

# Freshwater Finds

## Inland waters yield a trove of artifacts, history, and mystery

By SID PERKINS

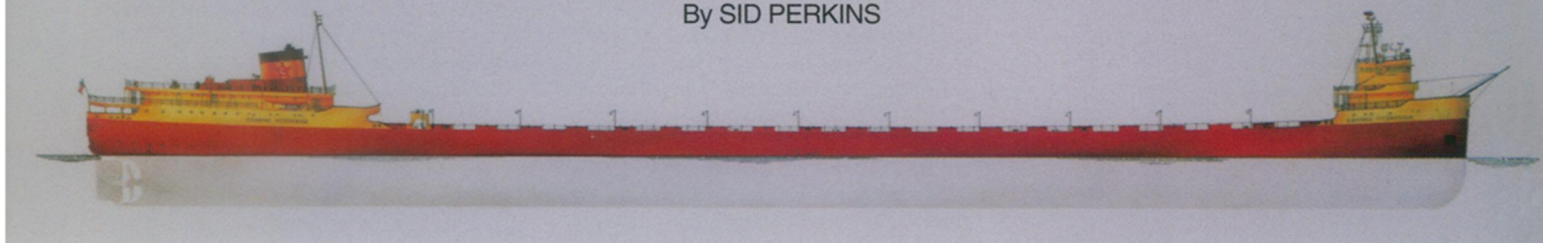


Illustration: R. Champ

**F**or many people, the mere whisper of the word “shipwreck” brings to mind a flood of fanciful images: clear, warm waters, shifting white sands, the glint of pirate gold.

Archaeologists know that reality is often very different. Shipwrecks can be found miles from any ocean. Waterlogged timbers and slowly rusting hulks are strewn beneath the murky, bone-chilling waters of many northern lakes. Among their companions in the gloomy depths are prehistoric and pioneer sites inundated by water that rose behind 20th-century dams.

Increasingly, researchers are using technology developed for exploring the ocean depths to unlock the secrets of ships and sites that lie beneath the United States’ inland waters. These scattered remnants of the past—sometimes magnificent, frequently mundane—are irreplaceable time capsules that can give a better sense of who our ancestors were, how they lived, and the events and environment that shaped the world of today.

Inland waters cover a vast number of sites and objects, says Daniel J. Lenihan, chief of the National Park Service’s Submerged Cultural Resources Unit in Santa Fe, N.M. For example, the waters of Wyoming’s Yellowstone Lake hold everything from steamboats to wagon wheels. Dams in the Southwest have inundated more than 2,000 documented historic and prehistoric sites, including Anasazi ruins and pre-Columbian rock art.

*The 729-foot ore freighter Edmund Fitzgerald sank in a storm on Lake Superior on Nov. 10, 1975. Its mysterious demise inspired a folk song by Gordon Lightfoot, and the accident quickly became one of the world’s most famous shipwrecks.*

New advances in preservation techniques hold forth the possibility that some of these artifacts can be restored,

quest, and defense—water was the easiest means of getting around.

Like most highways, the lakes and

rivers have seen their share of accidents. Over 6,000 ships have been lost on the Great Lakes and the St. Lawrence River since Europeans first explored them, says Thomas L. Farnquist, director of the Great Lakes Shipwreck Historical Society’s museum, located in Sault Sainte Marie, Mich. On average, there is a wreck of some sort every 2 or 3 miles along the Mississippi and Missouri Rivers and their major tributaries, says Kevin J. Foster, maritime historian of the National Park Service in Washington, D.C.

Researchers at the Great Lakes Shipwreck Historical Society have converted a survey vessel retired by the U.S. Army Corps of

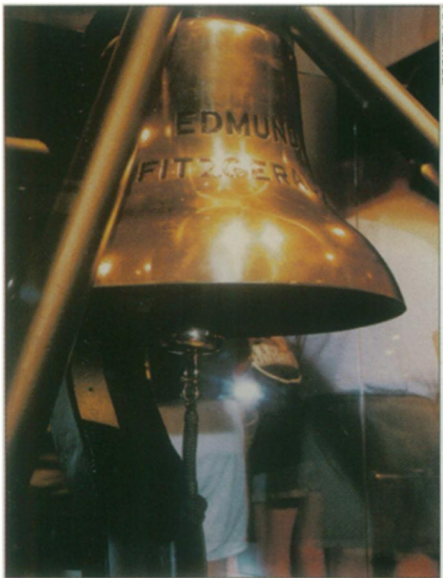


David Matthews of the National Geographic Society helps launch a submersible minirover that will assist divers in exploring an 1875 steamboat wreck that lies 240 feet beneath the surface of Lake Superior.

Engineers into a dive boat capable of deep-water operations. Last summer, the scientists, in conjunction with the National Geographic Society, used it to explore and document four wrecks on Lake Superior—some of them in water up to 265 feet deep—about 10 miles off Whitefish Point on Michigan’s Upper Peninsula, says Farnquist.

The 47-foot research vessel is packed with electronics from stem to stern, including side-scan sonar for probing the lake bed and Global Positioning System equipment for pinpointing the location of

**L**ong before the advent of asphalt and automobiles—even before steel rails spread across the West—waterways served as interstate highways. The rivers and lakes were already there, brushstrokes on a landscape left behind when the glaciers retreated more than 10,000 years ago. For exploration and trade—as well as for invasion, con-



A. Kennida

The bell that once rang from the pilot-house roof of the Edmund Fitzgerald was recovered from the wreck in 1995 and is now displayed in the Great Lakes Shipwreck Museum in Whitefish Point, Mich.

wrecks. The divers breathe mixtures of helium and oxygen from so-called rebreather systems that enable them to carry smaller tanks and stay down longer. They can explore the lake bottom at depths down to 500 feet. Using remote control, scientists on board the ship pilot small submersible craft that operate in conjunction with the divers. With these submersibles, the researchers can produce in a half day's survey what would previously have taken an entire season of dives.

Underwater archaeology isn't always about recovering artifacts, Farnquist says. Sometimes it's about solving a mystery—and with more than 550 ships lost on Lake Superior alone, there's more than enough mystery to go around.

One of the lake's most famous shipwrecks is also one of its most recent. The *Edmund Fitzgerald*, whose loss was immortalized in a folk song by Gordon Lightfoot, sank without a distress call on Nov. 10, 1975, taking all 29 people aboard to the bottom of the lake. Although the ship was found the next year at a depth of 535 feet, what caused it to sink is still unknown.

There are several popular theories about why the *Edmund Fitzgerald* sank so quickly, Farnquist says, including faulty hatch clamps and the implosion of a hatch cover. Some people believe that the ship, traveling in exceedingly rough weather and high waves, struck the lake bottom in a shallow area, then broke in half later or took on water and sank.

"We've conducted three different expeditions down to the wreck so far, the last one in 1995," he says. "It definitely didn't break in half at the surface, but there is still no evidence as to what actually caused the ship to take on water."

In another of Lake Superior's unsolved

puzzles, two French minesweepers built in Thunder Bay, Ontario, were on their way to their first assignments in Europe in 1918 when they sank without a trace, taking 70 French sailors with them. "The boats haven't been seen to this day, although now we think we know approximately where to begin the search for them," Farnquist says.

**A**rchaeologists are using side-scan sonar in a multiyear project to map the bottom of 115-mile-long Lake Champlain, which lies on the border between New York and Vermont. In June 1997, the researchers discovered a Revolutionary War gunboat—one of a fleet of 15 U.S. ships commanded by Benedict Arnold before he turned traitor—that had been missing in action since it sank in the lake's icy waters in October 1776.

Lake Champlain also yielded the well-preserved remains of an enigmatic boat found in the lake in the mid-1980s. "When we first saw the wreck, we didn't know what it was," says Kevin J. Crisman of the Institute of Nautical Archaeology at Texas A&M University in College Station.

The vessel had a large rotating turntable under its deck and a geared mechanism connected to a small paddle wheel on each side of the boat. Crisman could not determine the boat's function until he discovered the travel accounts of a few 19th-century British tourists.

It turns out that the boat was a ferry, powered by horses that walked on the turntable.

Crisman describes the excavation and study of this nearly forgotten boat in *When Horses Walked on Water*, slated for publication by Smithsonian Institution Press early this year.

This type of vessel, which Crisman describes as "the poor man's steamboat," was common in the United States in the early to mid-1800s; about 10 of them operated on Lake Champlain. Although generally overlooked by historians, the ferry fascinated the foreign tourists enough for them to record their observations about the ship and how it worked.

**N**ot all of the United States' sunken nautical history lies beneath water—some of it is buried under cities and cornfields. Excavations where waters once flowed have yielded a bonanza of artifacts and archaeological knowledge, Foster says. Construction along the waterfront in New York City, in places where the harbor has been filled in, has laid bare hundreds of finds, including Colonial trading vessels.

Similarly, bulldozers at a construction project in an old warehouse district in Richmond, Va., exposed portions of a canal system that contained a number of abandoned boats. Some of these were flat riverboats known as James River bateaux, whose design and construction methods had been lost, says Bruce G. Terrell, archaeologist for the National Oceanic and Atmospheric Administration.

The meandering Missouri River, once a lifeline to the settlers and troops on the frontier, has yielded a bounty of artifacts from vessels that sank and were buried intact by sediments. The U.S. Fish and Wildlife Service operates a visitor center in Missouri Valley, Iowa, that houses more than 200,000 objects recovered from the *Bertrand*, a steamboat that sank in 1865.

The steamship *Arabia*, which sank in September 1856 after hitting a submerged tree, was carrying 200 tons of

Arabia Steamboat Museum



The wreck of the *Arabia* was excavated from 45 feet beneath a Kansas cornfield in late 1988. The side-wheel steamboat (inset) hit a submerged tree in September 1856 while carrying 130 passengers—none of whom died in the accident—and cargo up the Missouri River to the frontier.

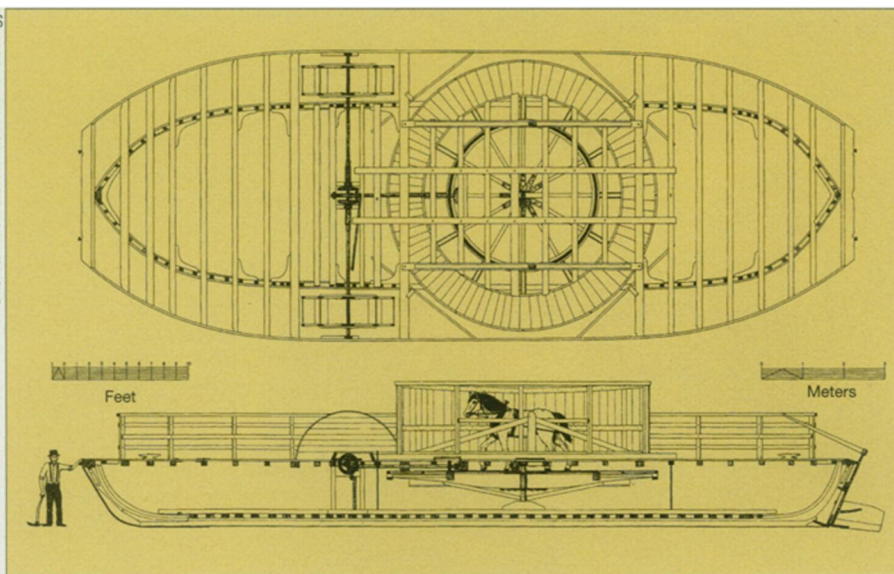
merchandise meant to stock frontier stores for the upcoming winter. This booty—which included guns, boots, carpentry tools, castor oil, and cognac—was recovered from beneath a Kansas cornfield and is now on display in a museum in Kansas City, Mo.

**A**fter removing a ship or other artifact from its long-time resting place, archaeologists must preserve it for display or study. This is a challenging task indeed, because many times the sudden change of environment can initiate a series of destructive changes in the object.

“For every dollar spent on excavating or recovering an object, you can expect to spend another \$10 or \$12 in conserving it and curating it,” says Foster.

The problem is especially acute for sodden organic materials, such as wood and leather, says C. Wayne Smith, director of the Archaeological Preservation Research Laboratory at Texas A&M. The substances that give organic materials their strength and resiliency slowly dissolve during submersion, leaving behind only cell walls that would crumble to dust if the artifact began to dry.

To strengthen and add bulk to such materials, archaeologists routinely soak them in polyethylene glycols (PEGs), chemicals that are water-soluble and



Two horses walked on opposite sides of a turntable to power this “poor man’s steamboat.” The 63-foot-long horse ferry, recovered from Lake Champlain between 1989 and 1992, plied the waters from the late 1820s until the 1860s.

have a high molecular weight. Smith says using PEGs has its drawbacks, however. The treatment often leaves the preserved artifact with an oily, wet feel.

The chemical is also extremely hygroscopic—that is, it readily absorbs moisture from the air. For that reason, preserved items must be kept in low-humidity conditions. Even then, Smith says, PEG

may absorb some moisture and seep out to form small pools on the artifacts or drip from them and leave unsightly rings.

Smith and other researchers are investigating a variety of ways to solve these problems. One technique is to soak an artifact in a lower concentration of PEG and then add a catalyst that links the individual PEG molecules into large polymer chains. This further strengthens the preserved artifact and eliminates the chemical’s tendency to absorb moisture, thereby removing much of the need for costly climate-controlled conditions, Smith says.

In a report recently published on the World Wide Web, Smith and his team describe a preservation technique that uses silicone oils. These oils, like PEG, soak into organic materials and help prop up the cellular structure, but they do so much more quickly. While PEG may take up to 2 years to saturate an object, silicone oils can do the job in weeks or days, Smith says.

Although these new techniques would solve many of the problems associated with PEG, some archaeologists do not favor using them. The scientists worry that, once treated, an object cannot be returned to its previous condition if the chemical treatment meant to preserve the artifact actually proves to be detrimental in the long run.

“With any conservation technique, it’s always the best idea to have a reversible process,” says Foster.

“Some people, unfortunately, think reversibility is more important than conserving the artifact,” says Smith. “But research already shows us preservation with PEG isn’t reversible, either.”

Foster acknowledges that the use of PEG probably isn’t reversible, but he also says it’s the best technique now available. □

*HarperPerennial, 1997*  
177 pages, 5 1/8" x 9 1/4", paperback, \$13.00

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