

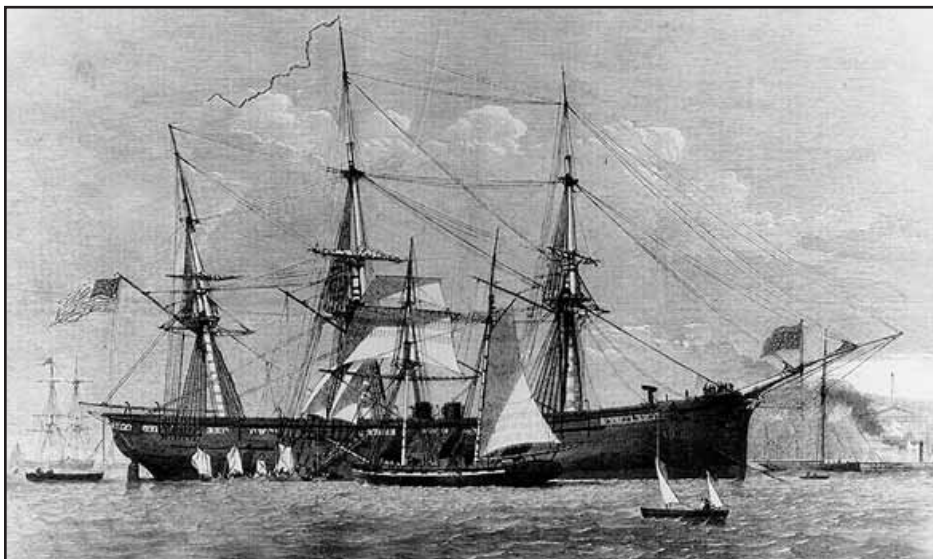
Connecting the Continents: The Trans-Atlantic Cable

by Bob Bachand

Samuel Morse and his companion paid out copper wire from their small boat as they navigated the waters between New York's Governor's Island and the Battery. The wire was insulated with hemp soaked in tar. Back on shore, the 51-year-old inventor sent an electrical current through the wire, confirming his vision that underwater telegraphic cables would eventually enable communication between America and Europe.

In 1844, just two years after his New York experiment, the artist-inventor supervised the erecting of a telegraph line between Baltimore and Washington, D.C., the first in the nation. Six years later the first operating undersea cable was laid between France and England. At the time there was a great deal of enthusiasm building for a trans-Atlantic cable, but some of the problems facing the venture were adequate shielding for a cable, planning a route and financing the undertaking.

With the discovery of gutta-percha's properties in 1842, the problem of insulating undersea cables was eventually solved. The substance is the sap of a tropical tree that is native to Southeast Asia and the Malay Peninsula. When it is allowed to evaporate and coagulate in the sun, it produces latex. The latex is then rendered soft and flexible in hot water and turns solid, but not brittle, as it cools. Gutta-percha was the material of



The U.S.S. Niagara. Photo courtesy Naval Historical Center

choice as an insulator for trans-Atlantic telegraph cables from the very first, until polyethylene came into use in 1933.

U.S. Navy Lieutenant Matthew Maury, the nation's top oceanographer, was consulted about a route for a transoceanic cable. "From Newfoundland to Ireland," he stated, "the distance is about sixteen hundred miles, and the bottom of the sea between the two places is a plateau." At the time nothing was known about the Mid-Atlantic Ridge, the huge underwater mountain range that divides the Atlantic into two main basins. It runs from Iceland to 58°S latitude. Ultimately, however,

the ridge did not interfere with the laying of the cable.

In the mid-1840s, Cyrus W. Field was considered one of the New York's wealthiest residents. During that time the entrepreneur came to the conclusion that the connecting of the continents via telegraphic cable could bring enormous profits. Enlisting a number of investors and the backing of the British and U.S. Government, he began his quest to lay a cable between Ireland and Newfoundland. He did not realize, however, that it would take thirteen years and require some forty trans-Atlantic crossings before the venture could be accomplished.

One of the first tasks was to obtain a vessel large enough to carry enough cable to reach halfway across the Atlantic. The *U.S.S. Niagara*, a 5,200 ton frigate, was enlisted from the U.S. Navy. She was stripped of her armament. Room was then made to store 1,300 miles of cable. The *Niagara* was joined by the British man-of-war *Agamemnon*; they carried equal lengths of cable, taking about three weeks to store it aboard each ship.

On August 5, 1857 the two ships left port. The *Niagara* immediately began laying cable. Once its supply

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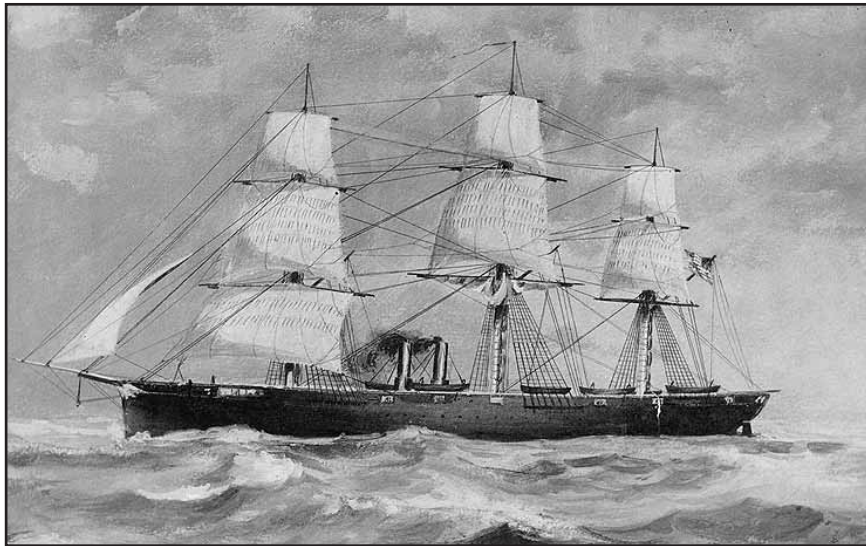
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was exhausted, the plan called for the *Agamemnon's* crew to splice its cable and proceed from there. But just five days after setting out, the *Niagara's* cable snapped and quickly disappeared below the cold North Atlantic waters. With no possible way to retrieve it, the mission was aborted and the ships headed back to port.

In the following year it was decided to have the two vessels meet mid-ocean, splice the cables and then each ship head for its own shore. The splice was made on June 26, 1858, and the cable was carefully lowered to the bottom. It broke almost immediately with the ships just a few miles apart. It was re-spliced only to break again when the ships were 200 miles from each other. At that point, the decision was made to return to port.

In July of that same year, the ships set out for another try. This time, however, the *Niagara* reached Trinity Bay, Newfoundland, and on the following day, the *Agamemnon* entered Valentia Bay on the Irish coast. Field was exuberant. He relayed the following message: "The Atlantic successfully cable is laid" to his wife, family and the Associated Press. Celebrations broke out on both sides of the Atlantic. The project was heralded as "the greatest human achievement in human history." But within a few days, the cable was no longer opera-



The U.S.S. Niagara. Photo courtesy Wikimeida Commons

tional and there was no hope of reviving the signal.

Over the next few years, finances and the American Civil War were responsible for slowing further tries at laying the transoceanic cable. In 1864 Field formed an additional partnership with British financiers and the British government. Through business arrangements, he was also able to enlist the use of the *Great Eastern*, a 693 foot-long, 22,500 ton displacement British vessel. It was capable of carrying enough cable to stretch across the entire Atlantic.

A new cable was also manufactured; it proved to be a great improvement over the one used in 1858. The

weight of the copper conductor was increased from 105 pounds per mile to 300 pounds per mile.

The *Great Eastern*, with its crew of 500 men, began to lay cable on July 23, 1865. For the most part, the ship was able to travel at about six knots as she paid out her cable. By August 2 she was just six hundred miles off Newfoundland. There had been a few incidents, for various reasons, that had caused the ship to come to a halt, raise the cable, cut a section and splice it. On that day, however, as the cable was being raised, it snapped and sank to the bottom.

A wire line attached to a grappling hook was dropped over the side in an attempt to snag the cable. The crew did succeed on several occasions, but each time they tried to raise the heavy cable, its

weight broke the shackle that held sections of the wire line together. On August 3, after another failed attempt, the *Great Eastern* returned to England.

In the summer of 1866, armed with an improved cable, the *Great Eastern* finally made landfall in Newfoundland. The continents were successfully connected. In early September her crew was even able to retrieve and connect the 1865 cable, putting two trans-Atlantic telegraph cables into use. But it was not until 1956 that the first trans-Atlantic telephone cable was installed. The first transoceanic optical system was placed into service in 1988.



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