



## HISTORY OF TECHNOLOGY

## A Revolutionary Craft

*Artisans re-create earliest American submarine*

On a summer night in 1776, an American soldier named Ezra Lee steered a tiny wooden submarine through New York Harbor, sidled up to the flagship of the British fleet, and attempted to attach a bomb to the warship's underbelly. The scheme failed, but Lee survived, and the sub, the *Turtle*, and its builder, David Bushnell, became icons of Yankee ingenuity.

Last winter Rick and Laura Brown, professors at the Massachusetts College of Art, embarked

on a mission of their own: to build a working replica of the historic *Turtle*. After scouring archives for clues to how the sub was constructed, the Browns invited timber framers, blacksmiths, and other specialists to Handshouse Studio, a workshop in Norwell that perpetuates traditional crafts. The team began building the replica by hollowing out two halves (below). "Bushnell wanted thick walls of solid wood to withstand water pressure," says Rick, "so we think he

built the *Turtle* from one large log." After weeks of work, the completed replica (bottom) was tested in nearby Snug Harbor (left). To dive, the pilot floods the hull interior knee-deep with seawater; to resurface after about 15 minutes, he pumps the water out by hand. "It works!" says Rick, a little amazed. Plans are under way to display the *Turtle* at museums nationwide.

—Glenn Oeland

### Three Centuries of Subs

**1620** Cornelis Drebbel, inventor to King James I, demonstrates first working submarine.

**1800** Robert Fulton's *Nautilus*, constructed of metal plates over a wooden hull, operates underwater for up to six hours.

**1855** The *Sea Devil*, built by German inventor Wilhelm Bauer, is powered by a four-man treadmill.

**1864** The Confederate *H. L. Hunley* becomes the first submarine to sink an enemy warship.

**1898** John Holland builds the gasoline-powered *Holland VI*.

**1900** The U.S. Navy purchases *Holland VI*, its first submarine, for \$150,000.

**1954** The first nuclear-powered sub, U.S.S. *Nautilus*, is launched.



CARY WOLINSKY (ALL)