

INA NEWSLETTER

VOL 13 NO 1



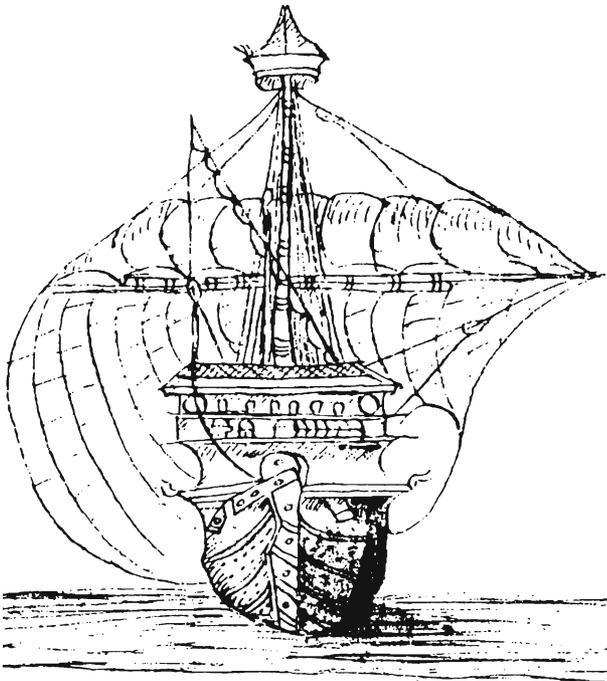
March 1986

Rediscovering Ships Of Discovery



INA Explores The Age Of Discovery:

By KC Smith



The daring transatlantic voyages that linked the Old World to the New were among the most important human migrations in history—tantamount, perhaps, to the biogeographical movement of *Homo erectus* out of Africa. While Pleistocene Man lumbered slowly afoot over land-bridges to the future, Medieval Man set out in small, wind-propelled vessels of his own construction across an expanse of liquid earth. Who knows what the former was seeking; the latter was intent on riches, fame, and the expression of his cosmographic concepts. It hardly matters that hundred-thousands of years separated these quests; both changed the evolution of humankind. What does matter is that trails of evidence of each migration were deposited along the routes for Modern Man to find and to explain.

Curiously, today we speculate almost as much about the mechanics of 15th- and 16th-century technology that enabled cultural circumnavigation of the world, as we do about the primeval expansion of Earliest Man into other environments to initiate populations and progress. In both cases, the recovered archaeological evidence is not voluminous. In the former instance, however, with the approaching 500th anniversary of the Iberian discovery of the Americas, there is excited impetus and corresponding effort to explain the means and effects of the European arrival into the Western Hemisphere.

Nautical archaeology has a vested interest in this scholarly process, since it was by way of boat that the immortal contact

Seeking to understand early ships of discovery such as the caravel depicted in a late 15th-century Italian manuscript, INA Research Associates and staff members involved in the enterprise are (from left to right) Donald H. Keith, Denise Lakey, Joe Simmons, Mark Myers, Bill Lamb, Roni Polk, Harding Polk, Tom Oertling, Roger C. Smith, and KC Smith. (Photo: KC Smith) Page 1 illustration after Landström.



In Search Of Ships That Altered The Globe

and colonization occurred. Indeed, reconstruction of this route to global geography is one of the most important questions the discipline now has to offer. A cadre of ten INA associates currently is fomenting hypotheses and studying evidence about seven shipwreck sites in the Caribbean where the answers may abound.

Colloquially, we call our project EXPLADISC, an acronym for Exploration And Discovery. Initiated several years ago with the search for two Columbus shipwrecks in Jamaica and the excavation of the Molasses Reef Wreck (MRW) in the Turks and Caicos Islands, the project was formalized six months ago when we began meeting weekly to create, organize, review and plan aspects of a strategy we hope will carry us toward knowledge. Our targets of scholarly assault are the 15th- and 16th-century vessels called caravels and *naos*, the space shuttles of their era, about which little is known and of which, no firmly dated examples have been scientifically studied. To carry out this research, we are using every tool that nautical archaeology has to offer: historic research, field survey, selective excavation, thorough recording, conservation, scientific analysis, reconstruction and publication.

Our most concerted efforts have focused on the Molasses Reef Wreck, which we believe may date within the time frame from 1492 to 1525 that is of particular EXPLADISC interest. The vessel's ordnance, ceramic remains and other artifacts certainly seem contemporaneous, although in truth, so little has been proven about maritime enterprise of the period that our research is establishing the data bank of knowledge as much as it is drawing from it. Moreover, even when the excavation, conservation and analysis of the MRW have been completed, and despite whatever we learn, the results perforce will have limited universality since statements of fact about period ships cannot be founded on a single example. This in part explains the scope of the EXPLADISC program to research, find, examine or excavate as many sites of New World ships of discovery as we can.

Additionally, with the forthcoming Columbian Quincentennial in 1992, nautical archaeology has a unique opportunity to contribute to the worldwide scientific scrutiny of the Age of Exploration. The Institute's present efforts to demystify the maritime technology that launched this era are intent on providing accurate and useful information for Quincentennial ship reconstructions and transatlantic reenactments.

Because of the enormity of our enterprise—to find, study and explain the caravel and the *nao* within a mere eight years—we tend to analogize EXPLADISC as a "Mission Impossible," or at least as a detective effort that would humble Ellery Queen. Both sentiments are among those reflected in articles in this *Newsletter* issue, which focuses on INA's exploration and discovery of the Age of Exploration and Discovery.

"The beauty of archaeology is that it keeps reminding us that we don't know nearly as much as we think we do." Donald Keith

"Pioneers of the past were resolved to forfeit their all in pursuit of lofty goals. So are we." Joe Simmons

"Sometimes when I work with old documents, I feel like I know the people contained among the pages; it's as though they are right here with me." Denise Lakey

"The daily process of handling and recording artifacts makes us acutely aware of the physical properties and limitations of both the artifacts and ourselves." Mark Myers

"The way to reach a broad audience is to demonstrate that we're like everyone else who wants to know where we've come from, what we're doing here, and where we're going." Roni and Harding Polk

"Why is EXPLADISC important to humankind? Because our archaeological efforts will unearth actual relics of maritime exploration and discovery for all humanity to see and to study." Roger Smith

INA And The Quincentennial

500th Anniversary plans worldwide recognize
the role of ships in the discovery of the New World

By Roger C. Smith

In the spring of 1984, when INA was invited to participate in a National Endowment for the Humanities (NEH) Conference on the Columbian Quincentenary, I was asked to represent the Institute at meetings in Gainesville and St. Augustine, Florida. The purpose of this NEH conference, and of four others that were held throughout the country, was to "identify the issues and opportunities for humanities research which the Columbian quincentenary seems likely to generate," and to "alert scholars and research organizations to the advantages of their early and full participation in planning for the quincentenary's public observances." In other words, charged with dispensing federal funds for research in the humanities, the NEH sought to gather scholars and research programs that might be interested in or merit support related to the approaching 500th anniversary of the discovery of the New World.

Since INA already had begun to address 15th- and 16th-century shipwreck research through the Columbus Caravels Project in Jamaica, the Molasses Reef Wreck excavation in the Turks and Caicos Islands, and brief surveys of early sites in the Bahamas, Mexico and the Dominican Republic, our goals seemed to coincide with the conference quincentennial theme. Asked to provide an overview of the Institute's Caribbean research, I organized a slide presentation for the participants, who included archaeologists, historians, anthropologists, geographers, architects, philosophers, Latin-Americanists, librarians, public broadcasters, foundation executives, and NEH program directors. In gathering individuals from institutions across the United States, the conference established a network of interdisciplinary and educational possibilities for 1992 celebrations that has only continued to grow.

Interest is international

Subsequent to this initial entry into the quincentennial network, INA has been in contact with an increasing number of organizations whose goals are concentric with ours. Among the first was the Comisión Nacional del V Centenario del Descubrimiento de América, the official Spanish commission established to coordinate Spain's involvement in 1992 activities, which will include a world's fair to be held in Seville. While recently working in Spain, INA representatives Denise Lakey and Joe Simmons had the opportunity to meet with executives of the commission and to arrange for mutual exchange of information, including the organization's newsletter, *América 92*.

The United States also has established a Christopher Columbus Quincentenary Jubilee Commission with the passing of Senate Bill 500 and House Bill 1492. Thirty commissioners from a variety of backgrounds have been appointed by President Ronald Reagan to coordinate U.S. commemoration of the historic voyages of discovery. One of the commissioners, Charles Poltzer of the University of Arizona, visited INA's Columbus

Caravels Project on the north coast of Jamaica last summer during a fact-finding mission.

The General Secretariat of the Organization of American States (OAS) has established a National Hispanic Quincentennial Commission to act as a clearinghouse for cooperative international research efforts, the first of which was a conference held at Santo Domingo in 1984. The resulting *OAS Quincentennial Newsletter* details the various proposals and projects inaugurated by OAS member states throughout the hemisphere. The official OAS bilingual magazine *Americas* has published articles on the Molasses Reef Wreck and the Columbus Caravels Project, and is interested in featuring future results of our work. UNESCO has established a similar international quincentenary commission, and its executive director, Dr. Amadou M'Bow, visited our projects in Jamaica in 1983, although INA is not currently involved with the organization's 1992 preparations.

Over the past few years, the Institute has developed a close association with archaeological colleagues at the University of Florida, where recently an Institute for Early Contact Period Studies was established to coordinate its quincentennial research. Florida's projects include a search in Haiti for La Navidad, Columbus's first outpost in the Americas, under the direction of Dr. Kathleen Deagan; interpretation of Puerto Real, Haiti, the fourth oldest European site in the New World; the translation and editing of a document discovered by Dr. Eugene Lyon in the Seville archives that details the configuration, rigging and provisioning in Columbus's caravel, *Niña*; the archaeological track of Hernando de Soto's expedition through Florida; and an international conference on early explorations scheduled for 1988.

Invited by Dr. Deagan to present INA's research on early shipwrecks at the International Congress of Caribbean Archaeologists last summer in San Juan, Puerto Rico, I began discussions on a collaborative effort to pinpoint the location of the *Santa María*, the timbers of which allegedly were used to build the stockade of La Navidad after the flagship's accidental wrecking in 1492 on Haiti's north coast. An INA team had planned in February to visit Deagan's excavation and to discuss with government officials the Institute's possible involvement, however, the cooperative reconnaissance trip was postponed because of political events on the island. Nevertheless, collaborative research continues through such means as the comparative analysis of ceramics from INA's early underwater sites with those of Deagan's from land during a visit this month to the Florida State Museum.

Research and replicas planned

Other academic quincentenary organizations include Indiana University, which has instituted an "America 500" pro-



This portrait of Christopher Columbus is attributed to Ridolfo Ghirlandaio of Florence. A woodcut of the islands the Admiral discovered is contained in the illustrated edition of Columbus's letter to Gabriel Sánchez of 1493.



gram for gathering Columbian writings; and the Latin American Institute at the University of New Mexico, which has begun publication of an excellent newsletter entitled *Encuentro*. The John Carter Brown Library at Brown University, a major repository of European Americana, also has instituted quinquennial programs that include an annotated bibliography on Columbus and another informative newsletter, 1992.

An equally important storehouse of early discovery materials, the University of Chicago's Newberry Library, will offer a summer institute on Transatlantic Encounters in conjunction with several Columbian Quinquennial Fellowships for scholars who wish to do research in its enormous holdings of books, manuscripts and maps. Dr. David Buisseret, head of the library's Center for the History of Cartography and formerly head of the history department at the University of the West Indies in Kingston, first showed INA representatives the proposed site of Columbus's grounding and the first Spanish townsite in Jamaica, where research subsequently has been undertaken.

In preparation for its program "Columbus and the Age of Discovery," Boston's educational television station, WGBH, last year sought INA's assistance regarding the design of discovery vessels to be portrayed in a six-hour television series now under production. The film will include a segment on the technological advancements such as ships, navigational instruments and maps that enabled the exploration of the New World. WGBH also hopes to film the "replicas" of Columbus's first three ships planned for construction under the auspices of the Spanish quinquennial commission.

The Institute has been contacted by a private group, Geo/Arts Associates, which plans to build its own "replicas" of *Niña*, *Pinta*, and *Santa María* in Maine. Another private organization, The Phileas Society of Ft. Lauderdale, Florida, was

founded early last year to sponsor seminars, symposia, research projects and expeditions dealing with the Age of Discovery. Already the Society has published three newsletter issues, and last October it held the First Annual Columbus Convocation, featuring panel discussions, films, and exhibits to which INA representatives were invited but could not attend. Most recently, we have been consulting with Partners for Livable Places, an INA supporting institution, regarding a joint project to produce an illustrated book about the ships of discovery.

Seeking not only to share INA's resources with the network of interested parties but also to further the Institute's study of the ships of discovery, Don Keith, Mark Myers and I submitted a proposal to the NEH for federal funds to support our ongoing research program. We were informed last December that the request had been accepted and that our projects would be funded for eighteen months. With additional support from the National Geographic Society, a third season of excavation at the Molasses Reef Wreck now will be possible. A grant also has been received from the Texas-based Meadows Foundation to aid the intended scholarly enterprises.

Many more organizations and programs have and will continue to spring up as the date of first Iberian contact creeps closer. If present trends are a measure, some of these groups will contact INA archaeologists for advice, assistance or participation in their quinquennial observances. We welcome these contacts for they signify a recognition by scholars and laypeople that ships—some very particular and long-lost ships—were the indispensable element in history's most earth-changing event. We also view these opportunities for exchange as opportunities for archaeology to support and to validate our understanding of humankind's seafaring past.

Ships Of Discovery Research

Separate scholarly efforts have coalesced
into a strategy with support, a scheme and a team

By Donald H. Keith

Our research program on ships of discovery evolved as much by accident as by design. It began in 1982 when Roger Smith went off to St. Ann's Bay, Jamaica, to look for two of Columbus's caravels, and I went to Molasses Reef in the Turks and Caicos Islands to excavate an early shipwreck there. When we finally met back in College Station later that year, we commiserated over the frustrations of our respective projects.

The St. Ann's Bay survey was land-based and thus in some respects was less expensive and easier to conduct. Roger's team employed an extensive array of remote-sensing instruments seeking the illusive Columbus caravels, which all were certain were there. One thousand miles away on Molasses Reef, my crew had no trouble finding the site, but how could we tell if it was a ship of discovery?

With permission from the Turks and Caicos government, we carried tons of heavily-encrusted artifacts home with us to College Station for conservation and analysis. Texas Archaeological Research Laboratories gave us two truckloads of equipment that had been used to conserve artifacts from the 1554 Padre Island wrecks, and Texas A&M University gave us a place to work, which we grandly named the Molasses Reef Wreck Conservation Laboratory. Nonetheless, it would be a while before we could clean and study the artifacts; we needed personnel and financial support. Even though former INA Board Member Sumner Gerard donated the use of his research vessel *Morning Watch*, and the National Geographic Society and Board Member Mrs. John Brown Cook funded the first two phases of field work in 1982, our costs were high. It was apparent that we had to approach our research in an efficient, economical yet comprehensive way.

Two avenues of approach

Continuing to confer about our two respective projects, Roger and I eventually realized that our investigations represented a two-pronged attack on the study of ships of discovery. The Columbus Caravels Project was a survey to locate known wrecks of discovery vessels in an area specified in historic documents; the Molasses Reef Project was a study of a fortuitously discovered site that appeared to date to the discovery period based on its location and artifact assemblage. Roger's research was deductive, starting with the recorded historical event and working backward to discover the archaeological remains. Mine was inductive, beginning with the archaeological remains and attempting to unravel their story through analysis.

We realized that our respective approaches were complementary; that they *needed* each other. How would I know whether I'd found a discovery ship without the remains of a *bona fide* example—such as those thought to lie at the bottom of St. Ann's Bay—with which to compare it? Similarly, our

readily available artifacts from the Molasses Reef Wreck might help Roger to identify any remains he encountered. Thus having taken the first step in exploring the nautical archaeology of ships of discovery, we wondered: Why not develop a plan for examining such ships that would integrate carefully-selected field work with archival research, artifact analysis, and conservation?

At the time, the mission we were proposing appeared to be a straightforward study in historical geography. All we had to do was to clarify how discovery vessels would have been designed and built and what they looked like based on evidence supplied by Caribbean shipwrecks. Nautical archaeology would be the tool with which to accomplish this. In the process we would sail the seas they sailed, see the places they had seen, and rediscover the earliest European beachheads in the New World.

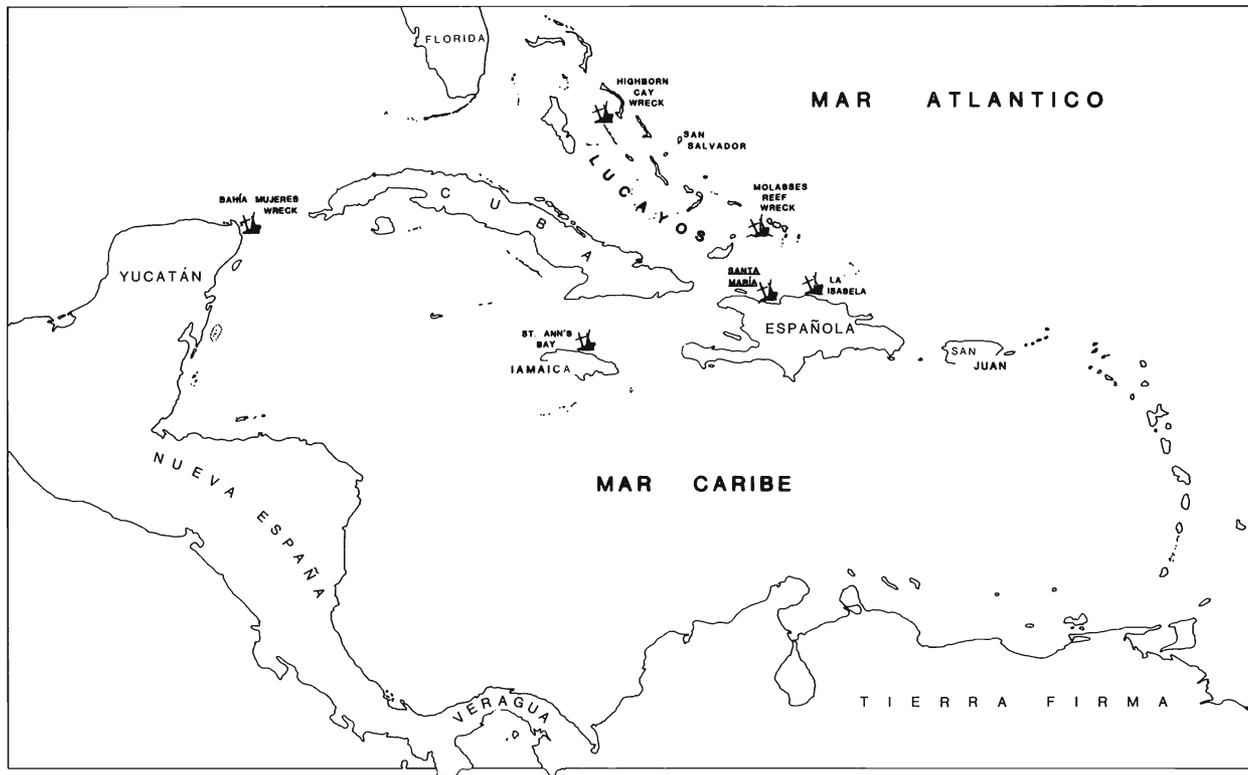
We were to find, however, that there is a world of difference between conception and implementation. Clearly, our present piecemeal approach was not going to work. We needed a comprehensive yet flexible strategy, lots of support, and most importantly, a dedicated Mission Impossible Force.

A team is assembled

In the spring of 1984, we held an informal series of a dozen seminars focused on "Ships of Discovery." Many people drifted in and out of the meetings, but a nucleus of individuals clearly expressed a continued interest in our research problem. Denise Lakey recognized the potential for archival research to aid in identifying early sites. Tom Oertling wondered what it would be like to reconstruct the hull of the *Santa María*. Mark Myers saw an important task in finding the right conservation techniques for the artifacts of exploration and discovery. Joe Simmons was enthralled by the ordnance so much in evidence on the early sites we knew of. KC Smith rubbed her hands in delight at the prospect of documenting it all. It seemed that we had found our team. We were ready to implement The Big Picture.

We decided on a strategy that encompassed both avenues of attack: we would examine fortuitously discovered early wrecksites we knew about, such as the Molasses Reef, High-born Cay and Bahía Mujeres Wrecks, and we would actively look for sites of ships of discovery recorded in history but as yet undiscovered, such as at St. Ann's Bay and Bahía de Isabela. We began to gather all information we could find about early maritime enterprises, and began to evaluate an initial reconnaissance that was conducted during field operations in 1983 of new target areas, to decide which promised the most potential.

Among the shipwreck locations we were considering, St. Ann's Bay seemed to be the best bet for finding documented vessels of discovery with hulls in a good state of preservation. The Molasses Reef Wreck was the most intact of the three early wrecksites we knew of, although after our brief survey at



Early New World shipwreck sites currently under study by INA researchers.

Highborn Cay, we were convinced that extensive hull remains lay buried beneath the ballast mound. The harbor at Isabela promised several Columbus-period shipwrecks, but we saw that these would be difficult to find beneath a seabed thickly carpeted with sediments. We discovered that the Bahía Mujeres Wreck was so completely entombed by coral reef that its revelations would be challenging to extract.

Many techniques employed

Proper investigation of these sites required the application of state-of-the-art surveying, recording and excavating techniques. We experimented with radial mapping using an electronic distance meter and theodolite. We employed magnetometry; side-scanning, bottom-penetrating, and computer color-enhanced sonar; and even psychic remote viewing. We cored coral heads to see whether sclerochronology could help us to date the remains. At home in the lab, we explored electronic, chemical and microscopic means to study artifact assemblages collected from early sites.

Fully aware that the ships and everything contained within them had originated in the Old World, we were delighted when Denise Lakey and Joe Simmons packed off to Spain for a year, hoping that during the course of their own project they also might discover information related to our research. And indeed, while Denise located repositories of historical documentation that could shed light on our wrecks, Joe toured Europe locating collections of early ordnance that could be compared to the artillery we were finding on Caribbean sites.

We contacted officials in the Bahamas and Turks and Caicos Islands, the Dominican Republic, Mexico, Jamaica, and Spain to negotiate permission to survey or to excavate sites in their waters. No less important were contacts we made with the original discoverers of the Highborn Cay, Molasses Reef, and

Bahía Mujeres Wrecks. Bob Wilke and Clint Hinchman supplied us with photographs and much useful information about the Highborn Cay Wreck. Alfonso Arnold, Bob Marx and Pablo Bush Romero helped us to relocate the Bahía Mujeres Wreck, and Pilar Luna, head of the underwater archaeology branch of Mexico's National Institute of Anthropology and History, organized the expedition during which it was found. We also received professional assistance from Herb Bump and James Levy of the Florida State Bureau of Archives and History Conservation Laboratory, who showed us how to build facilities to clean, conserve and store thousands of artifacts.

The work continued year-round. It included laboratory analyses and library research, preparation of popular articles, preliminary reports and funding proposals, and field work. By the end of 1985, we had consolidated our plans and were ready to implement an even more comprehensive strategy that will extend over the next two years.

Fueled by grants from the National Endowment for the Humanities, the Meadows Foundation, the Brown Foundation, the National Geographic Society, and Mrs. Nils O. Seim, this strategy includes a return to Molasses Reef to complete the excavation there, and expeditions to the Highborn Cay and Bahía Mujeres Wrecks, during which we will conduct test excavations and limited recovery of hull and ballast samples. Denise Lakey will return to Spain to continue her archival research, and Bill Lamb also will travel to Iberia to locate sources of stone for comparison with the Molasses Reef ballast and perhaps ballast from other New World sites. We also plan to survey two other known sites of Columbus-ship wreckings: at the mouth of Río Belén in Panama, where the caravel *Gallega* was abandoned in 1502, and on the north coast of Haiti, where the *nao Santa María*—perhaps the most famous ship of all time—was lost in 1492.



The only extant map known to have been drawn by Columbus is this amazingly accurate representation of the northwest coast of Hispaniola.

Good afternoon, Ms. Lakey. The photographs you have before you are of three unidentified shipwrecks: one from a small island nation just north of Haiti; one from the island chain of the Bahamas; and one in shallow waters close to the Mexican shore. We presently have no exact date for the sinking of these vessels. The few associated ceramic sherds indicate probable Spanish origin. Wrought-iron artillery recovered from each wreck hints at a date within the first half-century of European expansion into the New World. The presence on one of the wrecks of a small gun of basically 15th-century style indicates, for that site, a date within the first decades of the 16th century.

Your mission, Ms. Lakey, should you choose to accept it, is to identify these vessels and to provide us with the names of the crew and officers, lists of everything on board, descriptions of their sailing histories, and the purpose of each of the final, ill-fated voyages.

Had the task been presented to me in such a fashion, I would have smartly replied, "Get a better date upon which to focus the search, then come back to see me." However, site dating from artifact analysis in the case of the Molasses Reef and similar early wrecks may be a long time in coming [see *Newsletter*, 12:2]. To postpone implementation of historical research would be impractical.

As the scope of the early 16th-century nautical research has grown from excavation, conservation, and analysis of a single shipwreck into what now is colloquially called "The Big Picture," including both known but unidentified sites and historically referenced but as yet unlocated sites, our research has begun to focus on a return to the basics that have left so many of our questions unanswered.

Some time ago in a media interview about this early period of exploration and discovery, the question was asked, "Just how many ships do you suppose were lost? 25? 50? 100?" No one knew; no list had ever been compiled. So Don Keith, in his inimitable "Well, I'll-just-do-it" style, started such a list. Using only four basic, but nautically oriented, histories of the period of early exploration, he quickly compiled citations of 74 vessels known to have been lost in the Caribbean before 1520. Subsequently, in the course of our attempts to pinpoint the location of each wreck as closely as possible, it has become evident that more than one of the historians had little idea of just where some of these places were, despite the fact that they were referred to by name.

Yet another basic problem surfaced as we reviewed our

plan to send a small reconnaissance team to Haiti to investigate the possibilities and problems of looking for the *Santa María*. The question was posed: How do we really know where the *Santa María* ran aground? Of course we are studying those sources which all historians of the period study, but how accurate is the information? How much of it comes from people who actually were there? How much credence can be given to their words?

George Orwell once said, "The first duty of responsible people is to restate the obvious." It has become obvious to us that not only must we perform the standard task of examining the published information, but we also must seek out original sources to determine how historical interpretations may lead or mislead us in our search for the unlocated early sites and our quest to identify the others. Certainly this idea is not new: any archaeologist who has labored to correlate historical and archaeological records knows the difficulties.

The task is not an easy one. The story of the *diario*, or journal, which Christopher Columbus kept during his first voyage serves as an informative illustration of just one of the pitfalls.

While it is suspected that the holograph (the document in Columbus's own handwriting) of this journal was still in existence in the late 19th century, its location—indeed, its continued existence—today is uncertain. Several copies and an abstract are known to have been made, but only the abstract can now be found. As a result, modern historians have had to rely on only a shortened summary of this all-important record of the contact between Europeans and the New World.

The abstract and the only contemporaneous histories to utilize Columbus's journal relied upon copies. This fact is extremely important when interpreting Columbus's "own words" concerning the loss of the *Santa María*: the copier sometimes confused the words "miles" and "leagues" and the words "east" and "west." Such errors could send a too-credulous archaeologist to seek his site too far in the wrong direction.

Without doubt, the relocating of Columbus's original journal would be a *coup de maître*. However, such a find could only be serendipitous.

The task we have set for ourselves may seem to be a "Mission Impossible." We must compile an exhaustive list of all early discovery period wrecks and pinpoint in the real world those place names so easily passed over. Research in this latter area began in a broad sense with the work of geographer Carl O. Sauer and in a specific sense with the retracing of the four

Ne
Ho
By De

Necessary Use Of Documents Is Inherent Uncertainties

Erin Lahey

Columbus voyages by historian Samuel Eliot Morison.

To accomplish our task, we must thoroughly examine the published information and, more importantly, critically re-examine the known documentation for information missed, misinterpreted, or ignored by historians whose purposes were not the same as ours. We must seek new documentation likewise overlooked, misinterpreted or ignored because it makes only passing reference to a seafaring disaster or because it is housed in a lesser-known archive that is difficult to access.

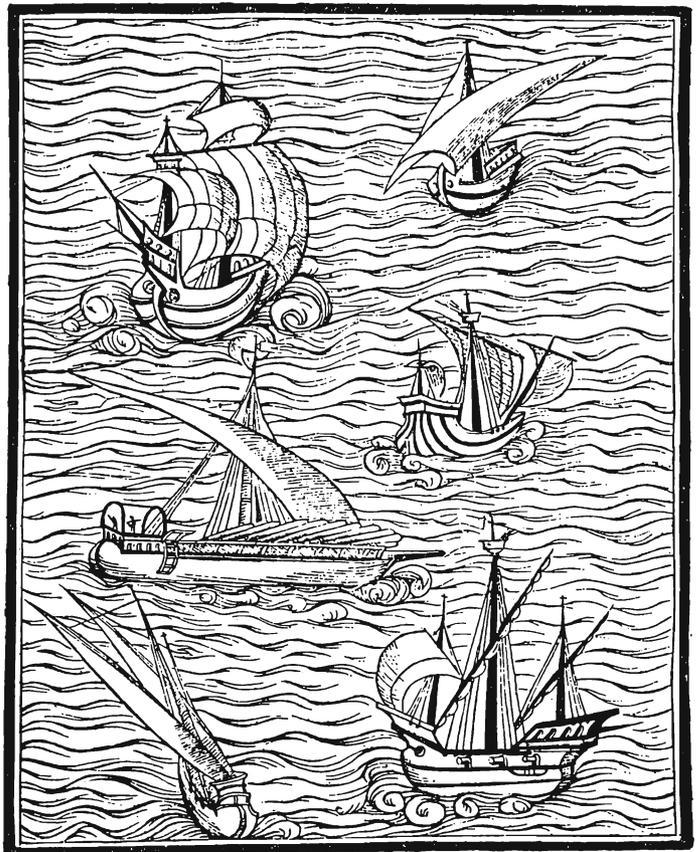
For those known wrecks which we wish to identify, we must always keep in mind that they may have been "extra-legal" or "unauthorized," making any documentation concerning the voyage even more difficult to locate or to interpret. We must consider that, as with artifacts, documents do not always survive. We must continually reinterpret the overall picture in light of new information gained from our work or that of others in the conservation lab and in the field.

Finally, we must restate the obvious: we must remain aware of the all-too-human tendency to wholly accept as truth whatever is written, be it a published authority or the firsthand account of a participant.

I am back on the second floor of the imposing 16th-century stone building that houses the Archivo General de Indias. My massive antique chair pierces everyone's labored silence with its groans each time my restlessness moves me. I longingly stare out the window at the blue sky and bright sun but return to the worm-eaten scrawlings that dump centuries-old blotting sand into my lap each time I turn a page. Ah=ah=ah=ah=CHOO! Is there anything of interest in this old document? No, only Doña Juana's protest over an unfulfilled contract of her deceased husband.

Then, there it is: the word "shipwreck." I swallow a childlike desire to squeal, "I found one!" Maybe it will be another false lead, ruled out when I read that the vessel sank in the Guadalquivir River just downstream from Sevilla. Nonetheless, I duly note the reference on a 4x6 card for possible future use on another project. But maybe, just maybe, it won't be a false lead. Maybe it really is the ship I'm looking for. And perhaps someday, after gathering tiny clues here and there like a modern-day gumshoe gathering clues at the county records office, clues which eventually solve the case, I'll know that it is the ship we seek.

Historic records and accounts are indispensable to scholars tracking leads and seeking details. But how trustworthy is the information?



Types of caravels were depicted by Pedro Medina in *Arte De Navegar*, 1545.

Enlivening History From Artifacts

MRW materials slowly provide clues to early ships
and a comparative collection for future finds

By Mark Myers and Joe Simmons

Once you have seen the artifact assemblage from the Molasses Reef Wreck, you begin to appreciate the meaning of no-frills voyaging. As the sign we left on the seabed atop the site declares, there is “No Treasure Here,” at least not in the conventional sense. There are no gold bars, no silver coins in neat stacks, no jewel-encrusted swords. The immediate impression given by the artifact assemblage is that the crew of this vessel carried only what they needed to survive in the unexplored New World: the ship itself, a few earthenware containers for food and drink, a few tools for keeping the ship afloat and personal equipment in order, and an incredible array of firepower.

We cannot say with assurance whether this impression is completely accurate. Much of what must have been carried aboard would not have survived the dynamic underwater environment of Molasses Reef. Practically all of the organic materials such as cloth, wood, rope and foodstuffs probably disappeared within the first few years after the sinking. But the fact remains that the individual artifacts we have found so far are extraordinarily ordinary. Unusually usual. While this in itself is useful information, the utilitarian commonality of the artifacts recovered to date from the shipwreck at Molasses Reef has prevented us from being able to use other available information in our efforts to date and to identify the vessel. There are several reasons for this.

The first concerns the applicability of the historic record. Most of the sources on post-medieval “material culture” are concerned strictly with special pieces, usually collectors’ items that probably have never seen a day outside of a museum. For example, if all we had to go on was the literature, we would have to assume, perhaps incorrectly, that the only two surviving examples of 16th-century bronze thimbles have come from the Molasses Reef Wreck and the *Mary Rose*. Documentation on these items is dominated by descriptions of gold and silver thimbles, making it extremely difficult for us to find a parallel for our bronze specimen. Probably others exist, but their descriptions may not have been published or even noted.

A second difficulty in our identification process stems from the fact that utilitarian objects frequently were not signed or otherwise marked by the craftsman. Even the guns recovered from Molasses Reef, which were examined carefully during their conservation treatment, are relatively devoid of ornamentation.

A third problem is that everyday items, and especially pieces of such items, can be quite unrecognizable when found alone or unassociated with related parts or objects. Rarely does a week go by without the plaintive cry ringing through the conservation lab, “Now, what the hell is this?”

Given these difficulties, what can we reasonably expect to

learn from the Molasses Reef shipwreck? This is an important question, for its answer, and the data we use to frame the answer, will be applicable to most of the early ships of discovery we intend to study.

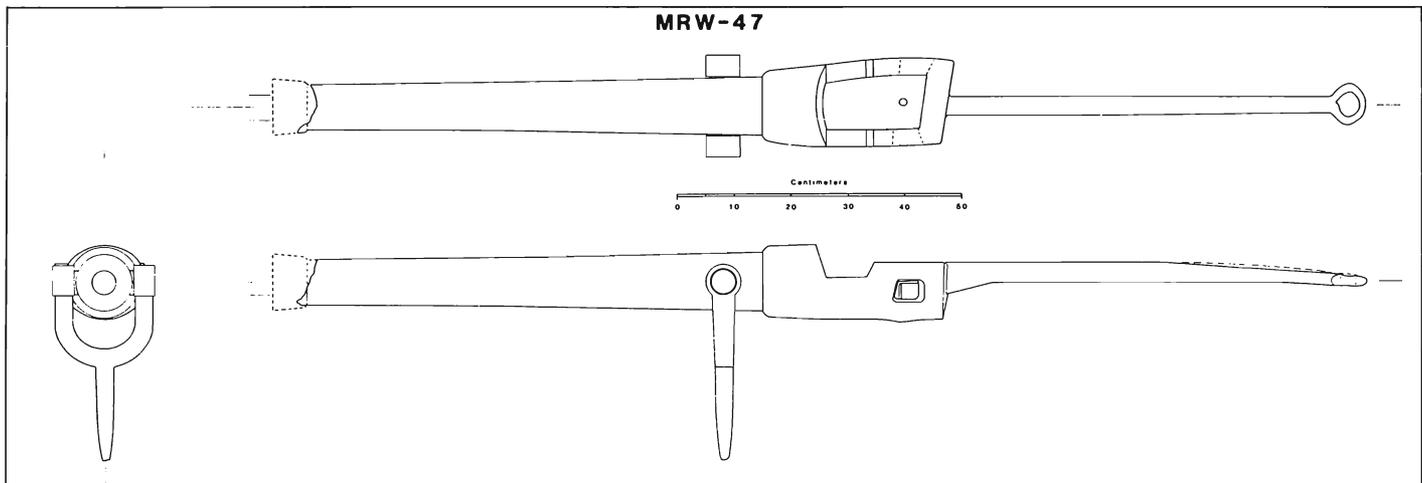
In regard to the Molasses Reef site, the single most important fact is that we have located and recovered nearly all of the ship’s complement of artifacts within certain categories. We have nearly all of the guns and shot, plus a generous assortment of fasteners, ground tackle and rigging. If we can match up a ship’s manifest with totals of certain groups of artifacts recovered from the wreck, we will have made a giant leap toward its identification.

Concerning individual artifacts, we have not yet found anything that specifically provides a year or place of origin. Coins, normally kings of the self-provenienced artifacts, are conspicuous by their absence. The only dating clues we have had to go by are the ceramic remains—a motley assortment of coarse earthenware fragments—and the armaments.

There are, however, a number of artifacts that ultimately may tell us something if we have the perseverance or luck to find comparable parallels. A decorated lead box, for example, which tentatively has been identified as an inkwell, may have cousins somewhere in a museum or in print. Other artifacts which may be datable include an embossed, wrought-iron sword pommel, a lead pump valve, and a pair of leg-irons. In addition, a few artifacts bear some sort of maker’s mark or decoration. Several of the guns have such markings, and one of the axe heads has a surprisingly clear set of initials stamped into one face. Again, a good comparative match might tell us a lot.

In addition to individual pieces, certain classes of artifacts may provide unique information. For example, the collection of fasteners hopefully will yield clues to the size of the ship and its method of construction. As a group, the shot is another example. The large shot were made in at least five different molds, one of which was found among the scatter of artifacts surrounding the ballast mound of the wreck. The presence of composite lead and iron shot in association with similarly sized cast-iron shot is another bit of technological information we are presently digesting.

However, of all of the artifact groups, the one that perhaps has told us the most has been the ship’s complement of ordnance. To date, the Molasses Reef Wreck has yielded a total of two *bombardetas*, thirteen *bombardeta* breech chambers, fifteen *versos*, about forty *verso* breech chambers, two *haquebuts*, hundreds of solid shot for these pieces, explosive shot or grenades, at least one shoulder arm, and two crossbows. Additionally, a *cerbatana*, at least two *bombardeta* breech chambers,



two *versos*, several shot, and half of a small bronze shot mold taken from the site by some of its earlier visitors have been located. We presently are attempting to have these kidnapped members of the artillery assemblage reunited with their brethren so that our picture will be clear and complete.

By all appearances, this ship was armed to the teeth. But for what reason(s)? Could the number and nature of the artillery collection, its shot and accompanying arms provide answers to this and other questions? If so, how?

To begin to answer, it is necessary to be intimately familiar with other contemporaneous collections of similarly manufactured guns; and for this, it is necessary to examine firsthand the individual pieces of such collections. We already have made a start on this requirement [see "Artillery in Focus," *Newsletter*, 12:4]. However, only a very few artillery assemblages exist which are comparable to our complement: the ordnance recovered from the 1554 wrecks off the Texas coast; the artillery and accessories salvaged by sport divers from the Highborn Cay Wreck in the Bahamas; those removed by CEDAM of Mexico from the Bahía Mujeres wrecksite; some of the guns found on the *Mary Rose*; and a particularly interesting group of pieces known as the Anholt Finds, recovered from a shipwreck site in the strait between Denmark and Sweden.

Analyses and comparisons with our ordnance is continuing, although already we have gleaned some valuable information. The guns found at the Highborn Cay wrecksite are very close to ours in size, appearance, and number. Moreover, their original distribution on and around the ballast mound was surprisingly like that of the Molasses Reef Wreck ordnance. Could these similarly sized and equipped ships have been on similar missions? Unfortunately, most of the artillery from the Bahamas site exists only in pictures; with the exception of two *versos* now in our lab, the whereabouts of other Highborn Cay guns are not known, and it will be extremely difficult to wring comparative data out of the images alone. Indeed, because they were never properly conserved, the guns may exist only as piles of rust, left to rot in someone's front yard, or as forgotten momentos hidden in the netherworld of someone's garage.

Analyses of individual pieces with unique characteristics, such as the *haquebuts* from the Molasses Reef Wreck, and the comparison of these with analogs elsewhere in the world are other possible sources of information. Similarly, we are learning a great deal about how early modern, wrought-iron artillery pieces were constructed. In addition to detailed external examinations given the Molasses Reef guns and powder chambers during their conservation, we have made opportunities to investigate them internally as well. One of the redundant *bombardeta* breech chambers acquired from an early site salvor



Among the Molasses Reef Wreck ordnance and accessories were fifteen *versos*, an example of which is shown above, an assortment of shot, and a shot mold. (Illustration: Joe Simmons; Photo: Mark Myers)

was offered for sacrifice. Using a rock saw loaned by the Texas A&M Department of Oceanography, we ceremoniously sliced a wedge out of the chamber, and the results have been very revealing. Through a close examination guided by our resident blacksmith, nautical archaeology graduate student Fred Hocker, we have been able to determine the exact method of manufacture and the sequence of steps in the process. Such thorough examination rarely, if ever, has been afforded to wrought-iron artillery in the past.

So why is all this work really necessary? Who cares besides us?

Military and technological historians are keenly interested in such information, including details which others might consider mundane or esoteric at best. Besides, we want to have an accurate grasp of every facet of the post-medieval material culture represented by the Molasses Reef artifacts. One can only learn so much from books, especially since books all too often perpetuate misconceptions or outright inaccuracies.

We are writing new chapters in the Book of New World Discovery and Exploration, and we are adding knowledge about facets of history elsewhere on the globe. At the bottom line, however, we would like to see accurately represented artillery and artifacts aboard accurately reconstructed replicas of Columbian vessels, planned for construction before the Quincentennial, instead of the highly questionable versions accepted in the past.

The artifacts of the Molasses Reef Wreck may be mundane and ordinary, but they are giving us insights into the routine activities of 16th-century mariners in a way that no frilly museum pieces could hope to accomplish.

Off-Spurned Ballast Is Seen As Another Data Source

The search for an identity and date of the MRW leaves no stone unturned

By William Lamb

It was not more than five minutes after I first met INA Research Associate Don Keith that he had me looking at ballast stones.

I was a prospective student of Texas A&M's nautical archaeology specialization, touring the Molasses Reef Wreck (MRW) conservation laboratory, and I happened to mention my background in geology. Keith believed a considerable amount of information about the shipwreck could be discovered by studying the ballast. His research goal was to determine whether the encountered rock types and their relative positions within the ballast pile could provide clues about the vessel's voyage history or where the ship had been built. The possibilities of ballast research intrigued me at the time, and now I have the task of trying to make these rocks speak.

A neglected artifact

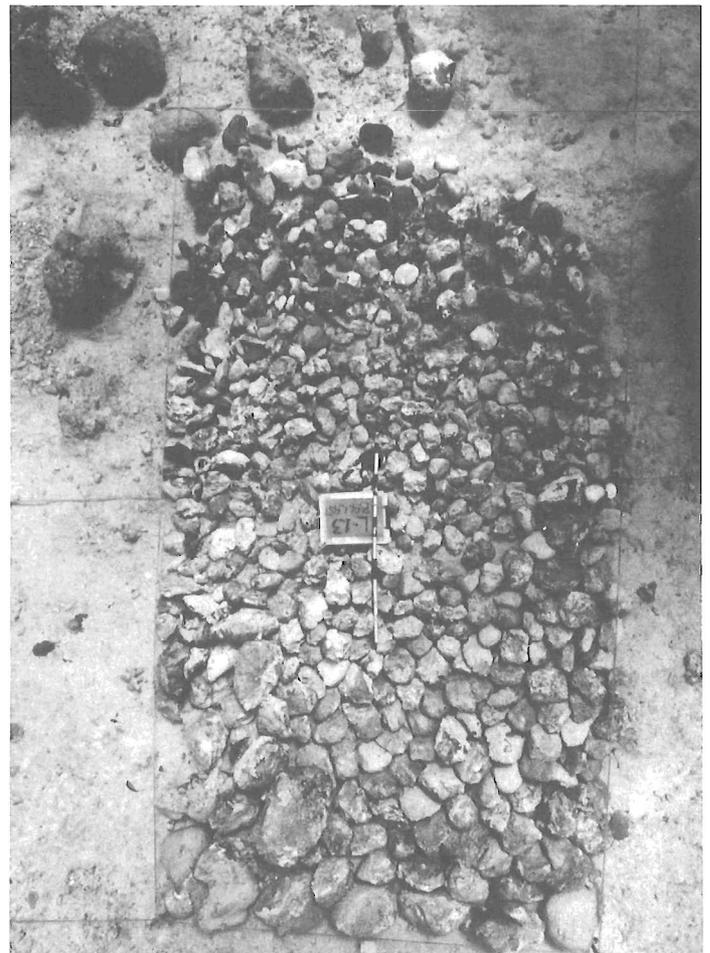
Stone ballast usually is neglected in the study of shipwreck archaeology because of the common belief that too many confounding factors exist for it to provide much useful information. However, in the case of the MRW project, where the recovered artifacts have not provided definitive evidence of the vessel's identity, ballast analysis is a necessary avenue of research. Before site excavation was begun, INA archaeologists decided to record and to study the ballast material in situ and later in the lab, treating the ballast pile as one large artifact. During the excavation, several cross sections, or transects, were made through the mound, during which stones and the positions of the stones were mapped on sheets of mylar. The recorded rocks then were removed from the seabed and transported back to Texas A&M for analysis.

The configuration of the original mound actually was rather ragged and unmeasurable. Because the stones would have to be moved in order to excavate the wooden hull remains beneath, Project Director Keith had his team transfer all ballast, except a small cube that was left intact, into a rectangular area off the site; the transplanted pile eventually measured 3 x 8 x 1 m in size. Then, through a series of calculations based on the density of a control sample recovered from the site and the size of the rearranged pile, a total weight in tons of ballast was derived. This information was sought to aid in determining the size of the ship.

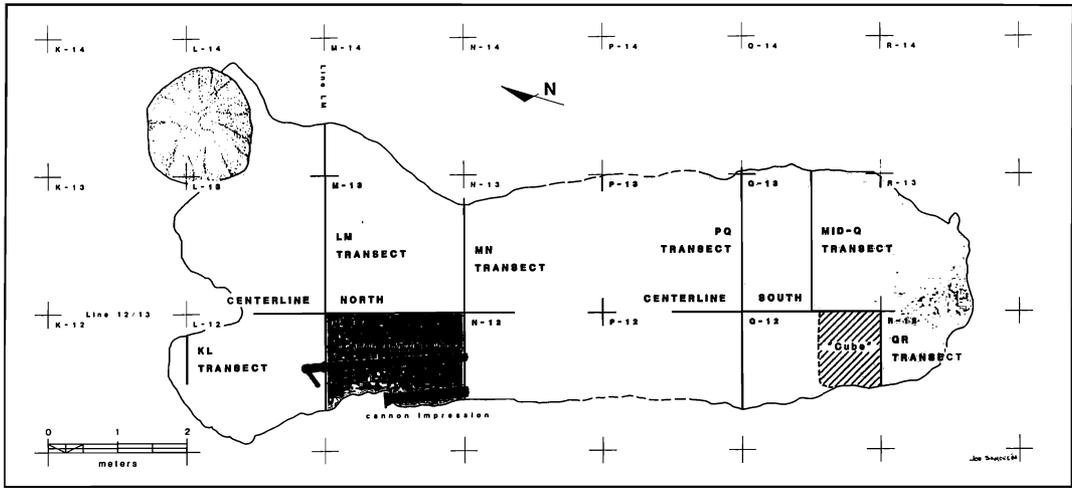
Unique constituents studied

When I embarked on my study of the recovered rocks, I realized that only those ballast stones possessing unique mineralogic or textural characteristics would be traceable to specific localities. Given that, the most useful rocks generally would be

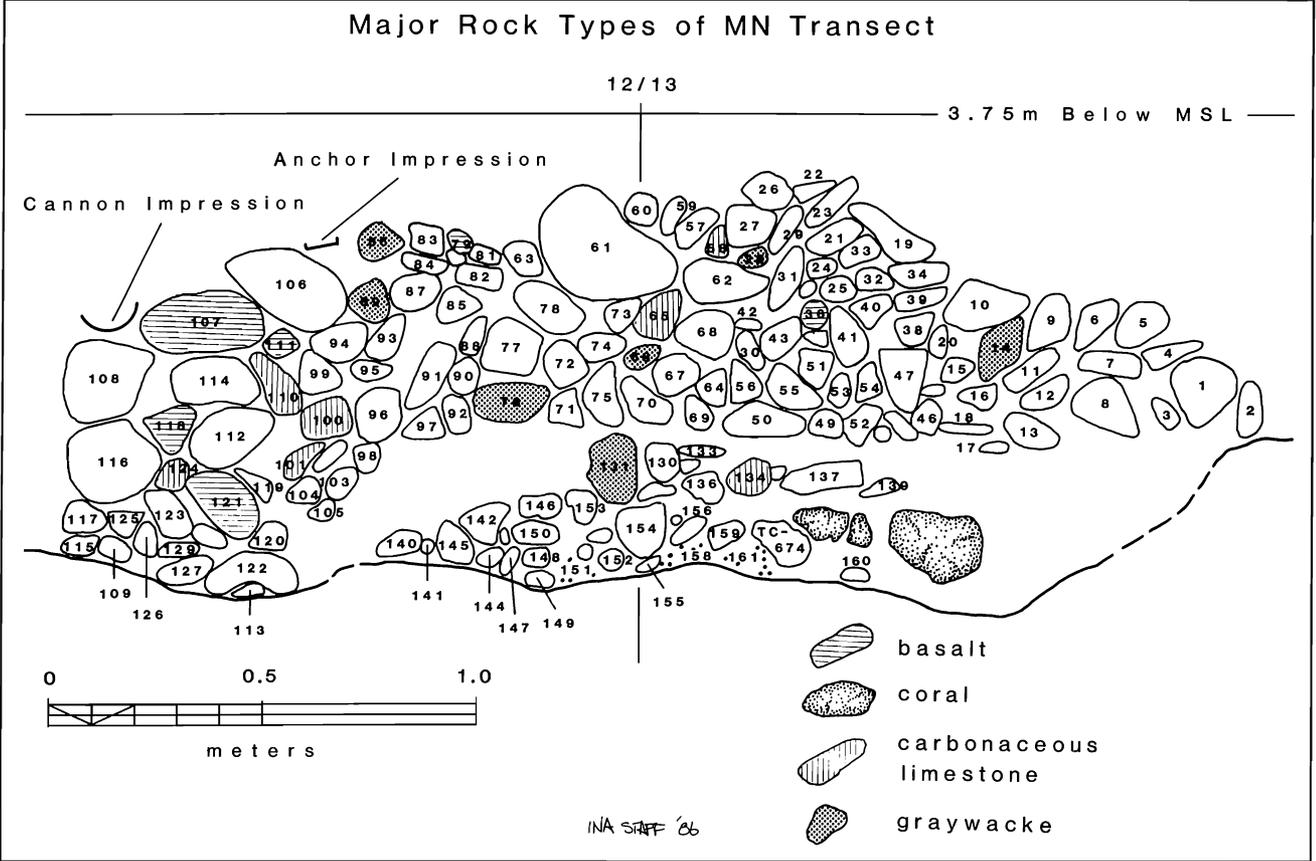
those of an igneous or metamorphic origin. Moreover, the relative percentages of constituent minerals in each rock would need to be determined accurately. To undertake these necessary observations, use of a polarizing microscope was required, so I had to review my petrography skills with a thin section course from the Texas A&M geology department. The one-thousand-plus stones involved in this project also demanded the use of a computer



Ballast stones excavated from the Molasses Reef Wreck were arranged in an examination area. (Photo: Dennis Denton)



The locations of transects where MRW ballast profiles were made are indicated on the site plan left. Having previously been trenched by salvors, the middle of the mound could not be reconstructed. A cube of stones was left intact to be excavated later and disassembled in the MRW conservation laboratory. Below is an illustration of one of the transects through the ballast mound. (Illustrations: Joe Simmons and INA staff)



data-base system to process the enormous amount of information in a variable but comprehensible manner.

Armed with a hand lens, rock hammer, pocketknife and looseleaf notebook filled with rock identification forms, I began to sort the rocks from one cross section by hand specimen identification. Selected rocks were cut into small rectangles with a diamond saw and sent off to be ground down to thin sections. As of this writing, I have completed analysis of the first ballast cross section and tentatively can report that some distinguishable groupings of like stones can be made within that transect.

When all of the pertinent ballast stones have been identified and the thin sections have been examined and described,

the next step will be to travel to the possible source areas to collect samples for comparative analysis. Because this wreck dates approximately to the Age of Exploration, the ballast material most likely will have come from the Old World, thus reducing the number of potential source areas. My field collection will begin on the Iberian peninsula since we infer that the ship was of Spanish origin. I will be using geologic maps to screen target areas beforehand, and plan to collaborate with a Spanish geologist to streamline the sampling process. The collected samples then will be made into thin sections and compared with those from the MRW assemblage. Hopefully, tangible correlations will appear that will enable us to link the ballast stones to their original locations.

Scant Hull Fragments Offer Small But Meaningful Clues

By Thomas Oertling

I have always related what I do in ship reconstruction to detective work as there are many similarities. My present "case," for example, developed about 500 years ago with the demise of a vessel near the Turks and Caicos Islands. While fellow investigators sleuth other aspects of this unsolved shipwreck, my assignment is to reconstruct the series of events—the building, sailing and sinking of the ship—that enabled the mystery to unfold. This is no small task, but critical, for without an explanation of the "corpus delicti," the rest of our evidence has meaningful but isolated significance. Furthermore, because we hope to tie this shipwreck to a larger pattern of events, every clue we uncover will be valuable for future comparisons.

And so, like any well-trained gumshoe, I proceed by examining small, disparate hints. Unfortunately, in this case many of the clues have been scattered and lost by nature and time.

The wooden hull remains of the Molasses Reef Wreck, looking like so much black, soggy cardboard, consist of four or five strakes and about twenty-four frame positions, covering an area of 7.5 by 1.5 meters. The pieces which survived were directly beneath the ballast, but even so, in the center of the preserved portion, there exists a large gap in the outer planking. On the seabed, vestiges of the frames in this area were lying at an angle to the others, which tells me that when the ship broke up there was a massive torquing of the hull that left the middle portion twisted and broken. The once-solid oak members have suffered greatly from their nearly five centuries under water. Most of the edges and surfaces have eroded away, taking with them clues left by the shipwrights' tools.

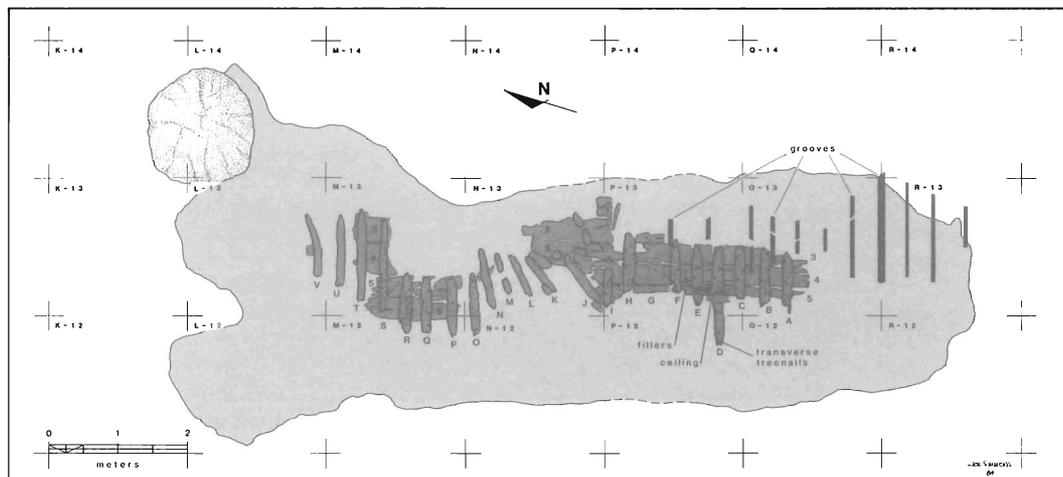
So far this case looks pretty perplexing. The wood is like soggy cheese; there are few tool marks of consequence; and the members that remain constitute about two percent of the hull.

However, an important deduction derives from the absence of remnants of the large, telltale keel: at least I know that our hull remains are *not* from the very bottom of the ship. From the edge of the outermost ceiling plank, short planks angle down to the outer planking and fill the space between the frames. Now where in the hull could these have been? Like any sleuth who uses previous crimes to find the *modus operandi*, I refer to other wrecks to interpret parts of our vessel which no longer exist. From roughly contemporaneous examples—the *San Juan* in Red Bay, Labrador; the Cattewater Wreck in Plymouth, England; and the Medieval ship at Rye, Sussex, England—I know that our remains are less than a meter from the keel. We have that part of the hull which rises from the keel but is just short of the turn of the bilge.

The frames are the first futtocks, and upon examination, I find that they were joined to the floors with two horizontal treenails and a dovetail mortice and tenon. The remains of a mortice are found on one of the futtocks and a displaced fragment retains one of the tenons, thus identifying the piece as a floor. The ship is beginning to come together despite the sparse evidence.

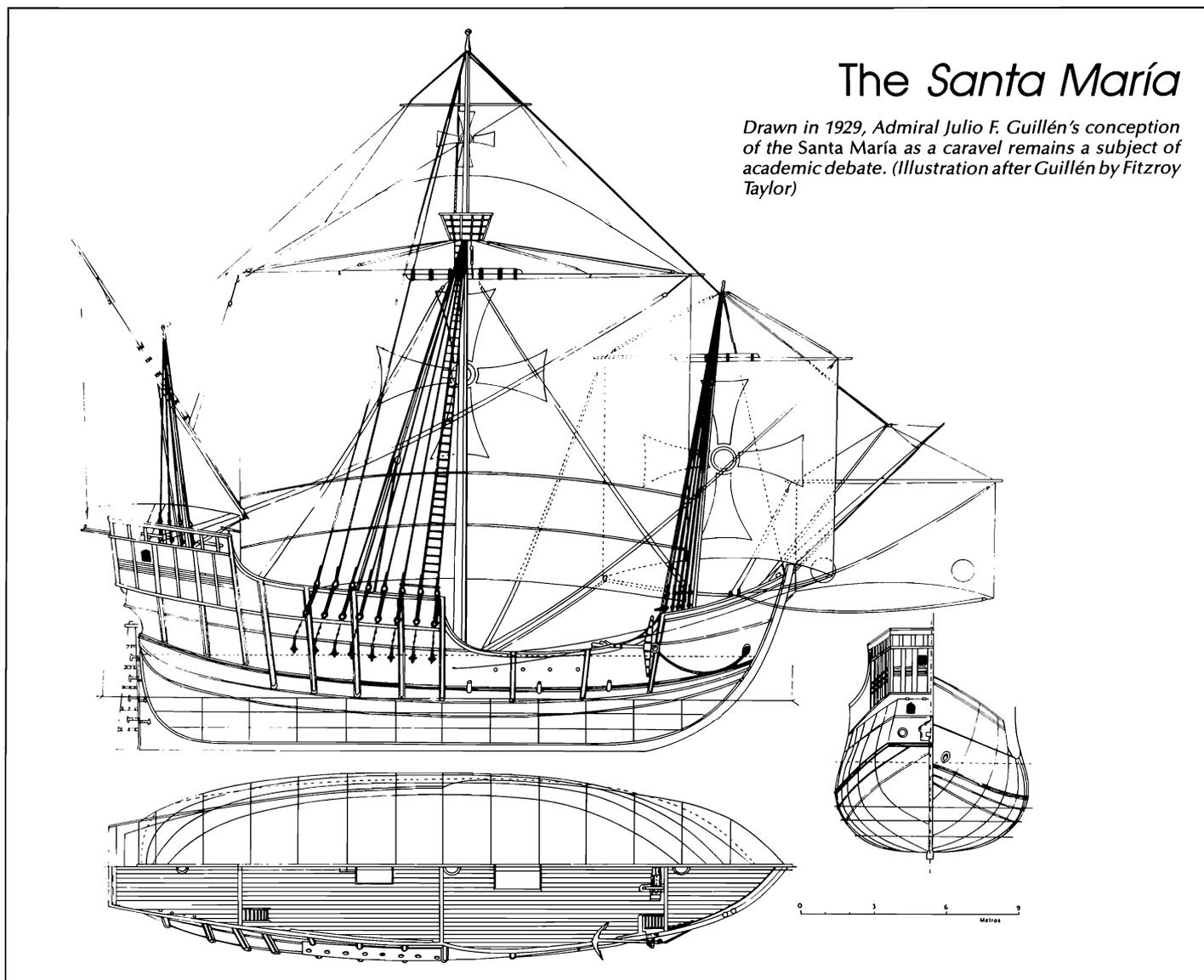
Other valuable clues are found in the large selection of iron fasteners, fittings and hardware. There are at least four types of iron hull fasteners, and the wooden treenails make five. Some of these types can be found in the extant wood remains. By comparing the diameters, lengths and frequency of the different types, possibly I can gain some idea of where each type was used on the ship. From the number, varying sizes and distribution of the chain rigging pieces, I may be able to infer the number of masts and the type of rig. Three rudder gudgeons have been found, but not the corresponding pintles. However, the gudgeons give me the profile of the stern of the ship

The scant wooden remains of the MRW hull will share only a few details about the construction of ships of discovery—one reason why other early sites are planned for excavation and study. (Illustration: Joe Simmons)



The Santa María

Drawn in 1929, Admiral Julio F. Guillén's conception of the Santa María as a caravel remains a subject of academic debate. (Illustration after Guillén by Fitzroy Taylor)



including the dimensions of the sternpost. This latter clue is important because it provides a rough estimate of the size of our vessel. When I add to this our information about the weight of the ballast and the ordnance, I have a starting point for calculating the tons burden of the ship.

Even the ordnance and other hardware is of value in solving the mystery. Study of the *bombardetas* has shown that with their wooden carriages they would have been about 4.5 m (15 ft) long, which indicates the minimum breadth of the ship. The position of the *bombardetas* and the anchor on top of the ballast suggests the relative location of a hatch in the deck.

Little by little, the clues are coalescing as I reconstruct the evidence from this shipwreck. From even the most scanty remains, we will better-understand the circumstances of this vessel and its contents; consequently, we will better understand the larger mysteries of the ships that sailed to the New World five centuries ago. The clues we work with are curious: some are obvious, some are obscure; some are helpful, and some are misleading. However, they all are important. With diligent sleuthing, perhaps one day I will say to myself, like Ellery Queen, "You now have all the information you need to solve the mystery. Do you know who did it?"

For Additional Reading

Among the articles published about INA's ships of discovery research are:

Keith, D. H., J. A. Duff, S. R. James, T. A. Oertling, and J. J. Simmons. "The Molasses Reef Wreck, Turks and Caicos Islands, BWI: A preliminary report." *Int. Jour. of Nautical Archaeology* 13(1):45-63.

Smith, R. C. "Fathoming Columbus's Caravels." *Americas* 36(5):18-23.

Keith, D. H. and J. J. Simmons. "An Analysis of Hull Remains, Ballast and Artifact Distribution of a 16th-Century Shipwreck: Toward a Better Understanding of Wrecking and Reconstruction." *Journal of Field Archaeology* 12(4):411-424.

Smith, R. C., D. H. Keith and D. C. Lakey. "The Highborn Cay Wreck: Further exploration of a 16th-century Bahaman shipwreck." *IJNA* 14(1):63-72.

Myers, M. D. "Estudio arqueológico de los barcos de exploración y descubrimiento de los siglos 15 y 16." *In Cuarta semana de la ciencia y las actividades subacuáticas*. Mexico City: Secretaria de Pesca, 1985.

Smith, R. C. "The Search for the Caravels of Columbus." *Oceanus* 28(1):74-77.

Smith, R. C. and D. H. Keith. "The Archaeology of Ships of Discovery." *Archaeology* 39(2):30-35.



INSTITUTE OF NAUTICAL ARCHAEOLOGY

P.O. Drawer AU, College Station, TX 77840

409/845-6694

OFFICERS—ADMINISTRATION

Donald A. Frey, President
George F. Bass, Archaeological Director

Michael L. Katzev, Vice-President
Rebecca H. Horlen, Secretary/Treasurer

BOARD OF DIRECTORS

John H. Baird
George F. Bass
Duncan Boeckman
John C. Calhoun, Jr.
Charles Collins
Mrs. John Brown Cook
Frank Darden
Michael J. Davidson
Claude Duthuit
Donald G. Geddes, III

Nixon Griffis
Harry C. Kahn, II
Michael L. Katzev
Jack W. Kelley
David C. Langworthy
Robert E. Lorton
Frederick R. Mayer, Chairman
Melvin M. Payne
Clinton A. Phillips

Ray H. Siegfried, II, Vice-Chairman
Williams T. Sturgis
Frank E. Vandiver
Robert L. Walker
Lew O. Ward
Peter M. Way
Garry A. Weber
Martin A. Wilcox
George O. Yamini

STAFF

Sheila Matthews
Mark D. Myers
Netia Piercy
Robin C. M. Piercy
Sema Pulak

KC Smith
J. Richard Steffy
Murat Tilev
Tufan Turanli
Frederick H. van Doorninck, Jr., Ph.D.

ADJUNCT PROFESSORS

Edwin Doran, Jr., Ph.D.
Cynthia J. Eiseman, Ph.D.
John Gifford, Ph.D.
D. L. Hamilton, Ph.D.

Carolyn Koehler, Ph.D.
David I. Owen, Ph.D.
David C. Switzer, Ph.D.
Gordon P. Watts, Jr., M.A.

RESEARCH ASSOCIATES

Jeremy Green
Donald H. Keith, M.A.
Denise Lakey, M.A.

Cemal Pulak, M.S.
Donald Rosencrantz
Roger C. Smith, M.A.

SUPPORTING INSTITUTIONS

Australian Institute of Maritime Archaeology
Boston University
Brown University
Bryn Mawr College
University of California, Berkeley
University of Cincinnati
Cornell University
Corning Museum of Glass

Departamento de Arqueología Subacuática de la I.N.A.H., Mexico
Kittery Historical and Naval Museum
Maine Maritime Academy
University of Maryland, Baltimore County
Massachusetts Institute of Technology
University of New Hampshire
New York University, Institute of Fine Arts

University of North Carolina, Chapel Hill
Partners for Livable Places
University Museum, University of Pennsylvania
Shell of Turkey, Ltd.
Texas A&M Research Foundation
Texas A&M University
University of Texas, Austin