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## NAUTICAL EVIDENCE FROM THE PHARAONIC SITE OF MARSA/WADI GAWASIS

### REPORT ON TWO PARTS OF A STEERING OAR/RUDDER

The site of Marsa/Wadi Gawasis is located 23km S. of the modern Port of Safaga on the Red Sea (Egypt). The first excavations were conducted by Professor Abdel Monem Abdel Haleem Sayed in 1976-1977. On the basis of textual evidence, he identified Marsa/Wadi Gawasis as the Middle Kingdom Pharaonic port of *Saww*, used in seafaring expeditions to the Land of Punt, located somewhere in the S. Red Sea region (Sayed 1977; 1980; 1983).

Since December 2001 the site has been jointly excavated by the University of Naples »L'Orientale« and Boston University (cf. Bard & Fattovich 2007; Fattovich *et al.* 2002; 2003; 2005; Fattovich, Bard *et al.* 2004; 2005; 2006), and a variety of new evidence has been discovered related to the maritime activities in the area. Ceremonial monuments along the top of the E. terrace, in the *marsa*, originally also functioned as landmarks for vessels approaching from the sea, as suggested by Honor Frost (1996: 876).

Recent excavation has revealed a possible landing place at the base of the S.E. slope, indicated by an anchor with clear signs of wear found lying on an ancient playa. In the W. sector of the site, six caves carved into the wall terrace were discovered beneath a thick sand deposit. The excavation of one of these caves (Cave 2) revealed it was used for food processing, as well as to store and dismantle ship timbers. Nautical evidence mainly found in this area consists of ship timbers, stone anchors and cordage. In Cave 2 ship timbers and anchors were often re-used in the cave structure itself. Specifically, ship timbers were re-employed, during different occupation phases, as threshold, ramp or walkway, and in the wall structure (Fattovich, Bard *et al.* 2005; 2006).

About 25 stone anchors discovered at Marsa/Wadi Gawasis represent the largest collection of ancient Egyptian anchors from the Pharaonic period. Each characterized by an upper hole and a groove for the rope, several examples also show L-shaped basal holes and dovetail mortises. While the upper hole and the L-shaped basal hole were used to remove the anchors from the sea bottom, the dovetail mortises seem to be secondary features, carved in order to adapt the stone anchors for re-use in the cave structure. Stone anchors recycled as constructional elements after the naval expeditions, reflect the seasonal and provisional nature of the site occupation (Zazzaro & Abd El-Maguid 2006: 139-162).

Numerous rope fragments, and approximately 30 bundles of rope stored within Cave 5, might also have been part of ship equipment employed for seafaring expeditions. The cordage is characterized by three twisted yarns of average 3.5cm in diameter (Fattovich, Bard *et al.* 2006).

During the 2004-2005 excavation season, also two parts of a steering oar/rudder blade<sup>1</sup> were found covered by windblown sand at the entrance to Cave 2, facing each other. The associated pottery dates to the early New Kingdom<sup>2</sup> (ca. 1550 to 1400B.C.), a period that corresponds to the site's final occupation phase (Fattovich, Bard *et al.* 2005). While the two blade elements were immediately recognized as parts of an ancient Egyptian steering device, the original aspect of the complete steering oar/rudder was more difficult to determine since it was found dismantled and incomplete. Furthermore, the fragments are not identical in shape and dimensions, as might have been expected, and they seem to have been modified and re-employed at least once. Nevertheless, it seems the two blade elements were part of the same steering



**Fig. 1** Marsa/Wadi Gawasis. – T1 face A (left) and T2 face A (right) (Photo Chiara Zazzaro).

### T1, segments T1a and T1b

A scarf joins T1a and T1b (Fig. 2). T1b was made of a wood species different from T1a and T2. It might be a later substitution, as this part is much better preserved than T2's lower part. Indeed, the lower parts of the blades were most susceptible to damage, as they would have been immersed in the sea for a long time. The maximum dimensions of T1 as complete (T1a and T1b) are: max. length 200cm, max. width 40cm, min. width 15cm, max. thickness 12cm. The fastening system consists of six mortises, cut within the T1 edge, with five partly preserved tenons still *in situ*, and two partly preserved mortises cut perpendicularly

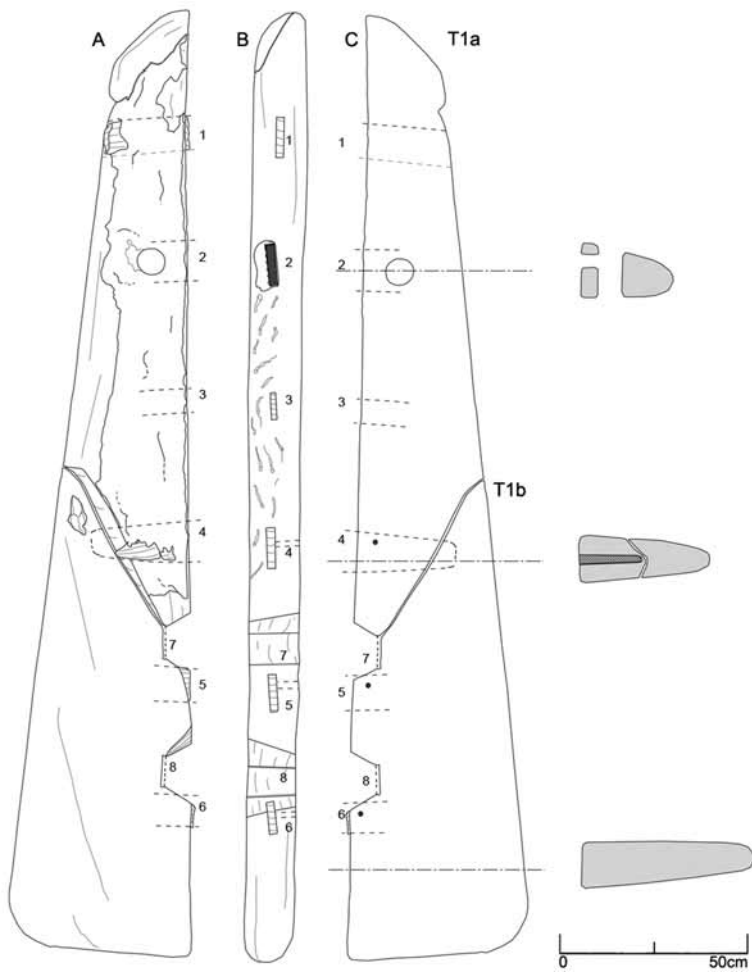
oar/rudder blade, based on their position as found and their archaeological context: they were dismantled and abandoned in the cave's entrance at the end of the last occupation phase.

This paper presents a preliminary attempt to reconstruct the original rudder, providing a technical description of the blade parts, and pointing to some archaeological and iconographical comparisons.

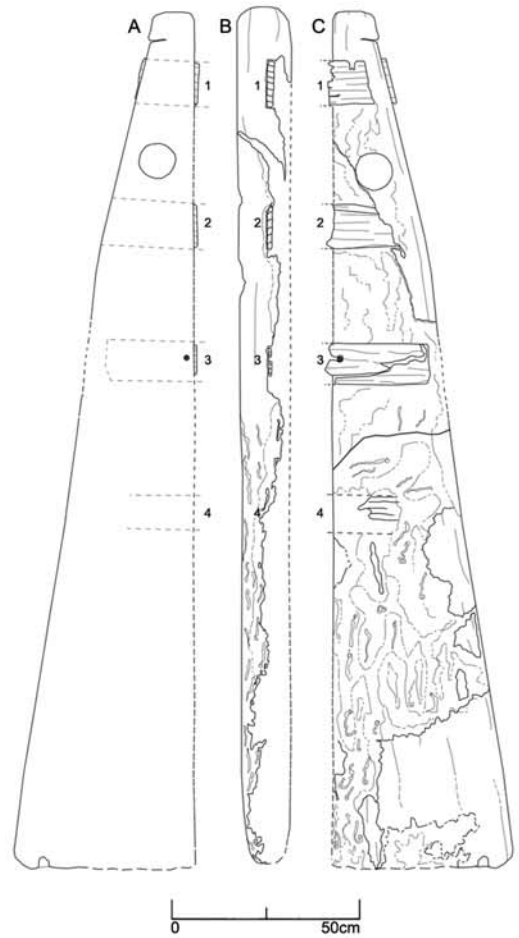
### DESCRIPTION

It was possible to carefully record the two parts of a blade on each side (Fig. 1) except for face B of element T2, and all portions that were in fragile condition. Further information is expected during the forthcoming restoration.

Both timbers are almost triangular in shape, with rounded external edges and rounded angles, and a slight groove on the top. Elements T2 and T1a are made of *Acacia nilotica*<sup>3</sup>. T1a, face A, has a fragile consistency and its surface has been damaged by insect activity, whilst the opposite surface on face C is much better preserved. T2 is poorly preserved, and the lower part has been completely eroded by shipworms. Element T1b is made of *Faidherbia albida* (Ana tree), an indigenous as well as sub-Saharan species. T1b, face A, displays heavy salt encrustation due to the long deposition in the archaeological stratum. The opposite surface on face C is much better preserved.



**Fig. 2** Marsa/Wadi Gawasis. – T1a and T1b (Drawing Cinzia Perlingieri, Chiara Zazzaro).

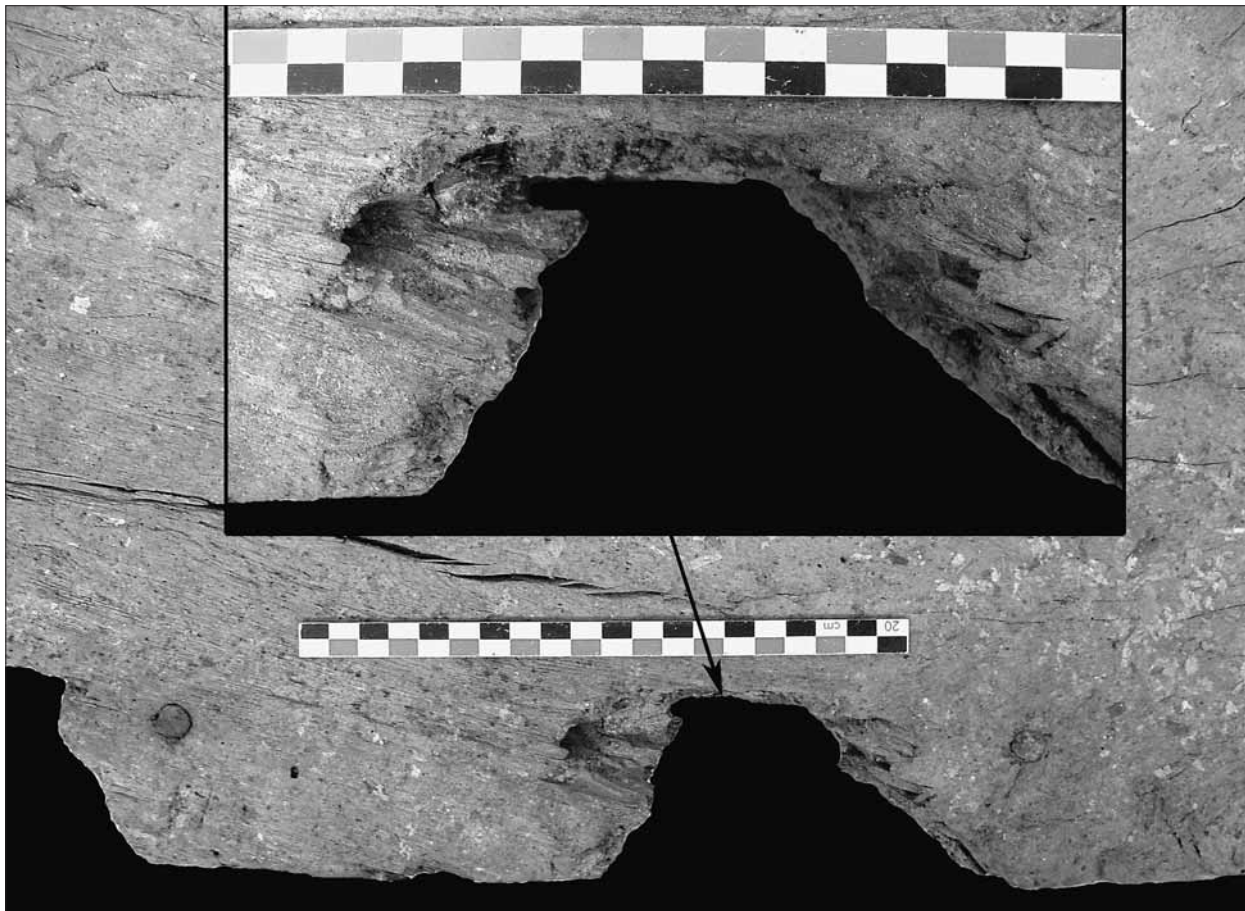


**Fig. 3** Marsa/Wadi Gawasis. – T2 (Drawing Cinzia Perlingieri, Chiara Zazzaro).

to the T1b faces. Dimensions of mortises nos 1, 2, 3 and 4 are: max. length 18.5 cm, max. width 9 cm, max. thickness 3 cm. Mortise-and-tenon joints 5 and 6 are partly interrupted by two trapezoidal cuts. Mortise 4 was cut into T1a and continued into T1b, displaying chisel marks in the cavity. Tenons in mortises 4, 5 and 6 are fixed with perpendicular pegs. The latter, 1 cm in diameter, are visible on face C, but do not appear on face A.

Tenons visible from edge B (nos 1, 3, 5 and 6) show tool marks indicating they were cut during dismantling. Remains of two more mortises (nos 7 and 8) are located between mortises 5 and 6, in correspondence of the two cuts; they are cut perpendicularly through the two faces of T1b (Fig. 4). Traces of copper still visible in these mortises might be caused by copper strips, which were removed by the two trapezoidal cuts, during the dismantling of the rudder, probably to reuse the copper fittings. Mortise 8 contains some rope remains. The author suggests thin copper strips passed through the mortise adhering along one side of the cavity, and the remaining part of the mortise was filled by rope<sup>4</sup>.

The scarf joining T1a and T1b is cut at an angle of 140°, whereby T1a's lower end and T1b's upper end are diagonally cut. A hole, 6 cm in diameter, through which rope would have passed, is perpendicularly carved into the upper part of the blade. Probably, the hole was carved where originally a mortise-and-tenon joint (no. 2) existed.



**Fig. 4** Marsa/Wadi Gawasis. – T1b, face C, details of mortises 7 and 8 (Photo Chiara Zazzaro).

## T2

The maximum dimensions of T2 are (Fig. 3): max. length 180cm, max. width 35cm, max. thickness 12cm. The fastening system consists of four fragmentary mortises with three partly preserved tenons. Originally two more mortises may have existed in the lower part of T2, where information has been lost due to significant shipworm and insect damage. The maximum dimensions of the mortises are: max. length 18.2cm, max. width 7.1cm. Because of erosion across the entire surface of face B, the thickness of the mortises were not measurable. Mortise 3 reveals a peg perpendicularly fixed through a tenon, also visible on the opposite face (C).

A hole through which rope would have passed, measuring 7.5cm in diameter, is carved into the upper part of the blade. It is suggested the lower part of T2 originally featured a similar system of joinery as T1, with mortises perpendicular to face A and C, since the damaged surface of T2 includes copper and rope fragments.

## COMPARISONS AND INTERPRETATION

The mortise-and-tenon fastening system of artefacts T1 and T2 obviously was designed to connect each element to a central loom. A similar system is attested by the steering oars from the Dahshur boats dating

to the reign of Senwosret III (1870 to 1831 B.C.) (Creasman 2005: 109, fig. 51; Ward 2000: 96). Hence, the original steering device from Wadi Gawasis was composed of two blade segments and a central loom (which is missing), dismantled by cutting the tenons.

The original fastening also included the use of copper strips, since copper traces are still visible in the two cuts along the edge of T1 and in the lower part of T2. The copper strips may have been used to protect or reinforce the mortise-and-tenon joints, or to fasten the blade elements to each other and to the loom. The strips were probably removed with parts of the timber during the dismantling of the ship (cf. the two trapezoidally cuts on T1). Dark bands on steering oars and quarter rudders visible in representations of ancient Egyptian ships, were interpreted as evidence of metal bands already by Reisner and Boureaux (cf. Boureaux 1925: 341-345; Reisner 1913: pl.12-13, 4801, 4820, 4825, 4844). Estimating the tentative reconstruction, the author also notes the two holes are roughly symmetrical to each other, and the mortise-and-tenon joints alternate between the two blade fragments, a system that might have improved the resistance of the steering oar/rudder as a whole. The circular holes in the two Gawasis timbers provide channels for rope to secure the (side?) rudder to the hull, as either found on the steering oars from the Dashur boats (Ward 2000: 96) and in several representations of ancient Egyptian ships and boats (Faulkner 1940: 7).

The triangular shape of the Marsa/Wadi Gawasis steering oar/rudder matches those shown in ship representations of the Second Intermediate Period to New Kingdom. Comparable examples include the triangular quarter rudders of the gold boat model from the Theban tomb of Ahhotep (ca. 1535-1525 B.C.) now in the Cairo Museum (JE 4681, JE 4669), boat models from Tutankhamen's tomb (1336-1327 B.C.) (cf. Jones 1990), and relief depictions at Ramses III's temple at Medinet Habu (1184-1153 B.C.), illustrating the naval battle against the Sea Peoples. The shape of the top of the blade also coincides with New Kingdom iconography such as the obelisk barge of Hatshepsut (1473-1458 B.C.) and the ships of the relief imaging queen Hatshepsut's expedition to Punt (Neville 1907-1913, pl. 72-75).

Although we do not know in detail the use of the Gawasis steering oar/rudder blade, it can provide us with information about ship dimensions. According to ancient Egyptian representations, and compared with the steering oars of the Dahshur boats, the proportion of the steering oar/rudder blade to the hull is frequently 1-8 to 1-9. Therefore, the dimension of the Marsa/Wadi Gawasis blade suggest a ship of about 14 to 18 m length, which seems appropriate for a vessel sailing on the Red Sea. Fleets sailing to Punt apparently included ships of different sizes, as is attested not only by Hatshepsut's relief (Neville 1907-1913, pl. 72-75), but also by the Papyrus Harris, which records Ramses III's expedition to Punt (Bongrani 1997: 46).

Queen Hatshepsut's expedition is the only one known that coincides with the probable date of the Marsa/Wadi Gawasis finds under discussion. However, there may have been other seafaring expeditions to Punt in the early New Kingdom that are unknown because no records of them have survived. Nevertheless, the discussed timbers testify to the final return trip of a Pharaonic ship on the Red Sea to Marsa Gawasis.

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## NOTES

- 1) The author decided to use the term »steering oar/rudder« since it cannot be specified whether the two elements of blade were originally part of a steering oar or a quarter rudder, which are both of them typical of ancient Egyptian boats and ships.
- 2) This paper follows the basic chronology set in the *Oxford History of Ancient Egypt* (Shaw 2000).
- 3) Wood analysis of ship timbers was carried out by Rainer Gerisch; cf. Fattovich, Bard *et al.* 2005.
- 4) The copper traces on the T1b edge, associated with the mortise and the rope remains suggest comparisons with evidence of similar and better preserved fastenings visible on other timbers from Marsa/Wadi Gawasis, which were discovered during the 2006/2007 field season, currently under study.

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