

THE INA QUARTERLY



Fall/Winter 2002

Volume 29 • No. 3/4



MICHAEL L. KATZEV

1939 – 2001

INSTITUTE OF NAUTICAL ARCHAEOLOGY



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On the cover: Michael L. Katzev (1939–2001) was not only one of the founders of INA, but also a great friend of both nautical archaeology and all he encountered. Here he is seen in 1974 sailing a 1:5 fiberglass model of the Kyrenia Ship in Kyrenia Harbor, Crete. Photo (and all other unattributed images in the tribute article) courtesy of Susan Katzev.

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The Institute of Nautical Archaeology is a non-profit scientific and educational organization, founded by George F. Bass, Michael Katzev, and Jack Kelly and incorporated in 1972. Since 1976, INA has been affiliated with Texas A&M University, where INA faculty teach in the Nautical Archaeology Program of the Department of Anthropology. The opinions expressed in *Quarterly* articles are those of the authors, and do not necessarily reflect the views of the Institute.

The *INA Quarterly* was formerly the *INA Newsletter* (vols. 1–18).

Editor: Christine A. Powell

A Tribute to Michael Katzev



Michael Lazare Katzev, a founder of the Institute of Nautical Archaeology, died of a sudden stroke at his home in Southport, Maine, on September 8, 2001. Millions of New Yorkers who never knew Michael's name will always remember the 14.5-meter Kyrenia Ship replica with Michael aboard sailing into their harbor in 1986 as the smallest of the tall ships honoring the centenary of the Statute of Liberty. Every nautical archaeologist (and every other serious student of antiquity) remembers the original of that replica, the fourth-century BCE merchant vessel that Michael raised and preserved. This issue of *The INA Quarterly* is dedicated to his memory, which will last as long as the discipline of nautical archaeology itself.

Michael was born in Los Angeles, California, in 1939, the son of a magazine distribution executive. After attending Los Angeles High School, he graduated Phi Beta Kappa in economics from Stanford University. Two years later, in 1963, he received a master's degree in art history from the University of California at Berkeley. His current passion was ancient bronze sculpture, and he spent a year each at The American School of Classical Studies in Athens and at Columbia University pursuing that passion. Michael trained in archaeological excavation with Charles K. Williams II at Nemea, Greece. However, he soon discovered that the only place that new statues were likely to be found was under water.

In the early 1960s, the premier program in the world for scientific shipwreck archaeology was at the University of Pennsylvania. At Cape Gelidonia, George F. Bass had

become the first "diving archaeologist" with professional training. In 1961, he had begun work on the several shipwrecks at Yassiada, Turkey, assisted by Frederick van Doorninck and many other "future greats" in nautical archaeology. Michael joined them in 1964.

He drove his beloved Mercedes sportscar from Athens to Bodrum. The roads were corrugated dirt and the fan belt broke south of Izmir. He emerged at the dig house from that sweltering dusty drive in blue jeans, a five-gallon hat, and an immaculately white tee-shirt. Seated in the doorway to greet him was Susan Womer, her feet holding an anchor concretion together while black rubber casting compound oozed over her hands and feet. Susan recalled, "I was impressed. Anyone who had driven that road and arrived looking so clean had to be something special. I never asked his first impression of me!" Notwithstanding the inauspicious beginning, they were married two years later.

Michael himself cast most of the iron objects on the Yassiada Byzantine wreck. These included axes, pickaxes, a hoe, a shovel, a set of billhooks, a pruning hook, and wood-working tools such as an adze, hammers, and sacks of nails.

In 1967, the Katzevs returned to Yassiada to work with Dr. Bass on the Roman wreck. It was then that Michael and Susan dreamed up the famous "underwater telephone booth," an underwater refuge that was later copied by several marine habitat projects and the U.S. Navy. The two spent much of their time in Izmir that summer handling the business of getting equipment through customs and to the site.



Michael down and dirty with a Yassiada iron concretion, Summer 1964.

Michael and Susan Katzev, with George Bass, inspecting the first telephone booth for Yassiada, 1967.



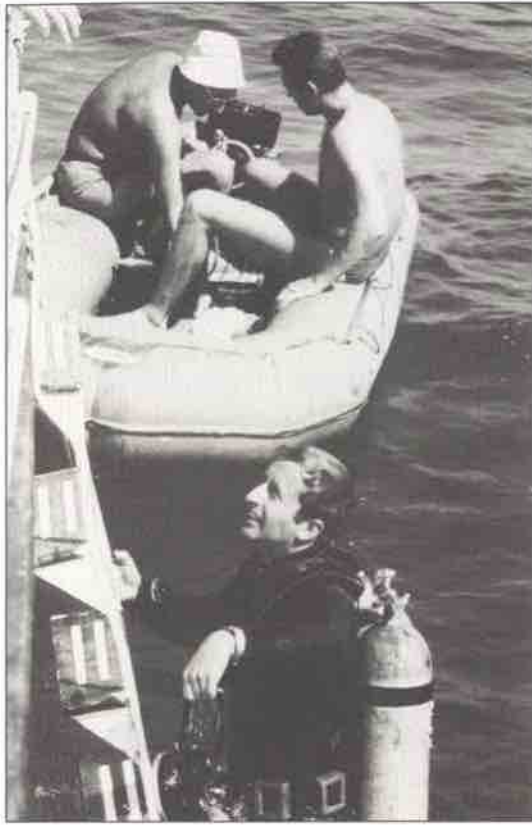
A few years earlier, President Kennedy asked Dr. Bass to have lunch at the White House with Archbishop Makarios, the President of Cyprus. The opportunity to undertake work in that nation was too good to pass up, and by 1967 the time was ripe. Bass later wrote,

"I had looked forward to the day when students trained at Yassiada would branch off on their own. Michael Katzev was ready. Not only was he familiar with diving and excavation techniques, but he had versed himself thoroughly in the less pleasant details of archaeology, spending winter months helping me prepare budgets, write proposals, choose staff, and order and ship equipment. He had learned foreign antiquities and customs regulations. At the same time, he was an excellent student with a background that included excavation on land" (*Archaeology Beneath the Sea*, 1975, pp. 166–67).

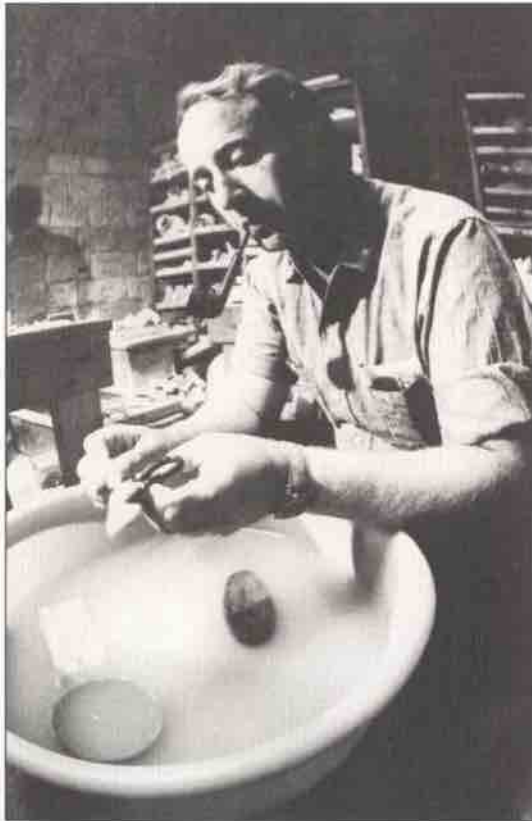
Shortly after Michael and Susan arrived in Cyprus, sponge diver Andreas Cariolou took them to a pile of wine jars less than a mile northeast of the northern coast town of Kyrenia. "It was the most beautiful thing we had ever seen," Susan recalls.

The size of the mound of mostly Rhodian amphoras suggested that a typical trading ship of the late fourth century BCE lay beneath. This site became Michael's life work. Over fifty persons worked under his direction in raising and preserving the ship and its artifacts. Those who worked on the project often remember it as the best part of their lives. The excavation itself was conducted under University of Pennsylvania Museum auspices, but the Museum could not take responsibility for conservation. Michael was teaching at Oberlin College during this time, and the College took on this obligation.

Of the 375 amphoras on the ship, 319 came from Rhodes, suggesting that the ship had called there. Perhaps it was the ship's home port. Other jars came from Samos or elsewhere in the Aegean. Another cargo of millstones had been made on the island of Nisyros, while the ten thousand almonds in the hold probably came from Cyprus itself. Since most of the eating utensils were in groups of four, the captain likely had a crew of three under him. Very few items of monetary value were found on the Kyrenia Ship. A possible explanation is found in the spearheads found concreted to the hull's outer sheathing of lead. Piracy was rife in these waters in the time of Alexander the Great's successors, and the culprits may have scuttled the ship to conceal their crime.

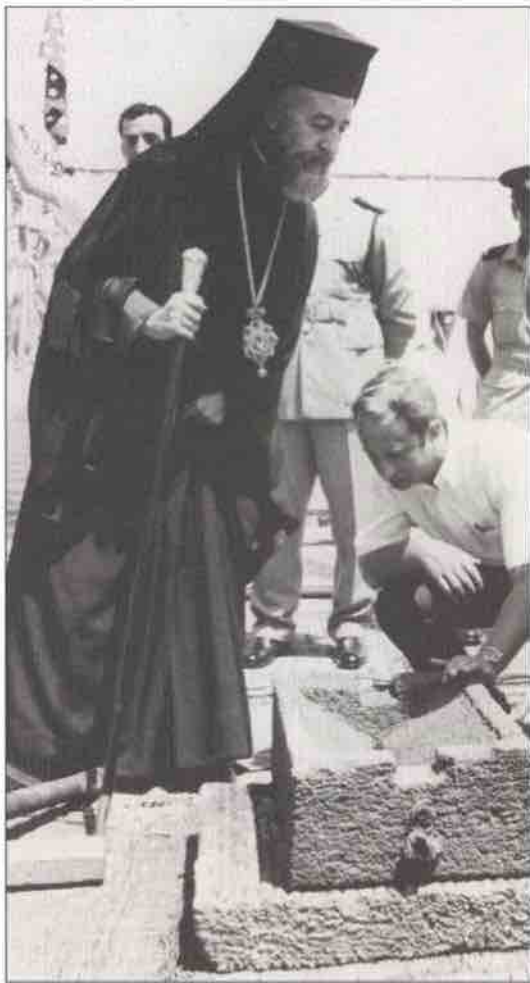


Above. The Kyrenia Ship Reconstruction Team, 1974. Left to right front: Robin Piercy, Susan Katzev, Frances Talbot Vassiliades, Michael Katzev, Director, Rear: Dick Steffy, reconstructor, Netia Piercy. Missing: Chip Vincent.



Above left. The search for sites in Cyprus, 1967.

Below left. In the Kyrenia Castle storeroom washing pottery, 1968.



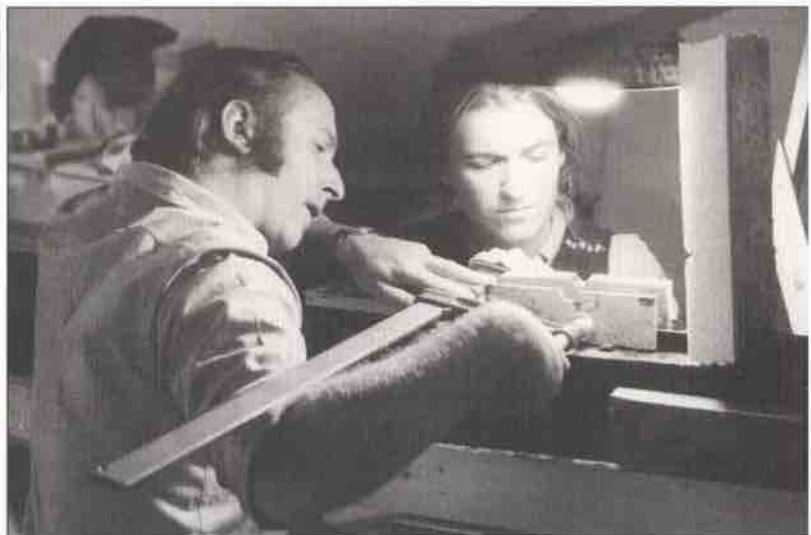
Above. Archbishop Makarios, President of Cyprus, visits the Excavation barge off Kyrenia in 1969.



Top Right. Michael and Dick Steffy building a temporary support scaffold to support the ancient ship.



Middle Right. Michael and Robin Percy rejoining an original ship's frame.



Bottom Right. Michael and Frances Talbot Vasiliades clamping the keel.



Michael with Robin Peirce in 1974 after the Kyrenia Ship had been reassembled.

The Kyrenia Ship was the best-preserved Classical vessel discovered up to that time, approximately seventy-five percent intact. It took nearly five years to raise, preserve, and reassemble the ship in the crusader castle of Kyrenia, where it is on view today. The Roman Yassiada ship had provided a glimpse of ancient shipbuilding techniques, but this vessel confirmed modern archaeologist's views. INA's J. Richard Steffy observed, "It told us how the Greeks built their ships." This was only possible because Michael's careful excavation techniques had preserved the maximum amount of information from the wreck.

When George Bass left the University of Pennsylvania in 1972, he discussed the idea of an "American Institute of Nautical Archaeology" with several friends and acquaintances. Jack Kelley was the first to pledge funds and agree to serve as a Director, but Michael and Susan Katzev were the first to volunteer for its staff. Michael was elected Vice-President at the first meeting. Thus, Michael Katzev is honored along with Dr. Bass and Mr. Kelley as one of the founders of what was to become INA after its move to Texas A&M University. The headquarters were originally on Cyprus, so that the friends and colleagues assembled during the Yassiada and Kyrenia projects could work together.

Kyrenia II in the July 4, 1986, Parade of Tall Ships up the Hudson River to commemorate the one-hundredth anniversary of the Statue of Liberty.



These plans were disrupted by the war of 1974 that ended in the partition of the island. Michael will be remembered by both sides first for his compassion for all the Cypriot people and then for his fierce determination to protect the reassembled ship.

Michael oversaw the construction of *Kyrenia II*, the replica built in the Psaros yard in Perama, Greece. Not only the materials, but even the construction methods were as close to the original as scholarship allowed. The results were surprising. As Mr. Steffy observed in *Wooden Ship Building and the Interpretation of Shipwrecks* (1994, p. 57),

"[The replica] has performed extremely well; it is drier, stronger, faster, and sails upwind better than expected. During one voyage the little ship encountered winds in excess of fifty knots without taking on much water and with insignificant damage to the hull and rig."

The replica served several purposes. It provided practical experience with ancient methods of shell-first hull construction, it provided valuable data on how an ancient vessel might have handled, and it provided excellent publicity for nautical archaeology.

The Liberty Ships parade into New York Harbor on July 4, 1986, was one example of the heightened profile that Michael gave to our discipline. In the film, "With Captain, Sailors Three," he sought to demonstrate that the of-

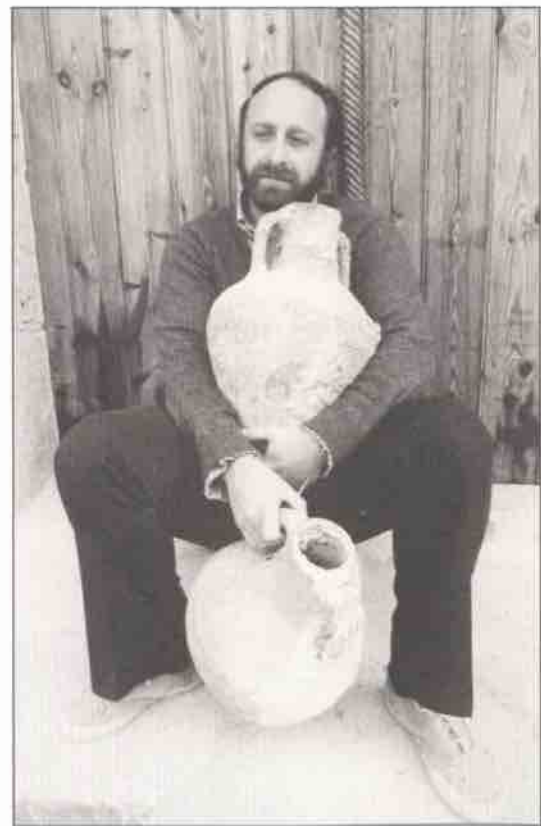
ten tedious work of recording an excavation is the key to its success. Articles in journals and magazines (including *National Geographic*), lectures, and appearances with BBC television (such as "The Ancient Mariners") sent the story of the Kyrenia Ship around the world.

Michael devoted many years to researching the final publication of the ship, which will be his finest memorial. Aside from the hull, he personally undertook virtually every aspect of the study and research that goes into publishing a major excavation. No one who has not been involved in this aspect of archaeology can appreciate how much time and effort was involved. The research included six years in Athens. During this time, he had the opportunity to excavate again with Charles Williams at Corinth. Later, much further research was conducted at a variety of times and places. Susan Katzev will now be seeing the publication through to completion.

The Katzevs returned to the United States in 1982, residing first in Arlington, Vermont, and later in Southport. Michael remained a very active Director of INA, assisting generously both in its academic and fund-raising activities. His contributions are sorely missed. In this issue of *The INA Quarterly*, several of Michael Katzev's colleagues will offer their memories of the man that did so much to shape the Institute of Nautical Archaeology and the entire discipline of archaeology. ☞

Right. Michael with amphoras from the Kyrenia Ship outside the storeroom of the Castle in 1975.

Bottom. Michael in the storeroom cataloguing the ship's pottery that same year.



Remembering

MICHAEL L. KATZEV

1939 – 2001

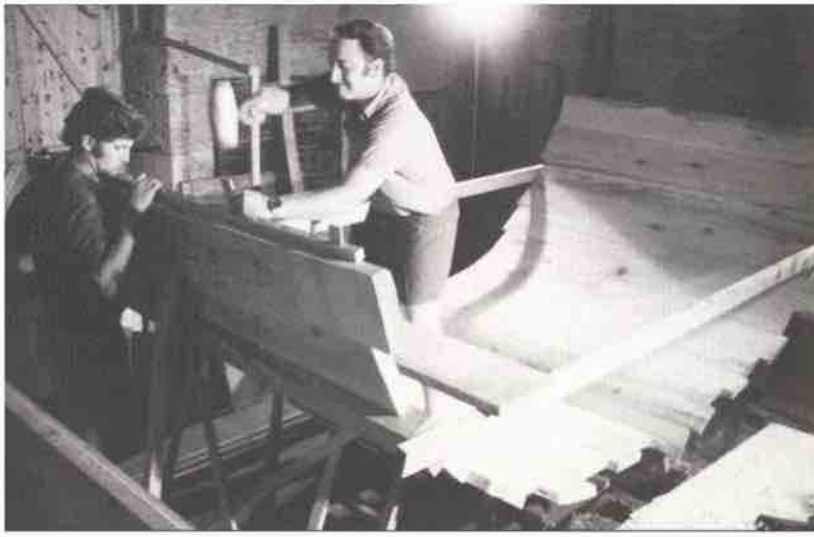


Michael aboard Kyrenia II as it entered New York Harbor in the Liberty Ships procession, July 4, 1986.

It would be difficult to overstate the contribution Michael made to nautical archaeology and to the formation of the Institute of Nautical Archaeology. Michael took everything he had learned at Yassiada to Cyprus—and then improved on it. His decision to actually re-assemble the timbers of the fourth-century B.C. Kyrenia wreck for display and research moved shipwreck archaeology in the Mediterranean to a new plane. It was followed by his advisory role in the construction of a full-scale sailing replica that provided much new knowledge of how classical Greek ships actually sailed. Michael was one of those extremely rare people who could do it all: he obtained permits, raised funds, assembled

staff, started a new museum, made a documentary film, wrote articles for *National Geographic*, lectured around the world, and made the results of his work available through various preliminary reports which presented all of the more important finds from the ship. Alas, he did not live to see the publication of the final report. This is being completed by Susan, who played such an important role in all their joint ventures. Michael agreed to serve as INA's first vice-president at a time when neither of us had any idea where we would find the funds for our new institute. The headquarters were initially on Cyprus so the two of us could work together as colleagues and, more importantly, as friends.

George F. Bass



Michael and Robin Piercy building a 1:1 section model in September 1973.

I first met Michael Katzev at the American School of Classical Studies at Athens, where we were both students during the 1963–64 academic year. On field trips, whenever group conversations turned to some matter involving political, cultural, or economic history, or even the stock market, Michael normally led the discussion. I soon concluded that he was among the most erudite people I knew. I was also somewhat dazzled by the 190-SL Mercedes he had brought with him from the States. When Michael expressed interest in our excavation of the seventh-century Byzantine shipwreck at Yassiada, I told him all I could about the shipwreck and its excavation. BJ and I both encouraged him to come to Turkey the following summer, and I wrote a letter to George Bass recommending that he send Michael an invitation to join the staff. It was the first—and perhaps most momentous—letter of recommendation I ever wrote.

The next summer, Michael drove his sports car from Athens to Bodrum to help Larry Joline and me in replicating the iron objects from the wreck. Eric Ryan and Susan Womer joined us in making a replica of one of the iron anchors. Michael was always finding ways to make the work easier, more efficient, and less messy. In response, we began to call him “Never Sweat,” not knowing that we were witnessing early manifestations of some of the inclinations and abilities that in a few years were to make him an outstanding excavation director. Michael played a key role in bringing our replication work to a successful conclusion and went on to publish the iron tools from the wreck. He also joined me in writing an article on our methods of replication; a lion’s share of the writing was his. Rightly or wrongly, BJ and I have always

proudly claimed that we were the ones who first introduced Michael to Susan. In any case, their very memorable engagement party and subsequent marriage in 1966 left us with a certain sense of accomplishment.

In early 1968, Michael asked me to join the staff he was then assembling for the Kyrenia shipwreck excavation. Circumstances required me to turn him down. I have, of course, very much regretted ever since that I was not a part of that wonderful project. Under Michael’s inspired leadership, most of the staff became a tightly knit family that has ever since remained remarkably close. In the spring of 1974, I was finally privileged to see the Kyrenia staff at work when I spent four months in Kyrenia with Dick Steffy, finishing wreck plans and hull-reconstruction drawings for the final publication of the seventh-century Yassiada shipwreck. Michael, always a man

of principle, had called me when he decided that he wanted Dick Steffy to work on the reassembly of the Kyrenia hull and told me he would pursue the matter no further if I did not want Dick diverted from his work on the seventh-century Yassiada ship reconstruction.

I remember particularly well Michael the scholar and Robin Piercy the craftsman building a full-scale replica of the midships section of the Kyrenia ship, seeking answers to questions about the hull’s construction as they went along, and always having great fun despite all the hard work involved. It was the same Michael Katzev I had known in Bodrum: doing the job in the best way possible and enjoying every minute of it.

Fred van Doorninck



Michael working on the 1:1 section model in October 1973.

It was a bitter cold night and the roads were covered with ice as my wife and I headed for the monthly meeting of the local AIA chapter at Franklin and Marshall College in Lancaster, Pennsylvania, early in 1971. We would never have left the comfort of our home were the program not about the excavation of the Kyrenia ship off the coast of Cyprus. We had read an interesting article about that excavation in *National Geographic Magazine* just a few months before and it aroused our interest enough to justify our hazardous journey. After a fantastic lecture, Lucille and I met the project's director, Michael Katzev, and his wife Susan and we discussed the project further. When a sleepy janitor asked us to leave because it was far past time to close the auditorium, we continued the discussion at their motel until the wee hours of the morning. Michael was that enthusiastic about the work he was doing. That wasn't the end of it either. By June of that year, my interest was aroused to the point where I took a leave of absence from my business to visit the Kyrenia ship project on the north coast of Cyprus.

What an experience it was to examine those fascinating hull remains in Kyrenia Castle! It was a mind-boggling six weeks, and it seemed to pass in hours. A multitude of questions about the mystery I had just witnessed were bouncing through my head. By the time I headed back to the States it had become clear that I would not rest well until I returned to Cyprus to study that ship more thoroughly, even if it meant getting out of my very comfortable business. That happened a year later, when I accepted Michael's offer to reconstruct the ship.

It wasn't just the fascinating hull timbers that drew me to the Kyrenia project, however. Michael, himself, was an extremely interesting person. He was an outstanding director and an excellent fund raiser. His organizational ability and the meticulous ways in which every item was recorded and handled were impressive. Conservation, photography, graphics, documentation, and storage were conducted with a thoroughness and efficiency seldom seen on archaeological projects. And yet, Michael impressed us most by the ways in which he led but did not dominate. That Kyrenia crew operated like a well-oiled machine, each person concentrating on certain areas of expertise in a most productive manner. He put his faith in each of us and gave us *carte blanche* as long as the project

benefited. It was an extremely happy, productive, and close-knit group—we were more like extended family than crew.

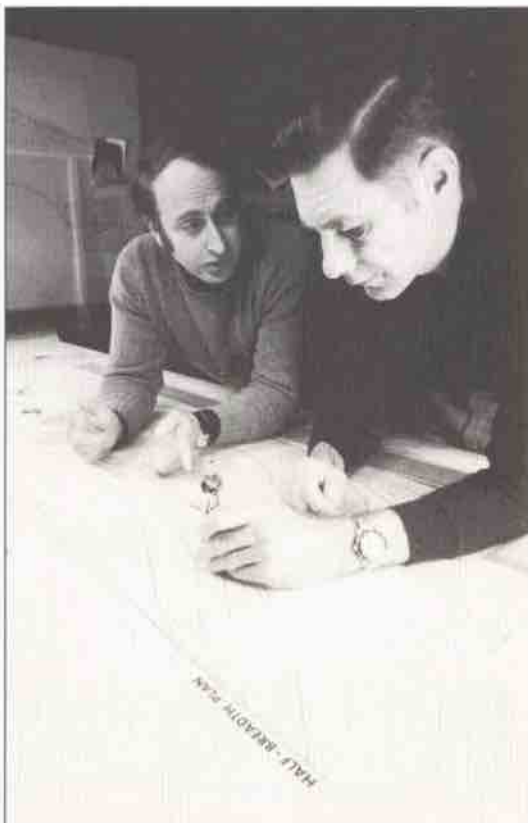
After the project was completed, Michael assembled a massive collection of information about the contents of the Kyrenia ship and the world they served. It was an enormous research effort, conducted for six years in the libraries of Athens and followed up later at a variety of locations. That information is now being processed for publication under the direction of his wife, Susan, and will be published soon. A restudy and elaboration of the details of the vessel itself will also be published in the near future. Michael later became involved with excavations at Corinth that were directed by Charles Williams, whom he had worked with years before.

In 1982 Michael and Susan returned to the United States, residing first in Arlington, Vermont, and later in Southport, Maine, where he passed away the age of 62. It was during these later years that Michael contributed so much to our Institute. He was one of the founding fathers back in 1972 and remained on the board until his death. He generously contributed time and money that helped enormously in INA's spectacular growth.

I cannot pay enough respect or gratitude to compensate for the opportunity and understanding provided to me by Michael Katzev. He was extremely supportive of all of my efforts, and I am still amazed that he was so cooperative and willing to experiment in what must have at times seemed like harebrained ideas of mine. I can never be grateful enough for his faith in my work and his total confidence and complete lack of interference in this previously untested method of reconstruction of a previously unre-

corded type of ship. I am certain, too, that many others feel as I do. One of Michael's greatest contributions was the people who labored and learned under his leadership and then spread those talents around the globe for the benefit of archaeology. I will not list them here for fear I will miss someone, but they are many in number. They serve—and in some cases direct—institutions on several continents. In fact, a number of them are on our own INA staff or have served it from time to time. Michael left us far too soon, but the fruits of his labors will benefit us for years to come.

Dick Steffy



Michael and Dick Steffy making a half-breadth plan of the Kyrenia Ship in December 1973.

Michael Katzev first descended from his white Mercedes 190 to the driveway gravel of the American School of Classical Studies in September, 1963. That fall and winter he immersed himself in the ASCS program of trips and seminars. In the spring he dug with me at Nemea, using his vehicle for transport on the week-ends between Nemea and Corinth. Although Michael's entrance upon the archaeological scene in Athens provided a moment of jazz, he entered the School as a meticulous scholar, as well-tuned as his car. It was always well worth sparring with Michael over dinner about archaeological sites or art-historical facts and talking about problems and theories of the ancient world. The conversations were like vintage wine and worth savoring.

But to me Michael's most generally important archaeological contribution was his excavation and presentation of the fourth-century merchant ship at Kyrenia, Cyprus. I visited Michael and Susan when they were in full swing excavating the hull, and I visited again once the hull was exhibited in Kyrenia Castle. It was a remarkable transition from fragmentary wood, clay, and metal sheathing half buried in an almost inaccessible place to a ship's hull totally reconstructed and beautifully exhibited in a long, stone-vaulted gallery where the whole world could look at it. Michael's genius for organization had trans-

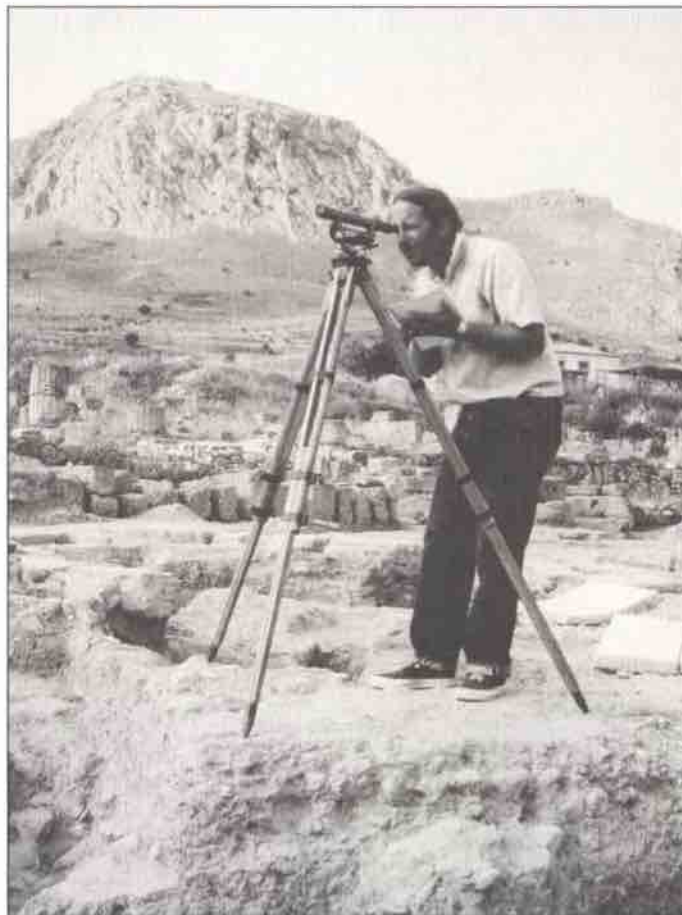
formed a long-abandoned and forgotten wreck into a tangible example of the ancient mariner's life and times, with all the finds from the ship arranged to give context.

Reinforcing the importance of this integration of excavation skills, care in restoration, and patience in the actual reconstruction that brought the old ship back to life was the sea-worthy, life-sized replica that thereafter sailed the Mediterranean and Atlantic. To make a forgotten ruin in the ocean bed into a monument the replica of which was christened by the then Minister of Culture of Greece, Melina Merchouri, and presented on television stations thereafter throughout the world was a feat of perseverance, love, and vision. It was a project in itself almost as big as that of raising the original, but demanding a completely different set of skills. No one except the excavator's wife or another archaeologist who has organized an archaeological project knows what efforts and anxieties over finances, what worries to form the right team, and to keep it together and producing, exist in undertaking a scientifically integrated and large-scale project. One man who undertook such a monumental job and vividly presented the results to the general public in numerous forms is that man of vision who stepped out of a sparkling white Mercedes in 1963.

Charles Kaufman Williams, II

Right. Michael takes a level in the Corinthian Forum in 1971.

Below. Reading sherds with Charles Williams in Corinth, 1978.



I see Michael Katzev now as he looked when I first saw him in 1968—the same way he appeared to many in the film of the Kyrenia Ship excavation. In it, he and his lovely wife Susan greet Andreas Cariolou in Kyrenia Harbor and then discuss the discovery of the shipwreck. He is smiling, relaxed, and enjoying the moment! Michael enjoyed the moments, big and small, all his life. He was able to do so because of his quick wit, his natural affection for people and his masterful ability to organize. He had a sense of flair tied with his thrill for real life. How else to characterize the trip when he drove his Mercedes convertible sports car on country, dirt roads in Turkey in the 1960s.

The fine project he directed, The Kyrenia Ship Expedition, is an example of his superior abilities. He directed it superbly with all its complications. Only those who have run projects realize the demands, from tackling minutiae to dealing with heads of state, that call for an amazing collection of skills. Michael had these in abundance and handled himself with such aplomb that he was an example to all. Consider that he led his team through the survey, excavation, conservation, and complete display of the Kyrenia Ship in a very short time period during a particularly turbulent period. He was cool in the face of adversity. He was dedicated; visitors were welcome at any time and he often gave freely of his weekends. He delegated because he knew no one person has all the skills or knows it all.

In assembling and leading his team, he developed and inspired a family of closely-knit members. As a testimony to his personal qualities, that team has retained some of the deepest bonds I've ever seen in the over eighty projects I've been associated with. As everyone continued with their lives and took other jobs, as marriages and chil-

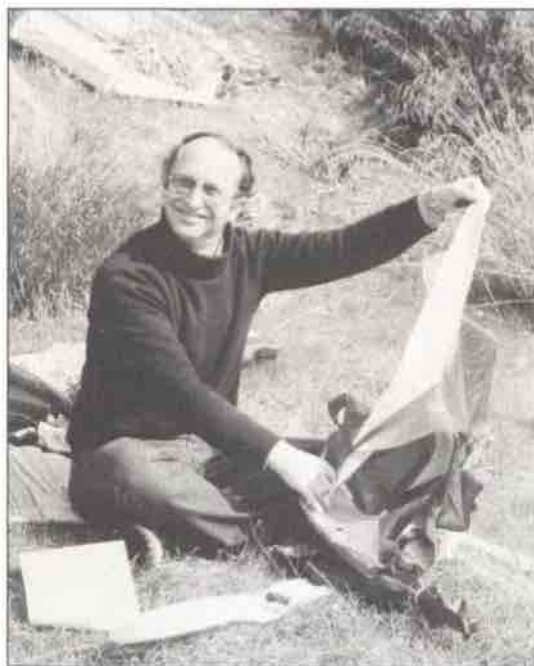
dren followed, Michael continued to act as a focus for them. In good times and bad, he maintained a close personal interest in their welfare, offering tremendous encouragement and support to those who chose the road less well traveled. He literally became a "godfather" to their children, a role he welcomed with relish and appreciation. He was always available with counsel and provided guidance on far-ranging issues. Important dates were a cause for celebration such as parties on his birthday or name day at his favorite restaurant in Corinth or at picnics in the woods on other people's birthday. He called people around the world on Christmas or other days so he could hear their news and wish them well. Michael cared.

Work never stopped for him. He is one of the few modern scholars to take upon himself virtually all aspects of the intricacies of study of an excavation, except for the hull, of the Kyrenia Ship. In his research and writing, as with everything else, he was a disciplined, methodical perfectionist. The corpus of this work will provide the material for the publication of the project. Somehow he even found time to assemble wonderful collections of wood-working tools and heads of walking sticks.

Whether it was to cajole, celebrate, or console, Michael was always there. I recall that I mentioned during a phone call that I needed some corrective surgery. His immediate response was "you must stay with us to recuperate." I gladly accepted and it was then that I last saw him and now picture him, by the fire with friends around him near his beloved sea.

His gift to us has been that we have all been fortunate to have known him, to have been cared for by him, and, in return, to have been able to care for him. You'll always be with us, mate.

Chip Vincent



Left. Michael preparing to fly a kite on March 8, 1981, in Greece.

Bottom. A small part of the Kyrenia Ship "family" assembled in Athens for the launching of Kyrenia II, July 22, 1985.



It was clear that Michael would be different from the rest of us when he appeared at the American School of Classical Studies in Athens with his Mercedes sports car and a white linen suit. California play-boy, we thought, "we" being the members of the "Class of '63-64." Our judgment was, of course, based on thoroughly superficial grounds, for beneath the polished exterior lay a sharp incisive mind. Over the years these two traits became more pronounced but also blended to produce a unique personality.

One of my Michaels, if I can make such a claim, was the person who came to Corinth for several summers to help clean up specific problems that had arisen during the dig season but had remained unresolved. A perfectionist, he worked hard, gave the excavations his full attention, kept meticulous notes, then went off for a weekend of relaxation and fun, or regaled us with stories over drinks and dinners at the dig house. When the water would go off, he would immediately jump in with a solution that would relieve the tension and make us laugh, like rigging up a hose to our reservoir to provide communal swimming-suit baths. But what I especially respected in Michael was his objectivity in addressing virtually any issue, unswayed by personal feelings. I felt I could trust his judgment both in personal and scholarly matters. His excavations of the Kyrenia ship were carried out, as one would expect, with precision, responsibility, and excitement. It is regrettable that a later project to excavate a deep-water wreck near Spetses never materialized. I am sure he would have come up with new and important methods for dealing with its problems.

My other Michael was one who organized vacations in Italy, where every hotel and restaurant were carefully mapped out for maximum comfort and enjoyment. His ability to remain cool and cheerful under tight circumstances is best illustrated by a trip we had taken to central Italy,

our last night spent in Grottaferrata in the Alban Hills outside of Rome. We left to make the long drive for the airport, late, of course—we were usually late. Half way there I realized that we hadn't picked up our passports from the hotel. Somehow we managed to turn back to the hotel, and while one group picked up the passports, the other called the airport, only to find that our flight had been canceled and we had been put on another flight, leaving almost immediately. Although the temptation was strong to skip the flight and spend another beautiful day in Grottaferrata, this was completely dismissed because there was now a challenge: to reach the airport in time. This was Michael at his best—fighting the odds and the autostrada to make the airplane. We did make it, but the final touch, to show that he was not flurried and in control of the situation, was when Susan and he strolled off to the duty free shops. Meanwhile I, the nervous traveler, rushed to the gate, and then sat for twenty minutes chewing my nails

until they appeared with time to spare before the flight was finally called.

When so many of us were weighted down with what we considered the serious challenges of our work, Michael managed to meet them with a laugh and a joke. I especially will never forget the summer the Greek junta fell and Cyprus was torn by war, when Michael and Susan, traveling in Turkey, managed to reach Corinth, helped us at the excavation by

photographing objects while we listened daily to the news of potential war, then returned to a divided Cyprus to finish up the ship work. Typically, they worked hard to finish the remaining work under depressing and tense conditions, while smuggling the handiwork of stranded Greek villagers in the north to markets in the south, to bring back much-needed supplies of money.

Michael was that rare combination of a good archaeologist, a faithful friend, a good husband, and a bon-vivant. He will be missed.

Nancy Bookidis



The famous 1960 Mercedes 190-SL sportscar in Maine, July 4, 1994.

For us, the four thousand inhabitants of the small township of Kyrenia, Cyprus, in 1968, Michael Lazare Katzev (Michalis) was the polite, humble and charismatic personality who led a scientific expedition, the results of which made our beloved hometown famous worldwide in the scientific circles of history and archaeology. However, as the years passed by Michael and his beloved kind wife Susan managed to take a very prominent and affectionate position in the conscience of the blacksmith, the fishermen, the carpenters, the custodian, the Municipality, and most of the Kyrenians. Michael was no longer a "foreigner." Kyrenians selfishly cherished him as a family member and a prominent Kyrenian citizen, an integral part of the great history of the town. With his friendly and warm approach and his humble and most kind personality and attitude towards people, irrespective of social status, he created a great number of friends and "relatives."

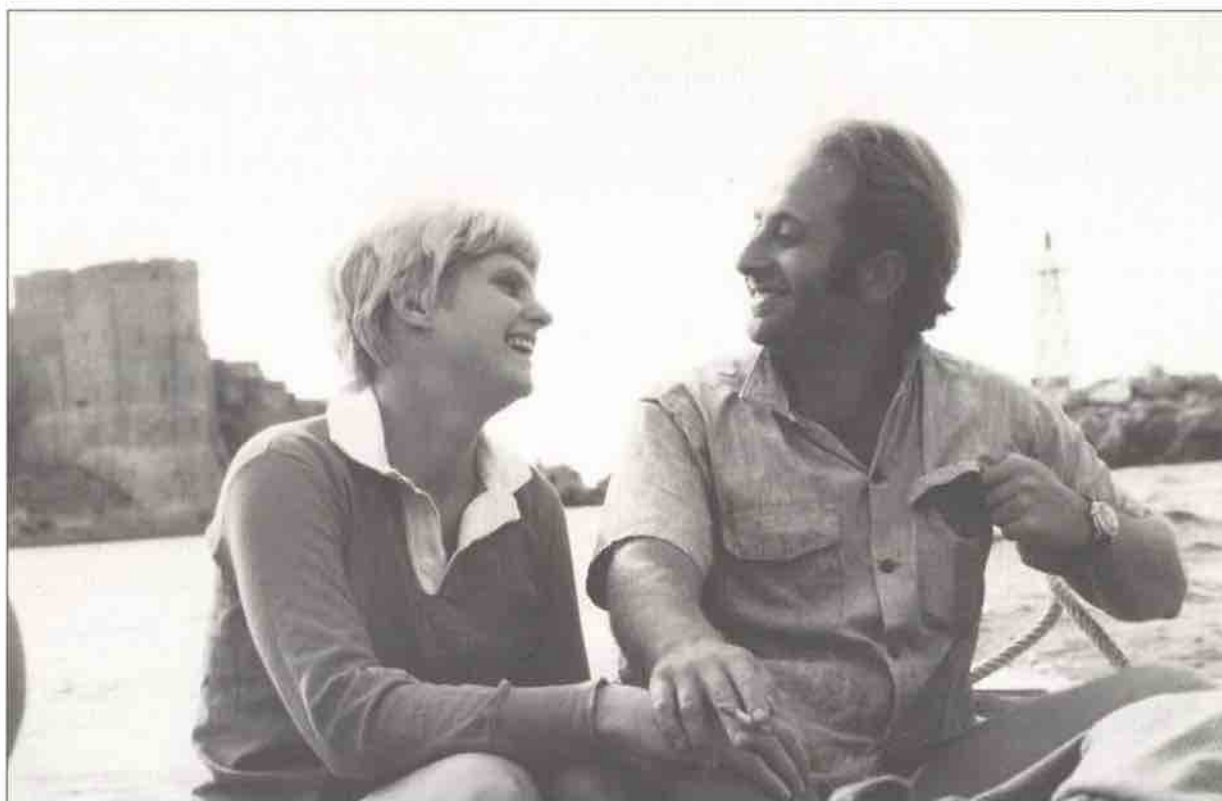
The premature loss of our great lover of Kyrenia found us all far away from home. Our sorrow was followed by sweet memories of Michael. Memories of our joyful life in Kyrenia gave us hope and perseverance to overcome and to come closer to his most kind wife Susan—with whom we all wish, one day soon, to return to Kyrenia to pay our respects and honors to the Katzevs over the ancient ship in the castle.

Expressing the feelings of most Kyrenians, I will say that no known human ever managed to so affectionately enslave the warm heart of the town of Kyrenia like Michael Katzev. We know that his spirit will always follow the destiny of our hometown and we shall always cherish and honor his memory. We pray to God for his soul and above all to always protect and give health and happiness to his most kind wife Susan, who has now so patiently undertaken to continue his immensely valuable mission.

God bless his soul.

Glaftos Cariolou

On behalf of the Family of Andreas M. Cariolou

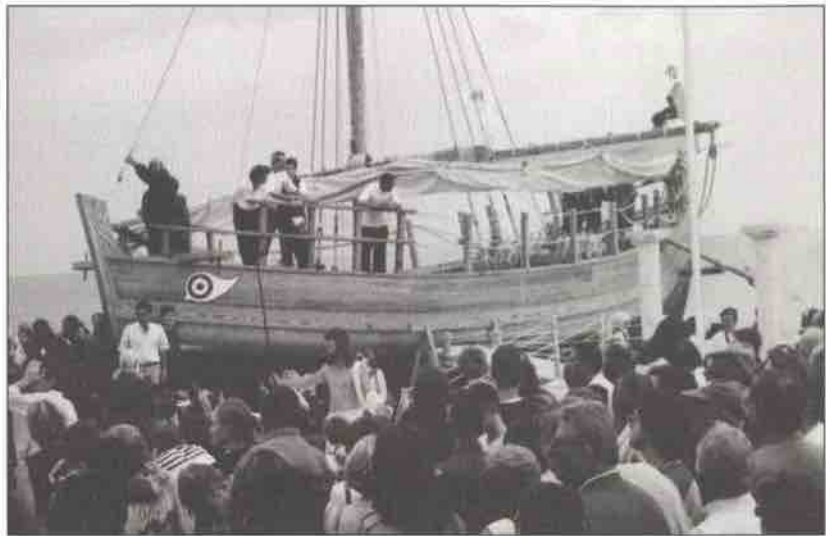


Michael and Susan headed for the excavation barge in 1969 with a tower of Kyrenia Castle in the background at the harbor entrance.

For Michael

I felt you looking over my shoulder as I watched the new replica of the Kyrenia Ship splash into Cyprus waters. *Kyrenia Liberty* was launched in Limassol only weeks ago on November 10, 2002, accompanied by a hundred-voice chorus of Kyrenians, an elegant modern dance ballet, and a symbolic loading of ancient products from each region of the land. In spring she will carry copper ingots of the same shape as those found on the bronze age Cape Gelidonya and Uluburun ships to Athens as a gift from Cyprus for making the bronze medals of the 2004 Olympics. Official duties will take her to St. Petersburg, Russia, in 2003 and Spain in 2004. Her send-off by the President of Cyprus, foreign dignitaries, and a crowd of several thousand friends was televised live to thousands more across the island.

It was a day of celebration that would have made you very proud—not for the ceremonies, but because *Kyrenia Liberty's* true mission is to promote learning. She is to have an active sailing life. Four different crews are training to recreate cargo and equipment of 2,300 years ago and experiment with sails, steering, and rigging to test her performance. A lad who worked on the excavation years ago is her captain and the prime mover in her creation. He is Glafkos Cariolou, son of Andreas, who found the original wreck site. Glafkos is inquisitive and passionate about the experiments ahead. He and Dick Steffy are e-mail



The launching ceremony for Kyrenia Liberty.

buddies, and already that first sail on launch day produced important discoveries about the way the ship was steered.

After the launch I visited the future home of *Kyrenia II*. This first and most authentic replica, built at the Psaros yard in Perama, Greece, had a short but very productive sailing life, riding out gale force winds with ease on voyages from Athens to Cyprus and back. Her sponsors in Greece, the Hellenic Institute for the Preservation of Nautical Tradition, have graciously committed to sending her to Aghia Napa, on the southeast coast of Cyprus. In the town center, the roof of a new museum will roll open to receive her as its centerpiece. Visitors will spiral down from her mast top to beneath her hull to understand the ship at every level.

The sail of the new *Kyrenia Liberty* bears twenty-five names of the Kyrenians who tailored it. On board at the launch were the custodian of Kyrenia Castle and a lady who ran a lace shop in the town. All of them hugged me and thanked me for you. What has become to them a symbol of their hometown and an ambassador for Cyprus, the *Kyrenia Ship*, began as our dream the day we first dived together on the wreck. Dear Michael, it all came true... far more than you imagined!

Susan Womer Katzev



Kyrenia Liberty raises her yard to set sail in Limassol Harbor.

Kiten Bay, Bulgaria, 2001

Kroum Batchvarov

The results of the first season at Kiten Bay were so promising that the joint INA-CUA (Center for Underwater Archaeology, Sozopol) team were granted a ten-year permit for excavating in the Bay of Kiten and for surveying the entire Southern Bulgarian coast. A small INA team consisting of Mark Polzer, Troy Nowak, and the author returned to Bulgaria in the fall of 2001 to continue the excavation of the shipwreck near Cape Urdoviza (*INA Quarterly* 28.1, 3–9).

The permit was obtained thanks to the formidable professional reputations and strenuous efforts of Dr. Hristina Angelova (Director of the CUA), Dr. Kalin Porozhanov (Research Secretary of the Institute of Thracology at the Bul-

garian Academy of Sciences), and the evident good will of the Bulgarian Government. The Institute of Archaeology in the Bulgarian Academy of Sciences also lent their support with the high opinion they expressed for our project.

Drs. Porozhanov and Angelova led the Bulgarian side of the INA-CUA excavation. Without the presence of Kalin Dimitrov and Captain Petar Petrov, archaeologists with the Center, little would have been possible. New Bulgarian University students Stanislav Bonev, Dimitar Vassilev, and Ivelina Petkova, with the valuable addition of Anita Dotzeva and Miroslav Todorov, also returned for the second season. Goran Saney of the Museum of Macedonia in Skopje rejoined us, as well.

Excavation and Hull Remains

While we understand the Ottoman Empire's dependence on shipping well today, we know virtually nothing about the ships themselves. Their diversity and construction have not been systematically studied. Since the Black Sea was closed to foreign shipping for so long, we must expect that shipbuilding on its shores stagnated. Therefore, it is likely that some elements of construction typical for earlier periods elsewhere may be observable in later vessels here. We hoped to test this hypothesis through excavation.

We decided to search for the sternpost of the ship in 2001, in order to determine the extent of preservation of

the hull and establish its surviving length. The scale of the expanded excavation persuaded us that the INA team could not do the measuring and recording alone, as was done in the previous year. This was a field school for the Bulgarian side, so it was desirable to train the students to take full advantage of their unquestionable abilities. For training purposes, we followed Troy Nowak's idea of establishing a "dry" square for practice ashore (fig. 1). Then we determined control points, handed the students tape-measures and showed them all the tricks of the trade that we have learned at the Nautical Archaeology Program and on other INA projects. Once they mastered the basics of

Direct Survey Measurement (DSM), I taught some of the students local recording of hull structures. After the techniques were mastered on shore, the students' trial by fire—or rather, water—began (fig. 2). Whether the teachers were good, or the students were uncommonly bright (self-complacency favors the first answer, honesty the second!), the whole exercise turned out much better than we ever hoped. The success of the project is largely due to the dedicated and hard, competent work of the students from New Bulgarian University.

The extensive preservation of the ship made it impossible to excavate it in its entirety within two seasons. This year we opened new squares along the longitudinal axis of the wreck. Two of them were aft of the bow square from the previous year, and were handed to student archaeologists under the guiding hand of Dr. Angelova. The last new square was aft of the trench from the 2000 season, where the end of the stern was expected to be.

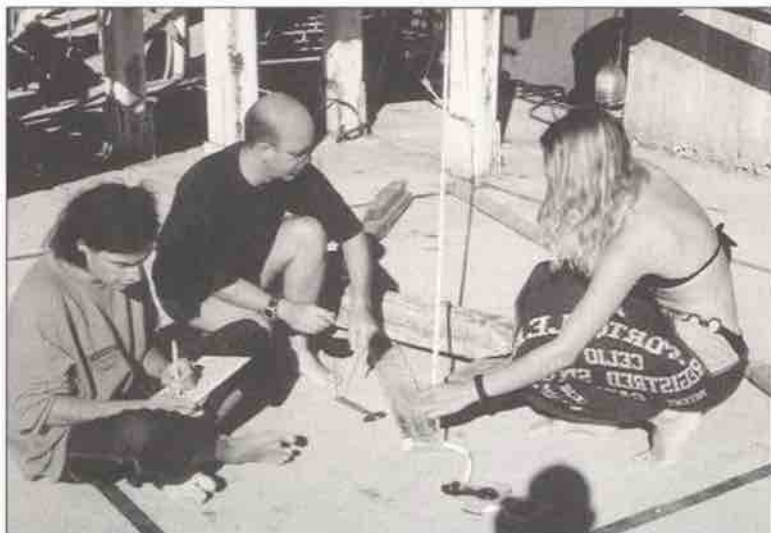


Photo: T. Nowak

Fig. 1. Bulgarian students Anita Dotzeva and Miroslav Todorov learning DSM in the "dry square."



Photo: K. Dimitrov

Fig. 2 (above). Archaeologist Anita Dotzeva mapping hull structure.



Photo: K. Dimitrov

Fig. 3 (right). The shaft revealed the pattern of the framing.

The two squares aft of the bow more or less covered the midships area. We expected to find either the maststep or extensive traces of the rigging. The removal of the overburden again, as in the previous season, uncovered large quantities of unconnected, fore-and-aft oriented timbers. It is hard to determine what they are. Some are clearly planks that were probably part of the deck, but the large number of timbers roughly square in shape is harder to explain. All of them survive in short lengths and so no curvature (camber) and few fastening holes are observable. Their heavily eroded state is no help in identifying them, either. For these reasons, it is not certain whether they are remains of deck beams. Nevertheless, the general shape and quantity of the found timbers suggest that they belonged to the collapsed deck or port side of the ship.

We attempted to excavate a shaft (following the visible frames on the starboard side) to search for the turn of the bilge, the part of the ship at which the bottom becomes the side. This failed when a storm filled the shaft at the end of the season. Nevertheless, we reached a depth of almost two meters without locating the turn of the bilge. This suggests that the surviving depth of the hull is at least two-and-a-half to three meters. This tallies rather well with the common proportions of vessels in the Eastern Mediterranean, namely length equals six units; beam equals two units; and depth in hold equals one unit. While the shaft may have failed to answer the question it was de-

signed to answer, it nevertheless provided us with very important data. It showed us that the normal pattern of framing consisted of overlapping timbers (fig. 3). On average, every second frame is through-bolted from stringer to wale. We observed no treenails or ceiling (interior planking) along the length of the ship. Instead, there were closely spaced stringers of differing widths and thicknesses to add longitudinal support on the inside. The lack of ceiling improved air circulation and helped combat rot. This was a common characteristic of craft built on the shores of the Black Sea until governmental enforcement of building rules derived from Lloyds around the beginning of the twentieth century.

In the stern, we uncovered two symmetrical, sharply rising timbers of massive scantlings, similar to the stringers in the bow. They may be footwaling that once ended in an inner sternpost. In the uncovered length of the two timbers, they are not attached to anything. However, we recorded a round hole on one of them that may have been an opening for an iron bolt. Aft of the two stringers we found a Y-shaped timber. Originally it was identified as a Y-frame, but later was determined to be a knee or crutch that tied the sides to the stern (fig. 4). Unfortunately, it was no longer in situ when found. Down to the depth that we reached, the inner sternpost was not located, but a small badly-eroded piece may have been part of it. The excavation showed that the ship was probably a double-ender, with sharply rising planks in the stern that had preserved



Fig. 4. *This almost complete (and huge!) knee probably supported the sternpost.*

Photo: K. Dimitrov

the shape of the bearding line, although the sternpost itself is no longer there.

Among the easy to identify timbers were four futtocks, no longer attached to the hull. Three of them were found in the stern squares. None of the futtocks survives to its original length. Three of them, however, are well enough preserved to show the presence of hook scarphs. Until now, similar futtock scarphs have only been found on ships from the Iberian Peninsula. It seems from the archaeological record that these scarphs fell out of use there soon after the turn of the seventeenth century. Most recorded futtock hook scarphs are of the dove-tail type while those from Kiten are simple straight scarphs. The closest parallels reported come from the sixteenth-century wreck at Yassiada, Turkey, excavated by INA in the 1980s. The Yassiada wreck has been identified as an Ottoman military transport and, based on a coin of Philip II of Spain found on the wreck, was believed to have been a captured Iberian ship. The futtock scarphs recorded at Kiten, twenty centimeters long by two deep, are fastened with a treenail and a long nail. This, so far, is the only certain treenail fastening observed on this wreck. Neither the treenail nor the nail is of particularly large size but, together with the notch, must have provided sufficient strength. Very likely, the scarph itself had less to do with the search for structural strength than with aligning the timbers of the frame while setting up on the building stocks.

The implications of the presence of hook scarphs on the futtocks of this wreck are rather important. First, the tradition of securing futtocks and floors with this technique may prove to have been much more widespread than hitherto believed. Second, the Yassiada wreck may prove to have been built within the Ottoman Empire itself, as Ce-

mal Pulak now believes, and not be a captured Spanish ship. It was double-ended like the Kiten wreck. Third, the hypothesis that older shipbuilding traditions survived longer in the Black Sea is likely to prove correct. Most other examples of futtock hook scarphs date to no later than the turn of the seventeenth century while the Kiten wreck is unlikely to be earlier than the second half of the eighteenth century. Alternatively, if analysis shows that the ship sank earlier (let us say in the seventeenth century), the present views on the development of metal houseware will have to be revised. The next field season ought to clarify these uncertainties.

Finds

Its shallowness and the two breakwaters that surround it determine the bottom dynamics of the site. The result is a bottom surge, the strength of which depends on the waves and wind, but which is generally sufficient to move around small unattached artifacts. Add to this the long occupation of the bay—from the Early Bronze Age to the present day—and it becomes quite hard to determine which finds belong to what site. The bottom is literally covered by pottery sherds. The vast majority of them date to the Bronze Age, but there is a significant presence of Medieval and Postmedieval pottery, as well. The upper fifty centimeters of the bottom deposits are unreliable for stratigraphic analysis, as the site has been excavated before to this depth and storms regularly stir up the bottom. Below this, the excavator reaches tightly packed mud; any artifacts lodged in it are likely to belong to this ship. To reach these levels, we removed all unattached timbers after mapping them. We redeposited them off-site in a specially excavated trench.



Photo: K. Dimitrov

Fig. 5 (above). Copper plate from the galley.

Fig. 6 (right). A copper pan emerges from the sand during the excavation of the galley.



Photo: K. Dimitrov

Smoking pipes represent the largest group of artifacts found on the site. Due to the conditions, it is probable that not all of them are from this ship. According to our conservator, Dr. Vessela Inkova, at least two, possibly three, of the pipes that almost certainly are from this ship were made in the same mold. They may have been products of the Varna workshop.

The excavation in the stern of the ship yielded a numerous and interesting artifact assemblage that unquestionably belongs to this ship. Dimitar Vassilev, a student from New Bulgarian University, uncovered a large marble pot with four buttresses that may be a mortar. Similar mortars are known from Greece and Turkey. This find marked the beginning of a very exciting week, which went far beyond the crew's wildest expectations. As we entered the untouched levels of the wreck, the flood of sherds of doubtful provenience dried up, and was replaced with interesting, well preserved objects that confirmed the importance of the wreck. Mr. Vassilev and I found a sounding lead, three copper plates (fig. 5), a decorated copper teapot, remains of at least two jugs, a wooden bowl, a large copper pan (fig. 6), and a few ceramic plates with green lead glaze (fig. 7). In addition, two tiles, coming probably from the ship's hearth, were uncovered. The lack of time prevented us from finishing the excavation of the square. It is very likely that more artifacts and the rest of the hearth will be excavated next season. The artifact assemblage in

the stern area suggests that our crew has found the ship's galley. It is too soon to make any definite conclusions based on the finds, but teapots are not at all typical for Bulgaria. In fact, very few are known and all of them are demonstrably imported. The general shape of the teapot suggests the late seventeenth to eighteenth centuries and it may come from Armenia or



Photo: T. Nowak

Fig. 7. One of the plates that were recovered from the galley.

the Levant (fig. 8). The copper plates are made of thin metal sheet, characteristic of late eighteenth-century products.

The exceptional preservation of organic materials in the waters of the Black Sea is attested by the large quantities of rope that have been uncovered. A wooden lock plate that sports carved and gilded decoration presents more evidence. After the hull itself (for me at least!), the most interesting artifacts are the rigging elements that may help reconstruct the rig of the ship. At this stage of research it is not possible to determine how the vessel was rigged. Its general shape, size, and distribution of rigging elements may suggest a two-master. Considering the exceptional preservation of the hull, it is likely that the maststep(s) are still in place. In a coming season, we may determine the number of masts.

In the 1980s, archaeologists recovered at least eleven blocks and parts of blocks. A complete block in working order and a large diameter sheave were excavated in 2000. In 2001, we found parts of six more blocks. The most interesting of these was a large treble-sheaved block found by archaeologist Anita Dotzeva of New Bulgarian University. Its size, location, and type make it possible that it belonged to the jeers (halyard tackle) of a large yard. According to most authorities, treble blocks are usually associated with the lower square sails of large ships. Yet we must note that almost all surviving rigging treatises and modern works discuss large square-riggers of the Western tradition. For this reason, we should use them very cautiously as comparative material. The truth of the matter is that there is no information published (or probably even surviving) on the rigging details of Black Sea vessels. Only nautical archaeology can provide the necessary and sadly missing information on this important subject.

Conclusions

After two seasons of excavation, I can make some preliminary conclusions. Based on the partial study of the ship carried out in the 1980s, Dr. Porozhanov suggested that the ship must have been about twenty-two meters length on deck and that some of the timbers are possibly part of a deck or platform. He predicted that the vessel may prove to be extensively preserved and of the greatest importance. Not all agreed with him at the time, especially on the preservation and deck issues. Our more detailed recording has proved him right and the doubters wrong. We have recorded twenty meters extant length of the wreck. Likely, the original length on deck was indeed about



Photo: K. Dimitrov

Fig. 8. Excavation of the teapot.

twenty-two meters, a large vessel for the Black Sea. As we have not uncovered the port side yet, we can only estimate the beam, but it probably was approximately six to seven meters with a depth in hold of around three meters.

The heavy scantlings mean that the ship was intended for rough conditions, which may support a Black Sea origin. The distribution of rigging elements points to a two-masted vessel, but this remains to be proven. The use of large scantling Y-shaped timbers and the dimensions of the timbers found on the ship imply that the shipwright did not suffer from material shortages. The general use of iron for fastenings means that iron was both easily available and cheap. The presence of foothook scarphs on this ship would point to a general Mediterranean tradition of shipbuilding. If the vessel indeed sailed in the second half of the eighteenth century or even later, the hypothesis that older shipbuilding techniques survived longer in the region will be proven. All other reported wrecks with hook scarphs on the futtocks date to no later than the first years of the seventeenth century.

Of interest is to note that in this region the typical location for the galley is in the stern of the ship, as in the seventh-century Yassiada wreck. The sounding lead and the high-quality teapot, plates, and pottery suggest that the skipper shared the stern with the galley and probably was a fairly wealthy man, perhaps a part-owner of the vessel. On the West Coast of the Black Sea, ships were typically owned by small consortiums of people, each of whose members owned a stated number of shares, the total number of which depended on the size of the vessel. Usually one of the part-owners was also captain and super-cargo

of the vessel. As a rule, the captain was chosen from among the people with the largest number of shares (in addition to the obvious need to be an experienced mariner). The ship that sank in Kiten Bay is large for the Black Sea region of the Ottoman Empire. This, and the fine houseware found in the stern, imply that the owners were successful and wealthy merchants. The further excavation of the wreck will undoubtedly tell us more about the owners, the type of trade they engaged in, and about life aboard ship in the Ottoman Empire during the Age of Sail.

The different origins of the artifacts—possibly from Armenia, or the Levant and Greece—mean that the ship participated in a broad trade network that connected the Mediterranean and Black Seas. The wreck in Kiten Bay is

of exceptional interest and may enrich our knowledge of the Eastern Mediterranean trade network and older shipbuilding traditions. No shipbuilding treatises exist for the vessels in this long-neglected region. Practically no other documentation and very little iconography exist that can tell us anything about the ships and their rigs in the Black Sea during the Ottoman period. Our only hope of filling this blank page of our seafaring knowledge is nautical archaeology. Never before has a ship in the waters of the Black Sea been excavated and recorded. The shipwreck that INA and CUA are excavating in Kiten Bay is thus a benchmark excavation that will provide a basis for understanding Eastern Mediterranean and Black Sea ship construction and rigging during the Ottoman period.

Acknowledgements: I would like to thank the excellent team that worked in Kiten this year. Troy Nowak is to be credited with registering artifacts, in spite of being mostly interested in hulls. Mark Polzer, as usual, provided steady support. All the Bulgarian students were excellent. I would like to especially recognize the great contribution of Anita Dotzeva, to whom is owed most of the measuring (and all the sketches) of midships and the treble block, my personal delight. Dimitar Vassilev made the first interesting find with certain provenience. Stanislav Bonev was willing to assist wherever the Project Director's whimsical fancy sent him. Ivelina Petkova struggled through recording a mass of small timber pieces that had no meaning for her and meant only marginally more to the Director.

As ever, the CUA staff, Captain Petar Petrov and Kalin Dimitrov, were indispensable. Mr. Roumen Zhelezarov, a NAUI instructor, was a dream Dive Master. For their infinite patience and great good humor, I shall be eternally indebted to my colleagues and mentors Dr. Angelova and Dr. Porozhanov. They are no longer merely my co-workers, but have become close friends.

This project would never have materialized without Dr. Kevin Crisman's encouragement, advice, sponsorship, support, and friendship. My personal debt to him is beyond measure. I would like to recognize our generous sponsors, Harry Kahn and INA. Thanks to their generous contribution, we have crossed another frontier of nautical archaeology.

I also owe much to the Bulgarian government for making it a hassle-free pleasure to work in their country, and to the Archaeological Institute at the Bulgarian Academy of Sciences for their trust in us. Finally, I would like to recognize the contribution of the Institute of Thracology to the development of nautical archaeology in Bulgaria and for its support of our project at Kiten. Its Director, Dr. Kiril Jordanov, could not have been kinder. ✍

Suggested Readings

Batchvarov, Kroum,

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In addition, for the inundated Stone and Early Bronze Age settlements of the Black Sea excavated by Dr. Porozhanov and Dr. Angelova see the entire run of Proceedings of the international symposium *Thracia Pontica*.

Landsat Bathymetric Analysis of Six-Fathom Shoal, Lake Superior: The Wreck of *Edmund Fitzgerald*

John S. Janks

Most people have heard of the wreck of the ore carrier *Edmund Fitzgerald*, if only from the Gordon Lightfoot song on the subject. From *Fitzgerald's* launching in 1958 until 1971, it was the largest vessel on the Great Lakes at 13,632 tons and 729 feet long. During its seventeen-year career, the ship carried literally millions of tons of iron ore from the western end of Lake Superior through the Soo Locks to destinations on the other Great Lakes. At 2:20 PM on November 9, 1975, *Fitzgerald* left Superior, Wisconsin with 26,116 tons of taconite pellets bound for Detroit. The ship set sail only minutes before the National Weather Service began issuing warnings of a major early-winter gale. This eventually developed into one of the worst storms of the twentieth century, with hurricane-force winds and waves forty to fifty feet high.

Fitzgerald was traveling about eight to fifteen miles ahead of another large carrier, *Arthur M. Anderson*. The two ships changed course about 2:00 AM to a northerly route intended to use the Canadian shore as a wavebreak (fig. 1). About 2:45 PM, the wind direction shifted to the northwest, exposing *Fitzgerald* and *Anderson* to much greater wind fetch and wave heights. The radio beacon at Whitefish Point and *Fitzgerald's* two radars were knocked out by the storm, hindering navigation. At 3:15 the captain and mate of *Anderson* observed *Fitzgerald* passing uncomfortably close to Caribou Island and the associated Six-Fathom Shoal. The ship was deep in the water (its wintertime load line had been moved 3.3 feet higher since it was built) and waves were breaking over the decks, adding additional burden. Although *Fitzgerald* may also

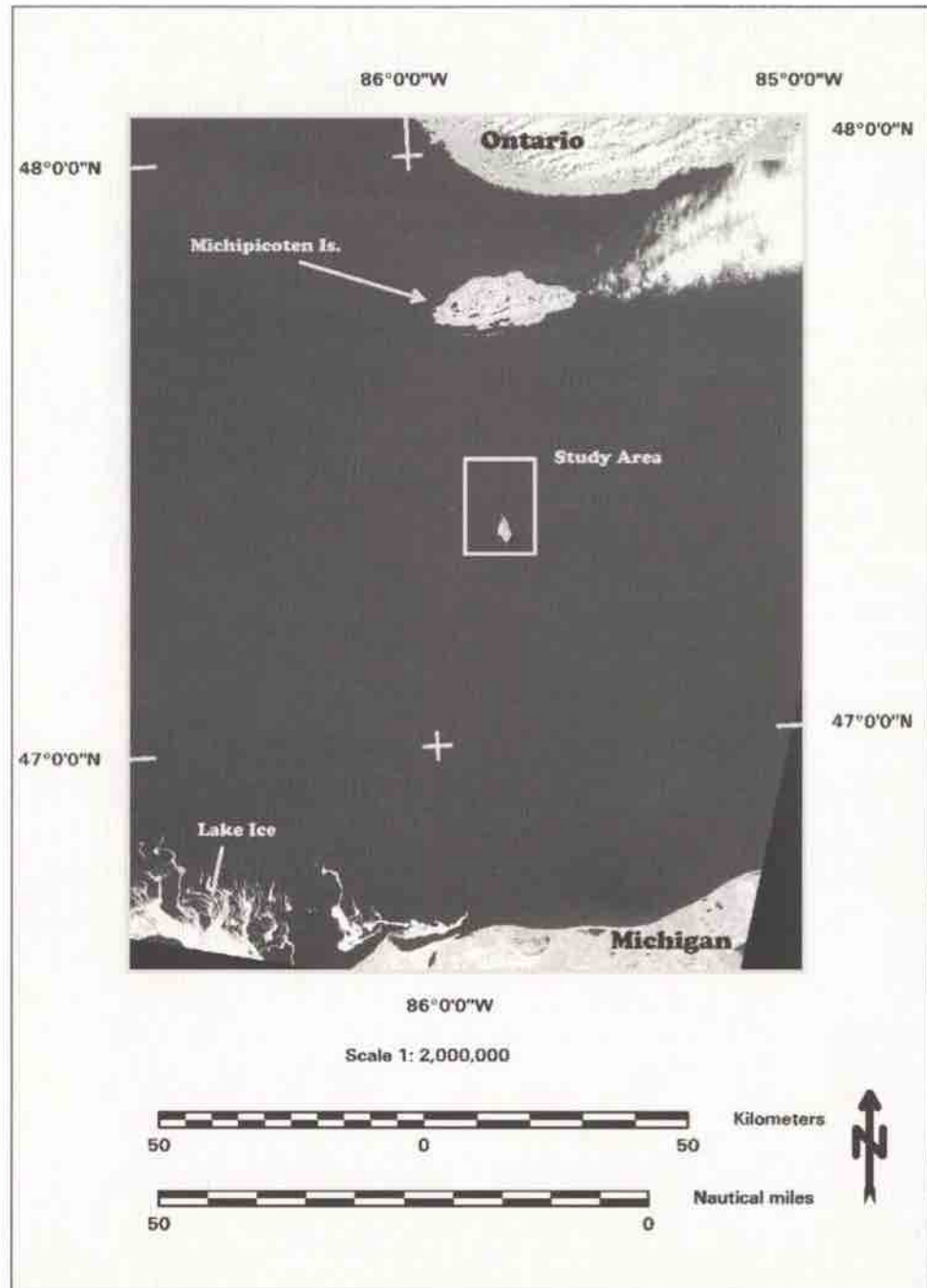


Fig. 1. A portion of eastern Lake Superior from the Landsat TM scene of April 29, 1984. The study area is near Caribou Island. Lake ice can be seen in the southwest corner of the image. The "Northern Route" shipping lane passes between Michipicoten and Caribou Islands.

have been taking on water through damaged hatches that had been noticed on October 31, further increasing its draft, the captain and crew, as well as most others, did not consider that dangerous. At 3:30, fifteen minutes after they crossed the Shoal, Captain McSorley first reported that *Fitzgerald* had suffered topside damage and was listing, but at 7:10 he stated, "We are holding our own." Nevertheless, the ship and all twenty-nine men aboard disappeared from *Anderson's* radar forever around 7:25.

The sinking has been the subject of controversy ever since. The U.S. Coast Guard concluded in 1977 that insufficient hatch closure, which allowed water to flood the ship, created the disaster. The National Transportation Safety Board arrived at the same conclusion in 1978. However, Board member Philip Hogue strongly disagreed, stating his belief that *Fitzgerald* struck bottom on Six-Fathom Shoal. The Army Corps of Engineers said that there was no direct evidence of hitting bottom on either some underwater pinnacles or *Fitzgerald* itself. The Great Lakes Carriers Association in a sharply worded dissent expressed their belief that the cause was most certainly shoaling. Many others, including the captain of *Arthur M. Anderson*, also believe that shoaling was the likely cause. The families of the crewmen dispute any claim that complacency on the part of the crew was involved. At stake in this debate is the solution to one of the worst maritime disasters on the Great Lakes in recent history.

Since the time of the sinking, little new evidence has been added to the discussion. Perhaps satellite remote sensing technology can be used to generate accurate and detailed bottom topography maps of Six-Fathom Shoal by correlating water depth and the satellite sensor response. Such maps could then be used to create high-probability areas where the ship may have grounded, and a sampling program begun.

Bathymetry and Shipwreck Investigations Using Satellite Imagery

Since the advent of the digital satellite sensor, much has been discovered about the interaction of visible light and bodies of water. The first digital sensor, the US Landsat Multispectral Scanner (MSS), launched in 1972, had a ground resolution of only seventy-nine meters. However, the Landsat Thematic Mapper (TM), launched in 1982, collects three visible and four infrared bands with a ground resolution of thirty meters, from an altitude of 704 kilometers. Visible blue light (Landsat TM Band 1) can penetrate as much as one hundred meters of water, depending upon clarity, sediment load, and bottom conditions. Lake Superior is known for its clear water.

There have been many remote sensing analyses of shorelines, estuaries, and shallow marine environments, but application of the technique to marine archeology is much less prominent. Some efforts were made to deduce formulae predicting hydrographic information using the spectral response of the satellite sensor but these attempts were useful only for local areas.

This study will use the Band 1 DNs to generate a bottom topography map of Six-Fathom Shoal. The goal is to identify areas where the ship may have grounded. As is well known in forensics, no two bodies can come in contact with each other without leaving a trace of the one on the other. If *Fitzgerald* had struck Six-Fathom Shoal there would be telltale evidence of the ship and her cargo (metal, paint, taconite ore) at the point of contact. Six-Fathom Shoal covers about eight to ten square nautical miles and sampling all of it would be prohibitive.

Satellite Evaluation of Six-Fathom Shoal

A Landsat TM scene acquired April 29, 1984, was chosen to determine if a correlation could be made between the water depth and the strength of the visible blue DN. This data set was the earliest ice-free scene available after the sinking of *Fitzgerald*. In the northeast corner there is a

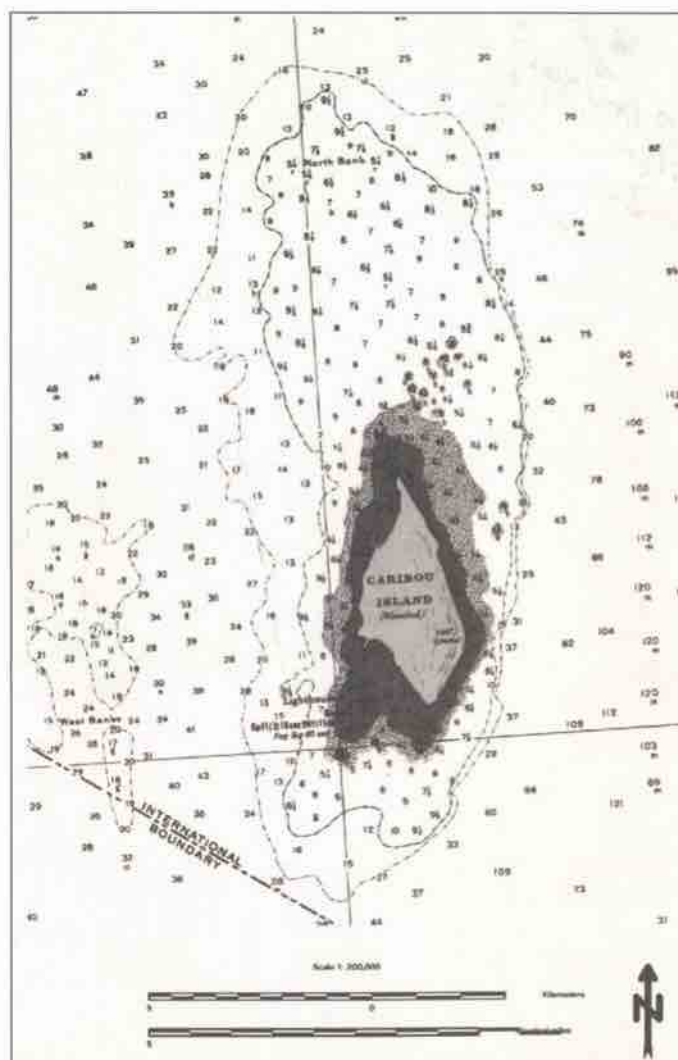


Fig. 2. Caribou Island and Six-Fathom Shoal on Canadian Department of Fisheries and Oceans Chart 2310. Depths are measured in fathoms (one fathom is 1.829 meters [six feet]).

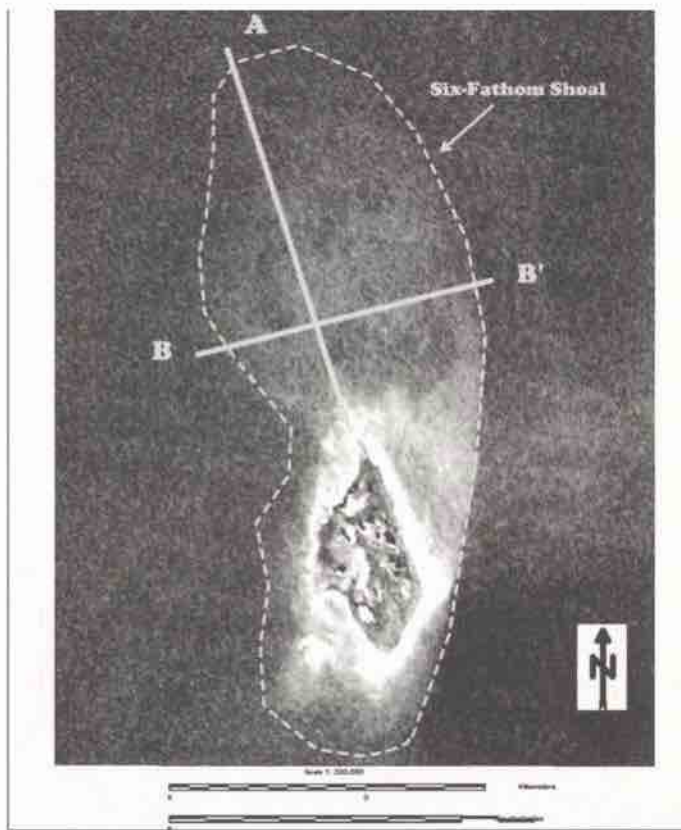
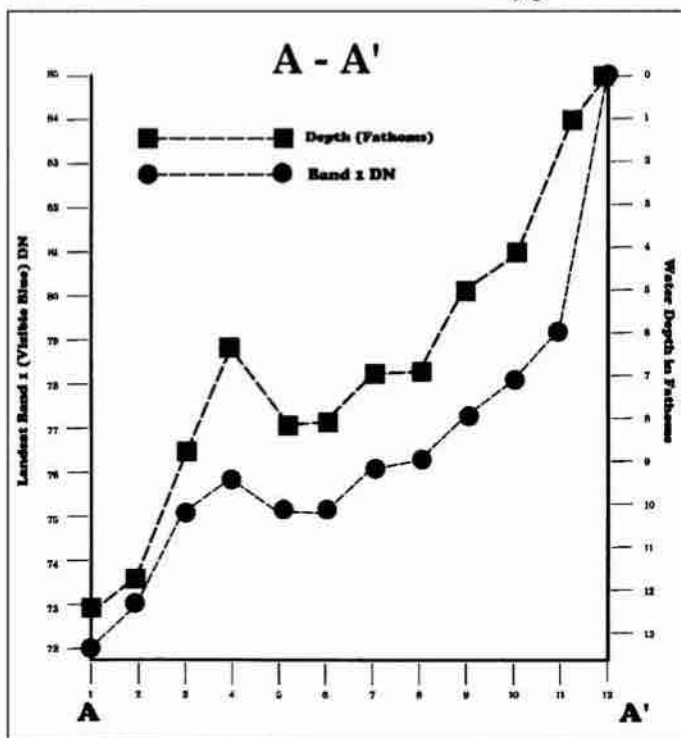


Fig. 3. Caribou Island and Six-Fathom Shoal as seen using the Landsat image of April 29, 1984, visible blue light (Band 1). The lines A-A' and B-B' are cross-sections shown in figs. 4 and 5.



cloudbank over portions of Ontario, and to the southwest there is some remaining lake ice near the Michigan shoreline (fig. 1). The larger Michipicoten Island lies almost directly north of the smaller Caribou Island. The "Northern Route," taken by Fitzgerald and Anderson on November 10, 1975, passes between these two islands. Six-Fathom Shoal is an underwater extension of Caribou Island.

To perform the analysis, accurate depths were obtained from the Canadian Department of Fisheries and Oceans Chart 2310 (fig. 2). This information was digitized and the TM image georeferenced to it. In that way the data in the study were set to the same projection and datum, WGS 1984. While Chart 2310 provides accurate depths, it does not provide the interpreter a visual perspective of the bottom topography, nor does it provide bottom topography other than where immediately sampled. Figure 3 is the visible blue light (Band 1) TM data of Caribou Island and Six-Fathom Shoal. The shoal appears nearly white (in the shallowest areas) to dark gray (in the deeper areas). The shoal extends four to five nautical miles northward before the water is sufficiently deep to absorb all reflectance. The outline of the shoal from the Landsat sensor correlates closely with its location on the hydrographic chart. Also shown on figure 3 are two cross-section lines: A-A' and B-B', indicating the sampling points where water depth and DN values were compared.

There is a direct correlation between water depth and Band 1 DN values along the north-south transect A-A' (fig. 4) and the east-west transect B-B'. Even the North Bank,

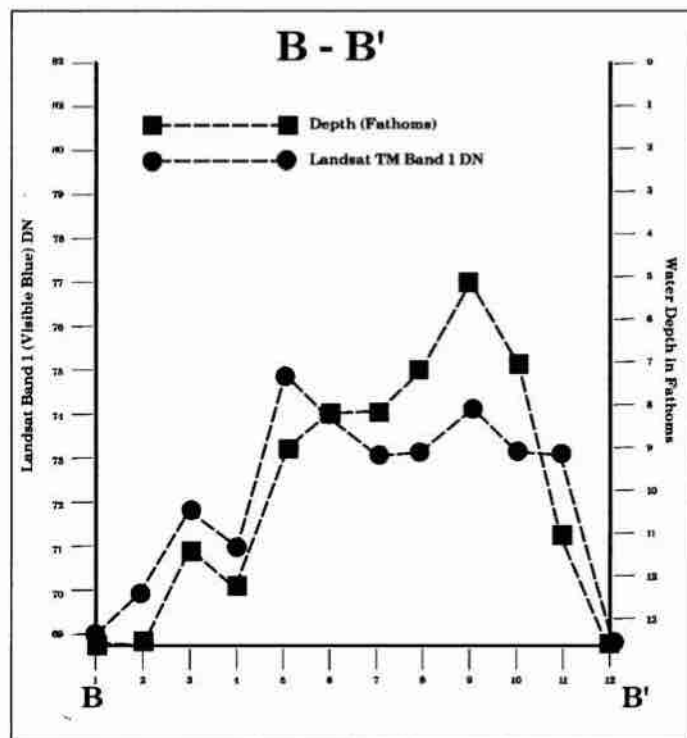


Fig. 4. Cross-sections of the study area (see fig. 3) showing the close correlation between water depth in fathoms and the DN values. Cross-section A-A' runs north to south across Six-Fathom Shoal, while B-B' runs west to east.

located along the northern edge of the shoal, can be detected using the DN values. The shoal bottom topography is uneven, and marked by irregular areas of deeper water often flanked by abruptly shallower ones. An interpretative map of the relative depths to bottom is seen in figure 5; deeper areas are shown in black while shallower areas are shown in white or gray. It is noteworthy that the deeper areas of the shoal are expansive, but abrupt shallower ones often flank them. In any sampling program, most of the deeper areas could be ignored on the first pass. Shallower areas determined from the sensor data correspond well with measured depth soundings. However, there are a number of locations identified from the Landsat data that do not appear on Chart 2310.



Fig. 5. Interpretative map showing relatively deeper (black) and shallower (gray) bottom topography on Six-Fathom Shoal. The shallower areas are potential sites for sampling for evidence of the possible grounding of Edmund Fitzgerald.

Additionally, the bottom topography contains a number of linear features that generally trend northwest to southeast (fig. 6). They are identified by a rather sharp contrast in DN values, indicating an abrupt change from deep to shallow water. What these features represent is not known, but they could be faults, changes in rock type, former shorelines, etc. There is a faint one at the northern edge of the shoal trending approximately 140° , the azimuth of the "Northern Route" shipping lane, which is the route taken by Fitzgerald the night it sank.

Archeology and Forensic Analysis

No one knows the exact route of Edmund Fitzgerald the night of November 10, since the crews on both Fitzger-

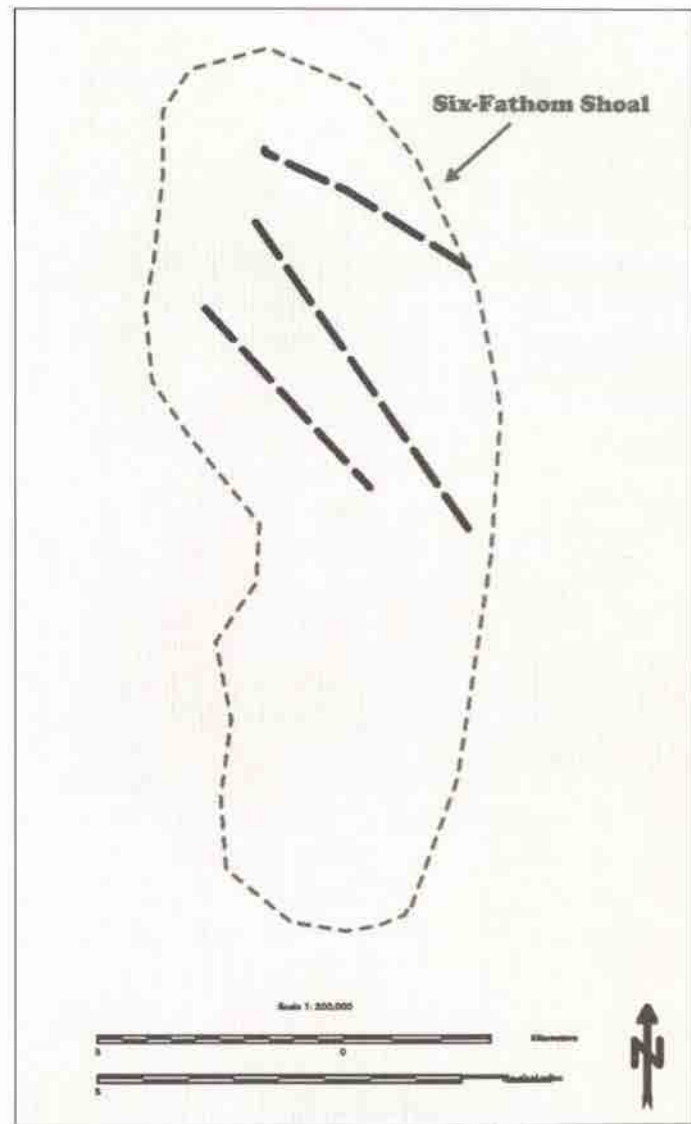


Fig. 6. Interpretative map showing a series of linear features of unknown origin that run NW-SE. The northernmost one trends approximately 140° . These linear features should be identified by field sampling and measurements.

ald and Arthur M. Anderson were preoccupied with the storm. As *Fitzgerald's* radars and the radio beacon at Whitefish Point were knocked out by the storm, there is no accurate idea where (and if) *Fitzgerald* crossed the shoaling area. *Anderson's* captain and First Mate said only that *Fitzgerald* was "in too close [to Six-Fathom Shoal]."

The ship itself lies in 535 feet of water northwest of Whitefish Point, broken in two, with one section upside down, and the other buried in mud. There is little possibility of finding remnants of the shoal on the ship. However, there is the distinct possibility that material from the ship would be left on the shoal where it struck. Satellite data alone cannot determine if and where the ship struck bottom; field sampling will be required to verify the identification of likely strike zones. The Landsat TM data can also be used as a baseline to compare newer IKONOS (4-meter) and Quick Bird (2.5-meter) sensor measurements. Once established interpretations have been developed, older Landsat MSS, space

shuttle, and Corona spy satellite photographic data can be used as well to refine the interpretations.

Conclusions

This preliminary study using the Landsat TM image acquired April 29, 1984, indicates that satellite sensor data can be a useful tool to generate bottom profiles and potential sampling locations. There is a direct correlation between water depth and Band 1 (visible blue light) response on Six-Fathom Shoal, Lake Superior. In some cases, shallower areas were detected using the satellite data that were not seen on the bathymetric charts. Interpretative maps showing shallow areas as well as linear underwater features were generated. This suggests that the use of finer-grained data from newer, more sophisticated satellites could help solve the mystery of the *Edmund Fitzgerald* and have other fruitful applications in nautical archaeology. ☞

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John S. Janks is a remote sensing scientist living in Houston, Texas. He received a BA from Monmouth College and an MS from the University of Illinois at Chicago, both in Geology. He has 13 years experience working with remote sensing in environmental, legal, and exploration matters. Mr. Janks can be contacted at jsjanks@msn.com.

Ionian Sea Study 2001

Brett A. Phaneuf, Paolo Ciavola,

George Papatheodorou, and George Ferentinos

The United States Navy generously provided the nuclear research submarine *NR1* and its surface support ship, the *SSV Carolyn Chouest*, for a brief geological survey of the north-central Ionian Sea floor in July 2001. The Laboratory of Marine Geology and Physical Oceanography at the University of Patras (Greece), the University of Ferrara (Italy), and the Department of Oceanography at Texas A&M University collaborated in this study.

The survey covered approximately thirty square kilometers in three days, continuously collecting high-resolution side-scan sonar data, CTD data, and digital imagery from down-looking, hull-mounted digital video cameras running parallel transects in an east-west direction. Depths ranged from approximately 650 to 750 meters. The search area was directly between the Italian and Greek peninsulas and was clearly a high-traffic region for ancient

commercial shipping (fig. 1). Virgil described this fabled path in *The Aeneid*.

Immediately discovered was an enormous and previously unknown community of deep-sea coral (*lophelia Petrusa*). The lophelia had formed numerous small and large bioherms, some more than twenty meters in height and several hundred meters long and wide. Since living coral was restricted to the tops of the bioherms, it believed that coral growth was periodically interrupted when the bioherms were covered with sediment flowing into the region due to an upslope mass-wasting event (essentially an underwater landslide).

An ancient shipwreck approximately thirty meters in length was also located during the course of the survey. The visible components included a partially exposed section of the hull, various concretions, and an anchor. Re-

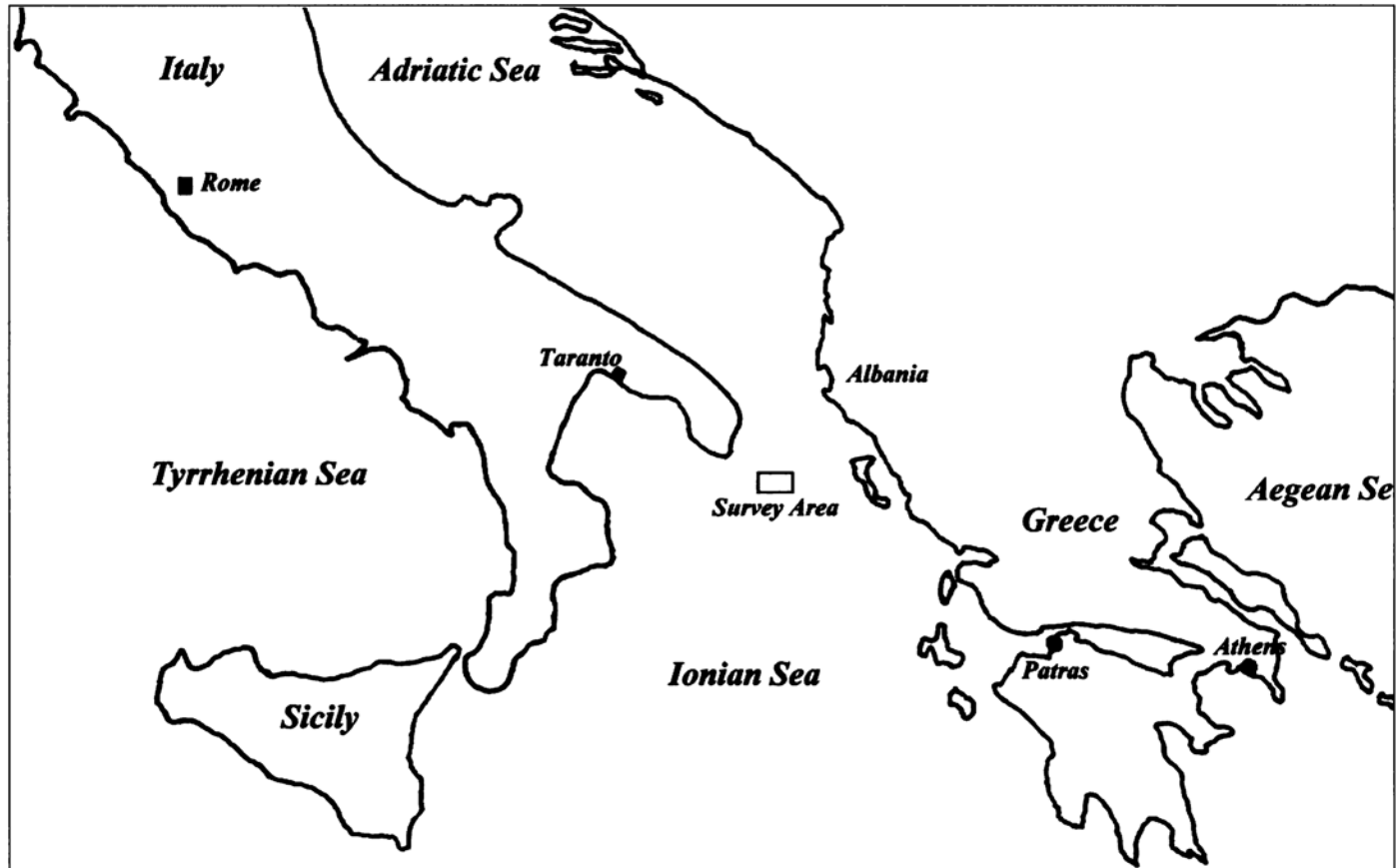


Fig. 1. Map of the Ionian Sea indicating the approximate survey area.

peated imaging with low frequency 150kHz side-scan sonar revealed the presence of a substantial portion of the ship preserved beneath the soft sediment of the ocean floor (fig. 2). Higher frequency imaging (600kHz) revealed only those objects that were exposed on the surface of the seafloor, such as the anchor (fig. 3).

Analysis of the shipwreck images, particularly the anchor, date the site to no later than the fourth century CE, so it is probably Roman. A considerable portion of the hull is buried in the soft sediment and quite possibly well preserved. This argues for a return to investigate the wreck more fully in the near future. ⚓

Fig. 2. This scan sonar image was collected at a frequency of 150kHz and allowed scientists to detect objects buried just below the surface of the soft seafloor sediment on the site. A considerable portion of the shipwreck is buried.

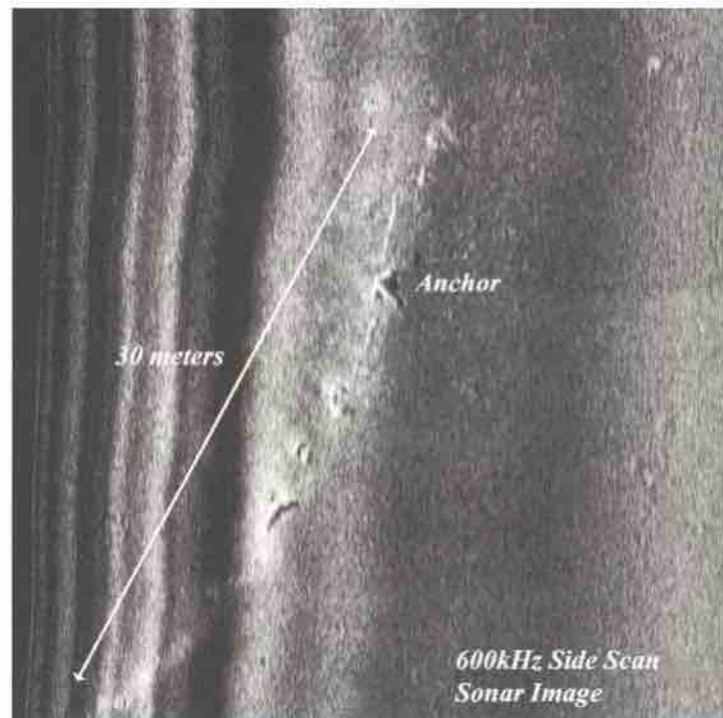
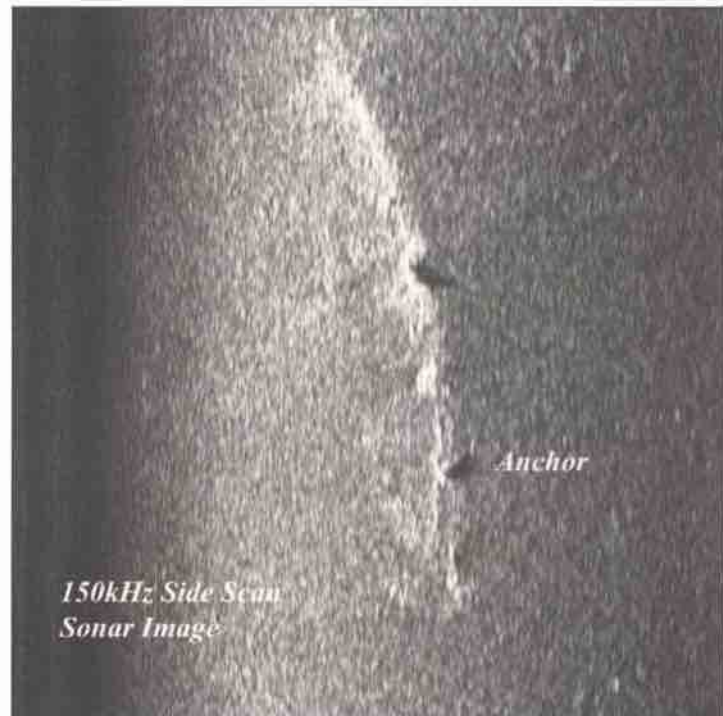


Fig. 3 (above and right). Iron anchor resting on the seafloor atop the remains of the hull of an ancient shipwreck. This sonar image collected at a frequency of 600kHz clearly defines the extent of the site visible on the seafloor surface, including an iron anchor and remains of the ships hull and numerous artifacts.



Brett A. Phaneuf is with the Department of Oceanography, Texas A&M University, Paolo Ciavola with the Department of Geology and Paleontology, University of Ferrara, and George Papatheodorou and George Ferentinos are with the Laboratory of Marine Geology and Physical Oceanography, Department of Geology, University of Patras. All would like to thank their respective institutions and the United States Navy for making this study possible.

Eighth Tropis Conference in Hydra, Greece

Athena Trakadas

The mountainous Aegean island of Hydra, off the east coast of the Peloponnese of Greece, hosted the Eighth International Symposium on Ship Construction in Antiquity from August 26 to 30, 2002. Also called *Tropis* (the ancient Greek word for "keel"), the conference brings together in Greece every three years an international group of scholars in the field of nautical archaeology. Focusing upon the Mediterranean, discussion topics range chronologically from the Bronze Age to the post-medieval period and typologically from aspects of ship construction to maritime iconography. Among the group of scholars that presented papers this year on their research were several current and former students, graduates, and faculty of the Nautical Archaeology Program (NAP) at Texas A&M University.

NAP professor emeritus, and one of the founders of INA, Dr. George Bass and former NAP student and Pabuç Burnu excavation Assistant Director Elizabeth Greene presented *in absentia*, "Discovery and Excavation: The 2001 Submersible Survey and the 2002 Excavation at Pabuç Burnu, Turkey" (read by Deborah Carlson). The paper presented briefly the results of the 2001 survey off the Turkish Aegean coast using the INA two-person submersible *Carolyn*. The benefits of this new survey tool were readily apparent by the fourteen ancient wrecks and ten possible wreck sites discovered over the course of one month. In addition, twelve known ancient wrecks sites were also further documented using *Carolyn*. One of the sites discovered in the 2001 submersible survey was Pabuç Burnu, a sixth-century BCE assemblage located near Bodrum. Excavation began on this site in June 2002, and continued into September. At the time of the conference, sherds of fineware pottery, several oinochoai, two large bowls, and a stone anchor 1.8 meters long had been discovered.

Deborah Carlson, a former NAP student and Assistant Director of the Tektaş Burnu excavation (1999-2001; see *INA Quarterly* 26.4: 3-8; 28.2: 3-8), presented the paper, "Reconstructing the *Fabri Navales*." Carlson examined archaeological and epigraphic evidence in order to provide a clearer picture of the social and economic history of *fabri navales*, the shipwrights of the ancient world. In her paper, Carlson offered the size and location of a temple of a *fabri navales* guild excavated at Ostia and several inscriptions made by members of *fabri navales* guilds as evidence that shipbuilders contributed more to ancient technology than just ship construction. By also examining the construction methods of certain harbor caissons, Carlson suggested that *fabri navales* might have participated in a wide range of projects, such as harbor construction.

Matthew Harpster, a NAP Ph.D. student, presented a paper on his dissertation subject, "Interim Report on the ninth-century AD Hull Remains found near Bozburun, Turkey." The Bozburun shipwreck excavation (1995-1998; see *INA Quarterly* 25.4: 3-13) led to the recovery of approximately thirty-five percent of the hull of a Byzantine merchant vessel. Working for the past several summers at the research facilities of INA in Bodrum, Turkey, Harpster has now recorded almost ninety percent of the hull material and presented his preliminary findings in this paper. His documentation has revealed that the framing pattern of this vessel resembles that found in the eleventh-century Serçe Limani vessel. Certain fastening patterns on the Bozburun timbers also indicate that portions of the ship were repaired, replaced, or re-assembled during the vessel's lifetime. Additionally, although Harpster has found no mortise-and-tenon joinery in the edges of the external planking, he has detected an unexpected method of edge joinery that incorporates dowels.

Asaf Oran, a NAP graduate and now conservator at the INA laboratory in Bodrum, Turkey, presented the topic of his M.A. thesis, "The Athlit Ram: Classical and Hellenistic Bronze Casting Technology." This paper re-examined of the bronze warship ram found off Athlit, Israel, which is one of the largest preserved from the ancient Mediterranean world. Originally, this piece was thought to have been made as a single unit using the sand-casting technique, a method not documented prior to the late medieval period. During his research, Oran utilized current analytical techniques to re-examine the ram and also compare it to other contemporary surviving bronzes. Archaeological remains of foundries were also examined by Oran, who concluded that the Athlit ram was cast using the lost-wax technique, and possibly the bow timbers of the ship were temporarily used as a core for the model.

Edward Rogers, a NAP graduate and author of a forthcoming SINA-series book on Egyptian boat construction depicted in tomb reliefs, presented, "An Analysis of Toolkits Recovered from Shipwrecks." This was a comparative survey of the forms and functions of various shipboard toolkit finds from the fourteenth century BCE to the eleventh century CE. Such finds include adzes, axes, drills, saws, chisels, mallets, needles, fids, wood and metal fasteners, caulking, pitch, rolled lead sheathing, and wood to fabricate new hull elements. From this wide variety of artifacts, Rogers revealed that the composition of toolkits from ships varied over the centuries and these collections can certainly indicate the change in shipboard

technology or shipbuilding techniques throughout antiquity.

Athena Trakadas, a NAP graduate, presented, "At the Pillars: The Survey of Tangier Bay, Morocco," on the INA survey of northern Moroccan waters that took place in 1999 (see *INA Quarterly* 28.3: 3-15). Under the direction of Brett Phaneuf, Tangier Bay and some areas of coastline in the Straits of Gibraltar were surveyed using remote sensing (sonar and magnetometer) and visual diving methods. Some of the finds included a wreck tentatively identified as HMS *Courageux*, a British ship-of-the-line that wrecked in 1796. Other artifact assemblages recovered include a possible first-century BCE shipwreck in the Straits of Gibraltar as well as an ancient anchorage on the north Atlantic coast of Morocco.

Dr. Shelley Wachsmann, a NAP professor, presented a paper on his recent field survey, "Phoenicians in Portugal." In the summer of 2002, Wachsmann and a small research team consisting of archaeologist, seismologists, and geologists, surveyed several sites in southern Portugal that have been identified as Phoenician settlements. Located along rivers, the presence of these sites reveal that

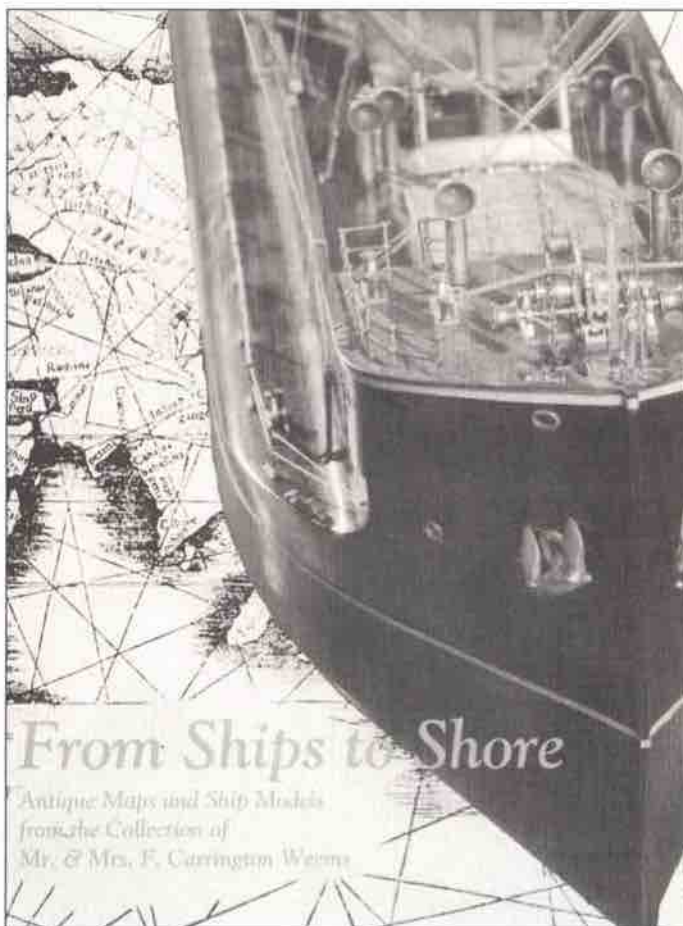
Phoenician expansion outside the Mediterranean extended beyond Spanish Iberia, raising the possibility of finding Phoenician ships outside the Straits of Gibraltar. Using various remote-sensing survey methods, the team searched lagoons, rice paddies, and alluvial fill in order to try to locate ancient, buried shipwrecks, shorelines, and possible harbor facilities associated with the terrestrial Phoenician sites.

The Hellenic Institute for the Preservation of Nautical Tradition, which organizes the *Tropis* conference, this year honored the recent passing of two major contributors to the field of nautical archaeology, John Morrison and Michael Katzev. John Morrison was instrumental in the scholarship of ancient Greek galleys. Michael Katzev, who passed away in September of 2001, is remembered elsewhere in this issue. At the plenary session, Susan Womer Katzev spoke about her husband, citing his particular fondness and enthusiasm for scholarly discussions such as those that take place at this conference gathering. NAP students and faculty have been part of *Tropis* since its inception, and their tradition of insightful research will no doubt continue to be part of the scholarly discussions of future conferences. ☞

Model Ship Exhibition

The J. Wayne Stark Galleries in the Memorial Student Center at Texas A&M University recently hosted "From Ships to Shore: Antique Maps and Ship Models from the Collection of Mr. and Mrs. F. Carrington Weems." Mr. Weems is a Houston real estate developer whose lifelong interest in the sea has led him to assemble a truly amazing collection of ship and boat models, maps depicting the development of the Americas, and marine art. The exhibit also included models from the Ship Model Shop in the Nautical Archaeology Program at A&M, including the model of the seventeenth-century *La Belle* built in 2002 by Glenn Grieco. Portions of the exhibition and the accompanying booklet were devoted to "Ships of Discovery and Colonization," "Merchant Ships of the Early Modern Era," "Warships," "Fishing Vessels," "Recreational Vessels," "Passenger Ships," and a general discussion of "Ship Models." Among the large modern models were the battleship USS *Texas* and the record-breaking Cunard liner *Mauritania*.

Kevin Crisman, Mr. Grieco, Cory Arcak, and Ayfie Atauz assisted the Stark Galleries with the development of the exhibition. Several of Dr. Crisman's students assisted with the text of the colorful eight-page exhibition booklet. In association with the exhibit, Dr. Robert Neyland delivered a lecture on the discovery, recovery, and excavation of the Confederate submarine *H.L. Hunley* (*INA Quarterly* 29.1, 14-24). ☞



Just Released

The Gondola Philadelphia and the Battle of Lake Champlain by John R. Bratten

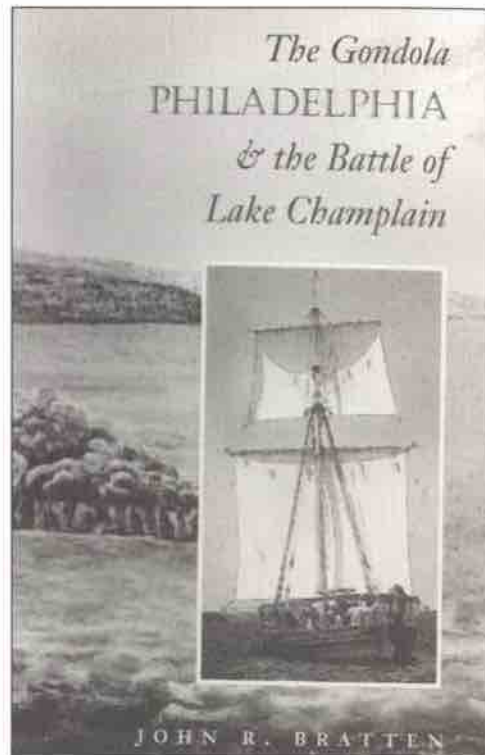
College Station: Texas A&M University Press, 2002
ISBN 1-58544-147-3, 256 pp, 90 b&w photos, 16 line drawings, 6 tables,
3 maps, bibliography, index. Cloth. Price: \$34.95

Lake Champlain, between New York and Vermont, has had an influence on North American history far beyond its size. The lake was on the most practical route between Canada and the Mid-Atlantic coast before the building of canals, railroads, and highways. Only a few miles north of the Hudson River, Lakes George and Champlain are drained by the Richelieu and St. Lawrence Rivers. Just twelve miles of the Richelieu is non-navigable, with an excellent portage road around these rapids. The Champlain Valley is therefore a natural route for commerce or invasion. Forts commanding the lake at Crown Point and Ticonderoga played important roles in the French and Indian Wars, the American Revolution, and the War of 1812. The peace treaty that ended the last-named conflict was motivated in large part by the American naval victory at Plattsburgh Bay on Lake Champlain. However, there might well not have been a United States to save at Plattsburgh had it not been for an earlier battle on the lake.

John R. Bratten, who earned his doctorate in the Nautical Archaeology Program (NAP) at Texas A&M University, has written a fascinating book about the almost-forgotten Battle of Valcour Island. The combatants were among the first naval vessels of the United States. One casualty of the battle—the gondola (gunboat) *Philadelphia*, raised in 1935 and currently at the National Museum of American History in Washington—is the oldest intact warship on display in North America. A replica, *Philadelphia II*, was built by INA Adjunct Professor Art Cohn and his co-workers at the Lake Champlain Maritime Museum. It can presently be seen at the museum in Basin Harbor, Vermont. Dr. Bratten combines an account of the battle with a description of the historic craft.

Philadelphia was built during a Revolutionary War arms race on Lake Champlain. The American rebels had taken the initiative soon after the outbreak of hostilities at Lexington and Concord in April 1775. Forces under Benedict Arnold and Ethan Allen had captured Ticonderoga and Crown Point and advanced across the modern Canadian border by May 18 (cannon from Fort Ticonderoga enabled George Washington to recapture Boston the following year). By November, the Americans had captured Montreal and blockaded Quebec. The siege lasted until early May 1776, when the arrival of a British army by sea forced the Americans to retreat. While the Continental Congress debated independence in late June, only a “fleet” of four small ships on Lake Champlain was holding the British lion at bay. Both sides undertook a crash building program for naval mastery of the lake. *Philadelphia* and its seven sisters were each built in two weeks or less from fresh-cut green timber. They were not painted or finished out because they were not expected to serve past the current crisis. The gondolas (commonly spelled “gundalows,” and pronounced “gun-lows”) had flat bottoms with no keel. Tests with *Philadelphia II* show that the gondolas could only sail downwind. They were therefore dependent on oars and poles much of the time. The gondola was primarily a gun platform. *Philadelphia* carried three cannon—one firing directly over the bow and two on trainable carriages amidships. All the guns were old (seventeenth century) and of Swedish manufacture.

The British won the 1776 arms race because they could bring prefabricated parts and even complete hulls around the rapids from Canada. The fleet that moved up the lake in November included three sail warships, three large gunboats, as many as twenty-four small gunboats, and many additional boats and canoes carrying troops. The American fleet included just four much smaller warships, three row galleys, and the eight gondolas. Benedict Arnold had the wisdom to defend an anchored position with his less-maneuverable vessels. The Battle of Valcour Island was a tactical victory for the British, but Arnold accomplished his strategic aim of disrupting any invasion of the United States during 1776. The delay allowed raising and training the troops who won the Battle of Saratoga in October 1777, which inspired the French intervention that helped win the war.



Bratten follows his account of the Battle of Valcour Island, including the sinking of *Philadelphia*, with a description of the 1935 discovery and recovery of the well-preserved gondola. The wreck looked for a permanent home for twenty-five years before the Smithsonian Institution accepted it. Unfortunately, proper conservation did not occur until then, and methods available forty years ago were less than ideal. The vessel has deteriorated somewhat. Fortunately, the Smithsonian recorded the gondola in 1961 and NAP student William A. Bayreuther III studied it in the 1980s. Bratten reports those findings. He also provides a catalog and description of the 767 *Philadelphia* artifacts and all the known information about the forty-four members of the crew.

The book meets the usual high production standards for the Studies in Nautical Archaeology series from Texas A&M Press. Illustrations and tables complement the text nicely. This volume should form a part of any collection concerned with early American naval history. ☞

International Handbook of Underwater Archaeology
Edited by Carol V. Ruppé and Janet F. Barstad

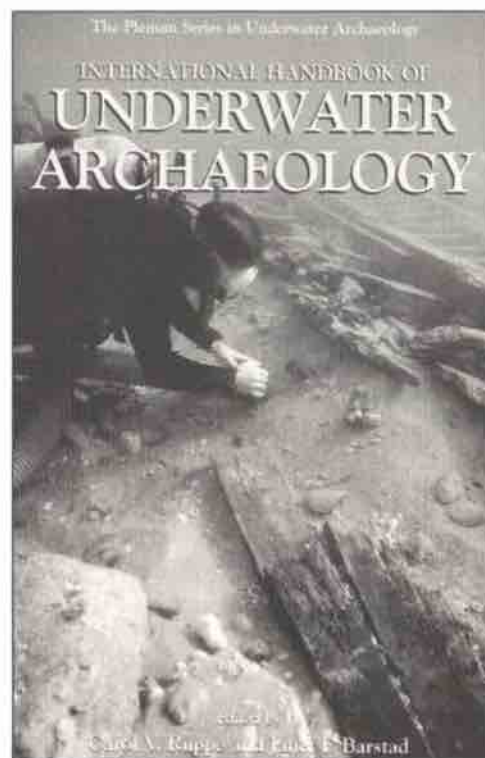
Kluwer Academic/Plenum Publishers, New York, 2002

ISBN: 0-306-46345-8, 894 pages, photos, maps, tables, appendixes, glossary, notes, bibliography, index, cloth, \$175.00

Nautical archaeologists are often asked to recommend a book to provide a general overview of their discipline. A decade ago, one could easily point to the 1977 *Maritime Archaeology*, edited by Keith Muckelroy, *The Sea Remembers* (1987), edited by Peter Throckmorton, or particularly *Ships and Shipwrecks of the Americas*, edited by George F. Bass in 1988. However, all of those works are now somewhat dated. *International Handbook of Underwater Archaeology* is designed to provide an up-to-date book along much the same lines. Edited by Carol V. Ruppé and Janet F. Barstad, this is the latest offering in the *Plenum Series in Underwater Archaeology* under the series editorship of INA's own J. Barto Arnold III. There are forty-eight chapters by a wide range of authors and researchers in the field. Although the authors provide background information, these chapters concentrate on developments since the early 1990s. The editorial work is excellent, but, as is usual in multi-author compilation, there is a wide range of individual styles, approaches, and opinions that the editors have made no effort to homogenize away.

The chapters are distributed among three parts and seven sections. The first part is an introduction, with a general overview by Barstad and a timeline of the history of underwater archaeology by John Broadwater (excavator of USS *Monitor*). The thirty-one chapters and over five hundred pages in Part II are the heart of the book. They provide a geography of nautical archaeology, with sections on the United States (fourteen chapters), Latin America and the Caribbean (four), Europe (nine), and most of the rest of the world (four). The editors acknowledge gaps in coverage for Canada and the former Eastern Bloc. INA members will recognize many of the chapter authors. For example, Barto Arnold wrote on Texas shipwrecks, Kevin Crisman co-wrote the chapter on Lake Champlain with Arthur Cohn, and Shelley Wachsmen and Dan Davis contributed the chapter on Israel. Part III includes fifteen chapters on "Issues in Underwater Archaeology," including ethics, technology, and the role of government agencies for archaeology in the United States. Summing up the entire volume is a short Afterword on "Archaeology in the 21st Century" by Dr. Bass.

Every serious library should have a copy of this book, because no other single current volume provides such a broad overview of the field of nautical archaeology. Obviously, the coverage of individual subjects in an encyclopedic work like this cannot be as detailed or technical as in the individual original publications. Nevertheless, there is more than enough information on most subjects to enable the reader to make an informed decision about whether to use the abundant bibliographic information to pursue further research. That makes the book cost-effective for institutions, despite its substantial price, since it may save having to buy a whole shelf of other research material. Regrettably, the price may keep *International Handbook of Underwater Archaeology* out of the hands of individual students and scholars who could profit from it. Be that as it may, nautical archaeologists again have a one-volume introduction to their discipline that they can unequivocally recommend. ☞



FROM THE PRESIDENT



The President's Letter gives me the opportunity at this time of year to wish all our members a Happy Holiday Season and a Happy New Year. It also allows me to look at the past, present and future of INA. This combined issue, Number 3/4 of Volume 29, completes *The INA Quarterly* for 2002. It is our intention to distribute four issues to the membership each year and this year we mailed out Numbers 1, 2, 3/4 and a supplement, *The George McGhee Amphora Collection at the Alanya Museum, Turkey*. These four issues total about 120 pages, which is larger than most *INA Quarterly* volumes.

The cover story in this issue is a moving tribute to Michael Katzev, one of the founders of the Institute of Nautical Archaeology. A true friend and supporter of INA, he contributed significantly in opening the frontiers of underwater archaeology. He will be sorely missed. Also included in this issue are articles by present or former students of the Nautical Archaeology Program reporting on a shipwreck excavation in Bulgaria, a survey in the Ionian Sea, and the Eighth Tropis Conference held in Hydra, Greece. An interesting article by John Janks discusses the use of Landsat bathymetric data to document bottom conditions around shipwrecks such as the ill-fated *Edmund Fitzgerald* in Lake Superior. Finally, the issue describes the newest release of the Texas A&M University Press' *Studies in Nautical Archaeology* Series, *The Gondola Philadelphia and the Battle of Lake Champlain* by John R. Bratten, and *The International Handbook of Underwater Archaeology* edited by Carol V. Ruppé and Janet F. Barstad. Looking back over the year and our accomplishments reflected in this volume of the *Quarterly* makes me proud to be the President of INA.

Now we are starting a New Year and are anxiously looking forward, anticipating new archaeological projects and the start of a new volume of *The INA Quarterly* to present our research. January is always one of the busiest months of the year for archaeology and, with little doubt, the most hectic. We start the year with a much deserved holiday break. Upcoming *Quarterlies* will include a review of the papers delivered by Nautical Archaeology Program students and faculty at the Archaeological Institute of America meeting held in New Orleans, January 3–6, 2003 and at the annual Society for Historical Archaeology Conference held January 14–19, 2003 in Providence, Rhode Island. These professional meetings are followed by the INA Annual Meeting that is being held in Houston, Texas, on January 31, followed by a special tour of the nautical archaeology facilities on the campus of Texas A&M University in College Station on Saturday, February 1.

In and amongst all this confusion, classes start again in mid-January for the Nautical Archaeology Program. Then we will finalize plans for talks to be delivered at the annual 2003 Ship Weekend to be held on Saturday, April 5 in College Station. Just prior to the summer projects, INA and the Nautical Archaeology Program will co-host—along with the Department of Oceanography, Texas Sea Grant, and the Marine Technology Society—the second annual Marine Committee Workshop. Somehow during all of this, the Nautical Archaeology faculty will continue to teach classes, supervise student research, and conduct their own research.

The summers bring no relief. This year we can anticipate an exciting Fifth World Archaeological Congress (WAC-5), being held on June 21–25, 2003 in Washington, DC. A number of papers by present and former Nautical Archaeology Program students and faculty are scheduled. You can see updated information about all forthcoming events on the INA web page at <http://ina.tamu.edu> or the Nautical Archaeology Program page at <http://nautarch.tamu.edu>.

Another exciting summer excavation season is being planned, including work in Turkey, Portugal, and Oklahoma. Dr. George Bass will lead the team to complete the excavation of the Pabuç Burnu shipwreck in Turkey, to be followed by a survey headed by Dr. Faith Hentschel, Associate Director of INA, to search for new shipwrecks in late August. Dr. Filipe Castro will be returning to Portugal with students to continue his work at the mouth of the Arade River. We are especially excited about the upcoming joint excavation with the Oklahoma Historical Commission on an early steamboat in the Red River. Dr. Kevin Crisman will be offering a field school excavation through Texas A&M University on this significant early nineteenth-century riverboat. We expect some of our members to wade out (literally) and observe the excavation.

So, as you can see, we have a very active year and many challenges lying before us. As I review what we did this past year and what we have to do in the coming year, I again am impressed and amazed at what we continue to accomplish year after year.

Donny Hamilton

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