

INA NEWSLETTER

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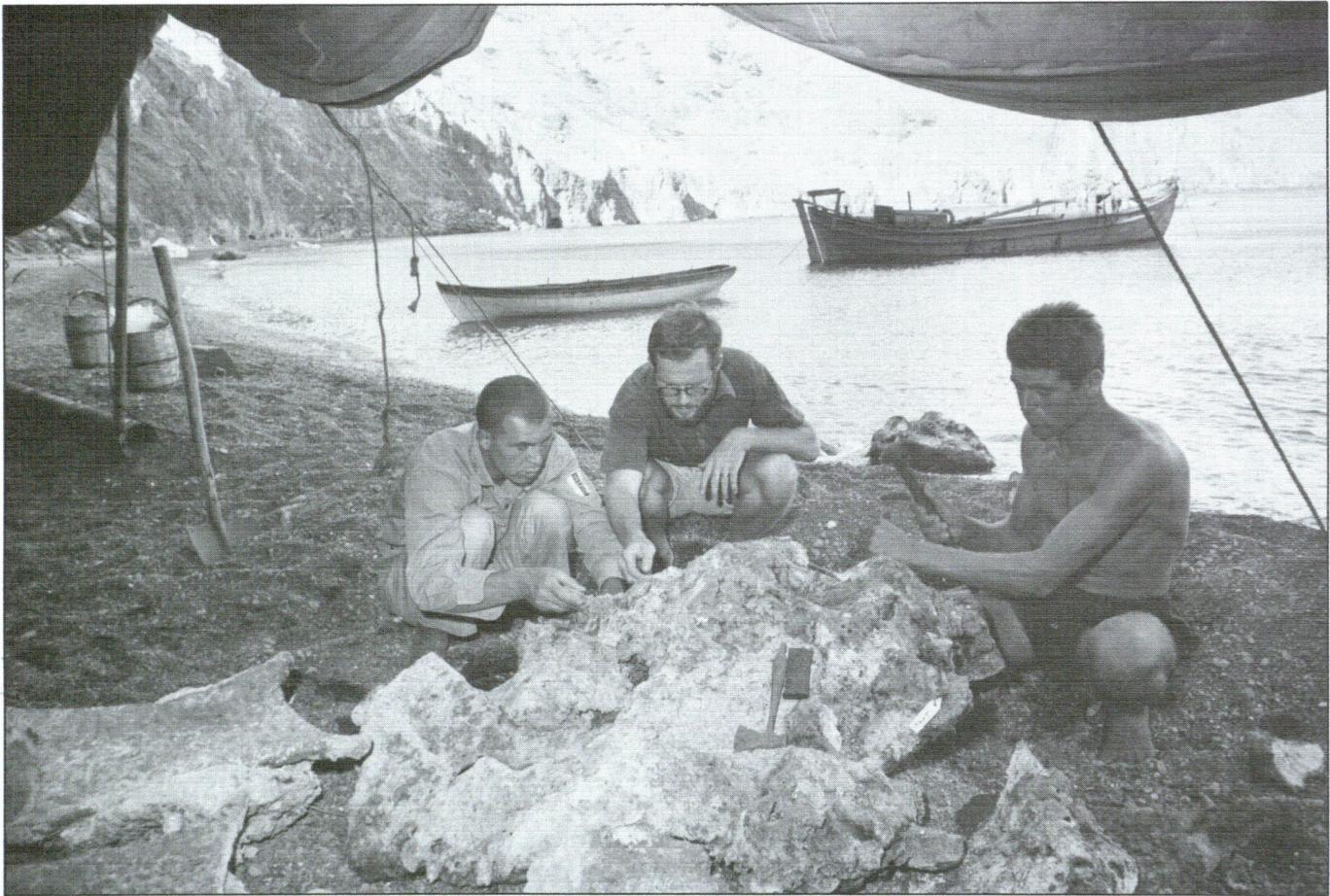


June 1988



Photo: Herb Greer

1960 Cape Gelidonya excavation research vessel
Lutfi Gelil



Herb Greer

George Bass, center, examines the huge ingot concretion chiseled free by Claude Duthuit and a Turkish sponge diver in hardhat gear (below) in 1960.



Peter Throckmorton

Return to Cape Gelidonya

by George F. Bass

I was a graduate student specializing in Bronze Age Aegean archaeology at the University of Pennsylvania in 1959 when a letter arrived from a photojournalist and diver named Peter Throckmorton, saying that he had found a Bronze Age shipwreck near Cape Gelidonya, Turkey. Believing that it should be possible to excavate as carefully under water as on land, Throckmorton wondered if the university might sponsor the excavation of the site. Although pioneers in France and Italy had laid the ground work with impressive experiments, at that time no ancient wreck had ever been excavated in its entirety on the seabed.

The complete excavation of the Cape Gelidonya shipwreck the following summer, with Throckmorton and me directing, was a milestone in nautical archaeology. When Throckmorton's letter arrived, however, I had no idea how to dive. I'd read every available book on the subject and on the infant discipline of underwater archaeology, and was even an honorary member of the Zagreb, Yugoslavia, Diving Club, for donating a dozen or so books to it when I stayed, by chance, for a few days with its president. But it took Rodney Young, chairman of the Department of Classical Archaeology at the university, to ask me to learn to dive so that I might serve as archaeological director of the forthcoming excavation.

The YMCA diving course in which I enrolled lasted ten weeks, but after the sixth lesson it was time for me to leave for Turkey. And we were still training with just fins, masks and snorkels! I begged the instructor, Dave Stith, to let me try on the tanks just once and that night, using tanks for the first time, I passed all of the necessary tests: donning and ditching the equipment under water, buddy-breathing the length of the pool and back, and facing harassment by the instructors. Still, I had never been deeper than the ten feet of the instruction pool when Peter and I crossed a stormy Atlantic in April on the *SS America*. We disembarked in Southampton and took the boat train to London in order to meet Joan du Plat Taylor, Honor Frost, and Herb Greer assistant archaeological director, draftsman, and photographer respectively. And it was in London that I met Claude Duthuit.

Claude had just arrived by plane from Paris when Peter introduced us on the sidewalk in front of a pub. He wore a trenchcoat, smoked Gauloise cigarettes, and seemed to me terribly sophisticated and *European*. He and Peter had met while travelling together to Turkey from separate adventures in India, and Peter asked him to be one of our divers. I soon learned that he had expected me to be an aged, perhaps white-bearded professor. Instead I was, at 27, a year younger than he was.

During the weeks we spent in Istanbul and Ankara obtaining necessary permits, I knew it was time for me to try diving a little deeper than the ten-foot swimming pool back in Philadelphia. My first effort, from a pier in the Bosphorus, was a bitter disappointment. With members of the Turkish Fish Men's Club urging me on, I failed miserably. Every time I descended past ten feet, the pain in my ears became so intense I had to return to the surface. Swallowing, holding my nose and blowing, and trying all the other tricks urged on me by the helpful Turkish divers failed to get me through the ten-foot barrier. I returned to the hotel terribly depressed. The wreck at Cape Gelidonya, Peter had told me, was nearly a hundred feet deep.

Next day Claude took me diving. This time we swam from a beach rather than from the pier. He told me not even to think about equalizing the pressure in my ears. We'd just swim around a few



Claude Duthuit in 1960.

feet deep so that I could get used to wearing the tanks and breathing through a regulator. I followed him, poking at living things in the sand with my fingers. We found an anchor chain and followed it. At the anchor Claude pointed to my depth gauge. It read 30 feet! A glance upward, toward the surface, proved to me that the gauge was correct. Without thinking about my ears, I'd allowed them to equalize. Now I could go to any depth. I could be an underwater archaeologist! My next dive was on the Bronze Age shipwreck.

The story of the Cape Gelidonya excavation has been related in Peter's *Lost Ships* and my *Archaeology Beneath the Sea*. Virtually without camping equipment, we spent three months on a narrow strip of beach only 20 to 30 feet wide, surrounded by cliffs so steep we never tried to scale them. We chose the beach because damp patches in the sand provided clues to the fresh water we were able to collect by digging away the sand and damming the resultant springs with low stone walls.

I'd married Ann Singletary just before sailing on the *America* with Peter. When she arrived at our isolated beach, Claude gal-



After more than 25 years, INA returned to Cape Gelidonya in its present research vessel, Virazon.

lantly gave up his Alpine pup tent, the only tent in the expedition, for our honeymoon. But even a tent was no protection against the stones that rattled down the cliff all too often; more than once the entire team found itself standing waist deep in the sea, in the middle of the night, looking back apprehensively at the beach until a mini-avalanche stopped.

The excavation, in fact, was halted a few days earlier than we had planned because of a storm which we feared might bring the whole cliff down. We were not concerned by this early departure, however, as our team of eight had dived on the wreck almost every day for three months, had swept the sand down to bedrock, and had even combed the seabed with a metal detector for any last traces of cargo.

It was Claude and Wlady Illing, a German diver at Cape Gelidonya, who convinced me to return to Turkey the following year to begin the excavation of a Byzantine shipwreck off Yassi Ada (Flat Island) near Bodrum. Otherwise, I'd have returned to Bronze Age archaeology on land. Claude became our chief diver, a position he held throughout most of the 1960s, and we shared many adventures until our lives drifted apart when he had to devote full time to the estate and affairs of his late grandfather, Henri Matisse, and I decided to leave (for only four years, it turned out) the field of underwater archaeology.

Our paths might not have crossed again had it not been for a late-night arrival in France by ferryboat from England in 1976. Robin Piercy and I were driving to Italy to join Don Frey for an underwater survey off the west coast of Sicily, one of the early projects of our new Institute of Nautical Archaeology. But all the insurance offices had closed, and we did not want to drive without French insurance. I told Robin of a friend in Paris who might put us up over night. A phone call and a quick train trip brought us to Claude's apartment.

In catching up with events of seven years, I described to Claude the new institute I had founded. He was fascinated. He asked who its directors were, and how to become one. I responded that if he was serious, I would nominate him.

Claude became an early INA director, coming each year from Paris with his wife Barbara to attend INA Board meetings. He also

visits INA field projects in action, which brings us to the point of this story.

Last year I decided that it was time for me, after 27 years of diving, to more or less hang up my fins and devote time to the publication of the Glass Wreck we excavated at Serçe Limani in the 1970s, and to research for publication of the Bronze Age shipwreck we are excavating at Ulu Burun, near Kas, Turkey. I formally requested that the Turkish government replace me as director of the Ulu Burun excavation with Cemal Pulak, our fine graduate student who has directed much of the excavation anyway.

With Cemal in charge at Ulu Burun, I was free to sail down the coast from Bodrum with several INA directors, including Claude. At Ulu Burun, on the spur of the moment, I suggested to Claude that we return to the site of our first archaeological dives. Tufan Turanli, captain of INA's research vessel *Virazon*, said it was only a few hours away. With twelve of us on board, we weighed anchor and headed for the next cape to the east Cape Gelidonya.

We arrived in the afternoon. Everything looked exactly as it had more than a quarter of a century earlier. I remembered to which rocks we had tied our earlier "research vessels" Bodrum sponge boats and I now instructed Tufan where to moor. But where was the wreck? We had only one dive apiece, and I didn't want to waste mine simply trying to locate the site! Claude and I argued, pointed, and argued some more.

Still uncertain, we suited up and jumped into the water with two of the Ulu Burun staff. At first we snorkeled back and forth, almost aimlessly, along the steep shore. Then, suddenly, I was certain. I headed straight toward the bottom. Almost instantly the huge boulder "big as a railroad car" came into view. On the seabed, my depth gauge read 85 feet—only half the depth of the Ulu Burun site.

I dropped to my knees at the base of the boulder, with Claude at my side, and began sweeping sand in an area that had yielded a number of stone balance-pan weights in 1960. Almost at once I found another, and saw that Claude had uncovered still another. I swam across the site and randomly picked up a shapeless lump of some kind of metal. Then we all searched the perimeter of the



Claude Duthuit and George Bass hand fanning at the base of the boulder "big as a railroad car" in 1987. (Photo: Don Frey)

site, looking for the anchors that must be in the vicinity but which have always eluded us.

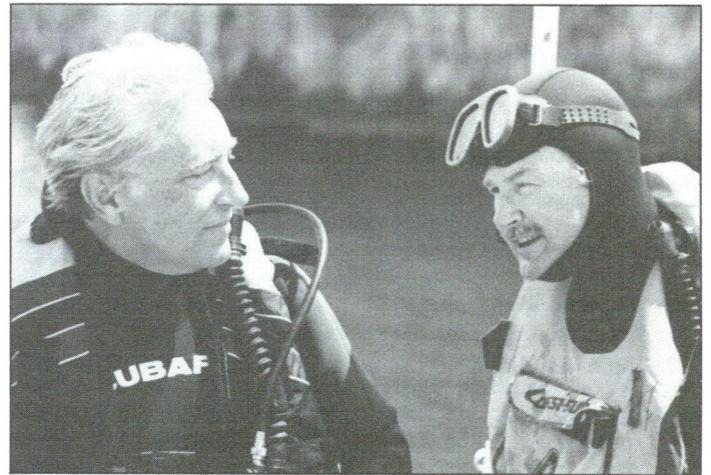
On deck, Cemal inspected our finds. One of the finds was shaped like a bull's head. Although we are finding many zoomorphic pieces on the Ulu Burun wreck, this was the first ever found at Cape Gelidonya. Then he looked at the lump of metal. It was the first metallic tin ever found on the site! We'd found lumps of tin oxide in 1960, but laboratory analyses of it had been doubted by some scholars. Now we had the proof that the Gelidonya ship carried copper and tin, the same raw ingredients for making bronze as the Ulu Burun wreck.

How had we found in a single 20-minute dive things we had overlooked during much longer dives in 1960?

Cemal led the next team of four divers. I'd told him to look under the edge of the boulder, for I wasn't certain that we'd really searched there thoroughly enough during the excavation of the site. But I was stunned when he returned after 20 minutes with several beautifully intact bronze knives! They are among the nicest artifacts ever to come from the wreck.

There is only one conclusion: as good as we were in 1960, we weren't that good! We simply had not yet perfected the technique of sweeping sand thoroughly from a site. We may also have spent too much time wrestling with the heavy and outmoded metal air-lifts used in the early 1960s.

After the third team dived and spotted still more objects, we sailed for the beach that had once been our home. Except that it was covered with plastic trash swept over it by the waves, it was just as we had left it. The low stone walls that had formed freshwater pools still stood. We drank cold, sweet water from one



Claude Duthuit and George Bass share a friendship that spans the history of scientific underwater excavation. (Photo: Don Frey)

spring. I marveled at the shallow cave which Herb Greer had used at night as a darkroom.

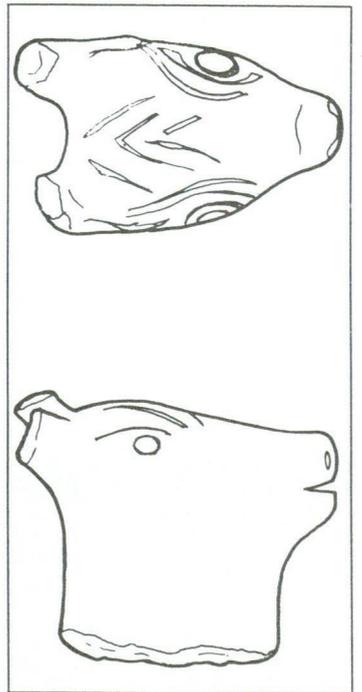
Near nightfall, a small boat arrived at the beach. A local family came ashore and began gathering driftwood for a fire to cook the fish they had caught. While Claude and I continued our nostalgic inspection, Yasar Yildiz of the Bodrum Museum of Underwater Archaeology, and our commissioner from the Turkish government, chatted with the family. When we gathered to return to the *Virazon*, Yasar was grinning broadly.

"Do you know what they call this place?" he asked.

Before we could respond, he answered his own question:

"*Amerikan yurdu*," he laughed, "The Place Where the Americans Camped." They don't even know why it's called that, but that's now its local name!"

"We weren't very good excavators in those days," I thought, "but at least we were the stuff legends are made of. Maybe there's some comfort in that!"



This 1987 field drawing illustrates the only zoomorphic artifact ever found at Cape Gelidonya. (Drawing: Nicolle Hirschfeld)

INA Enters the SHARPS Era

by Donny Hamilton

INA has always strived to excavate underwater archaeological sites with the highest degree of accuracy that modern technology allows. Accordingly, INA has not been hesitant to adopt new techniques in its quest for excellence. Excavations by INA staff members include a number of firsts in nautical archaeology such as the first private use of a mini-sub in archaeology, the first use of stereo mapping underwater, the first saturated dive on a wreck, the first discovery of an ancient wreck with side-scan sonar, and being one of the first to use a sub-bottom profiler for archaeological surveys. INA's equipment list reads like a "Who's Who" in diving technology. We have the first Kline & Associates manufactured sub-bottom profiler, serial #001. Now, just this past summer, INA became the owner of one of the first production models, serial #000, of the Sonic High Accuracy Ranging & Positioning System (SHARPS) conceived and developed by INA Director Martin Wilcox, known to most of us as Marty.

When Marty became a member of INA's Board of Directors in 1985, he asked INA President Don Frey what he could do to assist INA with his background in electronics and involvement in the development of the real-time ultrasonic scanner for obstetrics. Don replied that one of the biggest problems in underwater archaeology is the time it takes to accurately map a site, especially in poor

visibility and on deep wrecks where diving time is so short. So began the birth of what was to become SHARPS. There were a lot of setbacks in the development of the hardware, and even more in the development of software programs required to operate the system. Each was solved, one by one.

In its development stage, different prototypes of SHARPS were tested in Marty's swimming pool and on nearby archaeological sites, including one of Cornwallis' shipwrecks at Yorktown, Virginia. A production model was tested in a February National Geographic project in Chesapeake Bay, and INA's first use of a production model was on the site of Port Royal, Jamaica in June 1987.

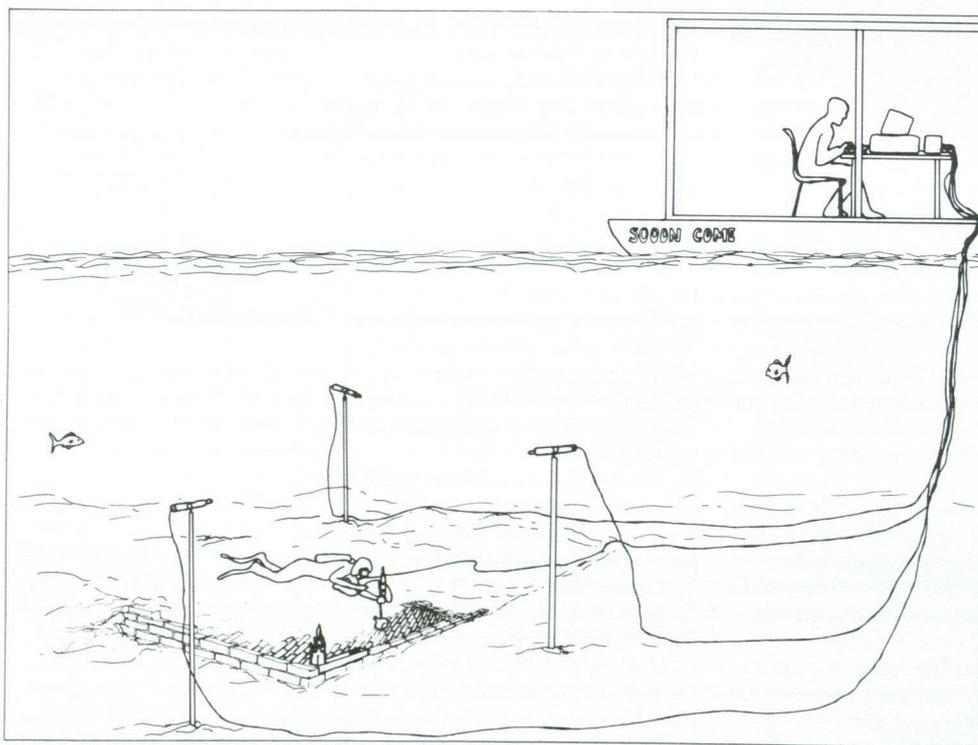
From its inception in 1981, the Port Royal Project has been quick to initiate and incorporate on a daily basis new technology in its research. The Port Royal Project has been using video to film all aspects of the underwater excavation and land-based work since 1984. Computers were introduced to maintain artifact records on data bases, and computer assisted drafting programs were used to draw excavation plans and to plot artifacts in 1985. Going to Port Royal without a computer is now unthinkable.

It was natural then for the SHARPS system to be tested at Port Royal before it was sent to Turkey to be used on the projects there.

Also, because Port Royal was closer at hand, Don Scott, a congenial Canadian who wrote the software for the system, was able to hand deliver the equipment and give us hands-on training, which proved to be extremely helpful. Initially, we had a number of frustrating problems with noise interference from an unknown source in Kingston Harbour. Don remained unflustered and rewrote the software to counter the interference. In addition, he incorporated a number of changes at the suggestion of the project director, Donny Hamilton.

The use of SHARPS at Port Royal was mutually advantageous. Its use on an ongoing archaeological excavation, not just a mapping exercise, brought up a number of questions and solutions that Don was able to answer, remedy, and incorporate in the software during several late night sessions on the computer. This made the SHARPS operating system more user-friendly and attuned to basic archaeological requirements.

Now, what is SHARPS? As its name (Sonic High Accuracy Ranging and Positioning System) implies, it is a system that allows fast, highly accurate three dimensional acoustical mapping on any underwater site, shipwreck, structure or feature. But why is there a need for a computer-



Three transceivers positioned on stationary poles in a triangular arrangement around the area being excavated track a fourth transceiver carried by a diver. Each of the four transceivers is connected by coaxial cable to a junction box which in turn is connected to the SHARPS Control Board installed in the computer stationed on the barge above. (Drawing: Helen Dewolf)

controlled system for mapping the underwater excavations at Port Royal or any other underwater site, such as a shipwreck?

Exact relationships between features and knowing exactly where you are on an archaeological site are crucial on excavations, especially when working in poor visibility on underwater sites. When excavations first began at Port Royal, we set an iron stake in the area to be excavated, and a second stake was set a measured distance from the first on a north compass bearing to establish a North/South line and a 10-foot-square grid system. All subsequent stakes were triangulated from this North/South grid line. It is difficult to maintain error-free accuracy in poor-visibility water where you cannot see the two ends of a tape measuring a distance. Even though the main underwater grid stakes are tied into established survey markers on land with a theodolite, small errors occur because of the distance and in plotting the angles.

In 1981, the deviation of magnetic north from true north was $2^{\circ} 19'$. This changes $8'$ a year. Thus, a N-S line established with a compass (with no error) will be off $2^{\circ} 19'$. The same line established in 1987 would have an error of $3^{\circ} 15'$. In addition, a simple directional compass will result in an error of a degree or more. Now, after seven years of excavations, a series of stakes has been established from previous positions resulting in cumulative errors that are hard to detect or correct. In most sites these errors are never corrected. Now, SHARPS permits virtually error-free mapping and allows previous cumulative errors to be corrected.

How does SHARPS work? In simple terms, the system consists of acoustical transceivers that transmit and receive a high frequency acoustical signal in the range of 300 khz. Three transceivers are positioned on stationary poles or towers in a triangular arrangement around the area being excavated, while a fourth, which is carried by a diver, is tracked by the three stationary transceivers. Each of the four transceivers are connected by coaxial cable to a junction box which in turn is connected to the SHARPS Control Board installed in the computer. The SHARPS board has its own external power supply. Minimally, the computer must be equipped with 640K of RAM, an 8087 math coprocessor, graphics display board (ideally a color monitor), and a hard disk to run the programs. The connecting coaxial cables can be as long as 300 meters; however, the fixed transceivers have to be within 100 meters of each other (200 meters under optimal, clear water conditions).

The diver-carried transceiver emits acoustical signals at a steady rate. There is an optional diver probe with a signal transmitting button that allows the diver to control the sending of acoustical signals, but this optional piece of equipment was not available on the INA unit at Port Royal. SHARPS works on the principle of the speed of sound underwater and the ability of each of the three surrounding, stationary transceivers to receive the signals emitted by the diver's transceiver and then to transmit the signals to the computer. At the computer, calculations based on the speed of sound underwater, time delay, and trigonometric mathematics are processed by the SHARPS software and the computer's processors.

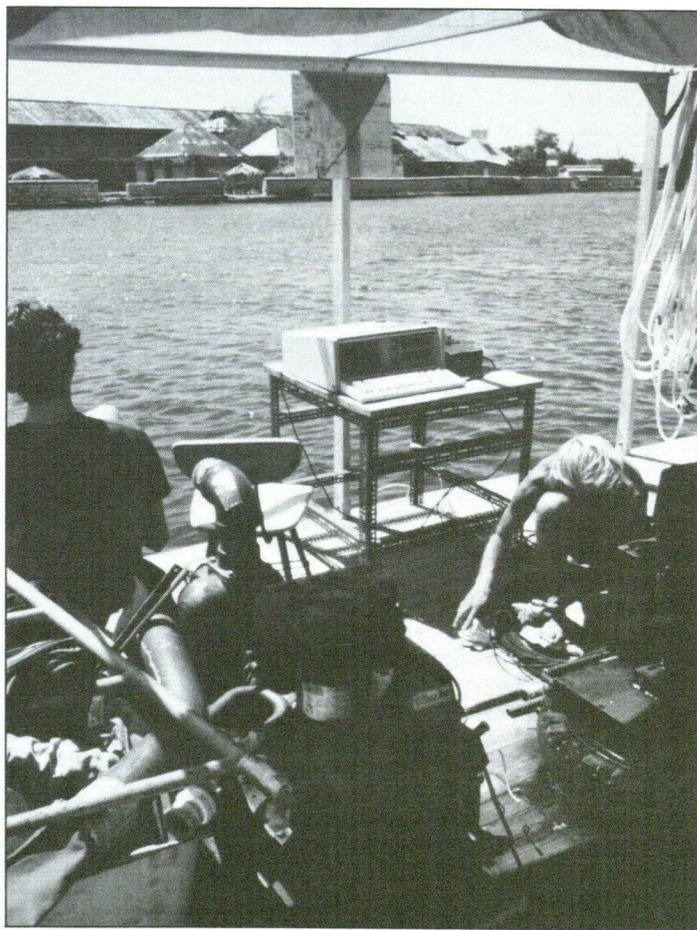
All signals are monitored by a personal computer and the location of the diver-carried transceiver is tracked on the screen of the computer. This means that stakes, objects, or features such as walls, floors, or ship hull remains can be calculated with precise X,Y,Z coordinates. During the process an outline or map is literally traced on the computer screen and stored on a computer disk file that can be recalled and edited. In the future excavations at Port Royal this system will be used to record architectural features in addition to plotting individual artifacts as they are encountered.

The system is very reliable and accurate. For example, multiple readings on a single datum point were recorded within 1 cm. The SHARPS system is made much more versatile by incorporating it

with a computer assisted drafting (CAD) program such as AutoCAD. This allows drawings to be converted easily to English units (which are used at Port Royal), rotated, viewed in perspective from any angle, viewed three dimensionally, combined with other drawings, printed quickly with a dot-matrix printer and more precisely drawn by a plotter.

This system will see considerable use in underwater archaeology, especially on deep sites with limited bottom time and on sites where visibility is poor. SHARPS will be used on the 150-foot-deep Ulu Burun Wreck in Turkey this summer. The system will allow the project personnel to compensate for the short diving times (20 minutes) by accurately mapping the site and plotting artifacts more rapidly and efficiently than is possible using tapes. The ability of SHARPS to calculate the precise X,Y,Z coordinates of any point and display it on the screen of a computer gives archaeologists instant visual verification.

Additional information on SHARPS can be obtained from Marine Telepresence Inc., Pocasset, Massachusetts, the marketing company for the system.



The computer positioned on the barge as excavators prepare for the next shift on the Port Royal site.

Port Royal's Dogs of Fo

by Helen Dewolf

During the 1987 summer excavations at the sunken city of Port Royal, Jamaica, D.L. Hamilton's team unearthed an unprecedented number of 17th-century Chinese porcelain artifacts. These porcelain finds included not only many sherds of bowls and cups of various types but also figurines—at least four, perhaps five, Dogs of Fo (pronounced *foo*). One small statuette, missing only the tip of its tail, was recovered virtually intact. Once we finished conserving and reconstructing the porcelain, another small and a large figurine were pieced together. From the few remaining sherds we believe that at least one, possibly two, Dogs of Fo remain in the Queen Street section of the INA Port Royal excavation (see *Newsletter 15/1*).

These Chinese porcelain Dogs of Fo are actually Blanc de Chine joss stick incense holders or burners. Originally, Dogs of Fo were in the form of large bronze statues guarding the doors of Buddhist temples. These lion-dogs have been, and still are, a popular Chinese design motif, and examples may be seen in various forms and media.

The porcelain figurines found in Port Royal were buried in the 1692 earthquake and seem to be associated with one specific dwelling. The Dogs of Fo were found in a fissure and scattered in front of the building. This discovery reaffirms the contention that the residences on Queen Street were those of merchants, captains and wealthier Port Royal inhabitants. Historical documents indicate that Blanc de Chine wares were exported through the Dutch Vereenigde Oostindische Compagnie (V.O.C.), the English East India Company, and, to a lesser extent, the Spanish Manilla Galleons. It must be noted that during the period 1640-1680 the English were banned from Chinese ports and so were unable to directly trade with the Chinese.

This porcelain is called Blanc de Chine because of its rich, smooth texture and white color. These wares were produced in Fukien Province, China, at the city of Te-hua. The potters of Te-hua had a large repertoire of subject matter for their molded porcelain statuettes. Most were Buddhist deities and saints, some were Taoist or Confucius subjects as well as animal figurines. It was an expensive but popular Chinese export porcelain trade item in the early- to mid-eighteenth century in the Netherlands as well as England. As shown by the Port Royal discovery, Blanc de Chine wares were a trade item as early as the mid- to late-seventeenth century.

Blanc de Chine differs from other porcelains because of its slightly lower firing temperature. In comparison to other ceramic types its paste is still highly vitrified, translucent, and milky white in color. This technique reached perfection during the fourteenth century with the development of a special clay ideal for the modeling of figurines. This clay became pure white when fired. The earliest pieces of true Blanc de Chine date from the seventeenth century during the Ch'ung-Chen period (1628-1644). On the best pieces it is impossible to distinguish between the paste and the glaze after firing. This gave the ware a distinctive appearance. From a ceramic standpoint, some believe Blanc de Chine to be the most perfect of all porcelains. Political upheavals in China curtailed official trading from 1657-1683, and the Imperial kilns at Cheng-te-chen were destroyed at this time. It was up to provincial kilns like those at Te-hua to take up the slack left by the destruction of the Imperial kilns. The takeover may explain why slightly



One of Port Royal's small Dog of Fo incense holders. (Drawing: Helen Dewolf)

lower quality Blanc de Chine wares were produced during this period. The paste of these wares ranges from milky white to cream to ivory tinged with a hint of pink, but the glaze is always thick, smooth, and almost velvety. Both of the small statuettes found in Port Royal are milky white and thickly glazed; the large one, however, is of a cream color and must have been fired at a slightly lower temperature because there is a visible distinction between paste and glaze.

Precise dating of Blanc de Chine wares is difficult because once the molds were made for the figurines, they were used for many years. For very popular statuettes, the molds were remade. Production continued with little change through the seventeenth and eighteenth centuries.

Dogs of Fo.

The Dog of Fo design motif includes three basic variations. The male Dog of Fo design has a lion-dog with one forepaw on a ball of brocade and a streamer from the ball going to and looping through its mouth. The female design has a small cub pup between its forelegs. The third variation is the use of mirror images of the figurine. It was this third variation that was found at Port Royal in both the small and large Dogs of Fo, all being the male design motif. Unfortunately, at this time we have very little of the fourth statuette and cannot come to any definitive answers regarding the use of these design motifs. We believe that this statuette is the mirror image of the large figurine, giving us two mirror-image pairs of the male design.

The questions raised by the existence of such exotic ceramics in 1692 Port Royal are intriguing, especially in relation to the numbers of intact and almost whole pieces of porcelain of the same design motifs and/or shapes. Did the Dogs of Fo belong to a merchant's store inventory? Were they a portion of his household goods? Were they examples of souvenirs of a veteran sea captain obtained along his voyages or through his associations with officers of different East India Companies? At this point in time this mystery is unresolved. It does, however, spark my imagination and desire to unravel the tale of Port Royal's Dogs of Fo.

EDITORIAL

The Abandoned Shipwreck Act

"I've done this full time all my life, and I'm fed up. The fun's out of the business now. The phones are bugged, people follow you around and break into your house for documents. They put drugs on your boat to get you arrested, they sink each other's ships, people are getting shot at and everyone sues each other. It's a very sick business today."

Robert Marx on treasure hunting in *Forbes* (June 16, 1986)

"Those pampered, self-indulged, well-cushioned refugees from the 'hard life' of politics just can't get it through their thick skulls that their Abandoned Shipwreck Act has been deep-sixed."

Ellsworth Boyd in *Skin Diver* (August, 1987)

Since 1979, America's lawmakers have attempted to pass a bill designed to protect historic shipwrecks. Nautical archaeologists, sport divers, treasure hunters and preservationists greeted each effort by intense lobbying of their Congressional representatives.

The Senate passed Bill S.858 in December of 1987, and it finally received overwhelming approval from the House of Representatives in April 1988. This bill gives States clear title to historic shipwrecks embedded in submerged State lands. In effect, it transfers the authority over such wrecks from the Federal Admiralty Court to State regulation. The bill also encourages States to create underwater parks and asserts that funds from the Historic Preservation Fund may be used to study, interpret, protect and preserve historic shipwrecks.

"The lure of the past & the magic of GOLD is yours to behold. Come enjoy the incredible treasure of the centuries, recovered from the lost Spanish ship Atocha and others by this remarkable man and his fearless team!"

Flyer for Mel Fisher's Treasure Exhibit in Key West, Florida

The State of Florida was unable to keep Mel Fisher from salvaging the *Atocha* for profit because an interpretation of Federal Admiralty Law considered Fisher as a legal salvor of the wreck. Under S.858, shipwrecks that are eligible for the National Register of Historic places will receive the legal protection of the State just as archaeological sites on land do.

Treasure hunters helped to defeat earlier attempts to pass similar legislation by emphasizing their role as entrepreneurs with the spirit of free enterprise burning strong within them. As has been shown repeatedly, most people who invest in treasure-seeking enterprises are disappointed with the big talk and zero return. Sport divers are also portrayed as being against the bill, but in fact, many support the preservationist aspect of it since the bill insures that wrecks will be preserved on the seabed rather than destroyed by prop-washing treasure seekers.

As readers of this *Newsletter* know, the archaeological and cultural value of properly excavated and evaluated shipwrecks is immense. The important word here is properly. The techniques of excavation underwater are fairly simple to master, but the knowledge required to apply such techniques precisely and appropriately depends on professional guidance. The evaluation of shipwreck materials can take decades: after more than 25 years, the Yassi Ada Byzantine wreck still provides provocative data about seventh-century maritime trade unobtainable from any



This sign was left on the Molasses Reef Wreck by INA excavation crew members.

other medium. What if INA had sold the artifacts still being studied today to finance its excavation work or to pay the salaries of staff members?

"Strong legislation alone has little impact because it is the effectiveness rather than the strength of legislation that is important. The effectiveness is dependent on many factors, including policing (always difficult underwater), society's attitude to the past, and public support for the aims of the legislation."

Martin Dean in *Sea History* (Spring 1986)

Opponents of the Abandoned Shipwreck Act see its wording as unspecific and suggest that states will be unable to properly manage their new responsibilities. Many states, Texas and South Carolina foremost, already have such administrative systems in place. South Carolina particularly has been successful in working with amateur divers, but the lack of assured authority over historic shipwrecks created difficulties within wreck management agencies.

President Reagan signed S.858 on April 28, 1988. Now shipwrecks in waters claimed by the United States have the same status as archaeological sites on land. Wrecks will be preserved as part of our heritage rather than being sacrificed for profit to a very few.

Cheryl Haldane

Ethical Concerns: Treasure Hunters and Archaeologists

Since S. 858 has become law, more archaeologists will have to wrestle with the ethical consequences of working with treasure hunters. Already, many of INA's past associates and graduates of the Nautical Archaeology program at Texas A&M University have been offered jobs by treasure salvors. Warren Reiss addressed this problem in a discussion held at a recent Council on Underwater Archaeology Conference where he addressed a hypothetical archaeologist offered a job with treasure salvors. Reiss holds an M.A. from the Nautical Archaeology program at Texas A&M and a Ph.D. in history from the University of New Hampshire. He is the director of the Maritime Archaeological and Historical Research Institute (MAHRI) based in Bristol, Maine.

Being paid to help treasure salvors conduct a proper site investigation, especially with the state's blessing, is a tempting offer. Instead of relying solely on the standard ethical position, let us consider the consequences of being involved and arrive at a particular ethical position for this situation.

Assuming that cooperation can be maintained between the treasure hunters and the archaeologist, this could be a fruitful union. First, we could say that the site is going to be destroyed anyway, so why not record whatever you can from the site? If you do not help them, someone else will. Besides, it would be nice to be paid well, especially to research a master's or Ph.D. thesis. In addition, the personal public relations benefits are enormous—T.V., newspapers, and even international exposure.

With these benefits in mind, let us look at the reasons why a cooperative effort should work. First, salvors say they are very interested in the pure archaeological and historical value of the site. Secondly, they admit that conducting a proper archaeological study will enhance the dollar value of the artifacts, so it at least partially pays for itself. Thirdly, you will have a solid contract from them to keep the collection together for a while to conserve, study, and publish. Fourthly, the state commission requires them to hire an archaeologist.

This is a fairly rosy picture. But let us consider the reasons why this may not work. The salvors' major interest is money, rarely directly related to artifacts. Salvors only need a facade of archaeological work to enhance artifact values and pass state commission standards. Anything more than a facade costs them direct expenses, time lost, and therefore big money lost from investors. A signature on a contract is only as good as that person's word. If you have any doubts at all about the person's honesty, you should not agree to any contract, no matter how "tight" it seems.

When two contradictory attitudes are involved, a working partnership cannot exist. The only common ground you have with treasure salvors is that you both want to excavate a wreck site. They need to excavate quickly, "conserve" artifacts quickly, conduct a bare minimum of research, and sell the artifacts as quickly as legally possible. They need all this to sell shares in the company, the real source of their income. Anything else contradicts their needs. An archaeologist's goals, by definition, must be just the opposite—excavate carefully, conserve and research thoroughly, interpret, publish, and exhibit the site. Artifacts sold into private hands are generally lost for any further study, comparison, or exhibition.

With these conditions in mind, consider what happens in the course of the project. First, you have promises of everything you need for the project, including time and money. On the site there will be one, or at best, two or three archaeologists working with a group of salvors on their boat, on "their" site, with crew members who answer to the company that issues their pay check and shares of the booty.

So what about those benefits to you and archaeology? You may or may not be paid, and you rarely will be paid to conduct research beyond the field work and field report. The press coverage will be good if you are only interested in the general public. The more times your archaeologist and historian peers see you involved with treasure hunters, the lower your position becomes in the profession.

As for saving some information from this site to comply with a state's laws, it is a minor benefit compared to the greater harm which will come from the example you set. The state bureaucracy and the salvors will say that the cooperative effort is working even if it is not. Less experienced and educated archaeologists will follow your lead and get into worse situations. Many more sites will be destroyed in the same manner, with the only benefits going to the salvage companies' principals—every other individual in America, our society as a whole, and archaeology as a profession will lose.

We should therefore conclude that one of the basic ethics of modern archaeology applies to this situation: if a site is being excavated for private profit, the resource will suffer destruction without commensurate gains in knowledge. Archaeologists should not get involved, except to voice objections to the situation that allows salvors to operate on historically important sites.

Warren Reiss

Grassroots politics

Nautical archaeologists and treasure hunters are at odds with one another, both in motives and goals. The theaters of this conflict have been, and continue to be, in the courtrooms, in the field, in the popular press, and at hearings of congressional subcommittees.

Of the many challenging problems facing nautical archaeologists, none are as disturbing, or as difficult to surmount, as the ever-increasing popularity which treasure hunters currently enjoy and the relatively meager support professional scholars receive from the general public. Equally disquieting is the hard fact that scarcely a project can be initiated that does not entail political entanglements or invite controversy.

With the fight to pass the Abandoned Shipwreck Act (S.858), archaeologists resorted to a political activity which can indirect-

ly have profound influence over policy decisions at the Congressional level: grassroots action. Letters to newspapers and other publications raise public awareness of the issues. Furthermore, letter writing can be an effective means of countering the pro-treasure hunting influences of other publications.

Treasure hunting consortiums employ a variety of sophisticated public relations techniques designed to enhance their image as heroes and to tarnish the perception of professional archaeologists. In many instances the distinction between archaeologist and treasure hunter has been blurred in the public mind, either intentionally, or as an inevitable result of biased reporting. Letters of support for academic research in the print media can counter these undesirable influences.

To increase effectiveness of these letters certain procedures and protocol should be observed. Letters written to newspapers should be short, to the point, and double spaced. Address them

The Men Who Stole The Stars

by George F. Bass

In 1979, Peter Stanford, editor of Sea History asked George Bass if he would write an article on the difference between archaeology and treasure hunting. Bass began a letter of response, and in the middle began to turn the letter into a short story to make his point. Since Sea History, that part of his letter has now been published in several other American and Dutch magazines as "The Men Who Stole the Stars." Except for substituting the word "stars" for "shipwrecks," everything in the story is based on fact.

When I looked into the sky that night, I thought at first that a cloud covered part of the Big Dipper. But the crisp night air had not a trace of moisture. After cleaning my glasses and looking again, I realized that Mizar simply was not there any longer. I called the observatory of the university nearest me.

"There's a star missing," I said. "Mizar isn't there any more."

"We have no comment at this time," was the reply.

The next issue of *Tempus*, our leading news magazine, provided an explanation. Under the "Science" heading was a brief news item:

Astronomer Claude Blakely, after years of research and experimentation, has at last developed a method of capturing stars. For an undisclosed price, he has sold Mizar to an anonymous dealer in Geneva. The dealer, through a New York spokesman, assures the public that the star will be put on display in a private planetarium within the next two years, and that hundreds of citizens will be able to see it there.

I began a flood of outraged letters to magazines, syndicated editorial writers, and politicians. The stars, I said, belong to everybody. Astronomers were supposed to map the stars, measure them, and study them in the most minute detail. But, I added, astronomers were supposed to be after knowledge. They were not supposed to own the stars. I didn't believe that Mr. Blakely should really be called an astronomer.

"Your attitude strikes me as hoity-toity," replied one of the best known of the columnists. "Claude Blakely knows more about astronomy than any Ph.D. or he couldn't have gone out and netted that star. And anyway, why should professional astronomers have all the stars? There are enough to go around. You're just jealous that you didn't make a buck out of it."

My response that the public as well as astronomers had a right to the stars, and that future generations had a right to see them, went unanswered.

Some of the public did write to their congressmen, but since most lived in smoggy cities and never saw the stars anyway, few letters were sent. A young congressman from one of the states with an exceptionally clear sky did, eventually, introduce legis-

lation to ban star catching. By then, however, Blakely had sold rights to his star-stealing device to a number of partners.

"The clammy hands of big-brother government are trying to take away the hard-won spoils of the last of the great inventors," thundered the columnist. "Claude Blakely and his partners represent the last frontier of free enterprise."

The night that I noticed Sirius was no longer in the sky, I opened the Newsletter of Private Star Lovers that had arrived in the afternoon mail. It had as a logo a bald eagle holding a star in its talons, flanked by waving American flags.

"Fellow citizens. Write to your congressmen about the communist-inspired plot to take away our rights to catch and sell stars. There are millions of stars in the heaven, as any schoolboy knows. You can't even see some of them they are so dim. There cannot be any rational reason to keep them all up there. Especially when there are billions of dollars to be made by private investors. Stand up for your rights as Americans. Stand up for free enterprise."

By then the night sky was beginning to look a bit faded. Investors were after the really bright, sparkling stars first, so the first-magnitude stars were disappearing at an alarming rate.

Astronomers made joint and private outcries about what was happening. "Precious knowledge about the creation of the universe is being lost forever. It doesn't do me any good to see Betelgeuse in the cavern of some Austrian duke," one wrote. "It's being taken out of context."

A senator from a rather foggy state submitted a piece to a family weekly:

At last astronomy is making money, not simply spending. Millions of dollars of National Science Foundation grants will now be saved that would otherwise have been wasted on larger telescopes and more radio telescopes. Have all the astronomers, spending all that money for centuries, ever made a dime for the public? They talk about knowledge. Claude Blakely is the first one ever to show common sense!

When Polaris was snatched, I was sure that the tide would turn in favor of amateur star gazers and professional astronomers. But, except for a few yachtsmen, most people were watching their TV screens and couldn't be bothered about it.

"Why didn't he use Loran to navigate!" my sister asked when she read the article about the sailor who lost his way because of the disappearing stars and ended on the rocks. "That's what all those satellites are for, anyway, isn't it?"

"They'll be snatching satellites next," I answered. I let the sharp photographs of the starry night drop one at a time in a pile on the floor between my feet. "That's the way it used to be," I mumbled.★

to the City Editor or Science Editor. All news editors are pressed for space; consequently, long letters are rarely published. Average the number of words in the shortest and longest letters which are typically printed in your local paper and make this the length of your letter. If the purpose of your letter is to comment on a recent article about treasure hunting or legislation, reference the article by title and date in the first sentence. Be current—writing about a month-old article will be of little value as it will be considered "old news."

Letters to politicians should be short also, no longer than one page single spaced. Use the representative's appropriate title. Your letter will undoubtedly be opened by an aide whose job it is to screen all correspondence for items relating to specific topics or bills of special interest to the particular legislator. It is critical, therefore, that specific pieces of legislation be named and your letter be clear and concise. An aide should not have to

spend time searching a letter to discover the writer's intent. Your intent should announce itself to the reader from the first sentence. Explain why, as a citizen, you believe your representative should take special interest in this kind of legislation.

Pollsters have determined, and politicians are fully aware, that a letter from a single citizen can indicate that as many as one thousand other voters share the same concerns but have not written. Therefore, the more letters received regarding a single issue, the greater the likelihood action will be taken.

Writing letters is a simple tactic available to everyone and has an effectiveness that far exceeds the efforts expended, but is generally unrecognized. Participation by the public in the political process is within easy reach of all, and is the best means of preserving our heritage and historical resources lying beneath the waves.

Marco Meniketti

TEL NAMI: A Promising Bronze-Age Maritime Site

by Maria Jacobsen

In the summer of 1985 a small team headed by **Dr. Michal Artzy**, Chairman of the Department of Maritime Civilizations at the University of Haifa, began a regional survey in the area of Tel Nami—a modest archaeological mound located some 14 km south of Haifa.

The tel is situated on a rocky promontory jutting into the sea from a wide sandy beach. As described by **Prof. Daniel Hillel** of the University of Massachusetts, conductor of the geomorphological survey in the area, this peninsula forms part of a partially submerged sandstone ridge running along the edge of the coastal strip west of the Carmel mountain range. It is the westernmost of a series of three parallel ridges separated by basins filled with alluvial soil. On these ridges the survey team found evidence of ancient habitations which, based on the ceramic finds, could be dated to the Middle Bronze II period (in the beginning of the second millennium BCE), the Late Bronze II (in the second part of the second millennium BCE), and the Byzantine period.

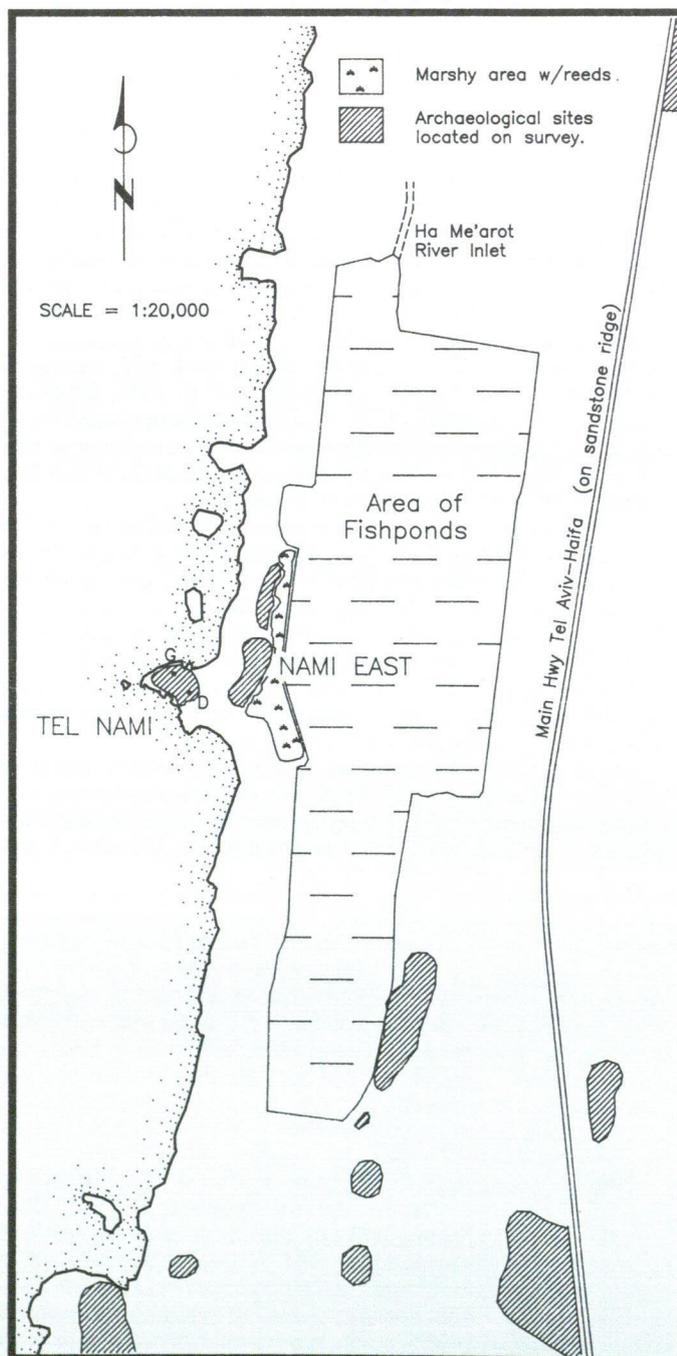
Although the tel was covered with a thick layer of beach sand, excavation there was aided by **Ezra Marcus** of Haifa University who developed a system that flushes away sand overburden with jets of seawater. The excavations during the seasons of 1985-87 revealed in one area (D) two distinct occupational strata separated by a thick layer of sterile wind-deposited sand. The earliest remains could be dated to the MB II A and possibly the early MB II B period. While the later remains, in which we may have two levels, date to the LB II period. In area D on the eastern slope of the mound architectural remains and pottery, particularly large storage jars of the types used in ancient maritime trade were found. Several MB II A storage jars (whose contents are being identified) were actually found *in situ* on the floor of a storage room, apparently destroyed by fire. Area G, on the northern and highest point of the mound, produced little pottery but revealed massive wall structures which might have been part of the settlement's defense system. A layer of charcoal, ash, and burnt mud brick found above the MB II remains in area D, and a second similar layer found above the LB II remains in area D as well as G, seem to indicate that a violent destruction ended both the Late Bronze the Middle Bronze cultures there.

The most surprising discovery came from an area some 75 meters east of the tel where sand dunes lie along the western banks of a series of commercial fishponds. During the winter storms of 1985-86 the sea shifted the dunes and exposed a patch of dark soil containing pot sherds. Among the sherds collected were pieces dated to the Late Bronze II, including a sherd of Cypriote White Slip Ware.

The following year, we decided to open a trial trench in this area, now called Nami East. Our fear that Bronze Age levels would have been completely destroyed by the construction of the fishponds proved unfounded. The small-scale excavation in the area revealed remains of a substantial building with 1.15-meter-thick stone walls connected to a drainage system and a deep circular sump. Several graves uncovered near the building indicated that the area had been used as a cemetery. In fact, these graves appear to have been constructed by reusing stones from the nearby building. A test pit dug beside the building exposed a stratigraphy similar to the one found in area D on the tel, i.e. two major habita-

tion levels of the MB II and LB II periods separated by a thick layer of sand.

The graves, though not yet fully analyzed, seem to date to the very end of the LB II period. Although every grave excavated so far was robbed in antiquity, they were rich in ceramic artifacts. Unfortunately, most vessels were broken and scattered by the robbers in their search for more valuable grave goods. Among the finds unearthed were coarse-ware oil lamps, pilgrim flasks, bowls, small



Charles Moore



View of Tel Nami from the sand dunes of Nami East. (Photo: Chris Monroe.)

storage jars, a cooking pot, and what appears to be a large crater. Other finds consist of beads, a long toggle-pin, and badly corroded bronze artifacts, including a fibula and part of a small, shallow dish, which may have been a piece of a balance pan.

Most important, perhaps, is the large amount of imported Cypriote wares which connect this site with the maritime trade networks of the time. They include fine-ware vessels of White-Slip II ware, several so called "Milk Bowls", Base-Ring II, and White Shaved juglets. Evidence of Egyptian influence was found in two graves; here the robber(s) overlooked a scarab signet ring with a silver band and a faience *udjat*-eye amulet. In a third grave were found two finely crafted gold rings with filigree designs. These rings, perhaps of Aegean origin, and other finds indicate the importance not only of the people buried there, but the possible significance of the site itself.

Due to the modern fishponds and the large amounts of sand covering the whole area, it is difficult to establish the exact extent of the Nami East settlement. From aerial photographs, it appears to be larger than the tel itself. What is perfectly clear is that Tel Nami is not, as we once thought, a humble fishing village but part of a much larger site now buried deep under the coastal sands.

The ha-Me'arot river is a very important feature of the area. Originating in the Carmel range, it crosses the two inland sandstone ridges and empties into the sea in the area of Tel Nami. Knowing the exact location of the ancient estuary is necessary to determine the suitability of Tel Nami as a protected anchorage and maritime trading station. Today the river does not have a dis-



An Egyptian scarab signet ring found in one of the Nami East graves. (Photo: Chris Monroe)

tinct outlet and is used to supply local fishponds in the marshy basin east of the site. However, evidence obtained from old maps and aerial photographs suggests that in the recent past the outlet was closer to the tel.

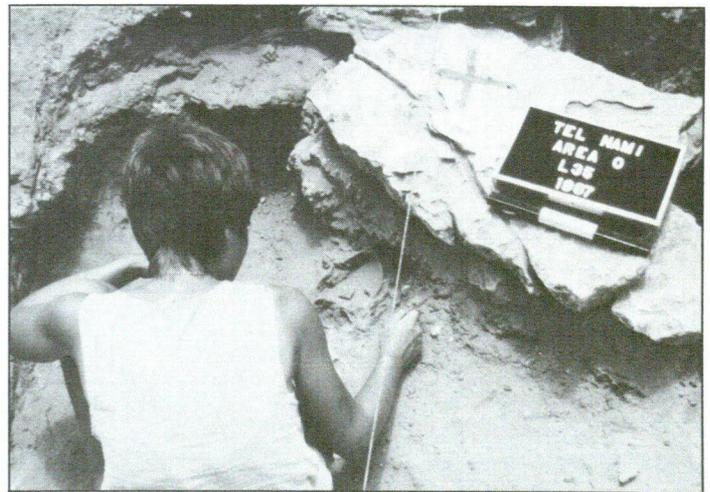
The marshy basin is still surrounded by a thicket of reeds, suggesting to Prof. D. Hillel of the University of Massachusetts that the area must have been a natural swamp (or shallow lake) fed by the nearby river. If indeed the ancient stream discharged into the sea via this swamp or lake, boats could have gained access to an ideal anchorage site through the stream's estuary. Perhaps this waterway provided access to the sites located farther inland on the second sandstone ridge. Further investigations will test these and other hypotheses.

Since 1985, an international team of archaeologists and students from Haifa University, Carsten Niebuhr Institute of the University of Copenhagen, University of Aarhus, University of Massachusetts, and Texas A&M University, as well as volunteers from the United States, Italy, and France have joined the project. They have made it possible to expand the terrestrial survey and excavations to include an underwater coastal survey.

During the 1987 field season, the excavation team consisted of 30-35 people. Texas A&M was represented by three graduate students: **Georgia Fox**, **Christopher Monroe**, and **Maria Jacobsen**. All three will return for the 1988 season and will be joined by **Aleydis van de Moortel**, a Texas A&M Nautical Archaeology program graduate now at Bryn Mawr College, and by **Prof. David Owen** from Cornell University.

At present, cooperation between Haifa University and TAMU provides an excellent opportunity for A&M students to get practical experience in excavation and survey techniques used on land and under water. This maritime site, with its clear evidence of Canaanite, Cypriote and Egyptian, and Aegean cultures, may also serve as a possible source for future student research.

As the site is still in its beginning stages of excavation, it is impossible to realize its full scope and significance, but the potential is great. If Tel Nami proves to be an early maritime trading center, as indeed suggested by the artifacts uncovered, it will be one of only a few excavated Bronze Age maritime sites. Also, parallels between Tel Nami and the Ulu Burun shipwreck, excavated by INA off the coast of Turkey exist (see *Newsletter 15/1*). Certain ceramic types, particularly juglets, bowls, oil lamps and pilgrim flasks, are common to both sites. This link could prove valuable in tracing the flow of goods throughout the Eastern Mediterranean during the Late Bronze Age.



Excavating the remains of a terracotta oil lamp amongst the scattered bone fragments in grave robber's dump, Nami East. (Photo: Chris Monroe)

International Internship Established

by Fred Hocker

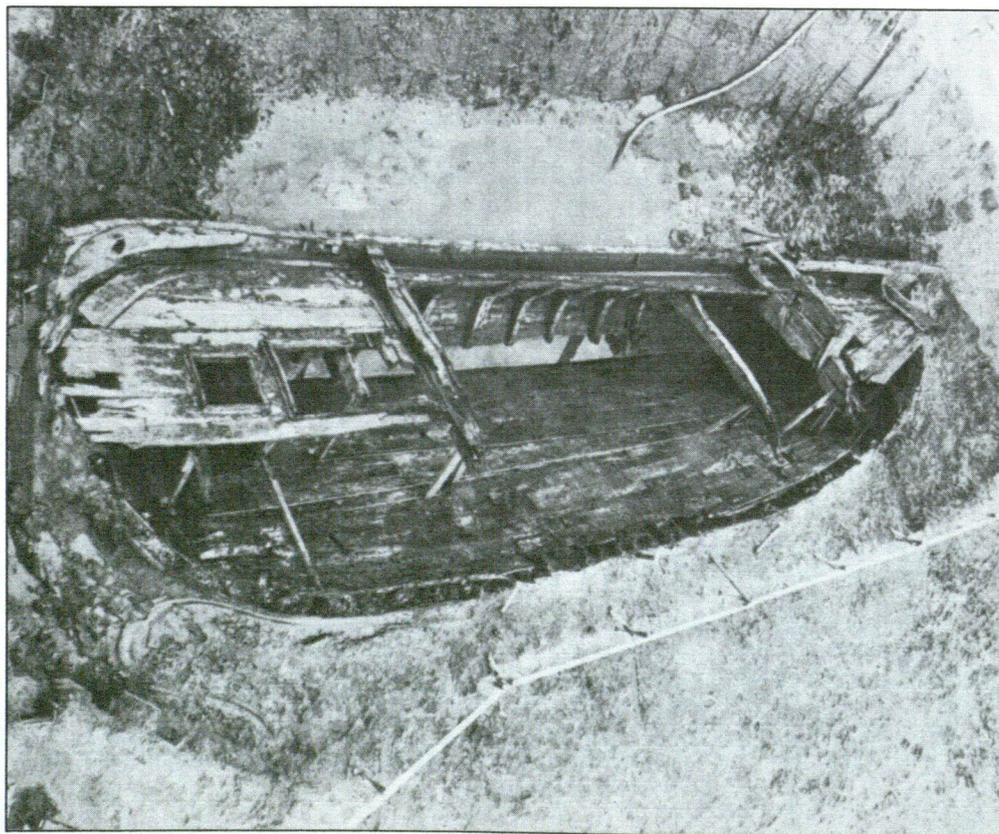
Fred Hocker, a Texas A&M Nautical Archaeology Ph.D. student, helped establish a new internship program at the Dutch Museum voor Scheepsarcheologie.

While a shipwreck such as the Late Bronze Age wreck being excavated at Ulu Burun by INA can bring a long-dead era to life for us, it cannot, by itself, tell us how that time, its peoples, technology, and cultures differed from the cultures that preceded and followed it. Because we want to know not only how it was, but also how it got to be that way and why it didn't stay the same, we need to look at evidence from before and after the wreck. We would also like to know if the wreck is typical of its time; is it a Chevy Impala, or is it an Edsel? To know this for certain, we have to be able to compare many wrecks from the same time and area.

Since the draining of the Zuyder Zee began in the 1940's, over 350 shipwrecks have been found in the polders, the new land reclaimed from the sea. They span the entire navigable history of the Zuyder Zee, from the 12th through early 20th centuries. These wrecks are mostly local craft of small to medium size, although several large, deepwater carriers have been found. Many of the wrecks can be dated rather firmly, and their cargos represent a wide variety of northern European products. The large number of sites in such a small area presents the development of shipping and shipbuilding with a clarity not seen anywhere else in the world. The cargos and equipment of these vessels form a comparative collection of northern European material culture that is without parallel. Because the wrecks are now on land, they can be

investigated cheaply and easily, in comparison with underwater excavations, and working time is not limited by available air or susceptibility to the bends, although it is limited by other, equally frustrating factors.

In order to preserve the knowledge provided by these wrecks, a branch of the government authority responsible for the draining and development of the new land (the Rijksdienst voor de IJsselmeerpolders, or RIJP) was established early on to investigate archaeological finds in the polders. While the creators of the authority had anticipated the discovery of medieval villages known to have been built in the Zuyder Zee area before the inundation that created the Zee, it was immediately apparent that shipwrecks were the most common finds. These wrecks were explored systematically and preserved or recorded as the archaeologists saw fit. Unfortunately, in the early years excavators were more interested in soil stratigraphy than historical research, and Dutch archaeologists were not yet interested in the development of shipbuilding. By the 1970's, the discovery of well-preserved wrecks in Germany (the Bremen cog), Sweden (The *Wasa*), Denmark (the Skuldelev Viking ships), and the Mediterranean (particularly the Kyrenia ship) had kindled an interest in shipbuilding history throughout Europe. Under its new director, H. Reinder Reinders, in 1976, the Museum voor Scheepsarcheologie embarked on an expanded program of systematic research into the development of Dutch shipbuilding and waterborne commerce. Methods for preserving wrecks in place were devised and particularly important vessels were singled out



This Dutch ferry, which sank in the 1620s, was excavated by the Museum voor Scheepsarcheologie in 1980-81. (Photo: RIJP)

for detailed research and publication. This dedication to research and preservation has led to a program of rescue excavation and publication that should serve as a model for other areas with large archaeological resources threatened by development. In addition, the polder archaeologists have one of the best publication records in Europe; final reports on important vessels appear at a rate of better than one every two years.

Most of the Museum's work is rescue archaeology. Whenever a vessel or other artifact (the Museum has investigated church roof remains, eel traps, and medieval drainage systems) is found, the Museum is notified and an investigation begins to determine the nature and relative importance of the find. Because the staff of the Museum is very small for the amount of work that needs to be done, and time pressure can be a major factor in the excavation, a variety of methods are used to achieve an optimum balance of preservation, research, and practicality. Large scale excavations are avoided whenever possible; the Museum prefers to excavate only enough of a wreck to determine its size, age, and basic type. Then it is covered with a mound specially constructed to maintain an artificially high water table over the wreck. If time, personnel, and funds are available, a full-scale excavation may be conducted at a later date. If necessary, construction projects may be halted or redesigned so as not to disturb the mound.

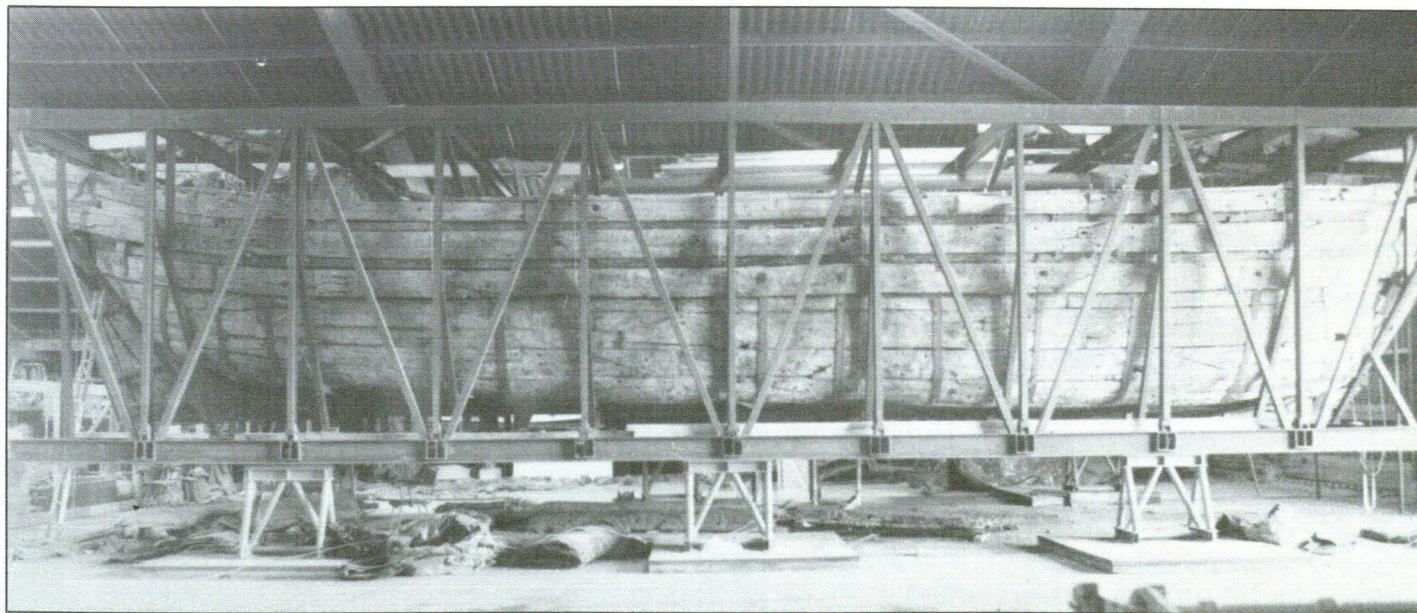
Where the vessel cannot remain in place, either because the ground is needed for other uses or the vessel is not judged important enough to justify halting or relocating construction, the vessel may be excavated in full, recorded sufficiently to allow easy identification of all hull elements, then dismantled and reburied at a "ship graveyard" used by the Museum to store excavated ships below the water table. If the vessel must be moved and is especially important or particularly well-preserved, it may be removed intact or in pieces to the Museum for conservation and display. In earlier years, before the "ship graveyard" was available, the limited funds and personnel of the Museum did not allow the preservation of every wreck. Wrecks which could not be preserved on site or reburied elsewhere, and which could not be conserved economically were excavated and recorded as completely as possible, and then destroyed.

While the destruction of the remains is not a desirable solution, it seemed only practical solution in many cases. With a staff of less than twenty people and often as few as five to ten, the Museum might have to investigate ten wrecks in a year, of which three or four might have to be excavated, with as little as three weeks available for an individual excavation. Under these conditions, the primary goal of the Museum was to preserve as much knowledge as possible, while the preservation of the hull remains, unless they were especially important or unique, or could not be studied adequately in the available time, was a secondary consideration. The acquisition of the "ship graveyard" has largely alleviated this dilemma.

Because their own ability to do research is severely limited by the amount of excavation and preservation which must be done, the archaeologists of the Museum are quite willing to host visiting scholars interested in Dutch ships and shipping. They have been particularly kind to graduate students from Texas A&M. To date, three A&M Nautical Archaeology students have undertaken research projects on material excavated by the Museum. Aleydis van de Moortel, who graduated in December, 1987, wrote her Master's thesis on the construction and performance of a cog-like vessel found in the polders. Ralph Pedersen is currently studying the excavation notes and timber recording of two medieval waterships (a type of general-purpose working vessel common from the 15th to 19th centuries) as he prepares to reconstruct them for his master's thesis. Since the fall of 1986, I have been recording and reconstructing an early 17th-century ferry; this work, which has been funded partly by INA, will form a part of my dissertation on flat-bottomed vessels in northern Europe.

In the future, we hope that many more A&M students can take advantage of the unique research opportunities available in the polders. In cooperation with the Museum voor Scheepsarcheologie and the RIJP, the Nautical Archaeology Program at Texas A&M has established a formal internship at the Museum for A&M graduate students. Participating students will work at the Museum for a semester or a year and take part in all of its activities, from excavation to conservation to research. In addition, they will be expected to complete an independent research project of interest to themselves and of use to the Museum.

The 17th-century ferry in storage after excavation. (Photo: RIJP)



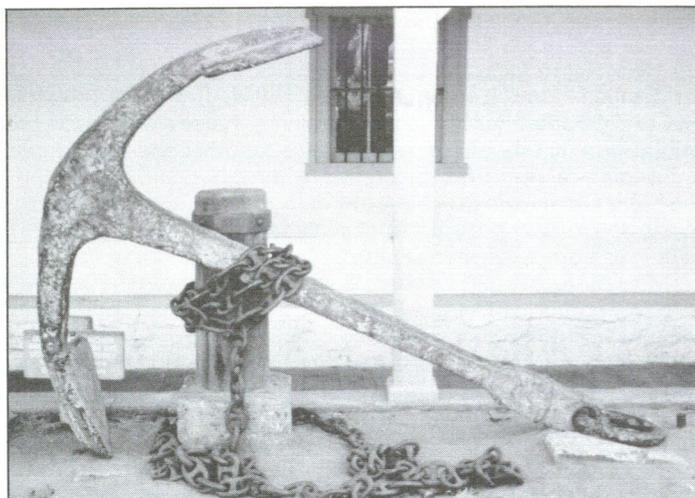
Research Topic: Bronze Anchors

While studying the history and development of anchors, from circa 1550 to 1860, I recently came across a somewhat unusual artifact on display outside the Old Custom House at Fisherman's Wharf, Monterey, namely a large bronze anchor. U.S. Navy divers working in Monterey Bay made the find in 1944; its origin is evidently unknown. The nine-foot-long cast bronze anchor is similar in shape to Pering's anchor of 1813, but has a more rounded crown and a circular ring. The flukes of the anchor are asymmetrical to the plane of the arms and possibly reflect a poor casting technique. There are some indistinguishable marks on the shank between the ring hole and the nuts (stock ridges), which have since been identified as Chinese numerical signs by nautical archaeology student Takahiko Inoue. The signs represent the number 166 or 162, although the third sign was somewhat indistinct and difficult to read.

Since learning about this anchor, I have been shown some photographs of another bronze anchor on display in the town square at San Jacinto, Ticao Island, Philippines. This anchor is similar in shape to the "Old Plan Long Shanked Anchor" and is approximately 14 feet long. The anchor was recovered from a Spanish wreck dating to 1626; a second bronze anchor, 16.5 feet long, still lies on the deep water wreck. An interesting point here is that both the known anchors and all the cannon from the wreck are made of bronze. This information and copies of the photographs were kindly supplied by Robert F. Marx.

Peter Throckmorton has mentioned knowing a Dominican Republic fisherman who once knew the whereabouts of a large "bronze anchor" lying underwater, but could no longer remember exactly where it was that he saw the anchor. Likewise, Ric Hajovsky has told me of a fifth bronze anchor off Punta Colorin, on Cozumel Island, Quintana Roo, Mexico. No photographs or dimensions are known of these last two anchors.

The one common denominator that comes to mind for these bronze anchors is that they were all in Spanish service. Mungo Murray (1765), in his *Supplement to the Treatise on Shipbuilding*, states that "The anchors of France, England and Holland are of forged iron; but in Spain they may be seen of copper, and likewise, in several parts of the South Sea [Pacific Ocean]." The *Cambridge Chronicle* for the week ending 29 April 1780 contained the following paragraph: "The large anchor taken on board the Spanish ship



Monterey Anchor

Photo: Jim Duff

from Lima to Spain, by the *Sprightly* and *Revolution* privateers some time since, proved to be copper and near two ton in weight."

Could it be at all possible that the Spanish were buying cast bronze anchors in Macau, China, to replace their "lost" European-made wrought iron anchors? The famous Portuguese master gunfounders, Manuel Tavares Bocarro and his son Pedro Dias Bocarro, had moved from Goa, India, to Macau in the 1620s. They were noted for their "fine cannon cast both in bronze and iron, small arms, ammunition, and even bells." The bronze guns were exquisite works of art, with elaborate markings and ornamentation. The iron guns, even though founded relatively cheaply and rapidly, did not blow apart killing the gunners. The Portuguese were trading allies with the Spanish until the hostilities in 1640, and there is no reason to believe that the anchors could not have been made in Macau. Still, why were the anchors made of bronze and what do the Chinese numerical signs signify?

If anyone knows of other examples of modern bronze anchors in the world, or of any literary references to them, any information or comments which could be provided would be greatly appreciated. I will gladly cover any reasonable costs incurred for photographs and photocopies. Jim Jobling, c/o INA, P.O. Drawer HG, College Station, TX 77841.

One Thousand Years Later

INA staff members are being filmed on location in Bodrum, Turkey, as the subject of a 26-minute documentary concerning work on the 11th-century A.D. Serçe Limani shipwreck.

The initiative for the film was taken by the Bodrum projects manager Tufan Turanli who made arrangements with Turkish Television (TRT) and gained their full financial support for the film. TRT is counting on the film as an export item.

Narrated in English, the documentary will show the work on the Serçe Limani wreck at the Bodrum Museum of Underwater Archaeology. The excavation of this ship ended a decade ago, but work on the hull and cargo continues. This important but rarely appreciated work of the conservators and reconstructors is the subject of the film. The reassembly of the hull, the casting of iron objects and the painstaking job of reclaiming vessels from an estimated one million pieces of broken glass from the ship's cargo are the main features of the film.

Shot by Tufan Turanli of INA and Anika Liversage, under contract with TRT, the film is being prepared on an "in house" basis so disturbances at the castle are kept to an ab-

solute minimum. If work proceeds according to schedule, the documentary will be ready later this spring.



PROFILE

Donald A. Frey

President, Institute of Nautical Archaeology

When Don Frey first volunteered to work on the Roman shipwreck at Yassi Ada in 1969, he had no idea that he was on the threshold of beginning a 20-year relationship with George Bass and the Institute of Nautical Archaeology. At the time, Don was teaching physics at Istanbul's Robert College, now Bogazaci University, and he was looking for something to occupy him during the summer.

After three months excavating the Roman wreck, he returned to academic lecturing, then spent time assisting underwater excavations in Greece before returning to INA in 1971. In 1971, Don Frey initiated INA's series of surveys along the Turkish coastline with a side-scan sonar evaluation of the seabed between Bodrum and Antalya.

Don left Turkey in 1971 for two years at Oxford University on an American Council of Learned Sciences Fellowship to see if he could find ways to link archaeology with his background in science. There, he designed methods to make magnetometer maps readable for archaeologists and outlined a course dealing with the application of scientific methods for archaeology. The next year he taught this course in the Anthropology department at the University of Wisconsin.

Whenever he could, the physicist took part in archaeological projects in Greece and Turkey. Underwater surveys in Turkey, at Gythion (the ancient port of Sparta), and the probable site of the Battle of Lepanto whetted his appetite for archaeology, and in 1975 he decided to follow his heart's ambitions, enlisting as a research associate with the Institute. For the next few years, Don worked with INA at Lipari, Mombasa, Sheytan-Deresi, Yassi Ada and in the Turkish surveys.

Through several fortuitous coincidences, Don became the Institute's chief language expert (he speaks four languages fluently and four others more than adequately) and one of its principal photographers. In addition to acting as INA's liaison between the Italian SubSea Oil Services company in the excavation of the 220-foot-deep Lipari shipwreck, he designed

tripods and other equipment for divers to use underwater.

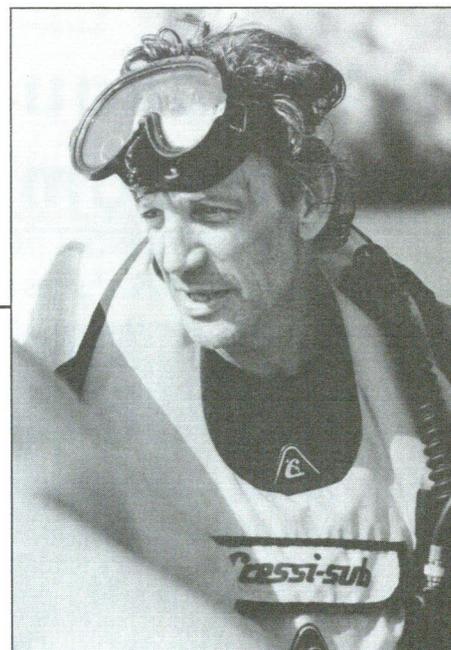
When the Serçe Limani Glass Wreck was excavated, Don and his wife Susanna Biehl manned cameras and the darkroom, and a hobby bloomed into a specialty. Now visitors to the Ulu Burun site can see Don excavating underwater, photographing the wreck area, making black-and-white and color shots of artifacts on shore, or typing madly on his portable computer as he tries to keep up with the administrative and fiscal duties of his present job as Institute President.

In 1982, INA's operations had grown so much that George Bass could no longer be both an administrator and an archaeologist, and Don signed on "for two years only." As he completes his sixth year in that position, he sees both continuing frustrations and fulfilling achievements.

"I'm not an archaeologist. My Ph.D. is in physics, and so I see my role as president as doing those things which make good archaeology possible. George Bass [INA's archaeological director] and I discuss these aspects together." Don's background as a staff member of many excavations allows him to balance the needs of archaeological operations with the fiscal realities of the Institute's budget.

Don is also committed to his four children, and juggles his time accordingly. He spends four months at home in Bodrum, four months in College Station, and four months on excavation and survey in Turkey. The division of his time contributes to the most difficult aspect of his job: "INA needs someone here year-round. I can't do all the things I would like to do, particularly regarding the planning of INA's financial system."

He sees the skills he brought to INA as those of a scientist with a background in computer programming. One of his primary goals has been to restructure INA's finances so that they are "user friendly" and available through the computer link he established between Turkey and College Station. Budgeting and long term financial planning occupy much of his time, but Don also invests in personal rela-



tions with INA directors, staff and research associates.

In addition to expanding INA's board, Don has sought other sources of funds for INA projects, coordinates INA's relationship with project directors, and manages INA's organization in Turkey, which is now as large year-round as earlier summer excavation teams.

"My greatest pleasure has been to coordinate the fiscal planning and policy-making relationships at INA that allow Institute personnel to be productive. I'm also enjoying being a photographer. The photography at Ulu Burun is particularly exciting because we have an excellent underwater lighting system for the first time."

His greatest accomplishment? "My involvement in the discovery of the Ulu Burun wreck. This shipwreck was crucial to INA because of the publicity and financial support it generated. To have a wreck so worthy of excavation and to be able to mount this huge project was tremendous. It came at a time when we were struggling to keep ahead of the complications of 20 different projects, and had over 130 people passing money around, so the financial restructuring I had done was critical in the operation's success."

And what if you could have whatever you wanted for yourself and for INA? "That's easy. For INA, I want to have so much money in reserve that we need never worry about paying our bills. And me? Well, Turkish sponge divers have told us about a shipwreck near Focha that has a bronze statue. I want time to spend on state-of-the-art remote sensing technology so we can find this wreck and other shipwrecks the sponge divers haven't found!"

Cheryl Haldane

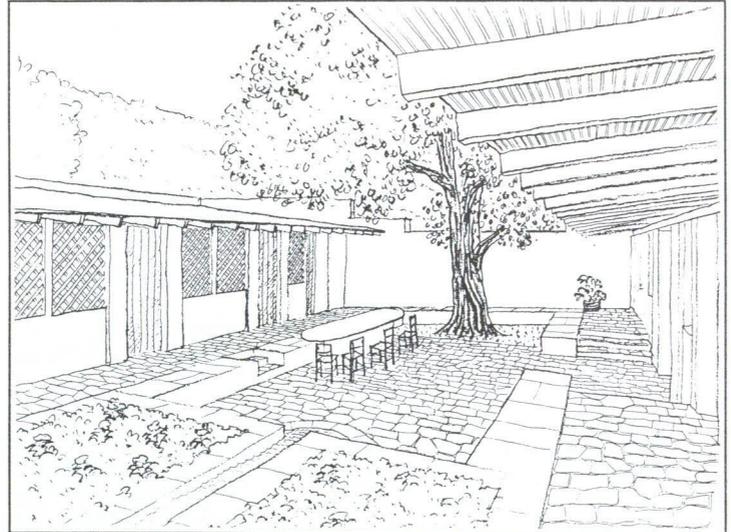
INA headquarters in Turkey Now becoming a reality

After more than a decade of hopes, the Institute recently acquired a plot of land for its first permanent headquarters facility in Turkey. Architects have visited the site on a hill above Bodrum, and several sketches of the first phase of construction are being considered by INA staff members.

For the past 14 years, INA has rented part of a large house and yard for housing volunteers and staff, storing equipment and providing a workshop. This "depot" served adequately until recent years but is too small for the current level of operations. Even with winter's reduced activities, INA currently has 22 people on its roster in Bodrum.

With the rapid escalation of real estate values in Bodrum in the past five years, it was clear that if INA did not move quickly the dream of a permanent headquarters on Institute-owned land would never be achieved. Tufan Turanli, INA's liaison in Turkey, began looking for a suitable piece of land about three years ago and settled on a parcel that includes a small olive grove on a hill overlooking the growing town.

At this point, founding directors of the Institute stepped forward and pledged the money required to buy the land and build a 1500-square-foot building to replace the present depot. Later, rising construction costs in Bodrum and a vision of INA's bright future prompted the directors to vote additional sums for a building that will eventually double the existing space. Because of the generosity of the directors, none of the funds for the construction or land acquisition will be drawn from INA's archaeological and operations budget.

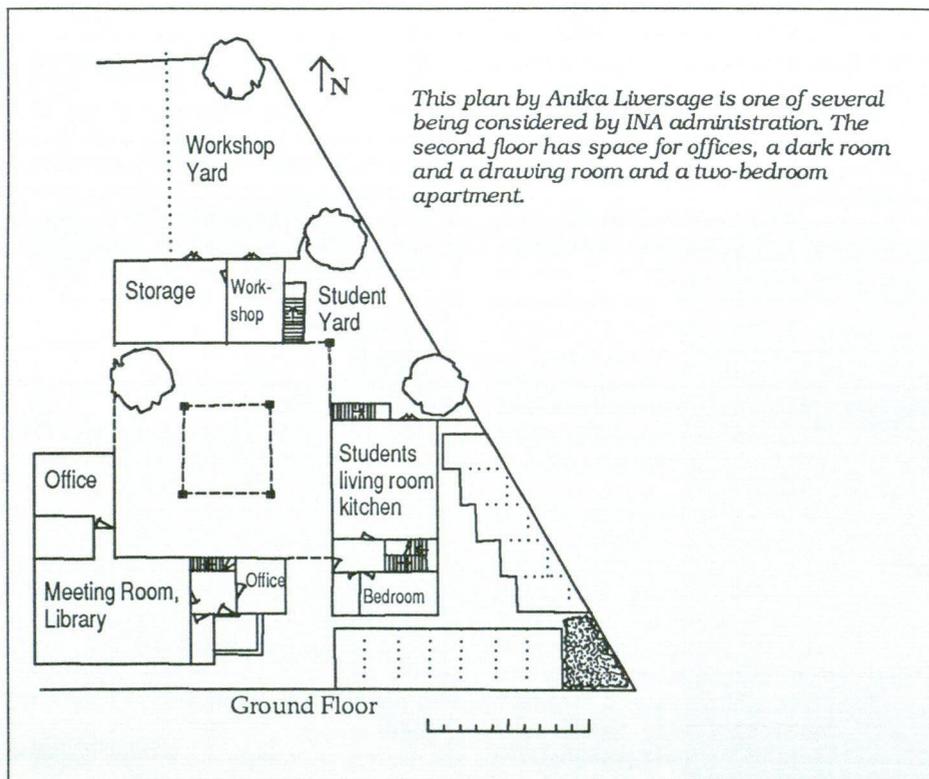


Danish architect Yal Heggr designed this central courtyard area surrounded by a number of bedrooms and offices as part of a larger Institute complex.

Initially, the new headquarters will include accommodations for 15 people, a drafting room, a photographic dark room, and four offices in addition to a storage area and workshop. Several plans are being evaluated, and all of them include options such as allowing winter offices to be used for summer accommodations. Each architect is also aware of the need to allow for convenient expansion of the complex which will ultimately include a library and perhaps conservation and research laboratories.

Construction is scheduled to begin late in 1988 or in 1989.

Cheryl Haldane



Our appreciation to these directors who are contributing to INA's permanent headquarters in Turkey:

John Baird
Gregory Cook
Claude Duthuit
Nixon Griffis
Harry Kahn
Jack Kelley
Ray Siegfried

NEWS AND NOTES

Thousands of archaeological books added to A&M library

When INA excavators leave the field each year and return to Texas A&M University, months of work lie ahead as the season's finds are analyzed and published. Now INA's home university is making their work a little easier. The Sterling Evans Library at Texas A&M has given priority to building its archaeological holdings; in the last two years alone thousands of books on ancient and classical archaeology have been added. Many of the recent purchases are books long out of print but essential to the study of the ancient world; some are rare even among more established archaeological collections and were not available at Texas A&M even through the interlibrary loan system.

A special grant and the acquisition of two private libraries, along with the university's substantial financial commitment to nautical archaeology, contributed to the collection's rapid development. In 1984 a grant of more than \$100,000 was awarded to the library by the Abell-Hanger Foundation; this was used to build up a core collection in archaeology of the ancient Mediterranean world and to add to holdings in New World archaeology. With supplemental university funds, in 1986 Texas A&M acquired the private library of a prominent, and now retired, classical archaeologist, bringing to the library many of the older classical sources lacking in the

university's relatively new and undeveloped collection.

The library most recently acquired another retrospective collection, this time the private library of Professor Thomas W. Thacker, who died in 1984. Prof. Thacker was the founder and the first director of the School of Oriental Studies at the University of Durham in England. During a career spanning more than fifty years, the professor built a remarkable collection of Egyptological and Near Eastern works, dating from the 17th century, and includes publications by British, American, French, German, Scandinavian, and even Soviet archaeologists.

Jane Treadwell, Head of Resource Development in the Sterling Evans Library, discovered Thacker's collection while searching for a journal of Egyptian archaeology. Again with supplemental university funds, the entire library was bought from a German bookdealer. Several hundred works in Egyptology, hundreds of dictionaries, grammars, and readers in virtually all of the major ancient oriental and Semitic languages, numerous excavation reports from Egypt and the Near East, and back-issues of several important journals make up the bulk of the collection, with a number of rare, first-edition folios of tomb paintings adding a touch of the spectacular to an already invaluable collection.

Margaret Lynch

Texas A&M/UT Sponsor Joint Program

Texas A&M's Nautical Archaeology Program is pleased to announce an association with the Classics Department of the University of Texas, Austin. Through a consortium agreement, students enrolled in a program at either university will be able to take courses at the other. The unique benefit of the program is that while participating in it, students pay all fees and receive credits for course work taken at the host university solely through their home in-

stitutions, while taking advantage of opportunities to work with scholars at both schools.

Two nautical archaeology students are taking courses at both Texas A&M and UT this year, but it is also possible for students to spend entire semesters at the host institution. No special application procedures are required beyond a short approval form from the graduate school, and financial aid is unaffected by the program.

NEH Interpretive Research Grants

The Interpretive Research Program of the Division of Research Programs, the National Endowment for the Humanities, wishes to announce the annual application deadline of October 1, 1988 (postmarked), for projects beginning on or after July 1, 1989, and of October 15, 1989, for projects beginning on or after July 1, 1990. Funding is available for up to three years of collaborative research in any field or fields of the humanities. Draft applications may be sent to the program for staff comments any time up to August 15. The Projects category supports collaborative research primarily in history, anthropology, literature, philosophy, musicology, art history, archaeology, religious studies, and the social sciences that employ interpretive rather than quantitative methods. A second category of support, Humanities, Science and Technology, supports collaborative research that draws on the theories and methods of the humanities to study current or historical issues to science and technology. For more information about the Projects category, please write or call Dorothy Wartenberg or David Wise at (202) 786-0210; for Humanities, Science and Technology, write or call Daniel Jones or Elizabeth Arndt at the same number. The address of the program is: Interpretive Research Program, Room 318 IR, National Endowment for the Humanities, Washington, DC 20506.

Annual INA memberships are available in the following categories:

- **Student Member:** \$15.00
- **Regular Member:** \$25.00
- **Supporting Member:** \$100.00
- **Benefactor:** \$1000.00

The INA Newsletter is published quarterly. Contributions or queries by members are encouraged.

Editors: Cheryl Haldane and Diana Thornton



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