasonably priced, ten-*dönem* olive grove for sale (a *dönem* is 1,000 m<sup>2</sup>, or about a quarter of an acre). We purchased four *dönems* for INA. Of the INA staff, Frederick van Doorninck and I each purchased one *dönem*, under a recent law that allows foreigners to own property in Turkey, and Tufan Turanlı and Cemal Pulak two *dönems* each, all for our own homes.

After studying commissioned sketches by European and Turkish architects, we chose for our INA headquarters a complex of buildings, based on Ottoman concepts, designed by one of Turkey's most noted architects, Turgut Cansever, who has won two Aga Khan Awards for his work. Thanks especially to the generosity of John Baird, Gregory Cook, Charles Consolvo, Donna and Bob Dales, Claude and Barbara Duthuit, Danielle Feeney, the late Nixon Griffis, Harry C. Kahn II, Jack and Jean Kelley, John Merwin, the Nason Foundation, the National Endowment for the Humanities, Mary and Richard Rosenberg, Ray and Milann Siegfried and their family, Martin Wilcox, Frederick Campbell, and Ron Bural, the main building and much of the dormitory have now been constructed and are in use.

The main building is a long corridor with side vaults for offices on the front, and larger rooms for a drafting lab and a director's office at either end. On a lower floor are a coffee/meeting room, a darkroom, bathrooms, showers, and temporary bedrooms that have housed seven students for the past two years. Now that the dormitory building is nearing completion, and partly occupied, the temporary bedroom walls in the main building are being removed to make a library capable of shelving perhaps 10,000 volumes. This is in anticipation of shipping to Bodrum in 1995 the Homer and Dorothy Thompson library, the G. Roger Edwards library, and the Peter Throckmorton library.

The dormitory is a series of two-story rectangular blocks joined by one-story connections; the one completed connection serves as a kitchen and dining room, although in warm weather students often eat on a patio outside.

Planned for the future, as funds become available, are a three-story library building, a conservation laboratory, and an additional wing for the dormitory. All of the buildings are of stone-faced concrete, with marble flooring.

Running along the west side of the complex is a short, unpaved road that the city has allowed us to name Sualtı Sokak ("Underwater Street"). On it, van Doorninck, Turanlı, and I have completed our homes, all in different styles designed by different architects, and Pulak's house is under construction. It is a unique neighborhood of colleagues who have worked together for 20 to 30-odd years, and remain, with our families, the best of friends.

This Bodrum "campus" has dramatically changed our lives and the way we work. For the first time we have proper offices and work spaces--with computers, printers, a photocopier, and a fax machine--in one location. It has allowed us to hire multi-lingual Marion Değirmenci as a secretary and accountant. Having the staff together in one place has increased both efficiency and morale.

Construction of the dormitory has allowed INA to attract a staff of volunteer students and professionals from around the world to study materials raised from the wrecks we have excavated. Our product is knowledge, disseminated through displays (in the Bodrum Museum of Underwater Archaeology, a 20-minute walk away), through films, and, especially, through publications.

The completion of a site as large and complex as the 11th-century shipwreck we excavated at Serçe Limanı, between 1977 and 1979, or the Bronze Age shipwreck at Uluburun, is a massive undertaking, for before publication or display, thousands of artifacts must be conserved, cataloged, drawn, photographed, and studied. This requires a tremendous number of working hours over a period of many years. To hasten ultimate publication and

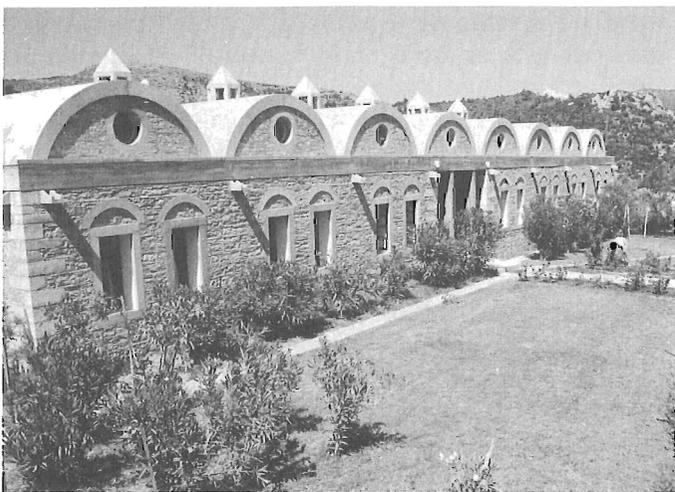


Photo: R. Piercy

*The facade of the completed main building of the new INA headquarters in Bodrum. Staff offices, a drafting lab, darkroom, and library are housed inside.*

display, we can now offer a mutually beneficial arrangement to volunteer students and technicians from around the world. They gain experience, or publication rights, and INA gets the job done! Without them, we would have to triple or quadruple our salaried staff.

Two years ago, for example, I wrote to dozens of universities that offer courses in medieval Islamic art, asking for volunteer graduate students. Five were chosen from the applicants: two from the United States, two from Spain, and one from Scotland. Each spent from a term to an academic year in Bodrum, and several returned for 1994-95, along with two new volunteers. What would have taken our own staff many, many years--to publish the largest collection of medieval Islamic glass in the world--is now almost completed, with 25 chapters out of a planned 32 in hand! For some of the students, their chapters will be their first scholarly publications. This is good for the students, good for INA, and good for archaeology.

Conservation of the myriad artifacts from Uluburun is being similarly speeded. In 1994, five advanced conservation students came to Bodrum for a summer training course offered by INA and sponsored by the National Endowment for the Humanities. Other conservators came from Egypt, the United States, and England during the summer and fall for the experience of working with materials from the sea, materials that require special treatments. They and the volunteer artists work under the supervision of the two professional conservators and two highly skilled illustrators on our staff. The new INA headquarters also housed last summer the three Nautical Program students who worked with Turkish students under the direction of INA president Fred Hocker on the full-scale reconstruction of the seventh-century Byzantine ship we excavated at Yassiada in the early 1960s (see above, pp. 3-7).

We now have a waiting list of volunteers who want to work in Bodrum while housed in our new campus. It should be noted that virtually all of INA's current staff in Turkey--Don Frey, Cemal Pulak, Tufan Turanlı, Sheila Matthews, Robin Piercy, Jane Pannell, and Sema Pulak--began as volunteers.

The combination of INA's new campus and the Bodrum Museum of Underwater Archaeology, under the dynamic direction of Oğuz Alpözen, has made Bodrum the international center for underwater archaeology in the eastern Mediterranean. When I join our students for meals or coffee in the new complex, or watch them at work in the museum, I am sometimes surprised to realize that those at the same table are from Belgium, Spain and Egypt, or from Finland, Israel, Canada and Italy, or from Turkey, Britain, Pakistan and the United States. It seems that the reputation of our approach to ancient shipwrecks, started from Bodrum in 1960, is spreading around the world. The new INA headquarters in Bodrum is helping to speed that approach on its way.

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# Review

by J. Cozzi

*Wooden Ship Building and the Interpretation of Shipwrecks*

J. Richard Steffy

College Station: Texas A&M University Press, 1994.

ISBN 0-89096-552-8, 314 pages, 271 illustrations, tables, glossary, bibliography, index, hard cover. \$75.00.

Available to INA Members for \$56.00.

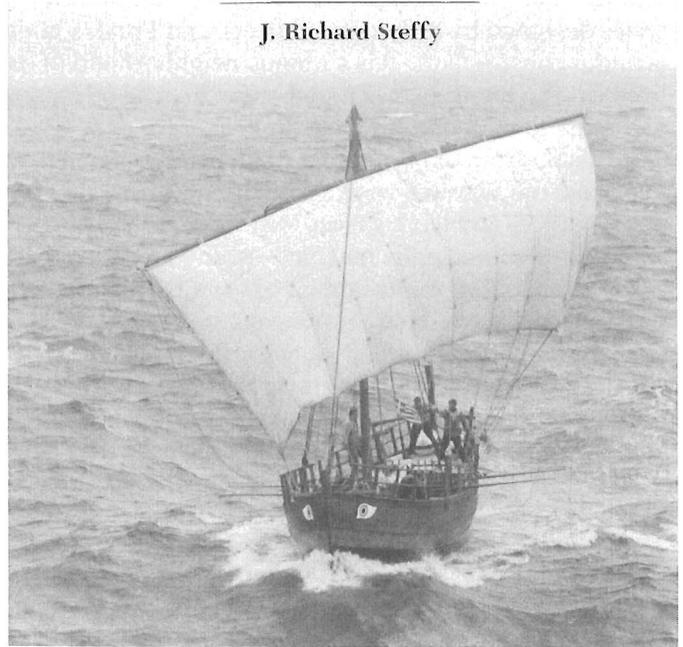
INA professor emeritus J. Richard Steffy has long maintained that the reconstruction of shipwrecks is a far greater task than the assembly of a vessel's conserved remains in a museum exhibit. For him, a reconstruction should reassemble the adventure of a ship from its inception as a technical enterprise, throughout its active life, to its deposition in and recovery from the archaeological record. In *Wooden Ship Building and the Interpretation of Shipwrecks*, Steffy shares the methodology of ship construction as well as a reconstructor's insights into the history of shipbuilding and the field of nautical archaeology.

Steffy wrote the book in response to requests from former students and fellow professionals; it is intended as a guide for those who document wooden ships and boats. Recently several "how to" manuals have been written about nautical or maritime archaeology (see *INA Quarterly* 19.3: 12-13), which recognize that documentation of the structure of a ship represents an important research objective. None of these works, however, presents a rational method for recording physical remains, nor do any detail avenues of inquiry for analyzing this data. Steffy avoids the composition of an all-encompassing tome on archaeology under water and concentrates on the methodology of ship recording and reconstruction within the context of shipbuilding technology through the ages. With this work, he fills the void left by earlier manuals.

*Wooden Ship Building and the Interpretation of Shipwrecks* is divided into three sections: an introduction to the fundamentals of ship construction and design, a brief history of shipbuilding technology, and the methodology for the recording and reconstruction of shipwrecks. Part one introduces the discipline of ship and boat reconstruction and challenges the reader to master the terminology of shipbuilding and seafaring as a way into the field. Steffy views the ship as a functional tool, requiring certain characteristics of stability and strength to perform well within a specific environment. He looks at the elements of hull de-

## WOODEN SHIP BUILDING AND THE INTERPRETATION OF SHIPWRECKS

J. Richard Steffy



sign, with examples of different forms from a variety of locations and time periods. The section includes a useful discussion of lines drawings as a means to convey three-dimensional forms on a flat media.

Part two takes the reader through a historical treatment of shipbuilding technology from the Bronze Age to the early 19th century. Steffy breaks his discussion into three periods: the ancient world, the medieval period, and the epoch of global voyages following the development of new routes to the Far East and the discovery of the Americas. *Quarterly* readers will recognize projects carried out by INA, such as the Late Bronze Age shipwreck at Uluburun, the Kyrenia ship, vessels from Yassiada and Serçe Limanı, the *Charon*, and the Brown's Ferry vessel. Examples of work by Steffy's former students abound, including investigations by current INA researchers Kevin Crisman, Cheryl Haldane, Frederick Hocker, and Sheila Matthews. It is important to point out that their work is not included simply because they were former students, but because they were forced to become experts in fields where none existed previously. Steffy rounds out this discussion with contributions from leading scholars about work in the Mediterranean and Northern Europe. Where

archaeological evidence is lacking, Steffy has consulted historical documentation of shipbuilding, such as Venetian and English manuscripts on shipbuilding and naval architecture.

Part three is the centerpiece of the book. It presents a thorough methodology of shipwreck recording and reconstruction, a field in which Steffy has provided constant leadership over the last quarter century, an effort which garnered him a prestigious MacArthur Foundation fellowship. Steffy makes the analogy between a shipwreck and a computer file, in that both can provide veritable cornucopias of information, but require proper access through disciplined and exact procedures. He is careful to warn that every project is unique, requiring its own recording, research, and dissemination procedures. His systematic approach to recording the remains of a vessel will be welcomed by those charged with this responsibility, and will enlighten the uninitiated in the difficult and time consuming process. Tips for field recording include labelling and measuring timbers, photography, scaled drawing, and cataloguing data. The need for proper planning before beginning any stage of recording or reconstruction is repeatedly emphasized.

Three types of reconstructions are outlined: graphic, three-dimensional, and physical. The first involves drawings, photographs, and accompanying text. Three dimensional projects involve modelling and replica construction, while physical reconstructions attempt to replicate the work of the original craftsman. Projects are divided into those with the potential to yield extensive reconstructions, termed "capital," and those that produce valuable, but less elaborate results, called "contributory." The section on three-dimensional research presents models and replicas built by Steffy and his students. Steffy, who prefers modelling to computer reconstruction, lists several modelling types, including: mold-and-batten models used in reconstructing hull lines, fragment models, models of specific timbers or shipboard equipment such as pumps and capstans, exhibition models for museum displays, and replicas. Users of computer assisted drafting (CAD) programs are warned that these systems are often incompatible with ships of many time periods and tend to overlook repairs and departures from modern design features. The learning process inherent in the manual creation of ship lines and models exceeds the timesaving aspect of CAD programs and brings the researcher one step closer to the vessel's original construction.

Steffy convincingly contends that accurate recording, appropriate research modelling, and technical drawings together transform shipwreck sites into a wealth of information about the past, which should be communicated to a wide audience. For Steffy, a high quality ship report should be lively, authoritative, comprehensible, precise, logical, economical, and suggestive; he incorporates this

advice into his book. Discussions of ship and boat reconstruction can easily degenerate into exercises in technical jargon slinging. Steffy avoids this by clearly identifying important considerations, as in his discussion of the progression from shell-first to skeletal-built construction, an important, though not always skillfully debated topic among ship reconstructors. His explanations are concise and exact, easy to follow, and entertaining to read. Following his own advice, he allows many fine illustrations to speak to the reader, thus eliminating wordy explanations. The 8.5 by 12 inch page format provides ample room for detailed technical drawings. Illustrations are well integrated with the text, including 60 photographs, of which nearly half highlight the chapter on research and reconstruction. The illustrated glossary is a rare and welcome find. For subjects beyond this study's scope, Steffy refers the reader to archaeological reports listed in a thorough bibliography, divided like the history section into ancient, medieval, and post-medieval periods.

Steffy's work is designed primarily for archaeologists who document wooden ships and boats; it makes an excellent text for teaching this aspect of nautical archaeology. Maritime historians, historians of technology, naval architects, and curators of vessels in maritime museum collections will find it of interest to view from an archaeological perspective the recording of vessels and the changes in shipbuilding technology over time. General readers should enjoy a voyage through centuries of shipbuilding and will ultimately find themselves better equipped to consult more technical archaeological reports.

The reader can discern the development of a methodology for the sub-discipline of ship reconstruction over the course of Steffy's career. Ideas formulated in the field, laboratory, and classroom have grown over the years into a widely respected research methodology, and now into an authoritative book. In *Wooden Ship Building and the Interpretation of Shipwrecks*, we are reminded that ship construction forced the application of a complex technology to the solution of transportation problems, and that shipwrecks, through rigorous and methodological study, can speak eloquently about the desires and aspirations of people in the past.

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*J. Cozzi is a Ph.D. candidate in the Nautical Archaeology Program at Texas A&M University. His dissertation examines sailing canal boats on Lake Champlain.*

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# News & Notes

## *A Phoenician Wreck at Yassiada?*

The reef that runs southwest from Yassiada (Flat Island), near Bodrum, Turkey, is especially treacherous. For about 125 m from the island, far enough out to deceive shore-hugging captains, it rises to within only two or three meters of the surface. Peter Throckmorton, who described the reef as a "graveyard of ships" when he first told me of it in 1959, estimated that a dozen vessels had ripped open their hulls on its rocks. Cannon balls are mixed with Greek and Roman pottery on the reef top, and chunks of raw glass of unknown date trail off into deeper water. On the east side of the reef, at depths between 32 and 42 m, were the remains of the well-preserved 4th-, 7th- and 16th-century wrecks that we have excavated, first for the University of Pennsylvania and more recently for INA.

One of INA's goals is to locate a well-preserved Phoenician wreck, and in a sense such a wreck has now come to us! In 1993, Yassiada's reef claimed a modern Lebanese merchantman, sailing from its Phoenician homeland to Rumania for a cargo of sheep. For months the ship's bow protruded from the waves, like a sentinel placed to ward off other vessels, but salvage efforts worsened the freighter's situation, causing it to slide out of sight down the side of the reef. The perilous reef will sadly but surely claim other victims for nautical archaeologists of the future.

--George F. Bass

## *Recent and Upcoming Lectures*

At the *Res Maritimae* conference, the second in a series titled "Cities on the Sea," in Nicosia, Cyprus in October, 1994, Cemal Pulak gave a keynote lecture on the Late Bronze Age shipwreck at Uluburun. A second keynote address, "Aspects of the Maritime Trade of Cyprus in Antiquity," was de-

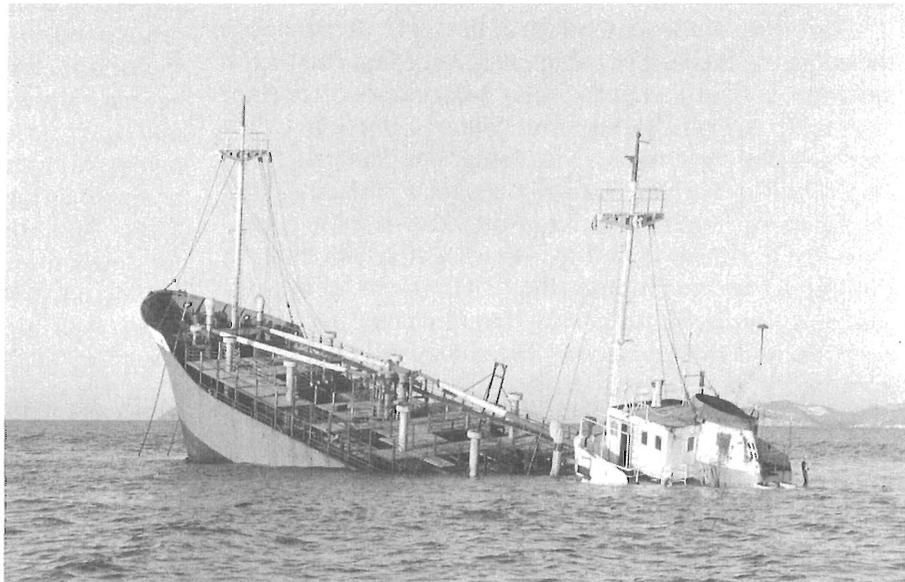


Photo: D. Frey

*A modern Lebanese merchantman, wrecked on the treacherous reef of Yassiada. INA's first Phoenician shipwreck?*

livered by Dr. Vassos Karageorghis, Director of the Archaeological Research Unit at the University of Cyprus. Dr. Shelley Wachsmann also presented a paper titled, "Were the Sea Peoples Fleeing Mycenaeans? The Evidence of Ship Iconography." Sponsored by the Cyprus American Archaeological Research Institute (CAARI), the conference explored maritime activity in Cyprus and the eastern Mediterranean from prehistory through the Roman period.

The Nautical Archaeology Program made a strong showing at the conference of the Committee for Underwater Archaeology (CUA), a division of the Society for Historical Archaeology (SHA). Program professors, students, and graduates took part in numerous lecture forums including: "Merchant Steam Ships" (chaired by Dr. Kevin Crisman), "International Underwater Archaeology", "Processual and Technical Issues in Underwater Archaeology" (chaired by J. Cozzi), "Florida's 16th-Century Shipwreck: A Preliminary Analysis of the Emanuel

Point Ship," and "Dutch Maritime Expansion and Historical Archaeology" (chaired by Dr. Robert Neyland, with Jerome Hall as discussant). The annual SHA Conference took place this year on 4-8 January 1995, in Washington D.C.

## *Nautical Archaeology Theses*

Three M.A. theses were submitted to the Nautical Archaeology Program faculty in 1994:

- Glenn Darrington. "Analysis and Reconstruction of Impermanent Structures of the 17th and 18th Centuries."
- Tina Erwin. "Personal Possessions from the H.M.S. *Boscawen*: Life on Board a Mid-18th Century Sloop During the French and Indian War."
- Sam Turner. "Saona Artillery: Implications for Inter-Island Trade and Shipboard Armaments in the First Half of the 16th Century."

## *INA E-Mail Address*

Communication with INA by e-mail is now possible at our new address: [nautical@tamu.edu](mailto:nautical@tamu.edu)

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# Profile:

## *Claude Duthuit*

INA Director Claude Duthuit has received one of France's highest honors, having recently been chosen for the Legion of Honor, the society founded by Napoleon to recognize meritorious service. The citation that accompanied his election spoke especially of his work in establishing a foundation to protect authors' rights and intellectual property, but it also praised his pioneering role in the development of underwater archaeology.

I am especially proud of this honor bestowed on Claude Duthuit, who took me on my first open-water dive in 1960, in the Bosphorus, as we prepared to undertake together the first complete excavation of an ancient shipwreck on the seabed, at Cape Gelidonya, Turkey. We were both then still in our twenties.

Throughout the 1960s, Claude remained a permanent member of our University of Pennsylvania team, serving as chief diver during our excavations of two Byzantine shipwrecks at Yassiada. It was then and there that so many of the techniques of underwater excavation, now considered standard, were developed.

During those days, it was Claude, calm and at his best under pressure, to whom I usually turned in times of crisis. Perhaps he did not rattle easily because of his background. After studying cartography, he had been an Alpine guide, and then served as a combat platoon sergeant in Algeria; at our camp at Cape Gelidonya he received the dreadful news that most of his former unit had been killed in an ambush.

But Claude was more than a man of action. Most evenings in camp saw him propped on one elbow in his sleeping bag, a flickering kerosene lantern by his head, reading some book on European history. His own book, *Turquie*, published in 1969 by the prestigious *L'Atlas des Voyages* series, beautifully captures the spirit and feel of the country he had come to love. And the film he produced on our work in 1961-62, shown on television around the world, remains a nostalgic record of the days when Bodrum, now a major tourist city, was still a small town of sponge divers and citrus growers, where camels rather than trucks hauled cargoes.

When I left the field of underwater archaeology for four years at the end of the decade, Claude and I went our separate ways. His interest in archaeology may have been influenced by his father, Georges Duthuit, noted Byzantine art historian and curator at the Louvre. Now, educated in art by his mother, Marguerite, daughter of the painter



Photo: D. Frey

*Claude Duthuit and George Bass, diving together for over thirty years!*

Henri Matisse, Claude dedicated himself more and more to protecting the integrity of his grandfather's work by compiling unique archives of the artist: *Henri Matisse: Catalogue raisonné des ouvrages illustrés* (Paris 1988), and, with Marguerite Duthuit-Matisse, *Henri Matisse: Catalogue raisonné de l'œuvre gravé*, two volumes (Paris 1983). According to his Legion of Honor citation, these works and the unpublished materials Claude has made available to art historians, as well as loans to various museums, have greatly enriched recent Matisse exhibitions such as those in New York and Paris.

After fate brought us together again in 1976, Claude joined INA's board of Directors. Can there be a more loyal director? Immediately after his marriage to Barbara, they flew to our annual board meeting in Dallas, and then drove back to College Station with Ann and me. I suspect that newlyweds have flown from College Station to Paris, but surely this was the first couple who ever came from Paris to College Station for their honeymoon!

Finally, it was Claude, an annual visitor to Bodrum, who suggested that we return to Cape Gelidonya, three decades after our excavation there. His insight led to visits in which well-preserved 13th-century B.C. pottery and a Near Eastern stone anchor were found, solidifying my controversial conclusion that in 1960 we had excavated a 13th-century Canaanite ship. Thanks, Claude. Thanks, Legionnaire Duthuit!

-- George F. Bass

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