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# INA NEWSLETTER

VOL 12 NO 2



Summer 1985

## *In Search Of Shipwrecks*

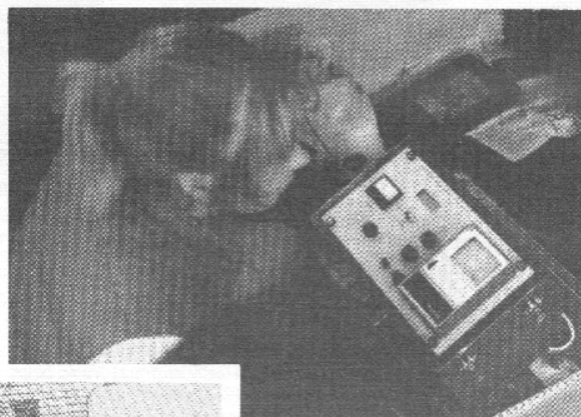
We focus this issue on the processes and tools used to identify ancient and historic shipwrecks that become the objects of scholarly study, or in some unfortunate cases, of wanton exploitation. The subject is especially timely because of the discovery this summer of two rather stunning sites: the cargo area of the Spanish treasure galleon *Nuestra Señora de Atocha*, and the seemingly intact remains of the passenger liner *Titanic*.

Whatever the ultimate disposition of either site, the dauntless searches for each have in common the means by which the wrecks were found: through the use of technology, contemporary records, and dogged persistence. The latter element obviously is a variable, but the former two are part of a triumverate of resources commonly employed to locate sites. These include ethnographic accounts, archival research, and electronic hardware. At various stages of nearly every modern shipwreck project, all of these tools are used—to confirm a report, to pinpoint a location, to identify a target.

To review INA's application of these means, we begin with an article by Research Associate Cemal Pulak about the Institute's annual coastal survey to inventory ancient wrecksites around Turkey. The fact that most sites surveyed are based on clues from Turkish sponge divers illustrates a reality about our discipline: that nautical archaeologists rarely are the ones who find the ships which they study; hunts often are prompted by reports from fishermen, sport divers, or salvors. However, rather than dealing with the process of gathering such ethnographic details [see *Newsletter* 9(1)], Pulak's article concerns the value of pursuing the information that is provided by informants.

The following article by Research Associate Denise Lakey, abridged from her Conference on Underwater Archaeology presentation last January in Boston, relates some of her experiences as an archival researcher in Spain seeking documents about 16th-century vessels of discovery. On a more local level, Texas A&M nautical archaeology student Marco Meniketti describes archival resources he has used to compile an inventory of shipwreck sites in the San Francisco Bay area—sources accessible to all and, indeed, the ones which often are employed by non-scientists to pinpoint wrecks they explore.

*Continued on Page 7*



**The Sources:  
Instruments  
Ethnography  
Archives**



## From Sponge Divers' Clues

# Turkish Coastal Survey Yields Wrecksite Inventory

By Cemal Pulak

Since 1980, the Institute's Turkish coastal survey has been an annual summer-end activity. Its purpose is to identify potentially significant archaeological sites for the Turkish government's and INA's growing inventory of submerged cultural remains, and nearly eighty shipwrecks and anchorage-related middens have been located and surveyed. From among these, a number of sites already have been chosen for excavation, the most noteworthy being the 11th-century A.D. and the 3rd-century B.C. wrecks at Serçe Limani, and the Institute's current excavation of a late Bronze Age shipwreck at Kaş.

Our expedition in 1984 was typical in its crew complement of INA personnel and government-appointed commissioners from the Bodrum Museum of Nautical Archaeology. Talking with sponge divers and then checking their reports, we completed our canvass of the southern and northwestern coasts of Turkey in five weeks with searches around Bodrum, Marmaris, and Kapıdağ Yarımadası. Our efforts resulted in the discovery and study of twelve new vessels.

We conducted our research, as usual, from the *Virazon*; after two months of hard labor at Kaş, she seemed as glad as we were to be chugging freely on the open seas. Her onboard assortment of excavation accessories and support equipment—compressors, remote sensing gear, a recompression chamber—remained with us to facilitate our investigation of sites that we heard about from the sponge divers. More than once we went out to sea to look for an informant who already had filed a wreck report, so he could show us precisely the place he had described.

### Sites span millennia

Our information came to us in ways and from people as diverse as the sites we examined. Some of the wrecksites were in better condition than others, in part a function of the depth and tranquility of their environment; however, location also was a factor. Scuba diving was never banned in the Sea of Marmara or the Black Sea as it was in the Mediterranean and the Aegean during the early 1970s. Consequently, it was no surprise to find that some of the sites we surveyed had been looted extensively.

Because it appeared that unrestricted diving soon would be permitted throughout Turkey in response to booming tourism, we believed it was necessary to survey as many shipwrecks as possible so that when diving regulations finally were established, recorded sites could be protected by antiquities laws. Our efforts were well rewarded, as the following compendium of 1984 finds reveals.

- A Byzantine wreck we had known about and had sought in the past finally was found scattered on a rocky slope 36 to 42 meters deep. It included at least sixty tiny amphoras and ten large, globular jars which dated approximately to the 11th or 12th century A.D.

- A cluster of ten amphoras of several types, mostly Rhodian and dating to the end of the 4th century B.C., were prominent features of a site 49 meters deep near Fethiye. One of the larger fragments of lead sheathing we found had preserved a section and the shape of what may have been a wale, suggesting a small, possibly boat-sized vessel.

- A site near Knidos revealed twelve uniquely shaped amphoras at 32 meters; additional jars may exist under the sandy seabed. Parallels have yet to be found for these containers, which may be of very late Byzantine origin and which have wide shoulders, flat bottoms, small mouths, and lug-shaped handles on the upper shoulders.

- North of Bodrum, in an area which generally may have been hazardous sailing grounds for ancient ships, we found scattered remains of Koan amphoras dating to the 1st century B.C. on a small vessel site 35 meters deep.

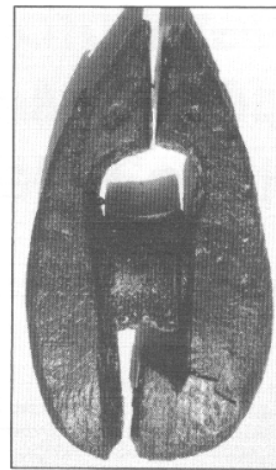
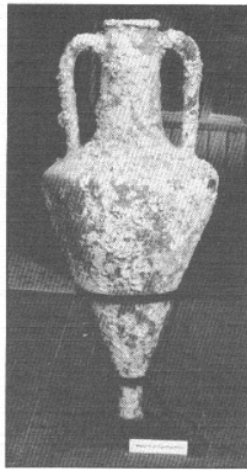
- A very significant discovery was made about 35 km from Serçe Limani: the wreck of a late 10- or 11th-century A.D. vessel that was carrying a cargo of glass. Its proximity in time and space to the "Glass Wreck" excavated by INA between 1977-79 supports the case that a flourishing Islamic glass industry existed somewhere in the Levant at this time. Located 70 meters from shore and distributed between 25 and 36 meters deep, the site included an array of other artifacts and at least some hull fragments, as a planking remnant with caulking still around the nail shaft attested.

- One of seven sites found in the Sea of Marmara, in a mere 6 to 8 meters of water, included the remains of Byzantine roof tiles in sufficient quantity to suggest a shipwreck adjacent to a long-accumulated anchorage midden. Five glazed Byzantine bowls also were found, although their association with the tiles was uncertain.

- Another mixture of maritime activity was discovered on a site nearby in 14 to 17 meters of water, about 30 meters from shore. Among the predominant group of ceramic fragments dated to the mid-4th century B.C., and of Chian manufacture, were the remains of Byzantine and other pottery types. Unfortunately, the wreck had been totally looted, with a loss of nearly 100 intact amphoras.

- Conversely, a relatively untouched Byzantine amphora carrier dating to the 10th or 11th century displayed more than a hundred ceramic containers of two different sizes, extending down a sandy slope between 10 and 22 meters. Seemingly little of the hull was preserved. A typical medieval anchor recorded nearby was of uncertain association.

- Two late 17th- or 18th-century Ottoman naval ships were studied within several miles of each other. One in 10 to 25 meters of water bore five large anchors, including three grapnels; ten cast iron cannons; and concreted rigging elements. The other, at



Left: Amphoras snagged by grapnels were recovered by two fishermen from the area of a site near Istanbul. Center: A looted amphora from a late 4th- or early 3rd-century B.C. wreck in the Sea of Marmara is now in a private collection. Right: A perfectly preserved sheave block was found on a badly looted site in the Sea of Marmara. (Photos: Turkish Survey Staff)

20 meters of depth, revealed three similar but shorter cannons, as well as rigging elements, hooks, ship's fasteners, cannon balls and bar shot. Also in abundance were shipboard materials: metal pans, bowls, dishes, pots, possible candlesticks, a mortar, ewers, braziers, a sieve, a pistol stock, and fragments of typical Ottoman glazed pottery.

- Among the most important wrecks discovered was that of a late 4th- or early 3rd-century B.C. merchantman, which unfortunately not only had been looted but which also had been damaged by dredging. In the immense, 30-meter-deep dredge pit, exposed ship's timbers were jutting from the sides and strewn along the slope. A perfect wooden sheave block, a thick piece of grass rope, doweled mortices and tenons, fragments of lead sheathing, and copper tacks were among the finds. Only scattered ceramic sherds remained, although two complete amphora types were recovered and a third distinct type recognized among the fragments. One of the intact jars was very unusual, being previously known only through a single, fragmentary example distinguished by the stamp of a ship's prow on its handles.

#### The final find

The last, and perhaps the most well preserved of the sites we surveyed was located near Istanbul. It had been found more than a decade before by two amateur fishermen, who noticed that an area offshore from a summer resort they owned was more bountiful for fishing than elsewhere in the vicinity. Not surprisingly, they guarded their secret, and although they were certain about the cause of the seabed anomaly, they could not verify its nature since neither man was a diver. However, one day their boat's grapnel felt heavier than usual, and when it finally was hauled to the surface, a small amphora caught on one of the flukes also broke water. The men decided to report their find after seeing a television documentary about INA excavations. (The same program also led to our learning about the second glass-carrying vessel at Serçe Limani.)

When we first met Mr. Akmanlar and Mr. Cizmeci and discovered that they had never even seen the wreck, we were rather discouraged, recalling similar meetings that had ended in disap-

pointment. In Bodrum, our interest in the wreck had been piqued by a photograph of the amphora; however, now we could only stare at each other blankly and brace our enthusiasm.

We were taken immediately by the two men to the site, which they had buoyed the previous day as a precaution against an overcast day concealing their sightings. By the time we arrived, we were more at ease and clearly astounded by the men's vivid description of the site they had never seen; the size of the wreck, the distribution of amphoras, bottom conditions, and other minute details had been gleaned merely by dragging heavily sinkered fishing lines over the area in search of fish. I was still a little skeptical about this unseen wreck as we plunged into the murky and chilly waters carried in by strong currents from the Black Sea. After acclimatizing to the freezing water that seeped into our wetsuits, we began to feel our way down the anchor line to the bottom.

At about 32 meters the dark, silty bottom began to take shape; small, rock-like objects could be discerned in the distance. As we cautiously made our way toward the round, dark shadows, we stared disbelievingly as they metamorphosed into hundreds of amphoras peering out from the mud. The wreckage was so large that we were prohibited by the visibility—only about 6 meters—from seeing more than a quarter of the wreck at a time.

All of the jars appeared to be of the same type. At one end of the site were two large *pithoi*, one of which was almost buried in the powdery bottom. The seabed conditions appeared to be ideal for hull preservation. The site was untouched, and we were the first to see it in 2,300 years!

Why a ship would sink here, we hadn't a clue. The nearest point of land is about 1.5 miles away; there are no shoals or submarine features to endanger a sailing ship. But whatever the cause, this was unequivocally the most well-preserved wreck I had ever seen.

The source of the amphoras remains to be verified, but we have speculated a northern or Black Sea origin, perhaps from the city of Chersonesos on the Crimea. However, the tragic event following her voyage across a sea that is known for its sudden and violent storms, and through the famed currents of the Bosphorus straits, probably will remain an eternal secret.

# Archives Harbor Clues To Vessel Identities, Fates

By Denise Lakey

In discussing archival investigation related to shipwrecks, two approaches can be considered: research for information to aid in the location of a known wreck, and research aimed at identifying a site that already has been located.

The first approach is easier since the investigator has a vessel name and date to begin searching through document catalogs. Even rudimentary organization at an archive is by single or groups of years, and the research scope helpfully can be limited to the time of sinking and perhaps a subsequent period of salvage. In the case of a treasure vessel, investigation is aided further by the fact that more extensive documentation generally was kept for ships laden with wealth.

For INA's current study of 16th-century vessels of discovery, including the Molasses Reef Wreck (MRW), the second approach is necessary; with this, one assembles a "shipwreck file" of contemporaneous Caribbean sites and then begins to eliminate the impossibilities. We use this tack when site dating from artifactual analysis could be a long time in coming, causing the vessel's identification through archival means to be postponed.

However, our research program goes beyond the identification of vessels with known locations: not only are we hunting down references and details about wrecksites, but we also are seeking comparative information on vessels of the period to aid in the interpretation of archaeological remains. Our interest extends to construction, sailing history, sailing routes, crew and passenger lists, shipboard duties, and cargo, provision and equipment lists. Unfortunately, published translations of documents from the Age of Exploration often are frustratingly truncated, making only mention, but not specifying, that a list appeared in the original.

Although it is extensive, documentation in Spanish archives often is poorly cataloged, and searching for a vessel identity is akin to surveying a large, sedimented harbor for shipwrecks of a certain era. As with a survey, it is first necessary to target the best places to look—in which archive to begin. For our study of Spanish exploration and colonization, the *Archivo General de Indias* (AGI) in Sevilla is best since the repository was created specifically to house Indies-related documents. There are, however, other archives—less well known, researched or organized but rich in material nonetheless. Because seafaring was the major means of trade, transportation and communication, references to maritime disasters can be found in a vast number of repositories—from municipal archives in larger trading centers and coastal communities to cathedral and parochial archives.

However, just as a marine survey cannot extend to every bay and river, so must an archaeologist concentrate on repositories promising greatest shipwreck information. These tend to be ones, like the AGI, that contain documentation about commerce. One type are the notarial archives, or *archivos de protocolos*, the

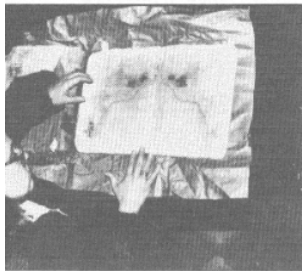
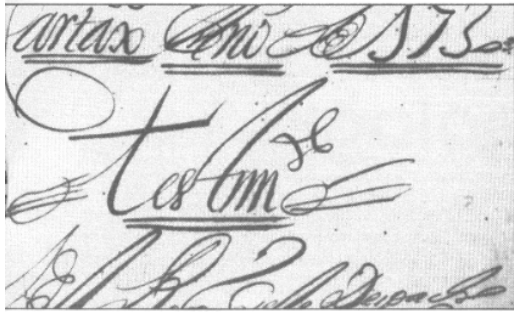


latter word referring to the set formats for transactions and agreements which a notary expedited. While functioning as a licensed person to whom citizenry could go when signing papers of legal obligation, the Spanish notary historically had an even wider role. Sixteenth-century merchants and seamen used notaries extensively to record everything from simple wage agreements to lading transactions to transfers of vessel ownership. In the past, such documents were maintained by individual notaries and passed on to a successor; however, in the 20th century, Spanish archivists have begun to collect, organize and make available these materials for research, although many remain scattered between pueblo and city.

To be more specific about conducting document research, I will describe three archives: the AGI and the *Archivo de Protocolos* of Sevilla, and the *Archivo Historico Provincial* of Cádiz. These cities were the two most important ports at the European terminus of the Indies trade, although other communities such as Huelva, Palos and Moguer also played very important roles in Spanish overseas expansion. In some places, such as the important port of San Lucar de Barrameda, the notarial archives have been lost to fire. Among the three repositories noted above, while they have distinctive histories, content and organization, there are sufficient similarities to warrant a general research approach.

When working at the AGI, the researcher's initial step is to determine which sections have significant information on ships moving between Europe and the Indies during a given period of time—a decision equivalent to choosing to survey the Caribbean instead of the Western Hemisphere. The AGI has sections devoted to various historic functions: the so-called House of Trade; the merchants' organization, or Tribunal; the *Contaduria*, or accounting section; and subdivisions for the various governing bodies (*Gobierno*) in the Caribbean, such as Santo Domingo and New Spain. Another subsection of *Gobierno* is the *Indiferente General*, which includes miscellaneous but sometimes valuable materials.

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Photos: Joe Simmons

# Wreck Inventory Data Available In Local Sources

By Marco Meniketti

**For three days she stood off** the entrance to San Francisco Bay, shrouded in dense fog. Unable to locate the dangerous channel shoals or even to see the Bay's entrance, the captain of the *Tennessee* prudently elected to wait out the weather. The ocean-going paddle-wheel steamer thus remained near the Farallone Islands, 26 miles outside the Golden Gate, with 496 passengers and crew who had come from Panama to join the gold rush.

Finally, berated by impatient passengers and encouraged by the sight of another vessel sailing blithely through the mist toward the Bay, the captain ordered the *Tennessee* to follow at half power. That decision, on the morning of March 6, 1853, proved fatal for the side-wheeler. Without landmarks as a guide, the ship's northward drift caused by current and wind went undetected until the bow watch cried out that he could hear breakers. Suddenly the fog parted to reveal waves crashing upon rocks of the Marin Headlands a mere 200 yards away! It was too late to turn around. The only hope was to ground the vessel in a small, sandy cove that today bears its name.

Full steam and hard port rudder drove the ship onto the beach; the impact sent passengers and cargo flying. One deckhand swam ashore with a line in his teeth to rig a bosun's chair, and another stood by onboard with two pistols to prevent men from escaping before women. Eventually, all people and most cargo were saved. The unfortunate vessel, however, turned parallel to the beach and began to break up from a merciless pounding of waves.

This account of maritime disaster is not a fanciful story but, rather, the synthesis of survivors' versions gleaned from newspapers of the day. Located in the records library of the San Francisco Maritime Museum, such articles and eyewitness accounts are among my primary sources for identifying and locating wrecksites in the region. Though the area is not generally known for historic nautical sites, hidden shoals, odd currents, and foul weather have made this once-bustling maritime center a final resting place for scores of ships, from schooners to oil tankers. In a twelve-mile stretch of the Pt. Reyes seashore lie seventy-eight wrecks, the earliest being the Spanish galleon *San Augustin*, sunk in 1594.

Not all sites of interest to nautical archaeologists are under water; the *Tennessee* is a case in point. Although the accident and its location were well documented, the vessel remains were not found until 1981, when a major storm stripped the beach of sand and revealed the carcass to archaeologists. The same storm exposed the intact hull of a clipper in San Francisco's Ocean Beach, the presence of which was unsuspected. Again, a trip to the Museum's library enabled identification of the ship and its fate. In both instances, National Park Service archaeologists were able to record the sites with the aid of volunteers and students.

My most powerful tools for locating wrecksites are a library card and a personal computer. However, in the process of writing a compendium of sites between Tomales and Monterey Bays, I have made use of original newspaper articles, logbooks of lighthouse keepers, survivors' accounts, materials in community museums, general literature, and interviews with "old timers." The latter source often yields the most accurate locational information which can be corroborated by other sources. Information concerning ship registry, name, cargo, intended destination, cause and date of demise, prevailing weather conditions, and other details are fed into the computer and sorted in various ways to generate patterns. When used in conjunction with navigational charts, an effective tool for predicting site locations is produced. Clusters occur along specific shoals, in common coves, and in similar weather patterns, and not surprisingly, National Weather Service records dating to the mid-1800s have revealed that years of bad storms coincide with years of wreck clusters.

Most of the sites are beyond the scope of sport diving, lying in rough, cold, turbid waters; exact locations must be pinpointed with hardware such as magnetometers and sonar. Ultimately, however, the sites must be dived on to confirm anomalies and to establish identities. Without the firsthand diagnosis, any site is a hypothesis without substance.

After receiving a degree in archaeology, I began to dive in order to reach wrecksites located through my own research and those which I heard about from sports divers. Whatever one thinks about sport divers, one must acknowledge that they discover wrecksites simply because they spend time in the water. Serious divers often are keenly aware of the historical value of sites and are genuinely interested in their identification and preservation, and I am always on the alert for their reports. Their pertinent information can be tied into my file and may be of value in zeroing in on specific vessels.

My methodology of combining contemporary historical accounts with nautical charts, maps, weather records and ethnographic accounts is neither new nor original. However, when assembled in conjunction with a computer, the approach becomes an effective tool operable at very low cost. It is no panacea for the location of sites, but its value as a first step has been proven repeatedly.

# Remote Sensing Technology Is Integral To Archaeology

By KC Smith

A decade ago it was eccentric for a nautical archaeologist to comprehend the workings of magnetometry or ground-penetrating sonar. When such means were needed, one called in Dr. Edgerton or a similar specialist. Today, scientists of the discipline not only understand how and why these tools are used, but most also have had operational experience with a variety of remote sensing equipment and associated electronic hardware.

## The new perspective

The change has come about for several reasons and in several ways. Among the former has been an overall maturation of the discipline, from a point of fledgling experimentation to one of practiced methodology. Similarly, as training and employment alternatives have expanded, the opportunities for theoretical and hands-on exposure also have increased, such that newer waves of nautical archaeologists view remote sensing as an integral tool. And there have been financial reasons: though not inexpensive to employ, remote sensing can decrease total project costs by hastening the time a crew spends searching for a particular target shipwreck.

The ways in which a new perspective about high-tech hardware have evolved perhaps most obviously are seen in the interdisciplinary subset of specialists that has arisen: people who apply their engineering sense to the problems of archaeology, either for love or business. The instruments they use rarely are prototypes, often being models originally developed and field tested by military or industrial concerns; however, creative and committed engineers have found ways to tailor basic gear to fit general discipline or particular project needs. Similarly, a closer cooperation has emerged between nautical archaeologists and private and federal groups such as oil companies, the US Navy, and the National Oceanic and Atmospheric Administration, which has made remote sensing tools far more accessible to rent, purchase, borrow or receive through donations.

## Several tools available

The remote sensing technology most commonly used in underwater archaeology includes magnetometry, side-scan sonar, and sub-bottom profiling. Used either singly or in consort, these instruments typically are augmented by computer hardware and programs in both data gathering and interpretation stages. In addition, mechanical, electronic and microwave navigational and positioning systems are auxiliary components which serve several important functions. Not only do they expedite search operations while primary remote sensing tools are being applied, but they also assure that underwater sites can be pinpointed, relocated and mapped with precision.

Magnetometers are employed when it is likely that a submerged site will have some form of iron remains—in the ship's architecture, hardware, armaments, other artifacts or ballast. "Mags" are unable to detect non-ferrous materials.

The principle of their operation is based on the fact that all points on the earth have some natural magnetic field strength influenced by local geology, which can be measured and patterned. The presence of an anomalous concentration of iron, such as provided by ships' anchors, cannons or fittings, will cause a noticeable variation in the local "gamma" (the unit of measurement of magnetic field strength) range. It does not matter whether the underwater evidence is atop the seabed or buried—a mag still can sense it—although obviously, the more the remains are concentrated or unmasked by unrelated features, the easier it is to pinpoint the site.

Several types of magnetometers have been developed; however, the one most frequently applied in marine archaeology is the compact and portable proton precession magnetometer. The components include a sensor, a chart recorder, an interconnecting cable, and a power supply. Typically, the sensor is towed behind a search vessel, although in very shallow or reef-studded areas it may be mounted on a boom on the boat's bow. Magnetic readings sensed by the unit are relayed to the chart recorder onboard, providing a graphic picture that reveals the size, shape and sometimes the depth of burial of an anomaly.

## Sonar devices

Side-scan sonars and sub-bottom profilers are portable, battery-powered acoustic devices that use sound waves to produce a hard copy, graphic image of the seabed and/or underlying sediments. With side-scan instrumentation, the towed sensor emits pulses of high-frequency sound (50-500 kilohertz) in beams that provide good resolution on a horizontal plane and wide coverage on a vertical plane. Sound waves returned to the sonar vary according to the texture and terrain of the seafloor, and the detailed image recorded by successive pulse returns can be interpreted with distinctions between natural and non-natural features. Thus, in general, this tool cannot detect buried debris.

Conversely, the sub-bottom profiler uses low-frequency sound (3.5-12 kilohertz), directed vertically downward by a towed sensor, to penetrate bottom sediments. The interfaces between various sub-surface sediment layers permit penetration of some sound energy while some is reflected, ultimately generating a cross-sectional view of seabed strata, features and bedrock. Buried hull remains will show up as a localized sub-bottom reflection. However, while it can sense shipwrecks that are buried, a profiler covers a narrow horizontal range, making it less effective than side-scan for broad-area searches and more effective for delimiting a site and its surrounding features once the target has been localized by other means.

In the same way that nautical archaeologists have advanced in their use of various remote sensing technology to locate shipwreck sites, so have the instruments themselves evolved in their portability, flexibility and sensitivity. More improvements can be expected. Yet there remains great latitude for marine archaeological applications of engineered products, and as these are integrated into standard methodology, a finer, less expensive and more effective level of science will result.

## In Search Of Shipwrecks . . .

Continued from Page 1

Finally, a brief review is included of current technology now used by scientists and salvors alike to make the business of finding shipwrecks easier. Much of the technical data have been drawn from a recent article by Charles Mazel (*Oceanus* 28(1):85-89), an electronics expert who specializes in archaeological applications and a former participant of several INA projects.

There are, of course, other components involved in the search for shipwrecks. Nonelectronic technology such as probes, coring tools, remote-controlled vehicles, and photographic materials play an indispensable role, as does the time-tested means of visually searching: by swimming, diving and towing in likely areas and by beachcombing. Similarly, modern documents such as nautical charts, aerial photographs, and geographical maps are exceedingly useful when the evident environmental features are interpreted with a "maritime sense." Clearly, no single method is sufficient to locate shipwrecks quickly or economically.

But, it goes without saying that a shipwreck search only attains value if in the aftermath the vessel is studied in a manner, using a completely different set of processes and tools, that recognizes the data it has to offer down to the most minute remaining detail. Therein lies the difference between the two sites found this summer, or the even more remarkable INA find two years ago of the Bronze Age vessel at Kaş. Shipwrecks found by scientists nearly always are treated with a respect and a final intention that exceeds the temporal goals of the excavation team; those found by treasure hunters rarely enjoy such long-term, humanistic benefits. Unfortunately, in the wake of discoveries such as the *Atocha* treasure, one suspects that greater numbers of shipwrecks will be denied their full historic potentials.

KC Smith

Page 1 photos: (top, bottom) Joe Simmons; (center) Turkish Survey Staff.

## Archives Harbor Clues . . .

Continued from Page 4

Next, to narrow the Caribbean down to a particular coast or reef system, one searches the section inventories for appropriate bundles of papers to begin skimming in earnest. A major factor in this process is the date listed. The Books of Registers and the registers themselves that were turned in to the House of Trade are a starting place, but by no means are they complete. By way of illustration: the Books begin in 1504 but the Padre Island 1554 ships are some of the earliest wrecks noted in them. Thus, in our MRW research and time period—the first quarter of the 16th century—the Books are of little help.

Even when reference to a wreck is found, it may not be easy to identify its location. Margin notes or fleeting mention often only say, "lost in the gulf" or "lost on the way back from the Indies." Using the ship's name, nickname, owner, master, date, and port of origin or destination, the researcher next looks for reports on the loss and/or salvage in documents such as expense accounts and letters. However, since many bundles are cataloged merely as "Letters to the House of Trade from the Royal Officials in Santo Domingo," it may be necessary to search many bundles of papers for references to wrecks and indications of their locations.

In contrast to the AGI, the two notarial archives in Sevilla and Cádiz are similar, although one main difference does exist: the latter repository is computer-cataloged and cross-referenced by notary name, notarial office and year. For several reasons, however, the catalog may be of limited use in shipwreck research; for example, many records were destroyed in the 1596 English attack on Cádiz. Indeed, only 130 bundles of papers exist for the entire 16th century, none of which pre-dates 1531. In addition, in dealing with any notarial records, it must be remembered that a document drawn up in any given year may have dealt with a ship loss that occurred two or three years before.

The *Archivo de Protocolos* in Sevilla, on the other hand, has considerable 16th-century material. The collection begins in the 1440s and runs sporadically to the 16th century when the volume of documentation explodes into an overwhelming

mass that can drive an investigator to despair. There are twenty-four different public notary offices, excluding notaries working for specific government bodies, and from one to ten bundles of documents—on the average three, occupying about a meter of shelf space—per notary per year. For the years 1490 to 1600, this amounts to about 8,000 bundles, or a stack of documents 2,600 meters (1.5 miles) long.

How, then, does one tackle the problem of research for a specific period, as we are doing for early vessels of discovery, when such an abundance of material exists? One starts systematically, by limiting the scope of the task and searching in the most likely areas before expanding to others. At Cádiz the options are limited by the relatively fewer resources; at the *Archivo de Protocolos*, research can be limited by date (e.g., 1492-1525 to start) and also to certain notary offices.

In addition, the published results of other archival researchers can be of invaluable assistance. One of these is the monumental study of the Indies trade entitled *Seville et l'Atlantique*, published in the 1950s by Pierre and Hugette Chaunu. The first five volumes of this eight-volume work are reproductions, year by year, of the AGI Book of Registers from 1504 to 1650 for ships leaving and entering Spain. The authors extensively supplemented the information with exhaustive research into other documents from the House of Trade. Thus, the Chaunus' work provides an excellent starting point with a format much easier to scan than the documents, and it can be consulted before coming to the AGI.

Another useful work is the five-volume catalog of American sources contained in the *Archivo de Protocolos*. Published in the 1930s, it is part of the larger *Colección de Documentos Inéditos para la Historia de Hispano-América*. Although not nearly a complete source for shipwreck information at Sevilla's notarial archive, the catalog nonetheless may point a researcher in the right direction.

Clearly, this is a simplified schematic for archival investigation and does not begin to cover all possible primary sources for historical research on 16th-century shipwrecks, in terms either of specific archives or their individual contents. For that subject, I would have to write a book.



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