



BOTTOMS UP!

The Corte Cavanella II boat and the laced boatbuilding tradition in the Northwestern Adriatic

BY STACI WILLIS AND MASSIMO CAPULLI

In the river systems and along the coast of the northwestern Adriatic Sea, a distinct tradition of laced boatbuilding persisted between the 2nd century B.C. and the 6th century A.D. The laced tradition of boatbuilding dominates the archaeological record in this region during this timeframe, presenting a unique nautical landscape when compared to the broader Mediterranean tradition of mortise-and-tenon joinery. In an effort to better understand this

tradition of laced boatbuilding, the *Su-tiles* Project was created with three main goals: 1) to broadly survey the tradition of laced boatbuilding, 2) to define the advent, rise, and decline of the tradition in the region, and 3) to explore the factors that influenced its preservation.

Currently, there are 19 known examples of the northwestern Adriatic laced tradition of ship construction. The basic feature of this tradition is that the planks of the hull were held together only by means of cordage, which passed through diagonally-oriented holes, located 1-2 cm from the internal edge of the plank to

Opposite page: Willis collects a sample of the planking for analysis.



PHOTO: M. CAPULLI

a trapezoidal hole along the edge of the external side of the plank. A bundle of plant material (known as 'seam wadding') was positioned along the internal seams between the strakes, and the cordage passed over it during the lacing process. Once the cordage was pulled tight and tied off, the holes were plugged with wooden pegs. The Roman-era laced boats of the northwestern Adriatic primarily represent small riverine and coastal watercraft, like the Stella 1 barge and Comacchio wreck, respectively. Recent discoveries on the barrier island of Venice Lido may suggest the use of this construction method to build sea-going vessels.

SUTILES PROJECT: 2017 RESEARCH SEASON

As part of the summer 2017 research season for the *Sutiles* Project, the authors conducted a thorough study of the hull remains of Corte Cavanella II, a northwestern Adriatic laced boat excavated in 1985 and currently being stored in the Archaeological Museum of Adria, south of Venice. The hull remains are kept in a vat of treated water along with a number of other unrelated historical and archaeological timbers from the local area. The vat had not been drained and the hull, which lay at the bottom of the vat beneath other timbers, had not been uncovered since the 1990s. It was only possible to drain the vat for a single day, but the

director of the Archaeological Museum of Adria graciously agreed to keep open the storage space of the museum - where the boat is held - for an extended time period. We therefore had access to this hull for approximately 10 hours, during which we produced a photomosaic of the hull, measured all construction features, and collected multiple samples for wood identification, conservation assessment, fiber identification, pollen analysis, and radiocarbon dating. The hull remains are stored upside down so that the visible surface is the exterior of the hull bottom. Due to time constraints and the deterioration of the hull, we were not able to flip the boat over to examine the interior surface.

OVERVIEW OF THE CORTE CAVANELLA II BOAT

The Corte Cavanella II hull remains are comprised of three strakes that form the flat-bottom of a laced boat, likely representing a small barge that was used for inner waterway navigation. At the time of its discovery, the hull bottom was incorporated into a dock structure alongside a man-made channel. The dock has a terminus post quem of the first century A.D. based on a coin dated to 97 A.D. The results of radiocarbon dating of the hull are not yet available, but we can provisionally conclude that hull construction likely dates to the first century A.D.



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The hull remains are in poor condition, with several breaks, and are preserved to a length of about 4.2 m. Individual planks range in width from 23 to 27 cm. Multiple repairs were noted, including one that ran almost the entire length of the plank. The planks are preserved to a thickness between 2.1 cm (near one extremity) and 2.6 cm (near the middle).

The holes for the lacing range in diameter from 1.0 to 1.7 cm (average of 1.2 cm) and are spaced from 5.7 to

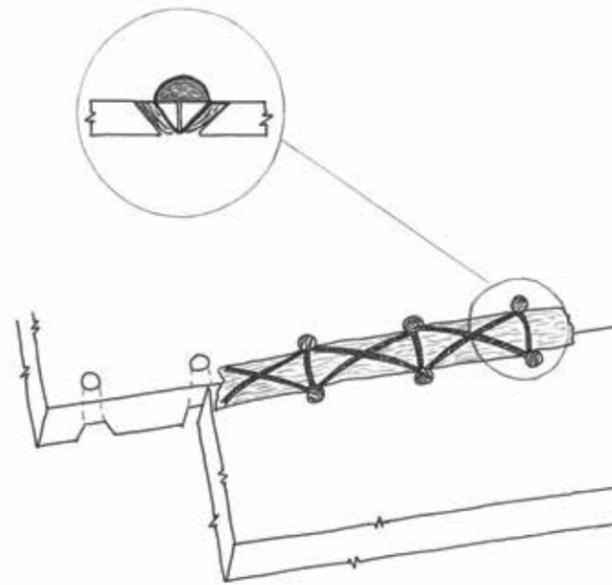
8.6 cm apart (average of 7.2 cm). Many of the lacing holes are expanded or cut twice, with two holes right next to each other. When the vessel was excavated, at least three frames were still attached to the hull. However, since the boat is currently stored upside down, we could not examine any of these frames during the 2017 season. While the frames themselves could not be studied, several treenails (used to attach the frames to the hull) are still preserved and range

in diameter from 1.7 to 1.9 cm. Five rows of four to six treenails run across the width of the hull, indicating the position of the frames. These lines of treenails are spaced from 70.5 to 75.4 cm apart.

From top: Capulli, Willis, Asta, and Facchi examine the Corte Cavanella II hull remains; Photomosaic of the Corte Cavanella II hull remains.



PHOTOS: (TOP) L. DI SIMONE; (BOTTOM) M. CAPULLI



MATERIALS OF THE CORTE CAVANELLA II BOAT

Previous publications about the Corte Cavanella II boat identified the type of wood used for the construction of the planking and the pegs. According to these reports, the planks were made of red fir or larch and the pegs were made of cypress. However, it is unclear how the wood type was determined (i.e., in the field by eye or microscopically in the laboratory). Furthermore, based on these analyses, the Corte Cavanella II boat would be the only vessel of this tradition that did not feature elm for the majority of the hull planking. It would also be the only known instance of the use of red fir/larch and cypress within this tradition of boatbuilding. Therefore, we wanted to confirm these unusual findings. So, in addition to recording the construction features of these hull planks, 12 samples were collected and sent to Nili Liphshitz at the Botanical Laboratories of the Institute of Archaeology at Tel Aviv University for wood species identification.

According to the results of Dr. Liphshitz's examination, the central plank was made of spruce (*Picea abies*) and the two outer planks were of cypress (*Cupressus sempervirens*). This is the first identification of cypress for any hull component of a northwestern Adriatic laced boat. Spruce was used for the ceiling planking of the Stella 1 barge and at least one of the pegs from the Venice Lido III tim-

bers. While different from the previously reported species, we were able to confirm that, in contrast to all other vessels of this tradition, the builders of the Corte Cavanella II boat did not use elm -- a hardwood -- and instead used softwoods for the hull planking.

Once again, counter to previous reports, samples of treenails (4) and pegs (3) were identified as dogwood (*Cornus sanguinea*) instead of cypress. Dogwood was frequently used within this tradition, including the pegs and treenails of both the Comacchio wreck and the Venice Lido III timbers as well as the treenails of the Canale Anfore II planks. A medium to large shrub, dogwood is quite hard, but not frequently used for the manufacture of goods because of its size restrictions. To our knowledge, there are no known instances of dogwood utilized in Mediterranean shipbuilding outside the northwestern Adriatic laced tradition.

LOOKING AHEAD

The work of the Sutiles Project is ongoing. Samples of the Corte Cavanella II hull have been sent out for radiocarbon dating and the collected fiber samples are also pending analysis. Additionally, there remain a number of other hull remains of the northwestern Adriatic laced tradition that have yet to undergo extensive study and new vessels are frequently discovered in the region. With each new find and each new study, we continue to expand our understanding of this regionalized boatbuilding tradition.

ACKNOWLEDGMENTS

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SUGGESTED READING

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PHOTOS: (TOP) L. DI SIMONE; (BOTTOM) S. WILLIS



FOR MORE INFORMATION about this project, read the authors' previous article, "Putting the Pieces Together: The Laced Timbers of the Venice Lido III Assemblage" in *INA Quarterly* 40.1: 10-15.



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