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Wisconsin Underwater Archeology Association

Mud Box - Filled With Stone: The Wreck Of The Scow Schooner *Dan Hayes*

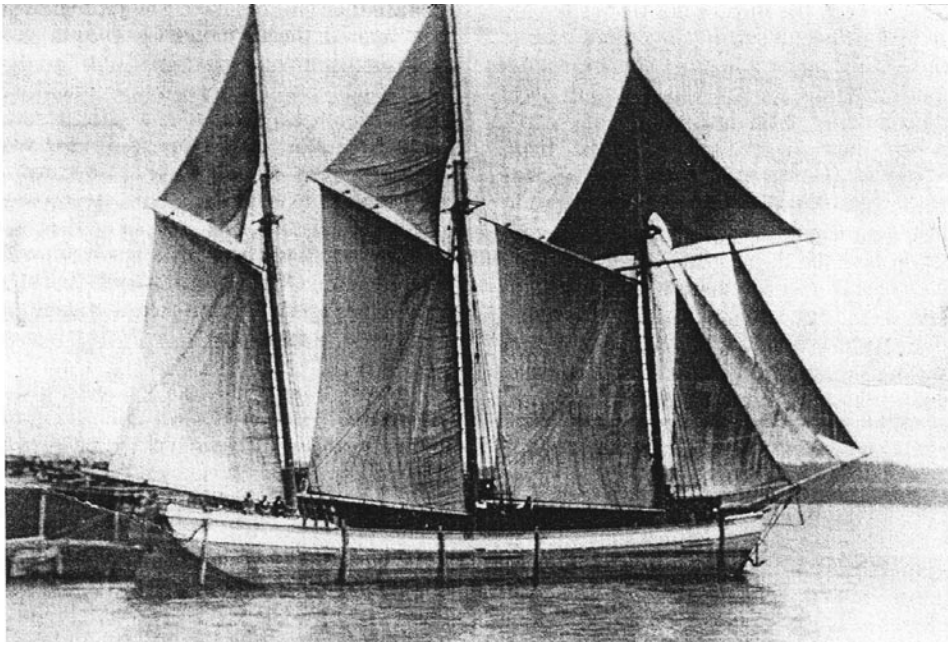
by Bradley Rodgers and Annalies Corbin

This story is an excerpt from an article in the International Journal of Nautical Archeology*, vol.32, 2003. Professors Rodgers and Corbin are in the Maritime Studies program at East Carolina University.*

This project focused on a scow schooner, located underwater at the abandoned Graef & Nebel quarry jetty in McCracken's Cove, Sturgeon Bay, Wisconsin.

As its name implies, a scow schooner's hull is flat bottomed and slab sided, while its rigging is arranged in the fashion of a standard schooner, fore and aft with two or three masts. The scow schooner represented a cost-effective 19th-century vessel type used to link small port communities to large and growing port centers such as Chicago, Detroit, Cleveland and Milwaukee. The scow schooner allowed smaller communities, without deep water access, to transport goods to market before rail lines were built. These vessels were invariably cheaply constructed, slab-sided ships, rarely exceeding 100 tons, with a shallow draft, a flat bottom, an assortment of bow configurations and a ramp stern.

The Dan Hayes
courtesy Manistee County Museum



The first scow schooners on the Great Lakes appeared in 1825 at Erie, Pennsylvania. They seem to have been adaptations of the typical scow form used along the east coast as lighters and work boats (Merriman 1997). Rigging scows fore-and-aft and fitting them with a centerboard produced an economically cost-effective sailing ship for coasting and hinterland trade. The consort system, developed on the Great Lakes in the late 1850s, allowed for the useful recycling of older sailing vessels. These vessels were often converted to barges to carry high volume, low unit value, bulk commodities, and were towed one or several at a time in line astern by a steam-powered vessel, usually a propeller steam barge or large tug.

Scow schooners were notoriously bad sailors because of their flat bottoms and squarish ends. Even when new, these vessels could carry no better than a B rating with insurance underwriters (Karamanski 2000). With only a sloping vertical tuck in the stern for water to pass over the rudder, and various ungainly bow shapes, they could not have maneu-

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WUAA Spring Meeting

The Spring 2005 Meeting of the Association was held in Milwaukee on Saturday, February 19, 2005. 19 people attended the meeting.

President Russel Leitz opened the meeting. Steve Wagner gave the Treasurer's report. Danny Aerts summarized the minutes from the Fall meeting.

WHS Diving Operations

Keith Meverden, the state underwater archeologist, reported on Wisconsin Historical Society activities. The WHS will survey the site of the scow schooner *Iris* in Jackson Harbor on Washington June 6 – 10. Volunteers are welcome.

The WHS will offer a certification class for first aid, CPR and oxygen administration on April 16 & 17. The certifications are required for participants in WHS projects. Cost will be approximately $75.

New diving regulations for state projects and state employees have been written and are being reviewed. They should be finalized soon.

The underwater preservation group is running on grant money. The underwater archeologist is not a permanent position, but appears to be ok for now.

Meteor

Danny Aerts reported that the museum ship *Meteor* in Superior has had a structural analysis and was found to be fundamentally sound, although major maintenance and improvements are needed. The museum is now raising funds for these needs. They currently have a grant which will match any funds donated.

Bob Lijewski made a motion that WUAA donate $100, which was seconded and passed by a voice vote. Russ Leitz will set up a date to work on the ship again.

Liability

There is a concern about having dive projects without liability insurance. Russ Leitz talked to other groups that pay about $600/yr for insurance. Bob Korth said Lake Association groups have event insurance. Either way it is probably not an expense we want to have. This issue will be discussed further by the officers and board.

Membership, Income and WUAA's Future

Russ Leitz stated that our membership has dropped off the last couple years and our expenses have exceeded our income recently.

Danny Aerts said that members may not have been receiving renewal notices promptly due to the turnover in the secretary position.

Dick Boyd mentioned that we have not had any special events lately, like training ship construction seminars and underwater archeology classes, which not only brought in members but also generated a small a profit.

Bob Korth suggested we need to update our mission and reach out to other people besides just divers. People may want to be members and support our work and goals even though they may not attend meetings. Greg Kent said the most important mission of WUAA is to educate.

Wisconsin's **Underwater Heritage** is published quarterly by the Wisconsin Underwater Archeology Association, a nonprofit association of individuals and organizations interested in studying and preserving the underwater cultural resources and historical sites of Wisconsin.

In addition to publishing this newsletter, the Association also holds semiannual meetings and provides support to members' research and publication projects. Annual membership dues are $15. For membership information write to the postal or email address below.

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Bob Korth also suggested we have a program which could be presented to various groups. Both he and Dick Boyd would be willing to give presentations. Keith Meverden has several PowerPoint presentations which could be adapted for our use.

It was suggested that we could try to get grants to support some things like the newsletter and documentation projects.

Dick Boyd recommended we set up a longer meeting to strategize for WUAA. It should be for a full day and it should take place in March or April. It could possibly hold in Madison at the Historical Society. Russ Leitz will coordinate.

No location or date was set for the Fall meeting. This will be decided at the strategy session. It seems to be helpful to tie it in with another event. Elections will be held in the fall.

Strategy Session

A "working day" is being planned to discuss strategies for the association. It will take place on Saturday, April 19, 2005 and will be held at the Historical Society in Madison. The following points will be addressed.

Evaluation of the WUAA mission statements.

Discuss if our prime mission is to educate people about the importance of our maritime history and preserving it for future generations.

How we partner with the state underwater archeologist and others to give the most support to their work.

Insurance as an issue.

Membership growth.

This meeting is open to all members. Please contact Russel Leitz if you plan to attend or if you have any recommendations.

WUAA Purpose

To facilitate the discussion of WUAA's mission and to aid in strategic planning, here is a list of the purposes of the Wisconsin Underwater Archeology Association, as stated in the current bylaws.

To promote research and education in underwater archeology in the Wisconsin area.

To provide training and information to perform underwater site surveys.

To publish results of sponsored projects for members and the general public.

To work in cooperation with organizations interested in underwater archeological resources.

To provide access to statewide information pertaining to underwater archeology.

To promote the conservation and in situ preservation of underwater archeological resources.

From The Archives

by Russel Leitz

The following article is from the Manitowoc Pilot*, November 1, 1917.*

First Steamers on Lakes

The *Ontario* and the *Frontenac*. Launched 101 years ago, were constructed in 1816.

The first steamboats on the Great Lakes were launched 101 years ago on Lake Ontario. Two craft operated by steam were constructed in 1816 on the shores of the lake, one being the *Ontario*, built at Sacketts Harbor, N.Y., and the other the *Frontenac*, which was launched at Ernestown, Canada, on September 7, 1816. The *Frontenac* was one of the finest steamboats afloat at the time. It cost $75,000 and was of 700-tons burden, its length of deck being 170 feet. The *Frontenac* was placed in operation 100 years ago, making three round trips each month from Kingston to York and Niagara. Capt. James McKenzie, who had had experience in the British navy, was placed in command. The *Frontenac* was in service on Lake Ontario for ten years, and soon had several rivals for the lake trade.

A fare of $15 was charged from Kingston to Niagara for first-class passengers, but deck passengers were carried for $3.75 a head. The freight rate was "4 shillings per barrel bulk".

The first steamship on Lake Erie was the *Walk-in-the-Water*, which was launched at Black Rock, near Buffalo, in 1818.

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vered or tacked with much efficiency when fully loaded. The centerboard was the one indispensable piece of equipment, as without it the ship could not have been sailed at all.

Historically Great Lake schooner scows carried three distinct bow shapes. They could have a ramp bow, with or without a cutwater, a nearly conventional schooner stem, or a 'bent bow' with the planking forming a V shape (Inches 1964).

When sailors grew sentimental over a schooner scow it was because of her character for what she could do in spite of her build (Inches 1964). In fact, when sailing light and beating to windward, such ships were reported to be quite fast, as fast as most conventional sailing schooners (Chapelle 1935). Their box shape also allowed them to carry more cargo than a conventional ship of the same dimensions (Inches 1964). All in all, the large capacity and small crews needed to operate the schooner rig made the vessels cost effective.

Dan Hayes Background

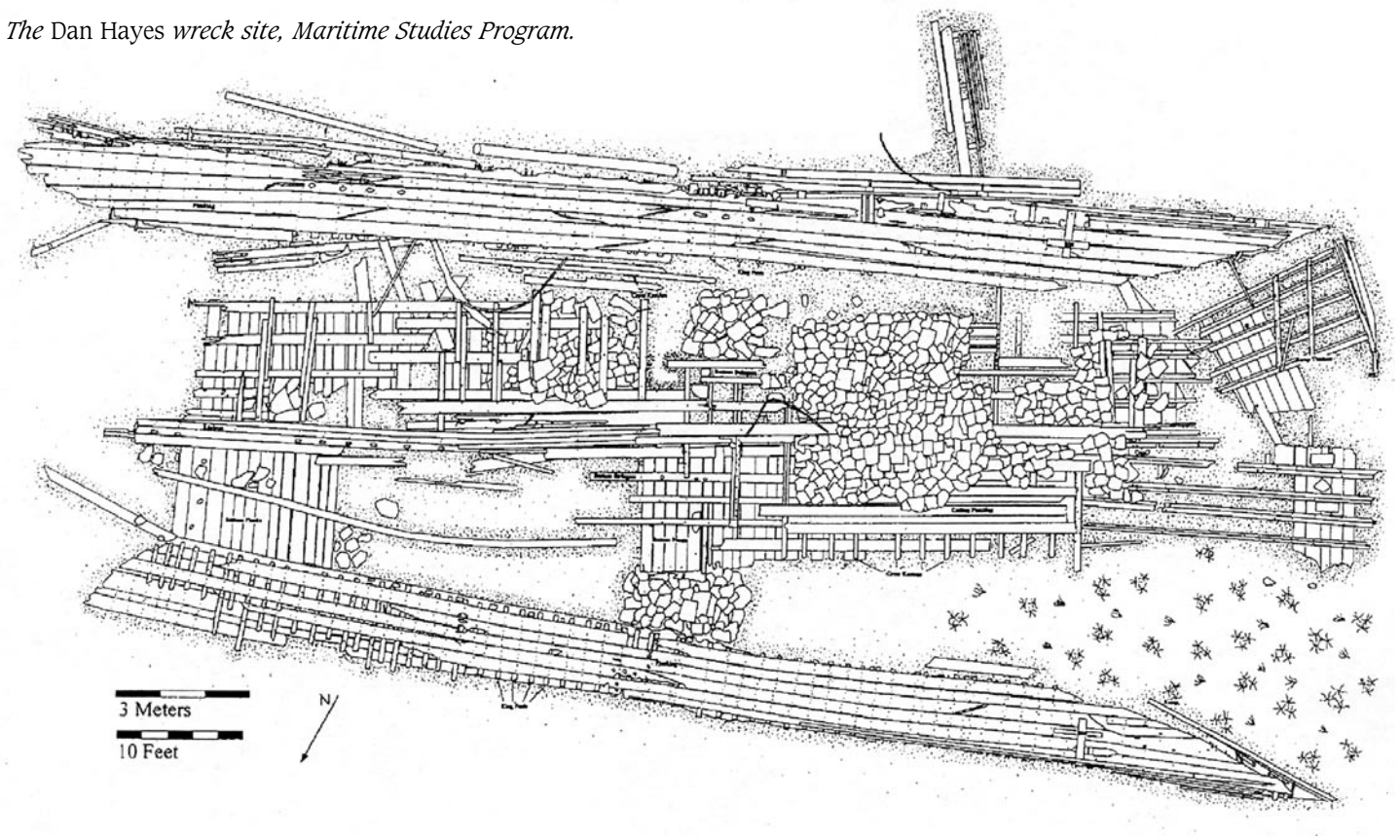
According to the vessel's enrollment, the *Dan Hayes* was built at Fairport, Ohio, in 1868, at a cost of $14,000, by R. Hayes & Fountain, with the official number 3504. The ship was listed as a schooner of three masts, with a length of 112.1 feet, a beam of 24.2 feet and a 7-foot draft. Her listed gross tonnage was 145 with a net tonnage of 138 (Runge)

During her early years the vessel's only owner was listed as Theodore Consaul of Milwaukee. The *Dan Hayes* apparently hauled lumber and reportedly could carry 170,000 board feet (Runge).

In 1882 the ship was reportedly rebuilt as a scow. Barge conversion obviated the scow's poor sailing qualities by adding the reliability of a steam escort, while maintaining the usefulness and economy of the scow as a consort. Typically the conversion involved removing the main mast to facilitate loading and unloading. It is unclear whether the deck amidships was removed for the same reason. Archeological evidence from other stone barge sites has shown no signs of midship decking or hatch combings, and tie bolts and turnbuckles were invariably installed between the port and starboard sides in the midships area to keep the ship's sides from splaying outward, a duty usually performed by deck beams.

On August 3, 1898 the *Dan Hayes* capsized in a stiff north wind

The Dan Hayes *wreck site, Maritime Studies Program.*



off North Point, near Milwaukee, with a load of lumber from Manistee. Apparently the ship sprang a leak off Fox Point and became waterlogged, floating only because of the lumber she carried. The crew battled to save the ship for five hours. Finally, Captain Ole Oleson and his three-man crew were forced to take to the yawl boat as the vessel became more unmanageable (DCA 1898, DDFP 1898). The *Dan Hayes* was eventually towed into Milwaukee and repaired. By May 1900 the ship had been purchased by the Graef & Nebel Stone Company and refitted for the stone hauling business (DCA 1900).

The *Dan Hayes* was intentionally grounded by the tug *Duncan City* on its last voyage on August 6, 1904. The vessel sank only a short distance from the wharf where it loaded.

Description of Findings

The wreck site lies in 6 to 8 feet of water, approximately 400 feet from shore. The remains represent the lower section of a wooden ship's hull, including the bottom and both the port and starboard sides, now splayed out and lying flat on the bottom. The vessel is constructed in the fashion of a flat or scow, with little or no deadrise, flat sides with no apparent swell, a ramp for a stern, and what may have been a modified 'bent' bow (Chapelle, Inches, Brewington).

The keel and keelson structure which formed the spine of the scow is internal to the bilge of the ship and does not protrude from the bottom as it would in a conventional vessel. This is an obvious adaptation to shallow-water operation, decreasing the likelihood of damage should the vessel run aground. There are cross keelsons which run the entire beam of the ship and are mortised directly through the keel. These cross keelsons are pinned into the mortise in the keel by iron drift pins driven through them from the bottom of the ship. Since the pins pass through the keel and cross keelsons, and into, but not through, the keelson, it is difficult to conclude that the bottom of the ship was not built in an inverted position. Though named cross keelsons, in flat or barge terminology, these scantlings are more analogous to floors in standard wooden ship construction. They add stiffness to the bottom of the ship just as conventional floors do, strengthening the vessel in cross-section. No limbers are needed for passage of water to the pump, as longitudinal stringers are placed between the cross keelsons and the bottom outer hull planking. This allows free flow of bilge water the length of the ship.

The lack of a centerboard trunk and chain plates makes it difficult to conclude that the ship ever sailed. Only a single piece of archeological evidence suggests this vessel was a sailing scow converted to a barge. Approximately 30 feet from what would have been the stem of the vessel the keel is no longer pierced for cross keelsons, but rather contains pockets for a set of discontinued cross, or half, keelsons. These pockets extend for about 27 feet along the keel and keelson and may indicate that the vessel once contained a centerboard which was later removed when it was converted to a stone barge.

The keelson remained intact only near the center of the ship. Any signs of the fore or mizzen mast-steps have disappeared with the keelson and the main mast-step is buried under tons of dolomite. The keelson's separation from the keel in the fore and aft sections of the wreck can be attributed to the fact that the fasteners from the keel are merely pins – not through bolts. The sides of the ship are fastened much like other ships of the Great Lakes with the larger scantlings drift pinned while the planks are fastened with nails and roves, also known as compression washers or clench rings. Construction of this scow, however, is unlike the construction techniques of a conventional schooner. The bottom planking runs athwartships with the planks fastened to longitudinal stringers located in the bilge. The stringers, in turn, are nailed under the cross keelsons. The cross keelsons are far fewer in number with wider spacing (4-foot intervals) than would be expected of floors on a conventional schooner. Longitudinal ceiling planking then covers the cross keelsons to form the cargo-bearing bottom of the hold.

The nail and fastener heads for the stringers, cross keelsons and bottom planking do not show inside the bilge of the ship even with the bilge ceiling removed. This has the obvious advantage of leaving a smooth hold. Any nail heads or projections into the hold would interfere with removal of cargo using a square-nosed shovel.

The smooth hold, combined with the fact that the keel and keelson pins are also driven up from the bottom, suggests that the bottom of the vessel must have been constructed upside-down and then inverted to an upright position for the attachment of the sides. This is not an unheard-of technique for constructing scows, but would require a substantial effort on the part of the shipyard to flip the hull over once it was complete. Despite the extra step in assembly, rolling the bottom of the hull is no doubt preferable to nailing upward in order to attach the bottom planking, stringers and cross keelsons. Perhaps the bottoms of these ships were flipped over during a

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site launch and only afterwards the sides and ends attached. One drawback to this construction method is that the pins, bolts and nails were not clenched, peened or flattened to prevent working loose or pulling through. Non-clenched fasteners may be one reason for a B insurance rating.

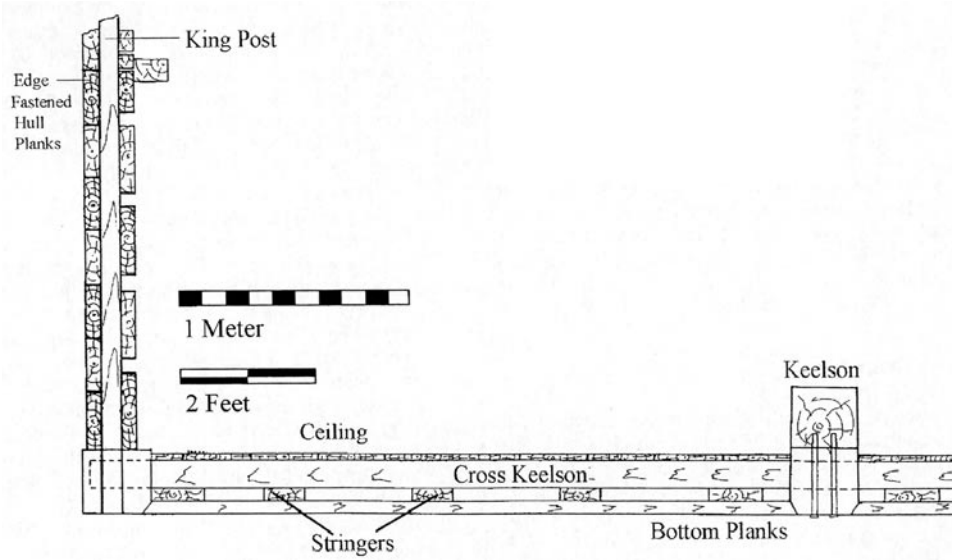
The sides of the vessel are attached to the bottom at a 90-degree chine. The chine log accepts both the cross keelsons and the king-posts, which act as frames running up the sides at 2-foot intervals. This manufacturing technique would make it easy to attach the prefabricated sides to the bottom after inversion, simply by raising the sides and stepping the king-posts into the chine log. The exterior and interior of the ship's sides are planked much like outer hull and ceiling planking on a conventionally-built ship, the notable exception being that there is little or no curvature, swell or tumble-home, and the gaps between the ceiling planks are fairly large. ■

Acknowledgments

This project was made possible through the efforts of the State Historical Society of Wisconsin, particularly the Underwater Division, and the Maritime Studies Program at East Carolina University. Special funding and assistance was provided by the Wisconsin Sea Grant Program. John Karl ably downloaded reports and photos sent from Sturgeon Bay to construct daily updates, placing both ECU and SHSW on line during the project. Jeff Gray, the Wisconsin State Underwater Archeologist and his assistants Russ Green and Kathy Green, effectively brought together divergent groups and specialized programs in an effort to ensure that Wisconsin's maritime heritage and submerged cultural resources be studied.

Field assistance was provided by the Wisconsin Underwater Archeology Association (WUAA) and special thanks goes to Russel Leitz, Bruce Burrows, Danny Aerts, Kristy Lingo and Jim Ankney for their help in documenting the wreck site. Visiting scholar Patrick Labadie was of great assistance on Great Lakes history. Additional thanks goes to Brad Birmingham for access to the wreck site through his property. Shirley Honold, Dennis Duebner, Willie Schartner and John and Donna Thennell. Local landowners, also graciously granted us access through their property. Final thanks goes to Jon Van Harpen for his interest in the project and the great research he was willing to share.

Cross section of the Dan Hayes *wreck site, Maritime Studies Program.*



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Underwater Discovery in India

Mahabalipuram, India (AFP)

Indian archeologists have found what they believe are undersea "stone structures" that could be the remains of an ancient port city off India's southern coast, officials say.

The archeologists learnt of the structures after locals reported spotting a temple and several sculptures when the sea pulled back briefly just before deadly tsunamis smashed into the coastline December 26.

Divers discovered the stone remains close to India's famous beachfront Mahabalipuram temple in Tamil Nadu state, said Alok Tripathi, an official from the state-run Archeological Survey of India (ASI).

"We've found some stone structures which are clearly man-made. They're perfect rectangular blocks, arranged in a clear pattern," he said aboard the Indian naval vessel *Ghorpad*.

Tripathi headed a diving expedition after the tsunamis uncovered the remains of a stone house, a half-completed rock elephant and two exquisite giant granite lions, one seated and another poised to charge in Mahabalipuram, 70 kilometers south of Madras.

The objects were found when the towering waves withdrew from the beach, carrying huge amounts of sand with them.

Experts say the tsunami "gifts" discovered in Mahabalipuram belong to the Hindu Pallava dynasty that dominated much of South India from as early as the first century BC to the eighth century AD.

Mahabalipuram is recognized as the site of some of India's greatest architectural and sculptural achievements.

Since February 11, Tripathi's team of a dozen divers have been scouring the seabed, diving three to eight meters (yards), to examine rocks with "geometrical patterns."

"European mariners and travelers, who visited Mahabalipuram in the 18th century, wrote about the existence of seven pagodas (temples) here," he said.

"Some believed it was a myth, others thought six of the pagodas sank under the sea while one remained as a rock temple on the shore.

"In fact, some scholars believe the entire city, barring a few rock structures and carvings, were submerged under the sea."

The divers have brought up pottery pieces and small stone blocks from the seabed.

"We'll study everything to gain an insight into early settlement in this area," said Tripathi.

Indian Navy commodore Brian Thomas said "extensive diving" had taken place east of Mahabalipuram's shore temple with underwater cameras used to record findings.

"The sea was often rough due to the wind and underwater visibility was very poor," Thomas told AFP. "But we found that the area was strewn with a number of blocks of various shapes and sizes."

The findings were expected to be presented at an international seminar on maritime archeology in New Delhi between March 17-19, archeology officials said.

Tripathi said experts would study how old the rocks were to fix the date of the ancient civilization at Mahabalipuram.

Cartographers say the waves which left nearly 16,400 dead or missing in southern India and the country's far-flung Andaman and Nicobar islands have redrawn the entire Mahabalipuram coastline.

One of a clutch of temples is partially submerged. But the magnificent eighth century Shore Temple, a UN World Heritage Site famed for its carvings representing characters from Hindu scriptures, survived the sea's fury.

This was thanks to a move by India's then prime minister, Indira Gandhi, who ordered that huge rocks be piled around the building to protect it from sea erosion after visiting the site in the late 1970s, officials say.

Coming Events

Apr. 2, 2005	**Launch of the new Coast Guard Icebreaker *Mackinaw*.** In Marinette. Open to the public. Launch at 10 am, gates open at 9 am. Contact Marinette Marine for details.
Apr. 16-17, 2005	**WHS Certification classes for volunteer divers.** In Madison. Contact Keith Meverden at 608-221-5901 or email knmeverden@whs.wisc.edu.
Apr. 19, 2005	**WUAA Strategy Session.** In Madison. Contact Russel Leitz at 715-258-2935 or email wuaa@mailbag.com.
May 21-22, 2005	**Thunder Bay Shipwreck Festival**. In Alpena, MI. For information call 989-356-9336 or check their web site at www.ThunderBayShipwreckFestival.com.
May 21-22, 2005	**Door County Lighthouse Walk.** For information, to request a brochure or to purchase tickets contact the Door County Maritime Museum at 920-743-4045 or www.dcmm.org.

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For those interested in the study and preservation of Wisconsin's underwater history and cultural resources.