

struction, without mortises or tenons, occurred in the middle of the first millennium CE.

Due to the short season, we only have preliminary data on the hull construction. Samples taken for ^{14}C and dendrochronology analyses will extend our knowledge, and at least two more seasons of excavation are required on the site.

Hadas Mor

THE DOR (TANTURA) 2002/2 WRECK

A piece of wood emerging from the sand at the shoreline of Dor Lagoon after one of the winter storms caught the eye of Kurt Raveh, who came to the conclusion that it might be part of a wreck. The wreck was designated 2002/2 and excavated during one week of the 2002 excavation season (Fig. 1). The site is on the shoreline, about 30 cm below sea level.



Fig. 1. View of the Dor 2002/2 wreck (Photo: N. Shezaf)

This posed the question of the excavating method: should it be a marine underwater excavating method or a land excavation one? What kind of equipment should be used in order not to damage the finds and to make this excavation a successful one?

To answer these questions Stephen Breitstein, of RIMS maritime workshop, was consulted, and he recommended conducting an underwater excavation using dredgers. All that was left was to figure out what would be the most efficient diving technique. Even though there was little time, it was decided that the first day would be 'trial and error day' in order to find the best way to excavate the site. Snorkelling, which was the first option, turned out to be impractical; using diving equipment turned out to be a better option. The weight of the divers' gear helped to stabilize them, in spite of the shallow water and the waves. Despite the initial concern regarding the excavating method and the content of the site, this turned out to be a good underwater shipwreck training excavation.

The excavated wreck is made up of two parts: what seems to be a stem or sternpost, and part of a hull. The stem is made of a reddish wood, possibly oak, and the hull is made of some sort of soft wood, possibly pine, and is covered with black sealing material, probably tar. The stem (or sternpost) assemblage is made of four components joined by a long iron nail. It is connected by a scarf with what seems to be the remains of the keel. At the scarf there is a 9 cm long stopwater or a wedge. The so-called keel is about 160 cm long and 7-10 cm molded. The longest element, designated W-1, is about 216 cm long and has a 100 cm long rabbet, which is 5 cm deep and 1-3 cm wide, where measuring was available. Another element, designated W-2, has three rectangular recesses. The length is about 10 cm, the width is about 6 cm and their depth 4-6 cm (Fig. 2).

The hull is constructed from planks nailed to frames using square-headed iron nails. The frames were set in pairs connected to one another by wooden treenails. The shortest frame was 50 cm long and the longest one 180 cm. The frames sided and molded measurements are pretty much alike, with small variations: the sided ranging from 7 to 12 cm and the molded ranging between 8 to 12 cm. The planks are partly broken off at their western end and covered with some kind of iron concretion at their eastern end. The longest plank measured about 4.5 m while the shortest one was only 1.5 m long. The planks are of different widths, but two of them are relatively narrow and might be patches, stealers or drop strakes. All the planks are 2-3 cm thick. The fact that no limber holes were found reinforces the assumption that this is indeed a part of an upper section of the hull rather than of the bottom.

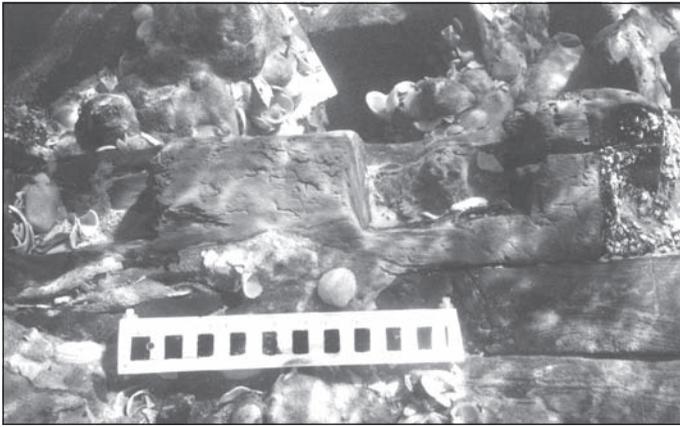


Fig. 2. Detail of W-2 element with rectangular recesses (Photo: N. Sheizaf)

One must keep in mind that the measurements were taken under rough conditions and only where available, but they were not the only means of documenting that was used during the excavation. Underwater photography, video filming and drawings (carried out by Chris, Kitty and Jimmy Brandon) were other significant means of documenting.

Although at first the wreck was thought to be parts of two or even three different vessels, as the excavation progressed it seemed more probable that all the parts belong to the same ship. By the end of the excavation a maximum depth of about one meter below sea level and a total working area of 4.1 m from north to south and 5 m from east to west was reached.

As for other features of the wreck, some traces of color were found on the inner and outer sides of the hull and samples were sent for analysis to the University of Pisa. Samples of wood were sent to a laboratory in Switzerland as well as to the Weizmann Institute for ^{14}C dating. The most significant finds that were excavated in the site, although detached from the main ship section, were three 'deadeyes', which led to the assumption that this was a 'modern' sailing ship, about 100 or 150 years old. Other dating analyses and further inquiry will prove this assumption either right or wrong.

The excavation was only the first step, and now is the time to take a closer and a more detailed look at the wreck, to try and answer the questions regarding the method in which the ship was built, for what purpose and by whom. Where was she heading and what happened to her? Kurt Raveh has suggested that the wreck is the remains of a vessel made of boats and wood by Napoleon's troops, who made a stop at Tantara on their way to Jaffa in May 1799. Some sort of a craft was built in a hurry in order to float the heavy artillery off the shore and sink it in deep water. Further investigation of the historical and archaeological finds is needed to determine if this is so.

Deborah Cvikel

THE *DOR DW2* WRECK - 2002 EXCAVATION SEASON

The excavation of *DW2* is a collaborative project of the University of Haifa, Leon Recanati Institute for Maritime Studies (Ya'acov Kahanov, Idit Yovel), the Israel Antiquities Authority, Marine Archaeology Branch (Ehud Galili and Jacob Sharvit), the Nautical Archaeology Society, Great Britain (Chris Brandon) and Aqua Dora 2000 Diving Center (Kurt Raveh). The 2002 excavation was the third season at the *DW2* site.

The site is 3 m deep and has been under study since 1998 when it was first excavated as a rescue excavation by RIMS together with the Israel Antiquities Authority and Aqua Dora. The 2002 excavation was limited and aimed at supplying missing details. The ship was located on the first day and the protective sandbags were quickly exposed. The sand was only partially removed, mainly to expose the edge of the ship and a few specific hull items. This time, the focus was on details concerning ship-building techniques, especially the joints and attachments between the keelson and the floor timbers, and the keelson and the mast step. Apparently, no joints were made between the keelson and the floor timbers, and the mast step was connected to the keelson by six metal nails, three at each side. These features were exposed for additional recording and measurements.

Since the dating of the ship is as yet inconclusive, a few samples were taken for ^{14}C and dendrochronological analyses (Fig. 1). The wood samples for ^{14}C were taken by Avner Hillman with the help of Yevgenia Mintz of the Radiocarbon Dating Laboratory of the Department of Environmental Sciences and Energy Research in the Weizmann Institute of



Fig. 1. Dor (Tantara) *DW2*. Cleaning the upper deck for dendrochronological sampling (Photo: N. Sheizaf)