COPPER SHEATHING for USS *Constitution*

On March 27, 1794, Congress passed the "Act to provide a Naval Armament" which authorized President George Washington to acquire a fleet to create the new United States Navy. Joshua Humphreys, a ship designer in Philadelphia, had persuasively argued for frigates (medium-sized sailing warships) as they would be the most economical, allowing the new Navy to get the most ship for the $600,000 allocated for creating the fleet.

Each of the six frigates that made up the new U.S. Navy was to be "copper bottomed", i.e., covered below the waterline in thousands pieces of overlapping copper sheets. England's Royal Navy began copper cladding its warships in 1758 and found it extended the life of the ships by preventing boring mollusks from destroying the wood. Copper sheathing also allowed for greater ease in cleaning barnacles and crustaceans from ships' bottoms.[1] The U.S. Navy was to do the same and because rolled copper sheathing was not yet manufactured in America copper sheathing made in England was purchased for the new U.S. Navy frigates. Enclosed with a letter dated April 21, 1794, Joshua Humphreys listed "An estimate of the quantity of Timber Plank &c for a frigate…" the size of *Constitution*, including the copper needed - "12000 feet of sheet copper for bottom".[2]

On July 2, 1797, just months before *Constitution* was to be launched in Boston Harbor, the Secretary of War wrote to George Claghorne, *Constitution*'s Naval Constructor:

> "It being of importance to the United States that the Frigate *Constitution* should be coppered on the Stocks before she is Launched into the Water – you will therefore be pleased to cause the said Ship to be coppered as high as light water mark as soon as the Bottom is prepared, as it will prevent heaving down afterwards and a Consequent heavy expense…"[3]

Between 1801 and 1803, USS *Constitution* was re-fitted in Boston for eventual deployment under Commodore Edward Preble to the Mediterranean Sea against the North African Barbary Corsairs. The 1797 copper sheathing was worn out and new sheathing was needed. Enter Paul Revere of "Midnight Ride" fame of the American Revolution. During the building of *Constitution*, Revere's foundry had "drawn down", i.e. made smaller in diameter, incorrectly-sized copper bolts purchased in England. By the time of *Constitution*'s 1803 re-fit he had a copper rolling mill in operation in Canton, Mass. and was able to provide the thousands of sheets of copper needed for the ship.

Throughout the 19th century, *Constitution*'s copper sheathing was periodically replaced and beginning with the 1833 docking of the ship in the new Charlestown Navy Yard dry dock souvenirs were fashioned from the copper sheathing (a miniature copper kettle was made from copper removed in the mid 19th century). In the 20th century, the sheathing was replaced several times. In the 1927-1931 extensive restoration of *Constitution* the final restoration report tallied the following about the copper:

> "Ship has been copper sheathed from keel to 23' 6" aft and to a height of 21' 0" forward - 3,400 sheets of copper, 14"x 48", in various weights; 28-oz. between keel and shoe, 26-oz. at turn of bilge and at water line; remainder 22-oz., all of which is secured to wood planking by 1 1/8" and 1 ¼" copper sheathing nails. Approximately 12.5 tons of sheathing copper, 1600 pounds [copper] sheathing nails, 38.4 tons new copper fastening[s] used; 4 tons old copper fastening [reused?], 8 tons old copper left in ship; a total of 63.7 tons of copper now in the ship."[4]

---

[1] Edgard Moreno, "Patriotism and Profit: The Copper Mills at Canton," in *Paul Revere – Artisan, Businessman, and Patriot: The Man Behind the Myth*, The Paul Revere Memorial Association (Boston, MA: The Paul Revere Memorial Association, 1988), 98.

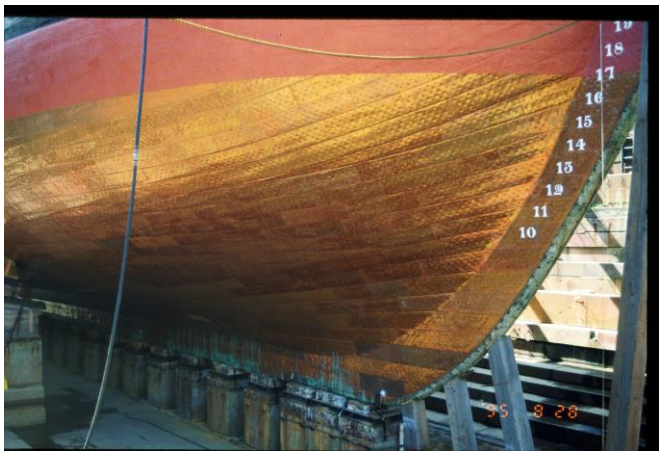
[2] Joshua Humphreys' enclosure in letter, Secretary of the Treasury, Alexander Hamilton from Secretary of War, James McHenry, 21 April 1794. *Naval Documents Related to the…Barbary Powers*, Volume 1, 1785-1801 (Washington, DC: Government Printing Office, 1939), 73, 75.

[3] Secretary of War, James McHenry, to George Claghorne, 27 July 1797. *Naval Documents…Barbary Wars*, Volume 1, 205.

Constitution's copper sheathing was replaced in 1975, and again in the 1992-1996 restoration with the following amounts used:
3,400 sheets (14" x 48") = ~10.2 tons (Weight per sheet = 6 pounds)
Copper nails per sheet ~120 - 150 = ~2,500 pounds (Weight copper nails total)
Rows of copper sheathing = 28
Weight copper sheets & nails (total) = ~11.45 tons[5]

The copper sheathing will again be replaced on USS *Constitution* during her 2015-2017 dry docking and restoration.

USS *Constitution*, May 19, 2015, Dry Dock 1
Note: 1995 copper sheathing on hull



USS *Constitution*, August, 1995, with new copper sheathing. The 1995 copper was provided by Revere Copper Company

Naval History & Heritage Command Detachment Boston (Credit: James Almeida, left & Patrick Otton, right)

For more information on USS *Constitution*, visit: www.navy.mil/local/constitution
or www.ussconstitutionmuseum.org or *Constitution*'s restoration blog at: www.usscm.org/restoration/blog

Researched & written by the Naval History & Heritage Command Detachment Boston, up-dated December, 2015.

[4] Commandant, [U.S. Navy Yard], Boston, "U.S. Frigate CONSTITUTION (IX21) – Research Memorandum", date stamped "Nov 27 1931", 60. The final phrase, "…total of 63.7 tons of copper now in the ship" is ambiguous – does this weight refer to all copper in the ship's structure, including pins, bolts, etc.? Or, did it mean only the copper sheathing and sheathing nails used below the waterline (whether new or re-used copper)?
[5] Note: The 1992-1996 restoration weights provided do not include copper bolts in USS *Constitution*, therefore this is not a weight of the total amount of copper currently in the ship.