The *Monitor* at Drewry's Bluff

(continued from page 10)

good commander to withdraw. I suppose the secession sheets are shrieking with delight at the defeat of the Lincoln gunboats. Our turn will come soon when we can act in conjunction with McClelland [sic], who is forcing his way toward the Rebel capital.

We came down the river in the evening & are now (Friday morning) [May 16] lying at anchor off City Point...I went on board the Galena at the termination of the action &...she looked like a slaughter house... of human beings....

[Editor Daly notes that, despite Keeler's statement that the Drewry's Bluff engagement was not a defeat for the Federal vessels, it was in fact viewed as a defeat. Admiral Goldsborough on May 12 wrote to Gideon Welles: "The Monitor and Stevens have both gone up the James River, with orders from me to reduce all the works of the enemy as they go along, spike all their guns, blow up all their magazines, and then get up to Richmond, all with the least possible delay, and shell the city to a surrender." The Navy did not pass the barrier until 1865.]

Perspectives on the Civil War

1993 Civil War Lecture Series

Presented by

The Mariners' Museum & *Monitor* National Marine Sanctuary
The Mariners' Museum ▪ 100 Museum Drive ▪ Newport News

Sunday, July 25, 2:00–3:00 P.M.
Huntington Room
Iron Sides and Iron Hearts: The Crew of the Monitor, Mark Greenough, *Public Historian, Living History Associates, Ltd.*

Sunday, August 22, 2:00–3:00 P.M.
Huntington Room
The Battle of Mobile Bay: A Case Study in Modern Warfare, Dr. Emory M. Thomas, *Professor of History, University of Georgia*

Friday, September 10, 5:30–6:30 P.M.
Huntington Room
The Monitors and Admiral Samuel DuPont's Attack on Charleston, William Dudley, *Senior Historian, Naval Historical Center*

Sunday, October 17, 2:00–3:00 P.M.
Huntington Room
The Monitor *Revisited: The 1993 Field Season*, John Broadwater, *Manager,* Monitor *National Marine Sanctuary*

These events made possible in part by funding from Sanctuaries and Reserves Division, National Oceanic and Atmospheric Administration

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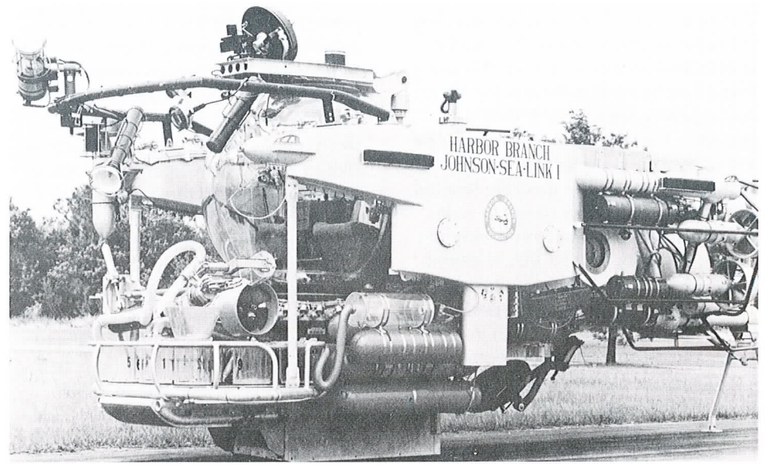
Monitor National Marine Sanctuary Activities Report
CHEESEBOX

Volume VI, No. 1 **July 1993**

NOAA PLANS MAJOR SCIENTIFIC EXPEDITION TO THE *MONITOR* IN 1993



The Johnson-Sea-Link *submersible will support the 1993 expedition to the* Monitor *National Marine Sanctuary.*

In July of this year NOAA will launch its first major expedition to the *Monitor* since 1987. Known as the *Monitor* Archaeological Research and Structural Survey (MARSS), the expedition involves a variety of investigations that will be carried out by a team of scientific divers and a manned submersible. MARSS will be conducted from the 168-foot research vessel *Edwin Link*, which is being chartered from the Harbor Branch Oceanographic Institution in Fort Pierce, Florida. All dives will employ mixed-gas technology in order to avoid the adverse effects which result from breathing compressed air at the *Monitor's* depth. (Most dive training organizations urge divers not to go below 130 feet on compressed air, and the *Monitor* lies in 230 feet of water.) Diving operations will be supported by a NOAA open diving bell, a deck decompression chamber, and a team of NOAA diving experts. In addition, the manned submersible *Johnson-Sea-Link* will be on hand to record the site and site operations on high-resolution color video. Sanctuary Manager John Broadwater will direct the expedition and participate in the diving. MARSS is being conducted by the Sanctuaries and Reserves Division of NOAA.

MARSS is an essential first step in assessing current management options for such issues as site stabilization, archaeological and research needs, and increasing public access to the Sanctuary. NOAA has been requested by various elements within the sport diving community as well as by several members of Congress to reevaluate policies related to public access at the Sanctuary. Before that can take place, however, NOAA must first conduct a detailed on-site assessment in order to comply with Federal historic preservation legislation.

There is also an urgent need to conduct a detailed assessment of the *Monitor's* hull. In recent years, NOAA has observed accelerated deterioration of the hull. Evidence points to both natural and human causes. A detailed assessment of these changes is an essential prerequisite to any plan to stabilize the hull by mechanical or electrochemical means. Divers conducting research on the *Monitor* have discovered more than a dozen fragile glass bottles on the wreck, apparently uncovered by the strong currents that sweep through the site. Archaeologists must map and recover these and possibly other artifacts before they are damaged or lost due to additional erosion or other causes. Archaeologists will also conduct a limited test excavation within the base of the turret to determine its condition and possible contents. As a pilot project for hull stabilization, divers will pump sand from the periphery of the site to an area beneath the hull to shore up the hull and relieve stresses. If successful, the entire area beneath the hull could be filled with sand to support the hull. NOAA will also deploy a permanent single-point mooring and sub-surface buoy suitable for supporting future expeditions to the site.

Research Objectives

NOAA has divided expedition goals and objectives into two categories, primary and secondary, to indicate their

relative importance and to indicate the criteria applied to the development of contingency plans. NOAA's research and management goals, as described in the Draft Revised Management Plan distributed in May 1992, as well as suggestions and comments from persons who reviewed the draft plan, were the basis for the expedition priorities.

Primary research goals

Deployment of a permanent mooring at the sanctuary: NOAA will deploy a clump anchor of approximately 4,000 pounds weight at a position about 50 feet off the *Monitor's* port stern (i.e., northeast of the stern). The location for the mooring anchor is a function of the prevailing currents at the site and the anticipated future usage of the mooring. Prevailing currents will carry the buoy and mooring lines away from the *Monitor*. The anchor will be located far enough away to protect the wreck against chafing by the mooring line but close enough to allow divers to swim from the anchor to the wreck without undue difficulty. The NOAA National Data Buoy Center will help determine the final size of the anchor based upon a maximum drag weight of an inflatable boat, two divers and related equipment. Project personnel will affix a subsurface float to the mooring anchor using line or cable.

Recording horizontal and vertical measurements of key hull components: the expedition director will determine the final hull points to be measured after an analysis of recent changes at the site. Scientists will record horizontal and/or straight-line distances between key points on the hull for use in periodic assessment of changes in the site. They will also record key relative elevations on the hull using a preselected point on the rim of the turret as a datum. These measurements will be used for updating the site three-dimensional model and for periodic assessment of site changes.

Mapping and recovering exposed and threatened artifacts: project personnel will establish a temporary baseline forward of the midships bulkhead to serve as a reference for mapping. They will then record the position of the baseline. Project personnel will also establish a reference elevation datum at the rim of the turret and document its position. Archaeologists can then record artifact locations in plan and elevation and photograph their locations. Finally, archaeologists will recover the artifacts, which will be placed in the care of a conservator for cleaning and treatment.

Conducting a test excavation within the turret: first, archaeologists will carry out a small test excavation within the base of the turret to determine whether the turret floor is still in place. They will also determine if artifacts and deck plating have fallen into the turret from the hole in the deck above the *Johnson-Sea-Link* submersible will have a special thruster located on a bracket near the submersible's bow. The submersible pilot will maneuver the submersible to a position over the turret in the desired location near the forward portion of the turret where the main crossmember is attached to the turret wall. This is the location where a hatch in the base of the turret should be located. An archaeologist will closely supervise the excavation from within the pilot sphere of the submersible, and/or in the water next to the turret. The excavation should not need to penetrate more than 3-6 inches before the base (floor) of the turret is encountered. Even if the wooden floor of the turret has disintegrated, the metal framework should still be in place. Archaeologists will examine whatever remains are encountered. If wooden decking is still present, it will be carefully probed with a wire or knife blade to reach a subjective determination of the extent of deterioration and damage from teredo worms. If practical, archaeologists will recover a wood sample from the turret floor.

Secondary objectives

Stabilizing a portion of the hull with sandbags and dredged sand: first project personnel will assess the feasibility of pumping sand from the site perimeter to the area beneath the hull where the hull is suspended off the bottom as well as the effectiveness of pumped sand in supporting and stabilizing the hull.

If project personnel determine that this activity is feasible, they will use a hydraulic dredge with extended hose sections to pump sand beneath the wreck. They will carry a long suction hose approximately 50 feet to the north of the hull, out of the primary debris field, from which they will pump sand to an area under the hull to be selected by an archaeologist after an initial inspection.

The archaeologist will select the area based upon how well the sand is likely to be contained by the hull in the face of constant currents. Divers will anchor the discharge hose in the desired location beneath the hull where sand is to be deposited. They will lower sandbags to the bottom for placement beneath the hull as needed to help shore up the area being filled with sand. Divers will also place several small pvc rods, marked at one-foot increments in the area before sand pumping begins, so that progress can easily be gauged. The rods will permit periodic measurements to be made in the future to determine if the sand remained in place or was scoured away or transported to another location.

Recording select portions of the hull in high-resolution video: project personnel will first videotape the underside of the hull forward and aft of the turret and in the vicinity of the pilot house. They will then videotape the stern, with special attention to the skeg, shaft, propeller and debris field where recent changes have been noted.

Deploying a current meter and thermograph and recovering the thermograph placed at the site in 1991: divers will recover the thermograph already in place and deploy a current meter and thermograph. These instruments will record long-term site environmental conditions, specifically water temperature and current velocity and direction.

Recovering selected artifacts from within the hull: project archaeologists will select artifacts for recovery based on an analysis of recent site video records. Artifacts considered for recovery include the broken portions of a serpentine-spoked wheel that activated a valve chest for reversing the engine and glass bottles that have been uncovered by currents.

Previous expeditions have located a number of bottles within the hull forward of the midships bulkhead. In order to map the locations of these artifacts, project personnel will establish a temporary baseline by using a vinyl-coated

(continued on page 11)

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PHOTOGRAPH BY RICHARD GARY

A costumed interpreter greets visitors to the Monitor *exhibit* Clash of Armor.

Discover 3,000 Years of Maritime History at The Mariners' Museum

One of the largest international maritime museums in the world, The Mariners' Museum in Newport News, Virginia, is dedicated to "preserving the culture of the sea and its tributaries, its conquest by man, and its influence on civilization." Since its founding in 1930, the museum has developed a collection of more than 35,000 maritime artifacts including ship models, scrimshaw, maritime paintings, decorative arts, intricately carved figureheads, working steam engines, and other items. The interpretation of its collection, which reflects man's use of the sea for transportation, food, battle, and pleasure, offers visitors insight into 3,000 years of maritime history.

The Galleries

Among the museum's newest galleries is the Age of Exploration, one of The Mariners' "core curriculum galleries" designed to cover important concepts of maritime heritage and experience. Through a fascinating collection of maps, ship models, charts, and books, the gallery chronicles the scientific and technological changes in shipbuilding, ocean navigation, and cartography that made the explorations of the fifteenth through eighteenth centuries possible. A unique hands-on Discovery Library features reproductions of early charts, books, maps, and navigation instruments for visitors to examine. Complementing the exhibit are fifteen short videos that help bring the Age of Exploration to life.

Other galleries include the *Engage the Enemy More Closely: Admiral Horatio Nelson* gallery, which highlights the brilliant career of the British admiral; the Chesapeake Bay Gallery, which pays tribute to this great body of water through maritime artifacts and photographs, work and pleasure boats unique to the Bay, fiber-optic maps, and interactive exhibits; and the "William Francis Gibbs: Naval Architect" gallery, which highlights the career of the man who designed the SS *United States*, World War II Liberty ships, and more than 6,000 naval and commercial vessels. The Mariners' Small Craft Collection reflects the international scope of the museum with more than forty vessels from five continents, including a gondola from Italy, canoes from Africa, and sampans from China and Burma.

Among the museum's most popular exhibits is the Crabtree Collection of Miniature Ships—sixteen exquisitely detailed hand-crafted miniature ships that depict the evolution of the sailing ship. The collection reflects twenty-eight years of intensive effort by artist-carver August F. Crabtree, whose models, most of them built to the scale of 1/4 inch to the foot, are truly miniature ships. Each vessel is constructed in the same way its full-size counterpart was built and many are decorated with incredibly detailed carvings.

The Mariners' Great Hall of Steam relates the story of oceangoing commercial steamships and includes the *Clash of Armor* exhibit which tells the story of the famous battle between the USS *Monitor* and the CSS *Virginia*. The exhibit features artifacts from the *Monitor* National Marine Sanctuary including the ship's iron anchor and navigation lantern. A video recorded in the sanctuary takes visitors on an underwater tour of the *Monitor* wreck site as it appears today. A platform in the shape of a ship's bow provides a stage for costumed interpreters who are on hand periodically to talk with visitors about the work of the *Monitor's* crew and life aboard an ironclad.

Other museum galleries include an Antique Boats Gallery, Carvings Gallery, Photography Gallery, Maritime Paintings and Decorative Arts Galleries, and Ship Models Gallery. Complementing the galleries is the award-winning film *Mariner*, which highlights maritime activity the world over. In addition, costumed historical interpreters including a woodcarver, eighteenth-century sea captain, and merchant sailor appear periodically in the galleries, bringing to life nautical skills as well as maritime history.

Educational Outreach

The museum's extensive educational program includes outreach to more than 21,000 students in local school systems each year. Small groups of students participate in hands-on classes, on-site demonstrations, and interpretations that bring maritime history to life. A variety of collaborative programs, hands-on activities, and family programs provide additional ways for young people and adults to learn bout maritime history. Other educational outreach activities include participation in annual community events and on-site workshops at schools and other locations.

The museum's Maritime Lecture Series reaches more than 1,000 individuals who learn about maritime history and current events from some of the nation's leading experts. A lecture series titled "Perspectives on the Civil War," sponsored by the museum and the *Monitor* National Marine Sanctuary, offers lectures, historical interpretations, and demonstrations led by knowledgeable maritime experts and historians. An Antique Motorboating Symposium co-sponsored by the museum and the Antique and Classic Boat Society draws motorboat enthusiasts from across North America for a weekend of workshops and hands-on demonstrations led by some of the most respected authorities in the antique motorboating field. The Mariners' "Exploring Our Maritime Heritage" travel program offers participants behind-the-scenes visits to local and foreign maritime sites and insight into maritime history in ways not generally available to other travelers.

The Collection

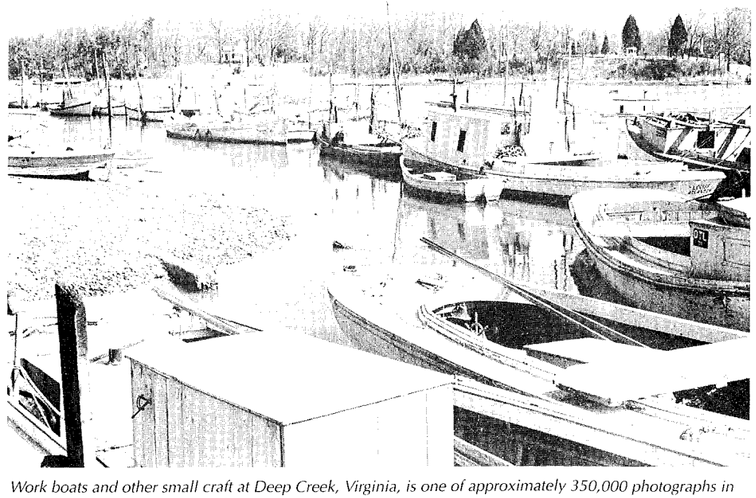
The museum continues to maintain and increase its vast collection of more than 35,000 maritime artifacts, more than 600,000 historic photographs and negatives, 70,000 volumes, and one million manuscript items. Currently, the museum is involved in a project to preserve and duplicate a segment of its photographic negatives depicting maritime history. Under a $228,000 grant from the National Endowment for the Humanities, the museum had duplicated several major negative collections, including those by Edwin Levick, Samuel Ward Stanton, and A. Aubrey Bodine.

Recent acquisitions include a beautifully detailed model of the RMS *Titanic* and one of the enormous propellers from the SS *United States*.

The Park and Noland Trail

The museum is located in a 550-acre park which features the Noland Trail, a five-mile walking trail surrounding picturesque Lake Maury. Picnic areas are available and boats may be rented for fishing throughout the year. The museum's park is a focal point for special events including an annual Earth Day celebration. Each summer the museum sponsors free outdoor concerts for the community.

The Mariners' Museum is an educational, nonprofit institution, accredited by the American Association of Museums. Located at the intersections of J. Clyde Morris and Warwick boulevards on the historic Virginia Peninsula, The Mariners' is accessible from Exit 258A on I-64. Hours are 9 a.m. until 5 p.m., Monday through Saturday, and noon to 5 p.m. on Sunday. Admission is $5 adults; $1, students (valid ID required for students age 18 and over), free for children under 6. For further information call the museum at (804) 595-0368.



Work boats and other small craft at Deep Creek, Virginia, is one of approximately 350,000 photographs in the collections of The Mariners' Museum.

The Mariners' Museum Library

From Mark Twain's pilot's license to fore-edge seascape illustrations, The Mariners' Museum Library and Archives hold a vast spectrum of material related to humankind's interaction with the world's waterways. The library houses more than 70,000 volumes and 350,000 photographic images. Along with monographs and photos, the collection includes ledgers, registers, dissertations, postcards, bound clippings, maps, ships' logs, published journals, television transcripts, charts, manuscripts, blueprints, newspapers, and memorabilia.

Archer M. Huntington, the institution's co-founder and early driving force, understood the value of a library to the museum's curators and in educating the general public. In 1930, the charter incorporated "...a museum and library pertaining to nautical subjects, things, and interests, and otherwise to advance learning." Unlike other museums, the library was not an afterthought but an important component of the establishment from its conception.

Port and starboard running lights signal the library's entrance which resembles the bow of a ship at the south end of the museum complex. This section, with its distinct gray slumpjoint brick exterior, is the oldest quarter of the museum. In 1980-81, the library required extensive renovations and in 1989 received a new roof. With alterations in the 1980s the library now boasts about 8,000 square feet. In keeping with a water-borne theme, the interior is decorated with posters and prints of the naval services, small craft, pleasure boats, and the like.

To keep the visiting researchers and the museum's educators and curators up to date on current developments, the latest issues of magazines and periodicals are easily available in the reading room. There is also a section on new acquisitions. The library acquires over 1,000 additional volumes each year, many of them donations.

The staff of seven welcomes more than 2,000 patrons a year and answers just about as many mailed inquiries. Last year the letters arrived from almost every state in the Union and over twenty countries. The archivist and librarian divided the responsibilities for the facility. Each has an assistant, and they share the talents of another full-time and two part-time assistants. For technical services support, the staff relies heavily on interns from Old Dominion University, the University of North Carolina at Chapel Hill, and the Catholic University of America as well as nine loyal, weekly volunteers. These volunteers bring many years of experience as former librarians, researchers, and employees of Newport News Shipbuilding to the library and archives.

Research requests for information are as varied as the collection itself. Genealogists find photographs of the liners that transported their ancestors to the shores of America. Divers seek data on wrecks. Scholars take advantage of the rare books and charts. Merchant seamen want to know the fates of vessels that took them to far-reaching oceans of the globe. Local students seize upon material they cannot find in their school libraries. Historians get excited about the logbooks. And ship modelers examine blueprints to obtain the exacting detail that their hobby demands.

Every special library has treasured materials that highlight the collection. At The Mariners' Museum Research Library one discovers hundreds of travel accounts and atlases dating back to the Renaissance. The archives preserve the photographs of the Edwin Levick collection of passenger ships, yachts, and America's Cup races. Of local interest is the A. Aubrey Bodine collection. The Bodine photographs are the best known images of life on the Chesapeake Bay. However, the most popular acquisition is the Chris-Craft collection, which documents the construction of one of America's premier pleasure boat builders.

The growing Chris-Craft collection documents individual boat construction records prior to 1960, with expectations to accession material to the year 1980 in the near future. The 350 linear feet of records are characterized by photographs, sales literature, plans, dealer price lists, engineering data, and engine manuals. The collection also contains documentation of the production of landing crafts and patrol boats for the U.S. Navy and Army during the Second World War.

Antique boat owners from across North America inquire about the original features of their mahogany boats so they can restore their craft to their old glory. Highlighting the collection is an antique boat symposium held each April sponsored by the museum and the Antique and Classic Boat Society. At this time researchers flock to the library to get a better understanding of the Chris-Craft collection and to examine the back issues of such magazines as *Rudder, Motorboating and Sailing, Yachting,* and *Motorboat,* as well as the extensive runs of British and American yacht registers.

While the founder of Chris-Craft hailed from Michigan, closer to home another type of nautical history is important. With the numerous naval bases in the Tidewater area and shipyards in Portsmouth and Newport News, the activities involving the U.S. Navy get the lion's share of attention. No naval event draws more patrons to the library than the famous Battle of Hampton Roads. Fascination continues with the March 1862 battle when the ironclad CSS *Virginia* (ex-*Merrimack*) clashed with its federal counterpart, the USS *Monitor*.

The library and archives contain a number of important *Monitor* and *Virginia* research items specifically and American Civil War material of a general nature. There is John L. Worden's personal image album. It cradled tintypes and carte-de-vistes of fellow officers. Worden commanded the *Monitor* during her famous engagement. To accompany this, the library has the unique multi-volume compilation of William Hester's articles on the two ironclads. The James Bullock Papers contain specification documents on the CSS *Alabama*, and there is also a log of the CSS *Florida*.

To flesh out these treasures are hundreds of photographs and monographs. The prints portray Confederate and Union warships, blockade runners, and civilian steamboats that naval officials pressed into service as transports, floating hospitals, and gunboats. Biographies, official papers, dissertations, navy registers, memoirs, manuals, scholarly studies, and published logs and letters round out the texts on the Civil War.

Until recently, this vast collection has been somewhat "hidden" from patrons, but efforts are being made

(continued on page 9)

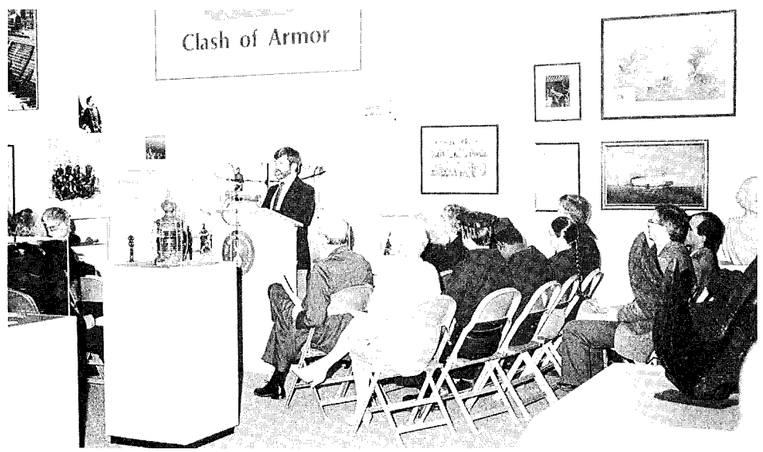
The *Monitor* Collection: A Study in History

The *Monitor* Collection was born the moment John Ericsson conceived the *Monitor*. One of the more interesting documents in the collection is a copy of Ericsson's conceptual drawing of a turreted vessel. Construction of the *Monitor* resulted in plans and sketches as well as contracts, requisitions, and correspondence. The Battle of Hampton Roads was the subject of paintings, sketches, articles, diaries, and even more correspondence, not to mention official and unofficial reports, news articles, poetry, music and books. Records related to the *Monitor* continued to accumulate during her long stay in Hampton Roads: supply and parts requisitions; correspondence and documents related to repairs and modifications; payroll records; crew lists; and orders to and from her commanding officers. And after she was lost off Cape Hatteras, there were more official reports, final pay rosters for her crew, articles and letters detailing the sinking. For the next hundred years, the *Monitor* continued to be a point of interest for historians.

(above) Capt. Francesca Cava, Chief of NOAA's Sanctuaries and Reserves Division, and (below) Dr. John Broadwater, Manager of the Monitor *National Marine Sanctuary, present their remarks at the opening of the* Monitor *Collection and the expanded* Monitor *exhibit* Clash of Armor.

Information on the *Monitor* really ballooned after the wreck was located by scientists aboard the R/V *Eastward* in August 1973. While few photographs exist of the ship afloat, photographic images of the wreck were recorded beginning with that expedition of discovery. In addition to the volumes of paper records, there were now videotapes, slides, photographs and negatives; sonar and magnetometer records; and, beginning in 1977, artifacts recovered from the *Monitor*.

Until 1987, groups of records were deposited with NOAA and with the agencies that assisted NOAA in various aspects of research and management. The North Carolina Division of Archives and History (NCDAH), for example, had taken an active role in seeking protection for the wreck after its discovery and continued to assist NOAA with research through 1982 and management through 1986. NCDAH generated a tremendous amount of research material and accepted responsibility for some of the video and photographic records generated by expeditions in which the agency had played a role. This material was stored at the agency's headquarters building in Raleigh or at the Underwater Archaeology Unit at Fort Fisher. When East Carolina University took a leading role in developing research plans for the site in 1983, they began to generate and accumulate research data on the *Monitor*. In the meantime, NOAA had undergone several reorganizations, resulting in *Monitor* material being stored in several areas in their headquarters building in Washington, D.C. Through a cooperative agreement with the U.S. Navy, *Monitor* artifacts were stored in facilities associated with the Washington Navy Yard.



It soon became apparent that the research data, particularly the videotapes of the wreck, were possibly the most valuable information about the site. There was concern about the storage conditions of the material and about its long-term survival and accessibility. And so the decision was made to seek proposals for a Principal Museum that would provide proper curation for the artifacts and the research data. The Mariners' Museum was selected as principal museum for the *Monitor* National Marine Sanctuary in 1987, and the *Monitor* Collection was formalized.

In addition to bringing together all of the *Monitor* material stored at NOAA, original material was solicited from the agencies and individuals involved in *Monitor* research over the years. NCDAH and ECU donated all of their records and research data, including video, photographs and negatives, and historical material. Several individuals involved with *Monitor* research also donated research material.

Under a cooperative agreement with NOAA, The Mariners' Museum now has curatorial responsibility for the collection, including artifacts recovered from the site. The research material is housed in the museum's library. In addition to research data generated by investigations of the wreck, the collection contains historical material on the *Monitor*, her officers and crew, drawings and plans, and copies of correspondence from Ericsson, government officials, and the men who served aboard her. There is also information on the CSS *Virginia* and her crew as well as on other monitors.

Cataloging is an on-going process. Since this is a "living" collection that is added to at every opportunity, cataloging will never be complete, but hopefully the current backlog of material will be available to researchers in the not-too-distant future.

The *Monitor* Collection was opened to the public for research in October 1992. Research in the collection is by appointment with the sanctuary education coordinator. Limited research may be conducted through the mail or over the telephone. It may be of interest to individuals researching family members who served on either the *Monitor* or *Virginia* that the portion of the *Monitor* Collection catalog relating to crew members of both vessels is available on several computer genealogy bulletin boards.

NOAA is actively seeking donations of *Monitor*-related material for inclusion in the collection. We are interested in family papers including diaries and journals, letters, or military papers. Catalog entries for donated material will include the name of the donor.

The sanctuary education coordinator may be reached as follows:

Dina B. Hill, Education Coordinator
P.O. Box 147
Rescue, VA 23424
(804) 599-3122

Mentorship Provides Educational Opportunity

The Mariners' Museum is a non-profit education and cultural institution founded and maintained to advance man's knowledge and understanding of his maritime heritage, the culture of the sea and its tributaries, its conquest by man, and its influence on civilization.

This mission is achieved through a wide variety of ongoing educational programming, exhibits and hands-on activities developed by the education department. One of the most exciting programs deals with internships/mentorships. One of the mentorships for the 1992-93 academic year took on a new twist, as it involved not only the Eduction Department, but also the *Monitor* National Marine Sanctuary. Octavia Cubbins, Director of Education for the museum, and Dina Hill, Education Coordinator for the sanctuary, met with Sue Greiner, Mentor Coordinator for New Horizons Governor's School for Science and Technology, and worked out a pro-

Arun Rao talks to a visitor at The Mariners' Museum about the Monitor *National Marine Sanctuary.*

gram for high school junior, Arun Rao.

The Governor's School is located on the campus of the New Horizons Technical Center in Hampton, Virginia. The school is designed for high achieving students. The mentorship itself is an opportunity for students to work under the guidance of professionals and to obtain hands-on experience in a field which they are interested in pursuing. It carries one hour of weighted high school credit as part of the science curriculum. Objectives for the students in the mentorship include:

1. An increase in knowledge and skills to include the development of the intellectual skills of rational thought, problem solving and creativity and to acquire knowledge of the interaction of science, technology and society (social science).
2. Development of work ethics and standards.
3. Enhancement of self-esteem and self-confidence.
4. Observation of a professional role model.
5. An increase in personal growth and maturity.

Arun Rao, age 17 and a junior at Poquoson High School, began his mentorship in September 1992. Arun's project/study was to assess the chemical and biological changes in the wreck of the USS *Monitor* and explore the feasibility of establishing a cathodic protection system for the wreck. By examining previously collected data, interviewing consultants/scientists in the field of corrosion engineering, and analyzing videotapes of the wreck, Arun was able to examine the amount of marine growth, the water conditions and current speeds at the site, and the corrosion potential and electrical continuity of major portions of the wreck.

Arun's observations yielded data to indicate that such a protective system would not be feasible due for a variety of reasons, including a lack of dependable electrical continuity.

In addition to major research at the museum using the *Monitor* Collection, during first semester Arun submitted a written scientific proposal which included an abstract, introduction, experimental design/method, expected results, conclusions/relevancy, and bibliography. During second semester, Arun made an oral presentation to faculty and students at New Horizons.

When most of his research had been completed, Arun served as an interpreter to visitors viewing underwater footage of the wreck in the museum's *Clash of Armor* exhibit.

Arun's favorite subjects are history and English. He is a member of the varsity tennis team and works as a lifeguard in the summer. He would like to attend either Princeton or the University of Virginia where he plans to pursue studies in international relations and law.

The Staff of the *Monitor* National Marine Sanctuary

John D. Broadwater, Manager

Mr. John Broadwater has been the sanctuary manager since April 1992. He received his B.S. degree in Electrical Engineering from the University of Kentucky in 1966, a M.S. degree in American Studies from the College of William and Mary, and is a doctoral candidate at the Scottish Institute of Maritime Studies, University of St. Andrews, Fife, Scotland.

Mr. Broadwater served as Vice-President and co-founder of Marine Archaeological Research Services Corporation. In this capacity, he participated in a search for ancient shipwrecks in Turkey, and surveys of Civil War shipwrecks in North Carolina and Revolutionary War shipwrecks in Virginia and New Jersey. Mr. Broadwater also participated in the 1979 and 1983 expeditions to the *Monitor*.

In 1978, he became Senior Underwater Archaeologist with the Virginia Department of Historic Resources, where he directed a study of shipwrecks from the Battle of Yorktown 1781), and developed a long-range management program for location, study, and protection of underwater archaeological sites throughout Virginia.

In 1985 he served as First Mate on the trans-Atlantic voyage of the replica square-rigged sailing ship *Godspeed*.

Mr. Broadwater has lectured throughout the U.S. and Europe, and has written and illustrated numerous popular and technical articles, including the article "Secrets of a Yorktown Shipwreck" in June 1988 issue of *National Geographic*. He is a certified Marine Survey Archaeologist by the Society of Professional Archaeologists and is an Instructor Emeritus with the Profesional Association of Diving Instructors.

Dina B. Hill, Education Coordinator

Ms. Hill has more than twenty years' experience in the field of cultural resources management. From 1972 to mid-1983 she was employed by the Underwater Archaeology Unit of the North Carolina Division of Archives and History. During her tenure there she assisted in development and implementation of five-year plans for survey and documentation of the state's submerged cultural resources. She assisted in the development and conduct of annual field schools in underwater archaeology in conjunction with local universities, and development and production of technical reports on field activities. Responsibilities also included participation in various research and education projects related to the *Monitor* National Marine Sanctuary carried out under a North Carolina-NOAA cooperative agreement.

Ms. Hill later served as administrative faculty of the Program in Maritime History and Nautical Archaeology at East Carolina University (ECU) in Greenville, North Carolina. Primary responsibilities included assisting in the development and conduct of research and education programs for the *Monitor* National Marine Sanctuary under an ECU-NOAA cooperative agreement. Responsibilities for the Program in Maritime History included assisting in development and conduct of field projects, production of technical reports, and development of grant proposals.

Responsibilities as education coordinator for the *Monitor* National Marine Sanctuary include development and implementation of an education plan for the sanctuary as well as development and production of education programs and products identified and defined by the plan. The plan emphasizes public outreach programs designed to make information on the *Monitor* National Marine Sanctuary more widely available to the general public.

Ms. Hill attended Old Dominion University and the University of North Carolina Wilmington with majors in history and archaeology.

Discover 3,000 Years of Maritime History at the Mariners' Museum

(continued from page 5)

to bring the material to light. The archivist and librarian have developed brochures on the holdings and have written short articles about various features in hopes to promote its use. Most critical, however, is the slow process of automation.

This effort started with the participation with regional libraries in a project to place current periodical holding records in an electronic format so other libraries can locate a title by online means. The library receives about 175 newsletters, flyers, magazines, and journals on such topics as history, maritime lore, shipping, commercial fishing, international trade, the arts, recreational boating, sailing, navigation, museum affairs, geography, and naval history. They originate from England, France, Canada, New Zealand, Australia, and across the United States. So one can readily understand the contributions these periodicals have made to enrich this form of database.

Continuing with these efforts the library has sent documentation of its rare book holdings to the Online Catalog Library Center (OCLC) as part of a joint grant with the Virginia History Library Network (HLN). Long-term plans call for the conversion of all records of the holdings converted by OCLC and the addition of part-time cataloger to the staff. The HLN is now in the process of writing a grant to make selected manuscript records available through OCLC; at The Mariners' the logbooks, personal journals, and account ledgers will be part of this tentative project.

For those wishing to use the materials in the library and archives, the facility is open 9 A.M. to 5 P.M., Monday through Saturday with the exception of holidays. None of the collection circulates, and the stacks are closed to the public, but a photocopying machine is available. Staff photographers can reproduce most images. Mail inquiries are welcome; however, the staff is not able to accommodate written requests for extensive research.

With the additional Chris-Craft material, undertaking the first steps of automation, and the addition of 1,000 volumes a year, the library and archives are growing at a steady pace. Their growth is not only measured in an increase in titles or linear feet of documents, but by the new services automation will provide patrons and staff. In this spirit, the library and archives staff accession books on topics ranging from the art of tattooing to steamer trunk labels, to maintain this unique collection characterized by Huntington as "devoted to the culture of the sea."

Editor's Corner

This is the first issue of *Cheesebox* since 1987. The current education plan for the *Monitor* National Marine Sanctuary calls for at least one issue of *Cheesebox* annually. Additional issues may be published if funds are available.

A number of changes in sanctuary staff have occurred since the last issue. The first education coordinator for the sanctuary was hired in August 1990. That position is currently held by Dina B. Hill, who has been involved in *Monitor*-related activities for almost twenty years. In April 1992, John D. Broadwater was hired as sanctuary manager, replacing Lt. Ilene Byron, who had served as manager since early 1989. Mr. Broadwater has also been involved in *Monitor*-related activities for nearly twenty years. *(See biographical sketches of the sanctuary staff on page 8.)*

Current management objectives include finalizing a draft management plan that was circulated for comment in mid-1992; continued planning for the MARSS expedition; developing long-range research plans for the sanctuary. Education objectives include continued development of programs on the *Monitor* such as the 1993 lecture series, identifying programs and products that will give children greater opportunities to learn about the *Monitor* sanctuary and the National Sanctuary Program, and development of programs that can be sent to classrooms, public service organizations, and other interested groups. Many of these programs are being developed in conjunction with The Mariners' Museum, the principal museum for the *Monitor* National Marine Sanctuary.

If you have any comments on *Cheesebox* or would like additional information on the *Monitor* National Marine Sanctuary, please contact:

Dina B. Hill, Education Coordinator
***Monitor* National Marine Sanctuary**
P.O. Box 147
Rescue, VA 23424

We look forward to hearing from you.

The *Monitor* at Drewry's Bluff
May 15, 1862

The following is taken from a letter from the Monitor's *paymaster William Keeler to his wife Anna. Keeler's letters have been published in a volume titled* ***Aboard the USS Monitor: 1862, The Letters of Acting Paymaster William Frederick Keeler, U.S. Navy to his Wife, Anna****, Robert W. Daly, editor. Annapolis: United States Naval Institute.*

{Editor's note: Drewry's Bluff is located on the James River approximately seven miles below Richmond. Union vessels, including the *Monitor*, had begun moving up the river on May 13, anchoring for the night at a place Keeler called Devil's Reach. The morning of May 14 the *Galena* ran aground after the vessels had proceeded a few miles from the reach and they were obliged to wait until 2:00 in the afternoon when the *Galena* could be refloated on the high tide. The vessels then "ran up a short distance where the banks were destitute of bushes to conceal sharp shooters & anchored for the night."}

"Thursday morning [May 15] we got under way in good season in the midst of a heavy rain storm & an occasional ball from the rifles on shore. Not a man could shew himself on the decks without a ball whizzing by him. A man on the Galena who was sounding was badly wounded & one passed between my legs & another just over Lieut. Greene's head.

We moved up, the Galena (the flag ship) taking the lead, the Monitor following. Two miles brought us to the obstructions in the river & they opened upon us from the batteries which were a series of hastily constructed earth works on a side hill rising from the water.

The river was so narrow that the vessels could not manoeuvre without running into each other so that we were obliged to run in and anchor. The Galena lay across the stream her broadside to the batteries, we anchored under her stern—the Port Royal & Aroostook a little further down stream & the Naugatuck still further down—& in this position we lay from 1/2 past 7 to 1/2 past 11, a perfect tempest of iron raining upon & around us to say nothing of the rifle balls which pattered upon the decks like rain.

But three shot struck us making deep indentations but doing no real harm. No one on board was hurt but all suffered terribly for the want of fresh air. It was one of those warm, muggy days with a very rare atmosphere which, shut up closely as we were, made ventilation very difficult. At times we were filled with powder smoke below threatening suffocation to us all. Some of the hardiest looking men dropped fainting at the guns.

Being unable to change our position, the batteries soon got the range & their shot began to tell fearfully on the Galena, against whom they seemed to concentrate their fire. Her iron sides were pierced through & through by the heavy shot, apparently offering no more resistance than an egg shell, verifying the Commodores opinion that 'she was beneath naval criticism.'

We soon began to see that she was being roughly used as shot & shell went crashing through her sides, still she held out & the thunder of her guns pealed out from the sulphurous cloud that enveloped her sending their iron messengers with remarkable accuracy. We could see large clouds of dirt & sand fly as shell after shell from our vessels exploded in the rebel works, & no sooner was a gun silenced apparently in one portion of the batteries than they opened from some other part or from some new & heretofore unseen battery.

Their guns were manned by sailors, probably from the Merrimac & the Jamestown & Yorktown [Patrick Henry], which last two had been sunk with the other obstructions. It became evident after a time that it was useless for us to contend against the terrific strength & accuracy of their fire.

Suddenly volumes of smoke were seen issuing from the Galena's ports & hatches & the cry went through us that she was on fire, or a shot had penetrated her boiler—her men poured out of her open ports on the side opposite the batteries, clinging to the anchor, to loose ropes, and dropping into the boats. We at once raised our anchor to go to her assistance but found she did not need it.

Her Capt. hailed us & said that he should have to leave us as he had expended all his ammunition, having fired 360 rounds. The smoke proceeded from a shell exploding & setting fire to a cartridge which one of the powder boys was carrying to a gun, burning him badly.

We all started down the stream, followed on the banks by sharp shooters cracking away at every man who exposed himself.

The Galena had fourteen men killed & twenty wounded, some of whom will die. The wooden vessels fought well but were not as badly injured as the Galena, on whom & on ourselves the enemies [sic] fire was concentrated. All our vessels combined could bring but ten guns to bear, but they were heavy & well served & the fire from them was almost incessant.

There was the same heavy howl of the shells, the screech of solid shot, the shrill whistle of the rifle balls as in my Merrimac experience. The captain occupying a position where he could communicate directly with the pilot made me an idler in the fight & left me at liberty to observe more closely the various incidents of the battle.

The shot would strike us with a heavy thud & the Monitor would shiver as if she were a sensitive being, shrinking from the blow. We do not regard the matter in the light of a defeat as we accomplished our purpose, which was to make a reconnaissance, ascertain the nature & extent of the obstructions, the position & strength of the batteries. We found them of such a nature that it was an impossibility to force them with the means at our command & the river is so narrow it is equally impossible to bring a much larger force to bear.

We could have remained there & let them hammer away but it would have done us no good & it was a matter of prudence on the part of a

(continued on page 12)

NOAA plans Expedition to the *Monitor*

(continued from page 2)

wire marked at ten-foot intervals. They will attach the baseline at one end to the midships bulkhead and at the other end to a suitable lower hull frame approximately 20-30 feet forward. They will use specially-fabricated padded brackets to attach the baseline. Following installation of the baseline, project personnel will make direct measurements to each artifact from two points on the baseline. They will make a sketch map of all artifacts and record a table of measurements. They will also make a video record of all artifacts *in situ*. On the surface, support personnel will make a site map to check the field data before any artifacts are recovered.

If project personnel discover additional artifacts in other areas of the hull or debris field, archaeologists on site will devise a mapping scheme. They should be able to make direct measurements from known points on the hull, with mapping to be done from the master site map.

Project personnel will first map all artifacts to be recovered, videotape them and then a team archaeologist will recover them. The archaeologist will place recovered artifacts in a padded container, after which they will be transferred to the surface vessel, stored in a secure location and kept wet until they can be returned to the conservation laboratory at The Mariners' Museum.

To facilitate recovery, Harbor Branch personnel will fit the submersible with an expanded aluminum mesh recovery basket padded with foam rubber. Special containers in the basket will be used for transporting small or delicate materials. All artifacts will be immersed in water inside the containers. Due to the fragile nature of most materials recovered from the marine environment, recovery and post-recovery handling of such materials must be done under strictly controlled, professionally supervised conditions. Improper handling or premature drying may result in irreparable damage to recovered materials. Only designated staff will handle artifacts and in accordance with a conservation plan.

Repositioning monuments placed at the site in 1990 to provide a "path" for visiting divers: divers will reposition two of the four concrete monuments to predetermined locations relative to the wreck and the newly placed mooring.

Field Operations

Project personnel will conduct diving operations from the surface vessel using a mixed-gas diving system, an open diving bell and a deck decompression chamber. The NOAA Diving Office and Experimental Diving Unit is providing the dive system. The system consists of an open bell in which two divers can be lowered to the bottom and then recovered. Communication can be maintained with the divers while they are in the bell.

Weather and other conditions permitting, at least two dives will be made each day, one in the morning and the second in the afternoon. Each dive will consist of a team of two divers and two surface support personnel. After the bell is placed in the water, the two divers will exit the deck of the support vessel and enter the bell; the bell will then be lowered to the site, guided by a downline, to a parking position approximately 30 feet above the bottom. The divers will then exit the bell and begin executing their assigned activities. Following each dive and the first stages of decompression, the divers transfer from the bell to a deck decompression chamber where they complete their decompression.

Archaeological methodology will consist primarily of mapping the positions of artifacts and hull features, recovery of artifacts, and limited excavation. Archaeologists will accomplish excavation within the base of the turret with a hydraulic dredge, powered from a pump on the surface vessel or submersible.

The primary emphasis will be in collecting relative site elevation data in order that the three-dimensional map of the site can be updated. As part of NOAA's *Monitor* Assessment and Prediction Program (MAPP), a three-dimensional site map is being developed on a computer-aided design and drafting (CADD) system. In addition to the research value of this information, it will provide a baseline reference for the annual site assessment which, in turn, will permit NOAA to maintain an accurate record of changes to the site. Since the establishment of level-lines, bubble-level tubes or other such devices is very difficult in deep water and strong currents, the NOAA Experimental Diving Unit is developing a special device which will measure precise values for depth at selected points on the site. The resulting readings will all be referenced to a relative datum, the lip of the turret next to the lower cross-member. To account for tidal changes, project personnel will re-check the datum periodically and at the beginning of each measurement session. To eliminate or minimize variations due to waves and swells, they will take several readings at each measurement point and average the resulting values. These data can then easily be converted to relative site elevation readings. Project personnel will prepare a site map containing an overlay with all designated measurement points clearly identified. Divers will carry this map when making measurements.

Project personnel will also take a limited number of horizontal measurements to check the accuracy of the site map and to augment direct measurements being recorded by divers on NOAA-permitted site expeditions.

Divers will expose still photographs and videotape throughout the project using both diver-held and submersible-mounted cameras and lights. Recording the locations of all artifacts and features of interest will receive the highest priority.

As in previous extended NOAA expeditions, support personnel will maintain a logistical base of operations on shore at Hatteras Village throughout MARSS. This base will provide support for the mission team, information to media representatives and assistance to invited guests. Personnel from the base will provide limited transportation for press and visitors from Hatteras to the sanctuary, and a limited number of press and visitors will be accommodated aboard the *R/V Edwin Link* each day of operations.

NOAA is planning a follow-on field expedition for FY94 to continue artifact recovery, if necessary, and to complete the survey work begun in 1993. NOAA also plans a final site visit for 1995 for inspection and assessment of previous work. However, no diving is planned for the 1995 expedition.