Is This One of the *Monitor*'s "Water Closets"?

During the period July 12 through July 19, the Cambrian Foundation conducted a private research expedition to the *Monitor* National Marine Sanctuary. Their objectives were to obtain photographs and video of the wreck to assist in ongoing research; take measurements to evaluate the rate of collapse and to assist in future attempts to recover major components of the wreck; and to recover two objects that had been located during the 1998 *Monitor* Expedition but had not been mapped.

On July 15, after documentation had been completed, what may be the officer's "water closet", or toilet, was recovered by Cambrian divers. The Monitor had four water closets, which were the first below-decks flushing toilets to be installed on a vessel. Two of the toilets, one in the captain's quarters and one for the other officers, were in the forward section of the ship, and two were located near midships for the crew. This object was recovered from the area indicated on plans of the *Monitor* as being the location of the officer's toilet.

The difficulty in determining whether the object is actually one of the toilets lies in the fact that the object is not complete, and that a large portion of it is badly concreted iron. The concretion prevents a detailed study of the object until it has been cleaned through the conservation process.

While the addition of flushing toilets to the *Monitor* was probably viewed by the officers and crew as a tremendous improvement to their difficult shipboard lives, the mechanisms could be tricky to operate. William C. Church, in his two-volume biography of John Ericsson, described an incident in which the ship's surgeon, during his use of the officer's water closet, failed to observe the proper sequence of operation and literally became airborne. It is no wonder that some of the later monitors still had "portable water closets," consisting of a bucket or slop jar with a canvas curtain around it, on their decks.

We will report more on this object in future issues of *Cheesebox*.

From the Pilot House

What a year this has been for the *Monitor*! We initiated a new comprehensive preservation plan, conducted engineering, geotechnical and archaeological surveys at the Sanctuary, and obtained commitments for continued research in 1999.

The previous *Cheesebox* (Dec. 1997) described NOAA's draft comprehensive, long-range preservation plan for the *Monitor*, "Charting a New Course for the *Monitor*." After public comments were incorporated, we finalized the plan and submitted it to Congress in April 1998. The plan outlines a six-phase strategy for stabilizing the *Monitor*'s hull and recovering key components for preservation, long-term curation and exhibition. Response to the plan has been very positive, and NOAA is moving ahead with implementation.

As described in this issue's lead article, the 1998 Monitor Expedition completed Phase I of the long-range plan (pre-shoring survey and mapping) and, in addition, accomplished the recovery of the *Monitor*'s propeller and shaft. I can't adequately convey the admiration and gratitude we feel toward the U. S. Navy's Mobile Diving and Salvage Unit Two (MDSU Two). The MDSU Two team and their commanding officer, CDR Chris Murray, were absolutely outstanding. For once the weather cooperated, too, giving us the opportunity we needed to demonstrate the effectiveness of combined Navy/NOAA dive operations. Both the Navy and NOAA dive teams set new records, logging more dive hours on the *Monitor* this year than during all previous NOAA expeditions. The NOAA team, comprised of government, university and private divers, was a model partnership for the application of cutting-edge diving technology on a deep-water site. The Mariners' Museum, always a key partner, arranged to pick up the artifacts from the Navy and to get them into conservation treatment in a remarkably short time. Visitors to the Museum can see the objects in treatment, and this has proven to be a popular exhibit.

We are hoping to reassemble the same teams for the 1999 *Monitor* Expedition, so stay in touch as we continue our effort to insure that the *Monitor* will not be lost to future generations.

John Broadwater, Manager

NATIONAL MARINE SANCTUARIES

***Monitor* National Marine Sanctuary**
The Mariners' Museum
100 Museum Drive
Newport News, Virginia 23606-3759

Non-Profit Org.
U.S. Postage
PAID
Newport News, VA
Permit No. 2041

Monitor National Marine Sanctuary Activities Report
CHEESEBOX

Funding by the National Oceanic Atmospheric Administration

Printed on recyled paper with soy-based inks

Monitor National Marine Sanctuary Activities Report

CHEESEBOX

Volume X, No. 1 **December 1998**

SUCCESS!

At long last Mother Nature cooperated, making the 1998 *Monitor* Expedition perhaps the most successful of NOAA's efforts to date. All of the primary goals were met and on June 5 the *Monitor's* propeller, the object of an unsuccessful recovery effort in 1995, broke the surface of the water for the first time since the ship was in the Washington Navy Yard in October 1862. The U.S. Navy, the National Undersea Research Center/ University of North Carolina at Wilmington, the Cambrian Foundation, and The Mariners' Museum all contributed to the success of the mission, which was the first phase of a long-range preservation plan submitted to Congress in April of this year.

As has been reported in previous issues of *Cheesebox*, NOAA is confronting a serious management problem at the *Monitor* National Marine Sanctuary: the collapse of the *Monitor*'s hull is imminent. NOAA prepared and submitted the long-range preservation plan in draft form last year and in final form earlier this year. The 1998 expedition was a critical element in the preservation plan, which recommends a combination of shoring the wreck and recovering major components. The mapping goals in the 1998 expedition were designed to provide engineering data required for developing detailed plans for stabilizing the *Monitor*'s hull and for recovery of components that may include the *Monitor*'s engine and turret.

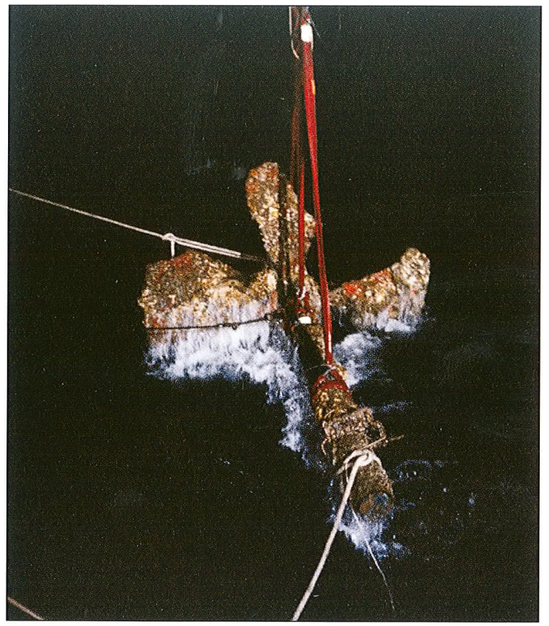
The goals, activities and results of the 1998 *Monitor* Expedition are essential elements in NOAA's comprehensive long-range preservation plan for the *Monitor* National Marine Sanctuary. Expedition goals were designed to generate a wide range of archaeological and engineering data needed to develop a detailed plan for stabilization of the hull and recovering selected objects from the site.

The primary goals of the 1998 *Monitor* Expedition included:

Goal 1: Document, through drawings, measurements and photography, the overall configuration of the hull, from above and from both sides; the stern, particularly the propeller, shaft, skeg, and aft debris field; the turret and its area of contact with the inverted hull; the lower hull, machinery space, engine and boilers; the hull forward of the midships bulkhead; and the area beneath the hull.

Goal 2: Map and recover exposed artifacts that may be damaged or destroyed by the action of currents, the collapse of portions of the hull, or by the planned hull shoring activities.

Goal 3: Excavate and/or probe inside and at the base of the turret in an effort to locate the guns and other contents and to identify obstructions at the base of the turret.



The* Monitor*'s propeller rises out of the ocean and is guided aboard the* Kellie Chouest *(photo by Jeff Johnston,* Monitor *Collection, NOAA).

Goal 4: Excavate and map the stern debris field and attempt to locate the rudder; move all material to a safe area to the northeast of the wreck; recover the rudder, if practicable.

Goal 5: Recover data from the current meter placed at the site in 1997, and replace the current meter for additional data collection.

Secondary goals included:

Goal 6: Inspect the permanent mapping datums installed in 1997, replace as necessary, and measure the distances between those datums.

Goal 7: Document and assess the untethered, mixed-gas method of conducting research dives at the *Monitor* National Marine Sanctuary.

The 1998 expedition was conducted in two phases: Phase I was conducted jointly between NOAA, the U.S. Navy, and the Cambrian Foundation, and Phase II was a cooperative effort involving NOAA, the Cambrian Foundation, the National Undersea Research Center/University of North Carolina at Wilmington, and The Mariners' Museum.

continued on page 2

Participating Organizations

Mobile Diving and Salvage Unit Two

Mobile Diving and Salvage Unit Two (MDSU-2), U.S. Navy, was responsible for providing diving and salvage services in support of NOAA expedition goals during Phase I. MDSU-2 coordinated all diving operations with NOAA on-site personnel to insure that expedition goals were met without undue adverse effects to the *Monitor.* MDSU-2 also provided NOAA with adequate space to conduct NOAA dive operations from the Navy support vessel, *Kellie Chouest.* NOAA dives were conducted simultaneously with but independently from Navy dive operations.

Sanctuaries and Reserves Division, NOAA

The Sanctuaries and Reserves Division (SRD) of NOAA was responsible for the overall planning and coordination of the archaeological and engineering aspects of both phases of the expedition, as well as for coordinating funding, interagency cooperation and all other aspects. NOAA archaeologists and research personnel were on site at all times during Phase I and Phase II to ensure that the expedition goals were met and that the *Monitor*'s hull and contents were not adversely affected. SRD conducted dive operations from the Navy support vessel to assist Navy divers when appropriate and to provide archaeological supervision when necessary.

The Cambrian Foundation

The Cambrian Fountain (CF), a private not-for-profit research organization, was responsible for dive training and on-site dive supervision. CF also provided trained, experienced divers and specialized equipment for on-site dives during Phase I and Phase II.

NOAA Diving Center

The NOAA Diving Center was responsible for establishing training and operational parameters, approving dive procedures, approving the participating NOAA divers, approving participating non-NOAA divers under a reciprocity agreement, providing essential equipment and personnel, and overseeing the on-site dive operations.

National Undersea Research Center/University of North Carolina at Wilmington

The National Undersea Research Center/ University of North Carolina at Wilmington (NURC/UNC-W) was responsible for the operation of the recompression chamber and for gas mixing and filling. NURC/UNC-W also provided a re-search vessel and captain as well as personnel and equipment to support the diving operation. They also provided a second vessel and captain to serve as a shuttle vessel for press and invited guests.

The Mariners' Museum

The Mariners' Museum is responsible for the conservation and curation of all recovered cultural material. The Museum also participated in the documentation, education, and public affairs aspects of the expedition.

Diving Methodology

All diving operations in Phase I were conducted from the DSESS *Kellie Chouest,* a 320-foot research vessel leased by the U.S. Navy. A rigid inflatable boat was used for NOAA dive support. A U.S. Navy recompression chamber and qualified operators were available on the *Kellie Chousest* at all times.

The goals, activities and results of the 1998 Monitor Expedition are essential elements in NOAA's comprehensive long-range preservation plan for the Monitor *National Marine Sanctuary.*

During Phase I NOAA dives were conducted from the *Kellie Chouest* by a small team of NOAA and Cambrian Foundation divers. NOAA dives were conducted completely independently of the Navy dives. However, dive schedules and work tasks were coordinated to maximize effectiveness. All NOAA dives followed procedures and protocols established by NOAA, NURC/UNC-W, and the Cambrian Foundation, and approved by the NOAA Diving Safety Board for assessment of self-contained, mixed-gas diving techniques.

NOAA dives utilized mixed gas rather than compressed air, and all dives followed NOAA-approved decompression schedules and were supported by a Navy deck decompression chamber (DDC) and diving medical technicians on board the *Kellie Chouest.* The use of mixed gas greatly improved the divers' effectiveness and ability to deal with possible emergencies due to the minimization of nitrogen narcosis and oxygen toxicity, potential hazards when breathing compressed air at the *Monitor*'s depth of 240 feet.

Divers breathed NOAA Trimix I, or "*Monitor* Mix," a special blend of 18 per cent oxygen, 32 per cent nitrogen, and 50 per cent helium. *Monitor* Mix tables were developed in 1993 for NOAA by Hamilton Research Institute and used successfully on the 1993 and 1995 expeditions. Gas mixing and testing were conducted by NOAA and Cambrian Foundation personnel.

During Phase II, NOAA conducted dives from the NURC Research Vessel *Cape Fear,* with support from the NOAA Ship *Ferrel,* which was moored nearby. The *Ferrel* was equipped with a deck decompression chamber, with qualified operations and medical personnel provided by NURC/UNC-W.

The breathing gas, decompression schedules and other dive procedures and equipment were the same as for the NOAA dives in Phase I. All diving operations in Phase II were conducted by a larger team of NOAA and Cambrian Foundation divers.

Archaeological Methodology

Archaeological methodology consisted primarily of observation, survey, measurements, and still and video photography. Survey and mapping activities utilized simple techniques, including the use of fixed hull reference points and surveyors' tapes. Probing and limited excavation were utilized for collecting data on the condition and contents of the stern debris field, the northeast deposit area, and the area beneath the raised hull and the turret.

Results and Accomplishments

The expedition conducted dives on twenty-seven of thirty possible dive days. A total of ninety dives were conducted, fifty-five by the U.S. Navy and thirty-five by the combined NOAA team. The expedition logged a total of 106 hours cumulative bottom time, nearly twice the total (fifty-five hours) of all five previous NOAA diving expeditions to the *Monitor.* Counting the lengthy decompression, the expedition logged a cumulative dive time of 625 hours.

On June 5, the *Monitor*'s four-bladed iron propeller was successfully raised, along with an 11-foot section of shaft. The Navy dive team recovered the propeller without damage. On June 10 the propeller assembly was transported aboard the *Kellie Chouest* to Newport News Shipbuilding, where it was offloaded onto a truck and transported to The Mariners' Museum, where it will undergo conservation. On June 12 The Mariners' Museum held a media event to formally unveil the propeller and announce that it would be conserved in a specially designed tank that permits public viewing during the conservation process.

In addition to recovering data essential to the upcoming effort to stabilize the *Monitor*'s hull and recover key components for long-term preservation and exhibit, thirty artifacts and samples were recovered, including wood and metal samples from the hull as well as core

continued on page 11

A Breechloader for the USS *Monitor*

A few days after the *Monitor's* battle with the CSS *Virginia,* the ship's Paymaster noted her preparedness for the next time the two ironclads would meet.

> We are being furnished with every possible instrument of destruction which it is supposed can be of service to us, shot, shell, schrapnell [sic], hand grenades, & wrought iron shot, which we now have permission to use, besides Enfield rifles with sword bayonets & plenty of small arms. [1]

The Enfield rifles Keeler mentioned were the British Model 1853 two-band rifles. The Union imported more than 500,000 various models of British Enfields. The Confederacy contracted for 400,000 Enfields. The United States Navy utilized the Enfield rifle because of it shorter length, which made it easier for a sailor to carry around below decks. Marines on board warships favored the longer rifled musket.

On the last day of the 1998 *Monitor* Expedition, one of the Cambrian Foundation divers discovered a brass musket butt plate lying partially buried in the sand. There was only enough time remaining on his dive to video tape the butt plate and provide a reference point for a return trip.

The following month, the Cambrian Foundation returned to the *Monitor* on their summer research trip. Conditions at the site were minimal. Visibility was poor, only about 8 to 10 feet. One of the divers located the butt plate and mapped its exact location in the wreck, then recovered the artifact. No other exposed musket parts were located and no excavation of the area took place.

There was a lot of speculation about the type of musket the butt plate came from, Enfield, Springfield, etc. Positive identification of the butt plate was not made until it was taken back to the Sanctuary office and more detailed examination and comparisons could be made.

At the Sanctuary office digital photographs were taken and a scale drawing made of the butt plate. Since the butt plate was brass, Springfields were quickly eliminated. With the exception of the 1855 Springfield rifled musket, all Springfields used iron fittings and the 1855 Model Springfield was largely out of US Navy service by 1860. The identification turned back to Keeler's Enfields.

On initial examination, this plate did not match the Enfields. Still, there was something very familiar about the distinct shape of the recovered butt plate. There are no apparent makers marks or numbers on the plate, but it has a very prominent "bulge" on the top of the corner where one of the three mounting screws went through. So it was back to the reference books. It took less than 2 minutes to tentatively identify the weapon. The butt plate was an apparent match for the Sharps & Hankins Navy carbine. The find of such an uncommon piece created a bit of excitement around the office. Still, a better verification was needed.

Information on Christian Sharps and his patented models of breech-loading rifles and carbines abounds. The United States Navy had been using various models of Sharps weapons since 1850. [2]

At the beginning of the American Civil War, the "Union Defense Committee of New York" began procuring arms for the Navy, including 100 Sharps rifles. In August 1861, 1,500 Sharps rifles were delivered to the Brooklyn Navy Yard. The majority of the weapons purchased for the Navy Department between 1860 and 1862 were the Sharps New Model 1859 Rifle and the Sharps & Hankins Model 1861 Breechloading Navy Cartridge Rifle. Each rifle cost the Navy $43. By May 1862, every Sharps in the Navy inventory had been issued and the total number in service was somewhere around 2,500. [3]

By the time the *Monitor* was ready for sea, the Navy Department was using three different models of the Sharps & Hankins weapons and three models of Sharps rifles and muskets. The recovered butt plate has a different profile than "true" Sharps rifles such as the NM1859, but it is a match for Sharps & Hankins style weapons. Exact identification from just a butt plate is not possible, since it is "typical of all Sharps & Hankins arms." [4]

All three models were .52 caliber and fired metallic "rim fire" cartridges. The Sharps & Hankins M1861 came in two varieties: one with a full wood stock and one with a short fore stock and a leather cover over the barrel. Both models were just over 47 inches long. The 1862 Model Sharps & Hankins was just over 38 inches long and had no wood fore stock. The barrel had a leather cover and some models of this weapon were "tinned" for sea service. Some Sharps & Hankins rifles were equipped with a sword bayonet, a few had the more familiar "triangular" socket bayonet, and some were not fitted for bayonets at all. Most of the sword bayonets used were manufactured by the Ames Sword Company of Chicopee, Massachusetts. Ames also made the Model 1860 United States Navy Cutlass.

The area where the butt plate was recovered is located on the starboard side of the wreck in an area just forward of the ship's magazine, and is the probable location of the ship's armory. Information about the weapons and weapons storage on board the USS *Monitor* is minimal at best. Accounts from some of the later class monitors state that the arms racks were located on the inside wall of the Ward Room bulkhead and this is probably where the *Monitor*'s arms racks were located.

The recovered butt plate is definitely an exciting discovery. It shows that what was considered state-of-the-art weaponry was employed on John Ericsson's state-of-the-art warship. Like many things recovered from the *Monitor,* it raises more questions than it answers, questions that can only be answered through continued investigation of the wreck. From historic naval records and "allowance" manuals, hundreds of different categories of items, in various quantities, have been identified as being on board the *Monitor* and this doesn't even include the myriad personal effects of the officers and crew. One brass butt plate cannot positively identify a particular model of Sharps, but it verifies what everyone involved with this wreck has long known: the *Monitor* is a time capsule holding a wealth of information and many surprises.

References

1 Robert W. Daly, *Aboard the USS Monitor: 1862, The Letters of Acting Paymaster William Frederick Keeler, US Navy To his Wife Anna,* United States Naval Institute, 1964, pg. 43
2 Earl J. Coates and John D. McAualy, Civil War Sharps Carbines & Rifles, Gettysburg, Pa., pg. 38
3 Coates, pg. 42
4 Robert M. Reilly, United States Military Small Arms 1816 - 1865, New York, pg. 61

Jeff Johnston
Monitor *National Marine Sanctuary*

Final Long-range Comprehensive Plan for the *Monitor* Goes to Congress

Earlier this year, NOAA submitted the final long-range, comprehensive preservation plan for the *Monitor* to Congress. As reported in the December 1997 issue of *Cheesebox,* NOAA had submitted a draft plan to Congress in response to a mandate that NOAA prepare a comprehensive preservation plan for the *Monitor.* The final plan, titled *Charting a New Course for the Monitor,* incorporates comments received from public and peer reviews but confirms the recommended option of shoring the wreck combined with selected recovery of major components including the engine and turret.

The plan contains preliminary engineering, conservation, and exhibition studies and estimates the total cost at $22 million. These preliminary studies will be refined in the coming months and efforts will continue to identify possible sources for project funding.

25th Anniversary of the Location of the Wreck of the USS *Monitor*

On March 8, 1974, John G. Newton, marine superintendent for the oceanographic program at the Duke Marine Laboratory in Beaufort, North Carolina, made the long-awaited announcement that five months of analysis of underwater television pictures and historical records had confirmed discovery of the wreck of the USS *Monitor*.

The wreck was described as "lying in 220 feet of water on a hard sand and shell-strewn floor." The *Monitor*'s turret, which fell off during the sinking, was one of the distinguishing characteristics that helped to identify the ship. The unusual shape of the *Monitor*'s bottom and its distinctive armor belt were other identifying characteristics, according to Gordon P. Watts, Jr., then underwater archaeologist with the North Carolina Department of Cultural Resources. Positive identification was aided by an 1861 handwritten description, believed to be a copy of the original contract as specified by the ship's designer and builder, John Ericsson.

Scientists aboard Duke University's research vessel *Eastward* had conducted a two-week search in August 1973 for the *Monitor* with support from the National Geographic Society, the National Science Foundation, the North Carolina Department of Cultural Resources, and the U.S. Army Reserve.

In searching for the *Monitor*, the *Eastward* had swept a 5-mile-by-14-mile sector of the Atlantic. The research vessel was crammed with advanced scientific gear, much of it designed by Dr. Harold Edgerton of the Massachusetts Institute of Technology.

Newton said the search area was determined by replotting the track of the *Rhode Island* as she rounded treacherous Diamond shoals, dreaded by mariners of the time as the "Graveyard of the Atlantic." An 1857 coast survey chart helped refine the plotting of the search area.

Joining Newton as co-investigators in the methodical hunt for the *Monitor* were Edgerton, Watts, and Dr. Robert E. Sheridan, a geologist from the University of Delaware. More than 60 persons aboard the *Eastward* and Army Reserve support vessels took part in the search.

During the first week of April 1974, a second cruise to the *Monitor* site was made for the purpose of obtaining complete photographic and television tape records of the site. The project utilized the ultra-sophisticated research vessel Alcoa *Seaprobe*, which was specifically designed for deep-ocean search and recovery operations.

The 243-foot *Seaprobe* was designed to search, core, drill, and sample mineral deposits in depth up to 18,000 feet and had the capability of recovering 200-ton loads from as deep as 6,000 feet. The *Seaprobe*'s dynamic positioning capability, which permitted it to hover over the *Monitor* without the use of anchors, facilitated the conduct of operations at the site.

The dynamic positioning capability was the result of the ship's unique propulsion system. The *Seaprobe* was equipped with two identical Voith-Schneider cycloidal propellers located in the bow and stern of the ship. The thrust of these propellers could be directed 360 degrees, enabling the *Seaprobe* to move sideways as well as forward or backward.

The *Seaprobe* was also fitted out with a search "pod," complete with side and forward-looking sonar for search and obstacle avoidance, television cameras with flood lights for inspection of targets, and two deep-sea 35mm cameras with strobe lights for detailed recording of targets. The search pod was lowered on a 4 1/2-inch-diameter oil drill pipe through a large center well at midships in the *Seaprobe*'s hull.

Once the *Seaprobe* had located the wreck of the *Monitor*, scientists began a systematic examination of the wreck site with the ship's search pod. The search pod was tracked by an acoustic beacon placed on the bottom near the site. Signals from this beacon were picked up by multiple microphones on the hull of the *Seaprobe*. This information was projected through an electronic maneuvering board as a point of light that provided a continuous projection of the relationship of the *Seaprobe* to the beacon. Since the relationship of the beacon to the wreck was also known, it was possible to graphically determine the relationship of the *Seaprobe* to the *Monitor*.

Although the examination was interrupted several times by deteriorating environmental conditions, the *Seaprobe*'s dynamic positioning capability made it possible for more than 1,200 quality photographs and several hours of video tape records to be collected.

Specific features of the *Monitor* were recorded including the port armor belt and the unique circular anchor well. Selected photographs from the Seaprobe expedition were used by the Naval Intelligence Support Center to prepare a complete photomosaic of the wreck. The mosaic remains one of the most important resources for research on the wreck of the *Monitor*.

On January 30, 1975, less than a year after the *Seaprobe* expedition confirmed the identification of the wreck as the USS *Monitor*, the wreck site was designated by the Secretary of Commerce as the nation's first marine sanctuary. The *Monitor* Sanctuary remains to date the only National Marine Sanctuary designated specifically to protect a cultural, rather than a natural, resource.

"From these poor men great dragons drew their breath...."

The title for this feature is from a poem written by Norman G. Cubberly during the 1974 Alcoa Seaprobe *expedition to the* Monitor. *This feature will highlight a* Monitor *officer or crewman or someone who may have served on board the* Monitor *but for whom no documentation can be found. Readers are invited to share any knowledge they may have of men who served or may have served on the* Monitor *during her brief career. We are particularly interested in receiving copies of service or pension records, discharge papers, correspondence, photographs, or other items related to men associated with the* Monitor.

The crewman featured in this issue is ***David Cuddeback****, who was born in New York and served as captain's steward aboard the* Monitor. *The following information is from* Crewmen of the U.S.S. *Monitor*: A Biographical Directory *by Irwin Berent and from the* Monitor Collection, *NOAA.*

Born in Port Jarvis, New York, Cuddeback enlisted for a 3-year term in New York on June 29, 1861. He was 21 years old, had hazel eyes, dark hair, and fair complexion. He stood 5 feet 10 inches tall. By March 6, 1862, Cuddeback was transferred from the *North Carolina to the Monitor*, on which he served as captain's steward, ship's no. 18. As of November 6 and 7, 1862, he was enrolled as landsman, and on the latter date he was promoted to ship's cook. He remained on the *Monitor* until December 31, 1862. Cuddeback was wounded aboard the USS *Keokuk* in Charleston Harbor in April 1863. He was listed as the ship's cook. He was discharged from the receiving ship *Boston* (late *Keokuk*) on May 20, 1863.

Cuddeback's great niece has stated that Cuddeback served on the *Monitor* at the time of the battle with the *Virginia* and that he was the captain's steward. Cuddeback gave her father a maroon tablecloth which he claimed was used on the *Monitor*.

This tablecloth, which has "Monitor" in gold embroidery, was donated by David Cuddeback's descendants to the War Memorial Museum in Newport News, Virginia, where it is currently on exhibit.

If you are a descendant of David Cuddeback, we would like to hear from you.

Sustainable Seas Expeditions

A project of the National Geographic Society, in partnership with NOAA's National Marine Sanctuaries, and made possible by the Richard & Rhoda Goldman Fund

In April 1998 the National Geographic Society, the National Oceanic and Atmospheric Administration, and the Richard & Rhoda Goldman Fund announced an unprecedented mission for the oceans. With a $5 million grant from the Goldman Fund, the Society launched the *Sustainable Seas Expeditions*, a five-year project of deep-water exploration and public education in NOAA's National Marine Sanctuaries.

The twelve sanctuaries conserve, protect, and enhance the biodiversity, ecological, integrity, and cultural legacy of the nation's marine environment. Ranging from American Samoa to New England, they include Pacific and Atlantic haunts of whales, sea lions, sharks, rays, and turtles; significant coral reefs and kelp forest habitats; and the remains of the Civil War ironclad USS *Monitor* off the coast of North Carolina.

Dr. Sylvia Earle, National Geographic Society Explorer-in-Residence, will lead the expeditions to the twelve marine sanctuaries, using the newly designed Deep Worker, a one-person submersible capable of exploring to depths of 2,000 feet. This innovative submersible technology will enable the expedition to:

- undertake the first sustained exploration of the sanctuary system to depths of 2,000 feet;
- photodocument the natural history of each sanctuary's plants and animals; and
- establish the first permanent marine monitoring network in the marine sanctuaries.

Ultimately, through opportunities for ground-breaking exploration, compelling images and video, and public involvement, *Sustainable Seas Expeditions* is designed to generate greater public support for marine sanctuaries and in turn increased conservation of our oceans.

Beginning is April 1999, *Sustainable Seas Expeditions* will employ the innovative *DeepWorker* manned submersibles. These small, maneuverable submersibles provide the gift of time to explore at depths unattainable using conventional means, even within normal diving range. By their spacecraft-like nature, these manned submersibles also will attract broad public interest in what "aquanauts" observe. Like astronauts reporting their direct view of Earth from space, *DeepWorker* aquanauts will be able to capture a sense of the ocean from within.

The deep sea is as uncharted as the vast interior was when President Thomas Jefferson commissioned Lewis and Clark to explore and document the then-unknown resources of the American West. Sustainable Seas Expeditions has the potential to produce significant scientific discoveries and extraordinary educational experiences for millions of vicarious participants, and the data gathered will provide stronger foundations for marine research and conservation polities.

"Whatever else is achieved, however, the ultimate success will be in the project's overall impact on dispelling ignorance about the sea," said Project Director Sylvia Earle. "With knowing comes caring, and with caring there is hope that an ocean ethic will arise that will secure a sustainable future for ourselves, and for the seas."

The success of the Sustainable Seas Expeditions will depend on the participation of many collaborators. To date, collaborators include the U.S. Navy, NASA, Monterey Bay Aquarium Research Institute, Mote Marine Laboratory, Center for Marine Conservation, SeaWeb, and the Jason Foundation—and the list continues to grown.

"With the potential of new discoveries beckoning and a national commitment to asses and understand our oceans, the Sustainable Seas Expeditions promise exciting viewing for the next five years."

Dr. Steve Gittings
Science Coordinator for the
National Marine Sanctuary Program

The National Marine Sanctuaries Accomplishments Report for 1998 is now available from the *Monitor* Sanctuary office. This is a comprehensive look at all of the twelve National Marine Sanctuaries and includes some visually stunning images. It is an excellent source of information for student reports on the oceans and the various resources contained within our marine protected areas.

By the beginning of the 1999 school year, The Mariners' Museum, with assistance from the *Monitor* Sanctuary staff, will have an on-line *Monitor* curriculum up and running. This curriculum will offer something for all ages—students and adults—and will include about 100 pages of text as well as approximately 100 images, both historical and modern.

As part of the curriculum, the new *Monitor* Bibliography will be put on line. A limited number of hard copies will be printed, most of which will be made available to university and research libraries to reach the greatest number of researchers. We will furnish the web address for the curriculum site in the next issue of *Cheesebox*.

Monitor artifacts can be seen in the permanent *Monitor* exhibit at The Mariners' Museum In Newport News, VA, as well as at the Hampton Roads Naval Museum at Nauticus in downtown Norfolk, VA. Conservation of the *Monitor*'s propeller and other artifacts recovered during the 1998 field season may also be viewed by the public.

A variety of material on the *Monitor* is available from the *Monitor* Sanctuary office, including back issues of *Cheesebox*, paper models of the *Monitor*, publications on the *Monitor*'s commanding officers and crew, an information book on the *Monitor* and the *Monitor* Sanctuary, and various brochures. This material is excellent research material for student reports on the *Monitor* and the Battle of Hampton Roads.

The *Monitor* staff can do limited research into the *Monitor* Collection for individuals with specific research interests. Copies of documents and images from the Collection can also be provided.

1998 *Monitor* Expedition

The propeller rests in its cradle aboard the Kellie Chouest *(photo by Cynthia W. Creamer, the Cambrian Foundation).*

A large section of a hull plate lies on the deck of the Kellie Chouest *immediately after recovery. The plate is currently undergoing conservation at The Mariners' Museum.*

Navy divers prepare for another dive on the Monitor.

The Navy's dive platform and two divers prepare to descend the 230 feet to the Monitor.

The propeller in its cradle sits under a sprinkler system awaiting conservation at The Mariners' Museum (photo courtesy of The Mariners' Museum).

A heavy crane lifts the propeller into the conservation tank to begin a three-to-five-year process. The conservation area is open to the public (photo courtesy of The Mariners' Museum).

Is this the Monitor's officers' "water closet" or toilet? Hopefully the early stages of conservation will reveal details that will answer this question (photo courtesy of The Mariners' Museum).

Navy personnel prepare the dive platform for deployment over the side of the Kellie Chouest.

One of the propeller's three broken blades is visible as the propeller sits in the conservation tank during an examination by a conservator (photo courtesy of The Mariners' Museum).

Some of the special guests who visited the 1998 Monitor *Expedition.*

NOAA and Cambrian Foundation divers situate themselves on the elevator on the stern of the Kellie Chouest. *The elevator takes the divers about 20 feet below the surface, where they begin their free descent to the* Monitor.

Norcross Family Papers Donated to the *Monitor* Collection

On Tuesday, September 1, 1988, at a ceremony at The Mariners' Museum, Mr. William Norcross and Ms. Donna Schardt donated the Norcross Family Papers to NOAA's *Monitor* Collection. The papers are primarily those of their great-grandfather, Joseph Norcross. They include water colors of ships designed by Joseph Norcross, patent certificates and drawings, and correspondence from various individuals and government officials, including Secretary of the Navy Gideon Welles.

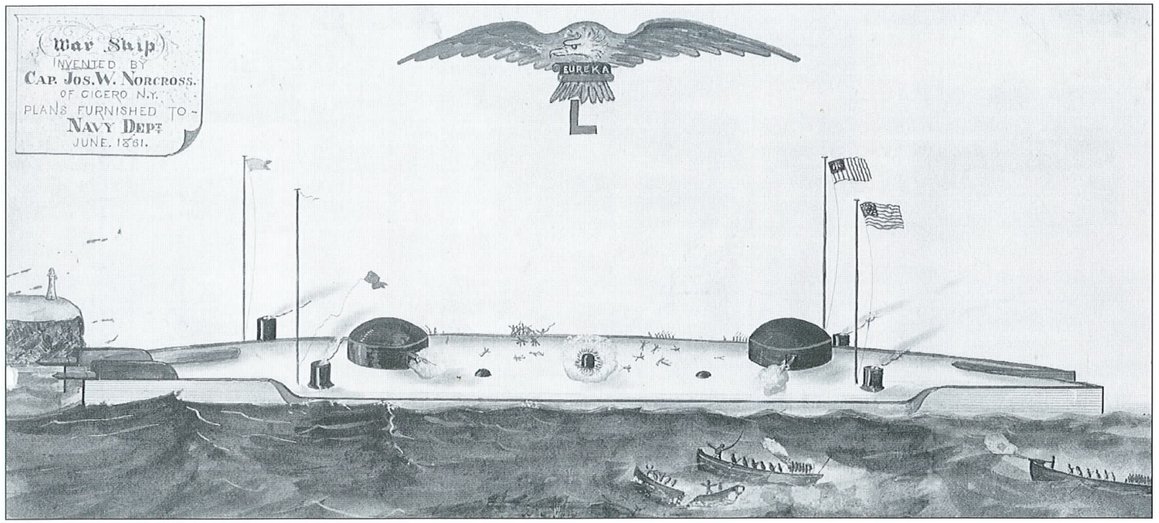
Some of the vessels designed by Joseph Norcross were similar to the monitor-type vessels built by the U.S. Navy during and after the Civil War. The Norcross "monitor" appears to have a catamaran-type hull and two rounded turrets. According to a newspaper article contained in the collection, the design for this ship was submitted to the Navy in mid-1861 but the plans apparently disappeared. While Joseph Norcross did build a vessel in the 1880s, it is not known if it was on the order of his turreted vessel design.

Patents were issued to Joseph Norcross for blocks and tackles and other vessel-related items. The Norcross Family Papers contain the patent documents, complete with official seals and ribbons, and detailed engineering drawings of the inventions.

The Norcross family donated the papers to the *Monitor* Collection to recognize their great-grandfather's contribution to ship design and his foresight in conceiving a monitor-type vessel. Condition assessments of the documents and accessioning into the *Monitor* Collection have been completed and the papers are now available for research.

NOAA's *Monitor* Collection is curated by The Mariners' Museum and contains historical documents and information as well as all of the scientific data that has been generated by NOAA-sponsored research on the wreck of the *Monitor*. The scientific data includes photographs, video footage, and technical reports on NOAA's various expeditions. All artifacts recovered from the *Monitor* Sanctuary are also part of the *Monitor* Collection and are curated by the Museum. Many of the artifacts are included in a permanent *Monitor* exhibit at the Museum.

The Mariners' Museum serves as the Principal Museum for the *Monitor* National Marine Sanctuary and has been a partner in the last three expeditions to the *Monitor* Sanctuary, including the 1998 expedition which resulted in the recovery of the *Monitor*'s propeller. The propeller and other artifacts recovered during the 1998 field season are currently undergoing conservation at the Museum (see lead article in this issue).



One of approximately twenty water colors included in the Norcross Family Papers, this illustration shows the unique hull design conceived by Joseph Norcross for his monitor-type vessels.

Environmental Hero

On May 22, 1998, Oceaneering of Upper Marlboro, Maryland, received the "Environmental Hero Award" from NOAA for assistance in developing the long-range preservation plan for the USS *Monitor* submitted to Congress earlier this year. The award was presented by John D. Broadwater, manager of the *Monitor* National Marine Sanctuary, to Oceaneering Technologies (OTECH) along with a letter from Vice President Al Gore which states in part: "President Teddy Roosevelt once said, 'Conservation is a great moral issue, for it involves the patriotic duty of insuring the safety and continuance of the nation.' By volunteering your time and energy, you are part of that continuing legacy. This award appropriately recognizes your efforts."

In 1997, the Office of the Director of Ocean Engineering, Supervisor of Salvage (SUPSALV) approached OTECH to develop a plan for the emergency stabilization and preservation of the *Monitor* and recovery of major components of the wreck. A team of OTECH engineers and divers, including Don Craig, Ken Edwards, Mark VanEmmerick, Leonard Whitlock and Steve Wright, conducted trade-off studies to define the best recovery method and developed budgetary costs. A preliminary plan was submitted to NOAA and SUPSALV and incorporated into the long-range preservation plan.

National Marine Sanctuaries and the Year of the Ocean

For over two decades, National Oceanic and Atmospheric Administration's National Marine Sanctuary program fostered an ocean ethic that encourages all of us to share a commitment to protect and preserve our nation's priceless marine resources. This ocean ethic recognizes the need for sustainable use and requires that sanctuaries take a lead role in managing and protecting marine and coastal areas for the benefit of this and future generations.

In 1948, conservationist Aldo Leopold wrote in *A Sand Country Almanac*: "When we see land as a community to which we belong, we may begin to use it with love and respect." Exchange the word land for ocean, and we can understand what is expected of us and how we must exchange our role of "conqueror of the [ocean] community to plain member and citizen of it."

In a number of profound ways the Sanctuaries promote this ocean ethic—through research into the workings of complex ecosystems, through monitoring environmental changes over time, and through the tireless efforts of volunteers, researchers, and educators. They carry the message that oceans, just as much as our nation's land, need help and deserve our respect.

In late 1997 the immense impact of the ocean on humankind captured the world's attention as a strong El Nino affected weather around the globe. This and other events such as toxic algal blooms sounded an alarm that lends urgency to the United Nations' declaration of 1998 as the Year of the Ocean.

As we prepare for a new century, the Sanctuary Program continues to provide leadership in this growing ocean ethic of marine conservation. In 1997, the National Marine Sanctuary program celebrated its 25th anniversary in events held around the country. From the halls of Capitol Hill to the shores of Monterey Bay, the sanctuaries showcased their long history of coastal stewardship and marine sustainability and outlined their goals for the twenty-first century.

In February 1997, Governor Lawton Chiles and his cabinet signed the law that brought Florida state waters into the Florida Keys National Marine Sanctuary. In June 1997, Governor Benjamin Cayetano approved the final designation of the Hawaiian Islands Humpback Whale National Marine Sanctuary, protecting the winter breeding home of the largest Pacific population of the endangered humpback whales.

The yearlong events in 1997—rock concert fund-raisers and designation celebrations, long-term plans for saving a famous Civil War ship, archaeological discoveries in the Gray's Reef Sanctuary—all carried the message of a new ocean ethic. Americans have long acknowledged the necessity of a Yellowstone or Glacier national park; increasingly Americans understand that protection must extend equally to our oceans. Today a growing number of citizens see national marine sanctuaries as important pieces of the larger mosaic of environmental conservation.

> *Today, marine sanctuaries are places in the sea, as elusive as a sea breeze, as tangible as a singing whale. They are beautiful, or priceless, or rare bargains, or long-term assets, or fun, or all of these and more.*
>
> **Dr. Sylvia Earle**

Editor's Corner

And yet another year has passed. It seems that 1998 was a good year for the *Monitor*. The final long-range preservation plan was submitted to Congress, and the first phase of the recommended shoring and artifact recovery was completed, thanks in part to the long-awaited cooperation of Mother Nature.

It is hard to believe that 25 years have passed since the wreck of this gallant little ship was located. Many of the individuals who were involved with the Duke University expedition that found the wreck are no longer with us, most notably John Newton, of Duke University and later the *Monitor* Research and Recovery Foundation, who led the expedition; and Dr. Harold Edgerton of Massachusetts Institute of Technology, who designed the camera system used to locate and photograph the wreck. These men were explorers in the true sense of the word and they are sorely missed.

The *Monitor* Collection received a most interesting collection of material in September, as detailed in the article on the Norcross Family Papers in this issue. Our thanks go to William Norcross and Donna Schardt for making these papers available to researchers. We will have a more in-depth article on the contents of the Norcross papers in the next issue of *Cheesebox*.

We would also like to express our appreciation to all of you who have written, called, and emailed for information on the *Monitor* and the *Monitor* National Marine Sanctuary. We have had a record-setting year in terms of the amount of information we have distributed to students, teachers, researchers, model builders, and interested members of the public. We appreciate your interest and support and hope that you will continue to follow the story of the *Monitor* as we continue our efforts to preserve this significant part of our past.

And finally, if you have family papers that relate to the *Monitor*, the CSS *Virginia*, the Battle of Hampton Roads, or related subjects, we would very much like to hear from you. We are particularly interested in hearing if you have any information on one of the *Monitor*'s officers or crew. A new study of the men who served aboard the *Monitor* is in preparation and we are looking for new information to include.

Got a Good Image of the *Monitor*?

If you have a good image of the wreck of the *Monitor* that you would like to share, we would like to hear from you. The education staff of the *Monitor* National Marine Sanctuary would like to produce a new Sanctuary poster as well as two new bookmarks and other items. We are asking researchers and divers who have visited the *Monitor* to submit images that they would allow us to use for these products. Images will be examined by Sanctuary and Mariners' Museum staff, and the one judged the best in terms of clarity and subject matter will be used for the next Sanctuary poster. Other images will be used for bookmarks, future issues of *Cheesebox*, and other education products, with the photographer's permission. Images will be used only once and the photographer will receive full credit.

The poster photograph will be representative of ongoing research in the *Monitor* Sanctuary. Private researchers and special use permit participants who have conducted dives to the *Monitor* are encouraged to submit photographs for consideration.

1. All images submitted for consideration should be in a color 8 X 10 format or transparency.

2. Photographers may enter as many photographs as they wish.

3. Each photograph should be labeled with the photographers name, address, telephone number, and appropriate credits.

4. All submissions will be acknowledged in writing within five days of receipt.

5. The photographs will be reviewed by a panel that includes the *Monitor* sanctuary staff, as well as members of the photography staff and director of the education department of The Mariners' Museum.

7. Permission may be sought from photographers to use images for bookmarks, future issues of *Cheesebox*, and other education products.

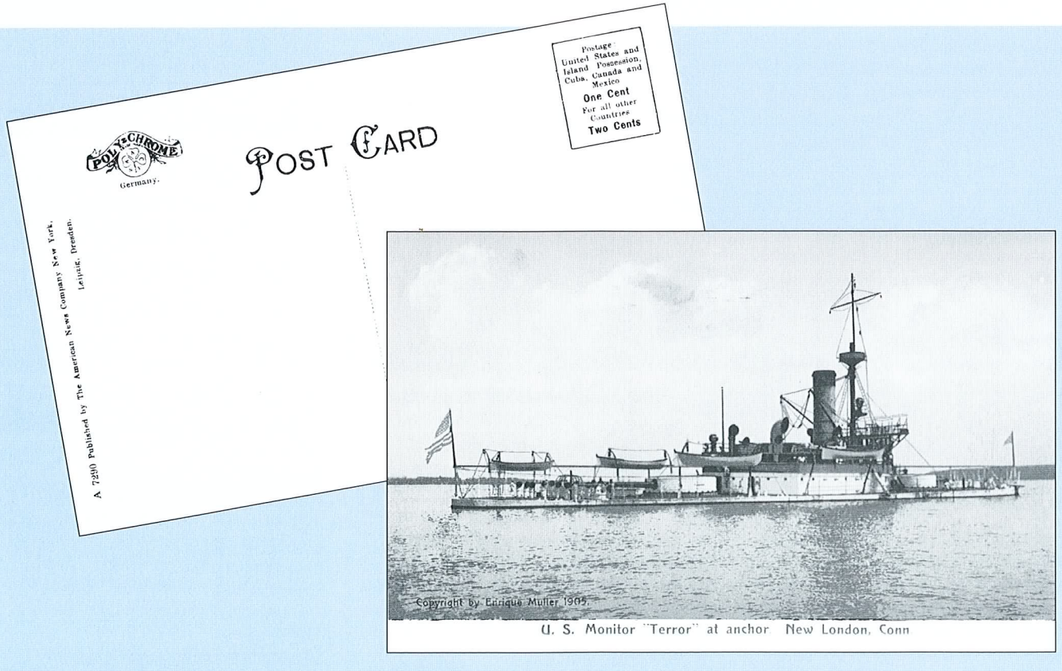
8. No photographs will be used for any publication without the express written permission of the photographer.

9. Images should be submitted by March 1, 1999. You will be notified by April 15 of the selection for the new poster.

9. Photographs should be submitted to

Dina B. Hill, Education Coordinator
Monitor National Marine Sanctuary
The Mariners' Museum
100 Museum Drive
Newport News, VA 23606
(757) 599-3122

See our new National Marine Sanctuaries web page at **www.sanctuaries.noaa.gov** with links to the Year of the Ocean and Sustainable Seas Expedition web pages.



This post card showing the "U.S.* Monitor *Terror at anchor, New London, Connecticut," was donated to the* Monitor *Collection by Jeff Johnston, one of the* Monitor *Sanctuary's research assistants.

Myths and Mysteries

This is a new column that will appear periodically to discuss Monitor *myths or to share new information that solves or adds to mysteries surrounding the USS* Monitor. *If you have suggestions for items that might be of interest to our readers, please let us hear from you.*

Of all the stories that have circulated about the night the *Monitor* sank, none has attracted as much attention as an account that concerns the *Monitor*'s cat. This story apparently originated in an article written by Francis Banister Butts, who served as a landsman on board the *Monitor* from November 1862 until the ship sank on December 31, 1862.

In an article titled "The Loss of the *Monitor*" by A Survivor which appeared in Century Illustrated Monthly Magazine, Vol. XXXI (November 1885 to 1886), Butts describes the circumstances surrounding the loss of the *Monitor* and his own actions that night.

> Bailing was now resumed. I occupied the turret all alone, and passed buckets from the lower hatchway to the man on the top of the turret. I took off my coat—one that I had received from home only a few days before (I could not feel that our noble little ship was yet lost)—and rolling it up with my boots, drew the tampion from of the guns, placed them inside, and replaced the tampion. A black cat was sitting on the breech of one of the guns, howling one of those hoarse and solemn tunes which no one can appreciate who is not filled with the superstitions which I had been taught by the sailors, who are always afraid to kill a cat. I would almost as soon have touched a ghost, but I caught her, and placing her in another gun, replaced the wad and tampion; but I could still hear that distressing yowl. As I raised my last bucket to the upper hatchway no one was there to take it. I scrambled up the ladder and found that we below had been deserted. I shouted to those on the berth-deck, 'Come up; the officers have left the ship, and a boat is alongside.'

Butts' account leads us to believe that 1) both of the *Monitor*'s guns are blocked by tompions (not "tampions" as stated in Butts' article); 2) behind one of the tompions are Butts' coat and boots; and 3) behind the other tompion are the remains of the *Monitor*'s cat. It was standard procedure for the tompions to be placed in the guns while the guns were not in use, so Butts' account of drawing the tompions from the guns rings true. However, we have no corroboration for the rest of his story. Other members of the *Monitor*'s crew wrote articles or gave accounts of the sinking; yet none even mentioned that the *Monitor* had a ship's cat, much less that she spent her final moments on the ship trapped in one of the XI-inch Dahlgrens.

Several of Butts' recollections differ, sometimes dramatically, from official reports and other accounts of the sinking. Other crewmen mentioned the "bucket brigade" formed in an effort to remove the water that was rushing into the ship, although their stories do not quite agree with Butts' account; other crewmen mention divesting themselves of heavy clothing before going to the top of the turret to wait for the rescue boats. Why did no one else mention that the ship's cat was in the turret that night? And why is there no mention of a cat on board the *Monitor* at any time? "Mascots" on navy ships were common and included chickens or roosters as well as cats and dogs. However, with the exception of the article by Francis Butts, we have found no mention of a mascot or ship's cat on board the *Monitor*. Paymaster William Keeler and crewman George Geer wrote frequent letters to their wives, discussing daily routines, meals, weather, and fellow officers and crew. Neither mentioned a ship's cat.

If the two XI-inch Dahlgrens are recovered from the turret, archaeological evidence may prove—or disprove—Butts' story. Meanwhile, if any of our readers have information about the *Monitor*'s cat, we would like to hear from you.

Cheesebox is published by The Mariners' Museum, Newport News, Virginia; Vol. X, No. 1, December 1998. Dina B. Hill, *Monitor* National Marine Sanctuary, and Chris Barnett, The Mariners' Museum, editors. Funding provided by the National Oceanic and Atmospheric Administration in the amount of $1,600.

SUCCESS!

...continued from page 2

samples and geotechnical data from the seabed.

Among the artifacts recovered were a 10-foot-by-3-foot deck plate that may be the propeller well cover; portions of two other deck plates, one with an opening that may have been a coal chute; part of a steam engine; and an unidentified object made of iron and brass or bronze. All of these artifacts are currently undergoing conservation at The Mariners' Museum. They are being treated by electrolysis, the process used on the *Monitor*'s anchor which was recovered in 1983. It is estimated that the propeller and shaft will be in treatment for three to five years. The smaller artifacts will take less time. Progress on the conservation of these artifacts will be reported in future issues of *Cheesebox*.

In addition to these objects, two artifacts were recovered by a Cambrian Foundation private research expedition in early July: what may be one of the *Monitor's* toilets, or water closets as they were called, and the butt plate from a rifle. Articles on each of these artifacts appear elsewhere in this issue.

Also recovered were a bottle fragment similar to one recovered during the 1979 *Monitor* Expedition, and a portion of a small tureen lid, the rest of which was recovered by a Cambrian Foundation research expedition a few years ago. These artifacts are also being conserved at The Mariners' Museum.

Media coverage of the expedition was extensive. The excellent public television science program NOVA assigned a production team to film the expedition for a one-hour documentary planned for the Public Broadcasting System in the spring of 1999; *National Geographic* sent a photographer to cover a week of the expedition for a possible magazine article; affiliates of all three major networks visited the expedition and aired news stories on the expedition; CNN visited the site and aired at least three stories; Fox and the Learning Channel visited the site; and because of the interest in John Ericsson, Swedish-American designer of the *Monitor*, a team from Swedish Television visited and aired a story in Sweden.

The 1998 *Monitor* expedition ended on June 26. The data generated by the expedition is currently being analyzed and a final report is being prepared. Also, preliminary planning for the 1999 *Monitor* expedition is underway. Current plans call for the actual shoring of the wreck to begin during the 1999 field season, along with assessing the feasibility of recovering the *Monitor*'s engine. More will be reported in future issues of *Cheesebox*.