Journal of Ancient Egyptian Interconnections

Ahhotep's Silver Ship Model: The Minoan Context

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Abstract

The tomb of Ahhotep (I) contained two metal ship models—one gold, the other silver—and a four-wheeled carriage. The models are anomalous in time and material. While the gold model represents a typical papyriform wood-planked Nile vessel, the silver model finds its closest parallels with a contemporaneous Minoan/Cycladic vessel crewed by ten rowers, exemplified by the rowed ship in the Miniature Frieze from the West House in Akrotiri on Thera. This conclusion is further supported by a long tradition of metal ship models in the Aegean. The silver model may be a copy of an actual ship or of a model of a ship. Ahhotep's models and carriage may represent booty captured by either Kamose or Ahmose during their battles against Avaris (Tell el-Dab'a) and subsequently interred with their mother. If this interpretation is correct, it could indicate a Minoan presence at Tell el-Dab'a during the Hyksos period.

Within the tomb of Ahhotep, wife of Seventeenth Dynasty pharaoh Seqenenra Tao II, were found two metal ship models—one of gold, the other of silver—and a four-wheeled carriage for use with them (Figures 1–3).[2] The wagon, made of wood and bronze, has pairs of metal staples on either side by means of which a model could be secured to it. Both models have complementary metal loops for this purpose. It remains unclear, therefore, whether the wagon was meant to do double duty with both models, or whether a second wagon either went missing after the tomb's discovery or had never been interred in Ahhotep's tomb.

F. W. von Bissing originally published the three artifacts separately.[3] He speculates in accompanying text, however, as to which model might have been intended for the wagon. While von Bissing notes that A. Mariette considered the wagon to have been an accoutrement of the silver model, he concludes that some of the structural details seem to favor its use with the gold one. By contrast, G. Maspero and É. Vernier describe how the silver model had originally been placed on the wagon, but was later replaced by the gold model because of the former's poor condition (Figure 4).[4] The regrettable circumstances of the tomb's discovery by Mariett's workers preclude any certainty regarding the exact details of the artifacts' state in situ.[5]

The two models are anomalous in three respects. First, Egypt did not have a tradition of metal ship models: Ahhotep's are unique in the Egyptian pharaonic archaeological record. The only other Egyptian metal ship representations—which hardly qualify as models—are neckpieces in the form of Egyptianizing Phoenician galleys dating to the reign of Necho (Twenty-Fifth Dynasty).[6] Second, Ahhotep's are the only ship models of any kind known from the entire Second Intermediate Period.[7] Third, both models are intended for display or use with a wheeled carriage; the only Egyptian parallel for a ship model on wheels is a New Kingdom wooden model of a distinctly foreign, Helladic-style galley, found at Gurob.[8] There is, of course, widespread evidence for the overland transport of boats on wheeled conveyances beginning in the Seventeenth Dynasty, but the subject does not seem to have been one normally represented in models.[9]

The gold model represents a typical wood-planked Egyptian papyriform boat with stem and stern papyriform finials.[10] Maspero suggests that the silver model represents the vessel-type used by the deceased to visit Abydos by water, while more recently, B. Landström and D. Jones have identified the silver model as papyriform.[11]

The silver ship model's hull is made of hammered sheet metal (Figure 5).[12] One extremity rises in an elegant arc that passes the vertical plain. The rounded shape of the hull continues up this high post. The other extremity ends horizontally, with a forked crutch attached to it.

The model is crewed by a team of eleven, which includes a single standing figure (reconstructed as a helmsman) and a ten-man crew who sit on five thwarts and face the horizontal end of the craft. The rectangular thwarts of beaten silver attach to the hull by means of silver wires that transfix the hull but lie flush against its outer sides.

Two rings on either side of the hull serve to attach the ship model to the carriage found in the tomb, or one like it. The rings are made of twisted wires that penetrate the hull and are folded against its interior sides. The exterior diameter of the rings is 8 mm, although they are not regular.

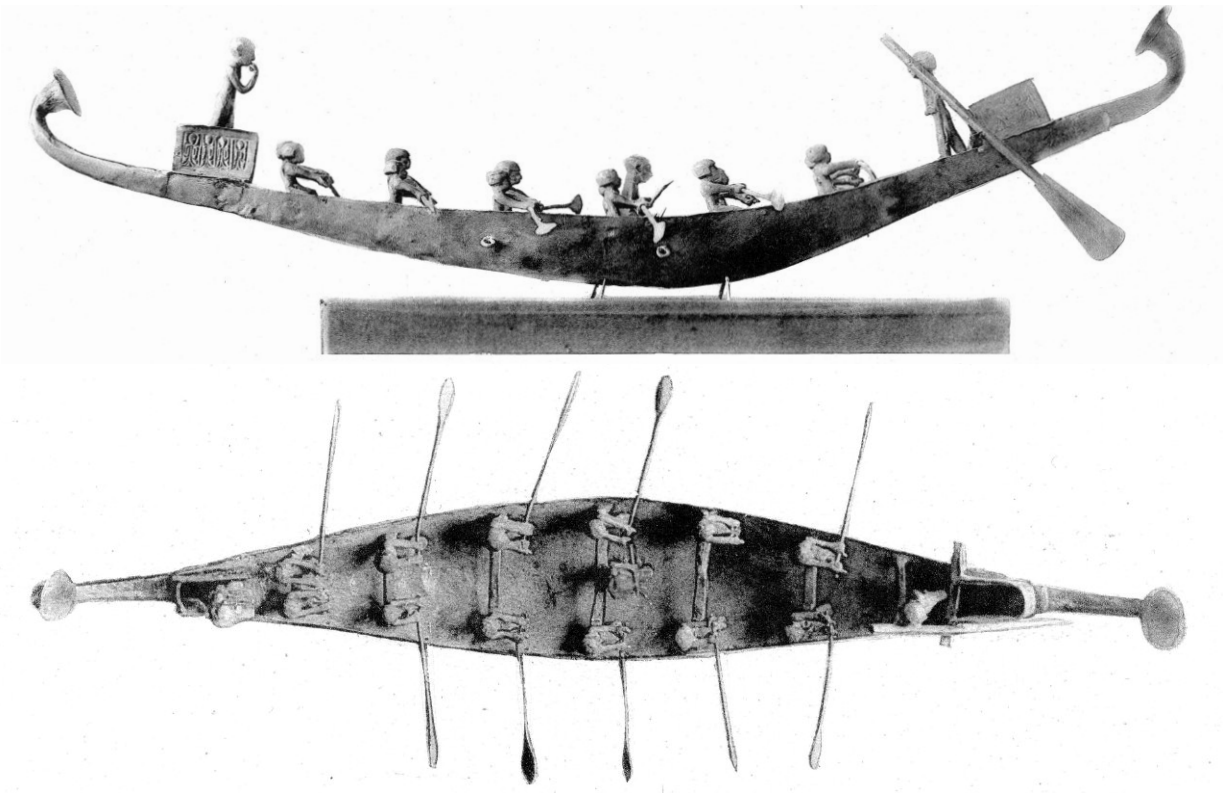

Figure 1. The gold ship model. From von Bissing 1900, Taf. X.

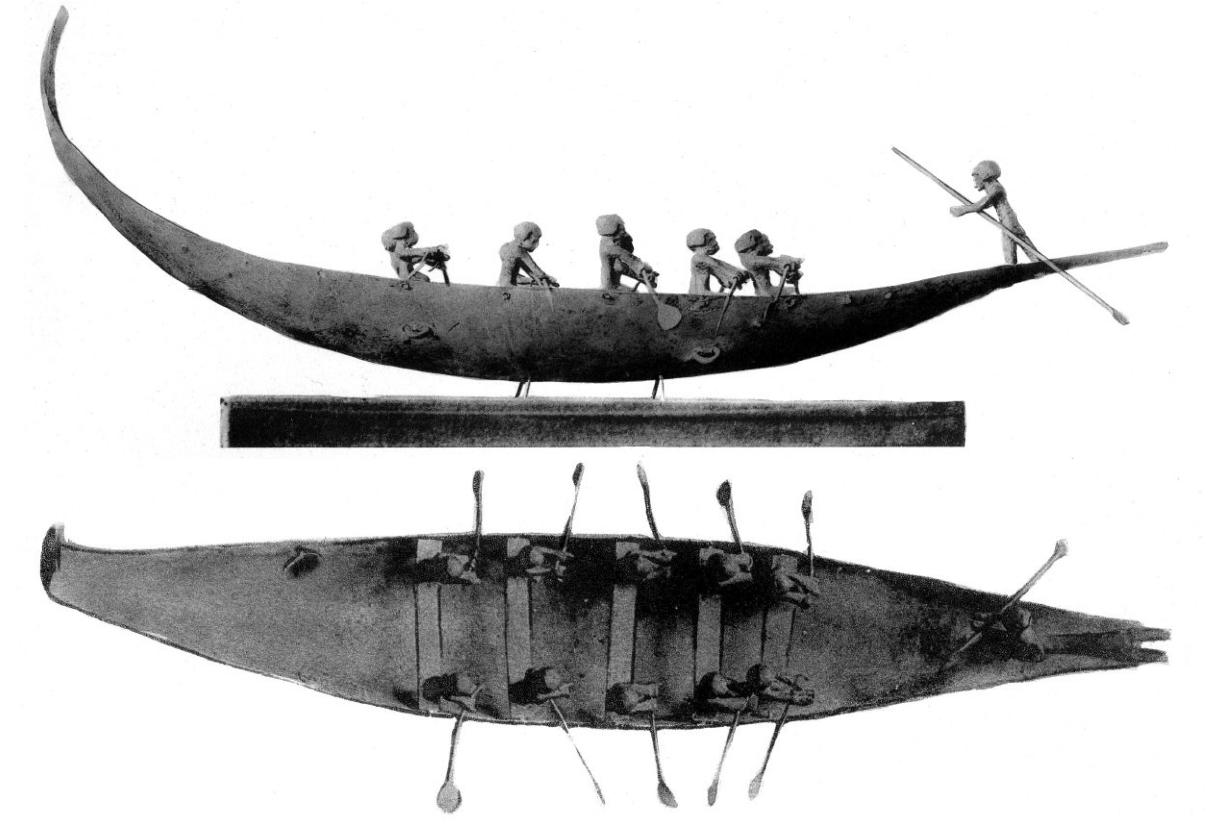

Figure 2. The silver ship model. From von Bissing 1900, Taf. X.

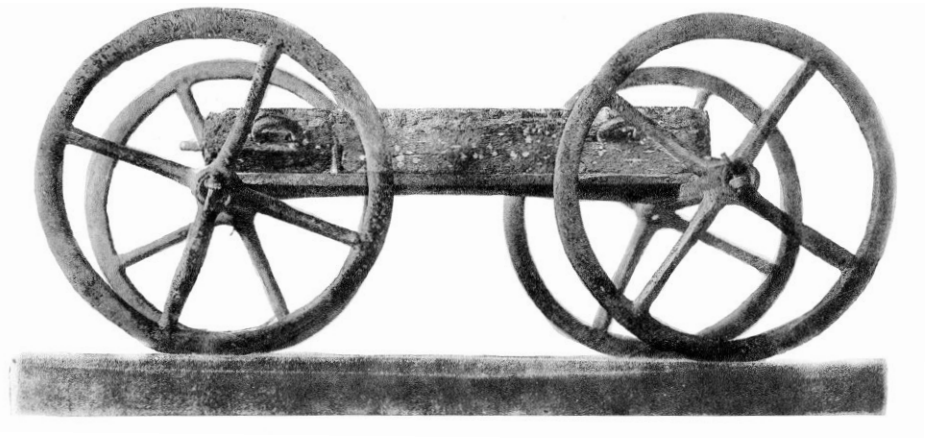

Figure 3. The wheeled carriage. From von Bissing 1900, Taf. X.

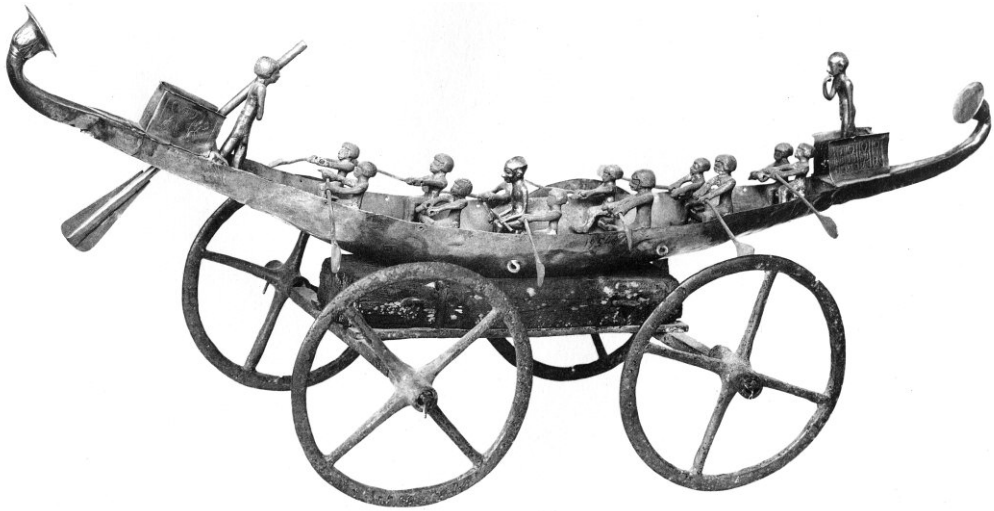

Figure 4. Gold ship mounted on wagon. From Vernier 1927b, Pl. XLIX.

The silver model now lacks some of its original parts. This may be surmised from additional pairs of holes—three at the high end and two at the horizontal end—that pierce the sides of the hull (Figure 5). These sets of piercings might be interpreted as serving to attach additional thwarts for rowers, but the irregular spacing of the three sets near the high extremity argue strongly against such a reconstruction. Their likely purpose was to attach decks to the model. Vernier notes a rod traversing the hull between the standing figure and the nearest pair of crew. This rod is visible on a recent photograph, but is missing in von Bissing's top view of the model (compare Figures 2 and 5). This is presumably a loose piece found with the model.

The silver model displays a further anomaly: while the gold model's quarter rudder is of the type common on royal Eighteenth Dynasty ship models, the helmsman of the silver model holds a steering oar rather than the tiller of a quarter or axial rudder.[13]

Steering oars lack tillers by definition, and one similar to that held by the helmsman of the silver model appear on Predynastic and Old Kingdom vessels—but these devices cease to be represented towards the end of the Fifth Dynasty.[14] By that point, tillers had appeared, and stanchions were portrayed supporting the looms of quarter rudders;[15] subsequently, substantial rudders placed on the quarters or at a notch in the stern replaced steering oars on Egyptian vessels. Steering oars were thereafter regulated to occasional appearances on cultic vessels and reed rafts.[16]

The configuration of the helmsman's arms is also unusual (although not unique) when compared with the different manners in which helmsmen are represented controlling steering oars or quarter rudders in Egyptian iconography.[17] These considerations raise the possibility that the figure reconstructed as the helmsman originally did not serve that purpose on the model. Additionally, the "steering oar" may actually be a cosmetic spatula added after the discovery of Ahhotep's tomb.[18] That object has received modern attention: the two surviving parts of the oar had been welded together by a Cairo goldsmith and received a sulfur-induced patination at the museum.[19]

Scholars disagree as to which extremity of the silver model represents the bow and which the stern. One manner of determining

Figure 5. Ahhotep's silver model. Note the rod placed as a beam in front of the "helmsman." This is presumably a loose piece found with the model, as it does not appear in von Bissing's original photo (see Figure 2; von Bissing 1900, Taf IX: 2e). Courtesy Egypt Memory.

the identification of a vessel's extremities is the seating of the figures propelling it; paddlers face the bow while rowers normally look towards the stern.[20] In his study of ship models in the Cairo Museum, Reisner notes that in Middle Kingdom Nile boats (Type II), rowers are shown seated and paddlers are depicted kneeling.[21] Following this rule, then, the *seated* crew of the silver model is portrayed rowing, and the model's high end is the bow (Figure 6).

Early Egyptologists, however, had on occasion the lamentable habit of arbitrarily rearranging the crews and the accoutrements of ship models, and it is not impossible that Ahhotep's silver model may have suffered this fate.[22] Von Bissing published the model with the figure identified as the helmsman placed at the horizontal end.[23] If this is the correct positioning, then the vessel is being rowed, and the high end is the bow. Landström, on the other hand, omits the helmsman in his drawing of the model, and considers the horizontal extremity to be the bow—thus turning the crew into paddlers.[24]

The forked device attached to the silver model's horizontal extremity bears comparison to the deep groove used to seat an axial rudder at the sterns of some New Kingdom Nilotic craft.[25] A second (but in my view far less likely) parallel is to a device that appears at the bows of Middle Kingdom ship models and has been termed a "bowstick" or a "bowsprit."[26] The purpose of such items remains enigmatic; perhaps they served as a fairlead for a bower anchor's hawser.[27] The objects are dissimilar to the silver model's forked crutch in having a relatively small groove quite unlike the pronounced fork on the silver model.

Thus, when all is taken into consideration, it seems that the model is best explained as propelled by rowers, with the high end representing the bow. Clearly, a characteristic Egyptian ship type did not serve as the source for Ahhotep's silver ship model, even though it appears to have been made by an Egyptian artisan(s).

Figure 6. Detail of a seated oarsman from Ahhotep's silver ship model. From von Bissing 1900, Taf. IX: 2a.

What foreign vessel, then, served as a prototype for the silver model? Two factors should guide our steps in addressing this question: (1) a comparison of contemporaneous water transport within the international cultural milieu of the Egyptians, and (2) which from among these cultures had a tradition of metal ship models. Let us review the evidence.

Syro-Canaanite Ships

A wall painting from the tomb of Kenamun (TT162), who lived under Amenhotep III, contains the most detailed recorded representation of Syro-Canaanite merchant ships (Figure 7).[28] In the scene, a flotilla of seagoing merchantmen with identical stem and sternposts is shown arriving at an Egyptian port. Other, albeit less informative, representations of Syro-Canaanite vessels show the same high vertical stem of the Kenamun ships, but with

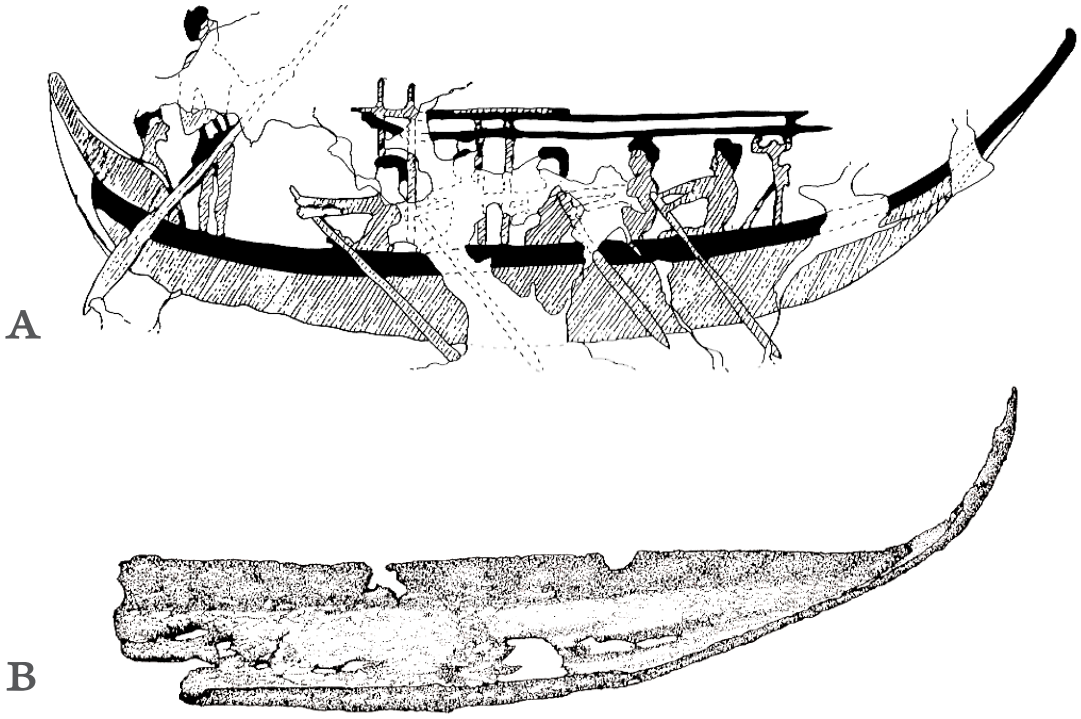

Figure 8a. Rowed ship from the Miniature Frieze, West House, Akrotiri, Thera. After Doumas 1983, 121: fig. 20.
Figure 8b. Fragmentary bronze model fragment from Keos. Late Minoan IB/Late Helladic II. After Göttlicher 1978, Taf. 25: 335.

rounded sterns rising at various angles.[29] A pertinent question regarding the Kenamun ships is whether their extremities are represented in profile or in frontal view. The concavity that appears at the external edge of the stem may indicate that they are shown in frontal view, in which case they bear a similarity to the flattened shape of the silver model's vertical, recurving post. Despite the detail of the Kenamun wall painting, its creators clearly did not comprehend the ships' rigging, suggesting they were working from copybooks and were at least once removed from the images of the ships that they created in the tomb.[30]

A tradition of metal ship models existed along the Syro-Canaanite coast—at least in Byblos, to judge from the bronze models found at the *Champ des Offrandes*.[31] Curiously, the best preserved of these Byblian models either represents an actual Egyptian Middle Kingdom ship or, more likely, copies a model of an Egyptian ship.[32]

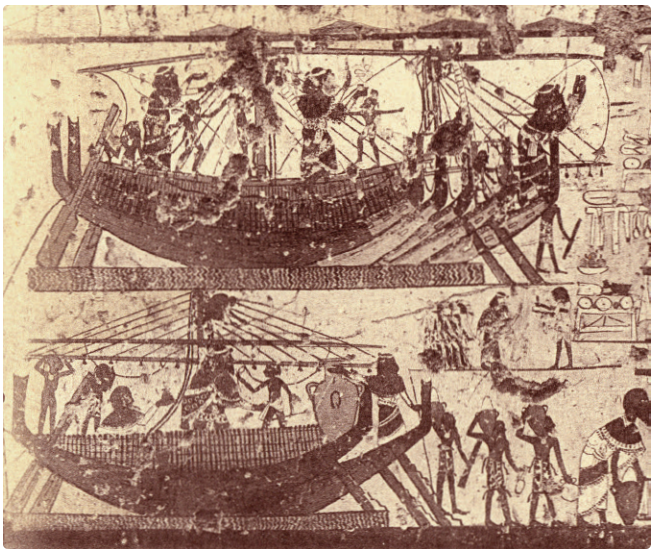

Figure 7. Syro-Canaanite ships from the tomb of Kenamun. Amenhotep III. From Daressy 1895, pl. XV.

Cypriot Ships

A series of three terracotta models from Kazaphani *Ayios Andronikos* and Maroni *Zarukas* represent deep-hulled cargo ships.[33] Nevertheless, they possess several elements of interest for this study. The stems that survive on two of the models bear comparison to the high end of Ahhotep's silver model in that they have a similar flattened profile, perhaps a result of the material of which the Cypriot models are made. Also, the models' sterns culminate in a vertical bifurcation, best preserved on the model from Site A, Tomb 7 at Maroni *Zarukas*. The vertical orientation aside, the sterns of these models bear a resemblance to the silver model's forked crutch.

I am unaware of any Cypriot metal ship models within the relevant time frame, although firedogs in the shape of Geometric galleys have been found at Paleopaphos and Salamis in Cyprus.[34]

Figure 9. Gold ring from Crete depicting a vessel similar to the ship under oar in the Miniature Frieze in the West House at Thera. After Evans 1964, 953: fig. 923.

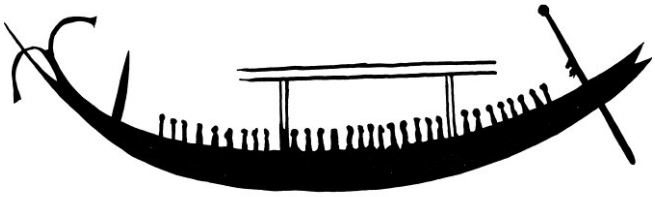

Figure 10. L. Basch's reconstruction of a crescentic ship on a pithos from Kolona, Aegina, ca. 1700 BCE. Note the bifurcated stern at right. After Basch 1986, 427: fig. 10.

Figure 11. Mourner carrying a high-status marble (?) ship model on the Hagia Triada sarcophagus. Heraklion Museum. Photograph by the author.

Minoan Ships

The silver model's profile bears a remarkable similarity to that of the rowed ship accompanying the paddled flotilla in the Miniature Frieze from the West House at Akrotiri on Thera (Figure 8A).[35] These two vessels agree also as to the five rows of oarsmen seated in each, and to the light steering oar noted on the silver model. Another representation of this ship type, identifiable by its shape and five files of oarsmen, appears on a gold ring from Crete (Figure 9).[36] The triangular object at the bow of the ship on the ring should not be confused with a sixth file of rowers; it probably represents the splashguard that appears on other representations of Cycladic/Minoan ships.[37]

Furthermore, the Aegean has a long tradition of metal ship models, beginning with three Early Cycladic lead longship models from Naxos now in the Ashmolean Museum.[38] A fragmentary Late Minoan IB/Late Helladic II bronze model from Keos also has a bow shape remarkably similar in its curve to that of the silver model (Figure 8B).[39] In general, the steering oars depicted on the ships in the Miniature Frieze seem inadequate for the vessels on which they are being used.[40] They do represent, however, an almost exact match for the steering oar of Ahhotep's silver model.

The bifurcation at the horizontal extremity of the silver model finds comparison in the curving stern bifurcation depicted on the Kolona ships from Aegina, which date to ca. 1700 BCE (Figure 10).[41] Ships on minuscule Minoan seals often have what appears to be a stern bifurcation.[42] This detail, however, probably represents the post and the horizontal stern projection, which appear most clearly and in greater detail on the processional ships of the Miniature Frieze at Thera.[43]

Conclusions

This short review demonstrates that Ahhotep's silver model is best understood as replicating a ten-oared Minoan ship or, alternately, a model of such a craft. Although no ship models appear among the items brought by Minoans depicted in early Eighteenth Dynasty tombs of nobles at Thebes (dating from the reign of Hatshepsut to the accession of Amenhotep II), such high-status items clearly existed, as indicated by the (marble?) ship model carried by a mourner on the Hagia Triada sarcophagus and by the bronze ship model fragment from Keos (Figure 11). Similar metal models could have been brought to Egypt by the Minoans—or alternately, as appears to be the case with Ahhotep's silver model, could have been constructed by Egyptian artisans for Minoans residing in, or visiting, Egypt. Another type of Minoan model, bull statuettes like those carried by two porters on the Hagia Triada sarcophagus, are brought by Minoans in the Theban tombs of Useramun (TT131) and Menkheperreseneb (TT86), both of which date to the reign of Thutmoses III.[44]

A silver ship model of Minoan character would complement other artifacts with Minoan affinities found in Ahhotep's tomb. P. Warren summarizes the Minoan parallels to Ahhotep's dagger and Ahmose's axe:

> Although technically of New Kingdom date, two further pieces must be mentioned here because of their close Hyksos connection. These are the axe of Ahmose, conqueror of Avaris and the Hyksos, and the dagger of his mother Ahhotep, both found in her tomb . . . The griffin on the axe blade has wings decorated with the 'notched plume' motif. The Minoan origin of this, proposed by Evans and with details noted by Morgan . . . is now well confirmed by the notched plumed wings of the almost contemporary griffin guarding the seated goddess who presides over the crocus gatherers in the painting in Ashlar Building 3 at Akrotiri, Thera . . . The Aegean origin of a lion chasing a bull in a flying gallop position in a rocky setting on Ahhotep's dagger remains clear, again as proposed by Evans . . . the axe shows a powerful symbol of Minoan religion adopted and adapted as a symbol of political power in Egypt (even though the griffin as such was earlier established in Syria and Egypt . . .). The lion motif of the dagger, locally engraved, expresses the Aegean mode of symbolizing power and speed. Processes of iconographical transfer of ideology expressed in symbols are continuing between the two areas.[45]

How might a ship model representing a Minoan craft find its way into the tomb of a Seventeenth Dynasty royal consort? One solution seems possible: it was taken as booty during the attacks and conquest of Avaris. Ahhotep was the mother of Kamose and Ahmose, the founders of the Eighteenth Dynasty. Kamose attacked the Hyksos capital of Avaris and claims to have taken much booty from its harbor, while Ahmose accomplished the conquest of the city and drove the Hyksos out of Egypt.[46] Even before the fall of the city itself to Ahmose, Kamose's Second Stele gives a vibrant view of the opulent treasure he carried away from the harbor of Avaris:

> I have cut down your trees, I have forced your women into ships' holds, I have seized [your (?)¬ horses; I haven't left a plank to the hundreds of ships of fresh cedar, which were filled with gold, lapis, silver, turquoise, bronze axes without number, over and above the moringa-oil, incense, fat, honey, willow, box-wood, sticks and all their fine woods—all the fine products of Retenu—I have confiscated all of it![47]

The hypothesis that a Minoan vessel served as the ultimate prototype for Ahhotep's silver ship model, and that that it had been taken as booty by Kamose or Ahmose from Avaris—together with the gold ship model, the wheeled wagon, and perhaps other items found in Ahhotep's tomb—presupposes a Minoan presence at Tell el-Dab'a under Hyksos rule. M. Bietak's excavations at Tell el-Dab'a have revealed remarkable Minoan fresco fragments, including bull jumpers, clearly indicating the presence of Minoans at the site.[48] He originally dated the Minoan fresco fragments found at Tell el-Dab'a to the Hyksos period, but has since revised his chronology, now placing them in the early Eighteenth Dynasty.[49] E. Cline as well as B. and W. D. Niemeier have disputed Bietak's redating, and he has responded vigorously.[50]

The present discussion, unfortunately, does not contribute to this debate, as dating the extant Minoan material at the site to the Eighteenth Dynasty does not preclude an earlier Minoan presence at Tell el-Dab'a that at present remains undetected archaeologically. It would hardly be surprising to find Minoans in Egypt at a time when the Delta was under Hyksos rule, as these Aegean seafarers make appearances in other eastern Mediterranean countries at or before this time (depending on the chronologies followed).[51] An alabaster jar lid with the name of the Fifteenth Dynasty Hyksos pharaoh Khyan on it, found in a Middle Minoan IIIA level at Knossos, also suggests a connection between Hyksos Egypt and Minoan Crete.[52]

The prototype vessel of Ahhotep's silver model would have been a relatively narrow craft better suited to coastal areas than blue-water crossings. Its size, and that of the rowed ship in the Theran Miniature Frieze, may be estimated based on the approximate 1 m length (*interscalmium*) required by each of the rowers to work his oar.[53] Assuming a fairly realistic scale of the human figures to the rowed vessel in the frieze, these vessels would have measured about 12–14 m from stem to stern.

If the silver model replicates an actual ship rather than another model, it would indicate that Minoan craft existed at Avaris. Egyptian texts refer to *Keftiu* ships in Syro-Canaanite ports, as well as being built or repaired at the royal Egyptian shipyard of *Prw-nfr*. It is tempting to identify any Minoan vessels built in Egypt as the *Keftiu* ships of these texts, but a study of the associations in which they appear indicates that the term most likely refers to Syro-Canaanite ships of a type used for trading with the Aegean.[54]

The wheeled cart found with Ahhotep's models remains an enigma within a Minoan context. There are no other known examples of Minoan ships depicted on wheeled carriages. Scholars generally agree that the Hyksos introduced the wheel—along with the horse, the chariot and the composite bow—to Egypt.[55] Thus, Ahhotep's wagon may represent a Hyksos influence, as the wheels seem to copy contemporaneous four-spoked chariot wheels.[56] Later Egyptian and Canaanite chariots became heavier; after a short-lived experiment with eight-spoked wheels during the reign of Thutmoses IV, they employed wheels with six spokes.[57]

Notes

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2. On Ahhotep, see Vandersleyen 1971, 129–130, 175–196, and additional bibliography.
3. von Bissing 1900, 19–21.
4. Maspero 1892, 321: fig. 297; Vernier 1927a, 219 [no. 52668]; Vernier 1927b, pl. XLIX.
5. Winlock 1924, 252–253.
6. Landström 1970, 141: fig. 411; Basch 1987, 335: figs. 719–720; Spathari 1995, 26, 27: fig. 18.
7. Reisner 1913, IV; Landström 1970, 98: figs. 311–312; Jones 1995, 30.
8. Brunton and Engelbach 1927, 17: pl. 52; Petrie 1933, 74: fig. 85; Wachsmann, in press.
9. van Walsem 1997, 226–231; Creasman and Doyle 2010 (this issue); Wachsmann, in press.
10. Compare Landström 1970, 110: figs. 340–341, 118: figs. 363–364.
11. Maspero 1915, 428, no. 4030; Landström 1970, 98; Jones 1995, 32.
12. Length: 38.5 cm; breadth: maximum 6.7 cm, narrowing at its ends to 1.5 cm; weight: 372 g. I base the following description primarily on the commentaries by von Bissing (1900, 19) and Vernier (1927a, 217–218).
13. For Middle Kingdom/New Kingdom quarter and axial rudder arrangements, see Landström 1970, 8: figs. 234, 236, 79: fig. 238, 82–83: fig. 246, 82: fig. 249, 83: figs. 250–252, 86: fig. 260, 89: fig. 271, 90: fig. 275, 92: figs. 283, 287, 288, 93: fig. 293, 99: figs. 313, 316, 101: figs. 319, 321, 102: figs. 322, 324, 106: figs. 327–330, 107: figs. 331–334, 114: fig. 352, 115: figs. 354, 356, 116: figs. 357–358, 117: figs. 361–362, 118: figs. 364–365, 119: figs. 368–369, 121: fig. 371, 122–123: fig. 372, 125: fig. 375, 128: figs. 381–382, 130: fig. 383, 134: figs. 389–391, 393, 135: figs. 394, 396, 136: fig. 399, 138: figs. 404–405, Jones 1990, pls. V, XVI–XXIII, XXV, XXVIII–XXXV.
14. Edgerton 1927, 257.
15. Edgerton 1927, 258: figs. 2–3.
16. Landström 1970, 95: fig. 297, 119: fig. 368.
17. Doyle 1998, 90: fig. 6–12, 97: fig. 6–19, C, 105: fig. 6–31, 108: fig. 6–37, 112: fig. 6–43.
18. Compare Biers and Terry 2004, 51: no. 28. Note, however, a bronze kohl stick from Assasif, which is contemporary with Ahhotep but dissimilar to the item held by the standing figure in the silver model. The item was deaccessed from the Metropolitan Museum (MMA 16.10.447) and is now in the Museum of Natural History. The kohl stick is 9.7 cm long and has "a small round 'spoon' rather than the elongated oval 'paddle'" (Christine Liylquist, personal correspondence).
19. von Bissing 1900, 19.
20. Wachsmann 1995, 10.
21. Reisner 1913, XVI.
22. Reisner 1913, XVI, 6: n. 4; Doyle 1998, 137–139; Wachsmann, in press. Von Bissing (1900, 19) notes that the crew appears to have been mounted in modern times, so the actual direction in which the rowers originally faced may now be lost.
23. von Bissing 1900, 19.
24. Landström 1970, 98: fig. 312.
25. Landström 1970, 99: figs. 313, 316, 101: fig. 321, 115: figs. 354, 356; see also Jones 1990, pls. XXX–XXXI; Doyle 1998, 128–132.
26. Reisner 1913, 3: fig. 14 and pl. I (no. 4798), 27: fig. 107 and pl. XXX (no. 4835); Landström 1970, 76, 77: fig. 226, 82: figs. 247–248, 83: fig. 251.
27. Wachsmann 1998, 257–258, 259: fig. 12.5.
28. Daressy 1895, pls. XIV–XV; Säve-Söderbergh 1946, 56, 57: fig. 11; Davies and Faulkner 1947, pl. VIII; Casson 1995, 35–36: fig. 57; Basch 1987, 63: figs. 111–112, 64: figs. 113–114; Wachsmann 1998, 42: fig. 3.2, 43: figs. 3.3–4, 44: figs. 3.5–6; 45.
29. Wachsmann 1998, 42: fig. 3.1, 46: figs. 3.7–8, 47: figs. 3.9–10, 50: fig. 3.14.
30. Wachsmann 1998, 42, 44–45.
31. Dunand 1954, 337–338: nos. 10089–10092.
32. Dunand 1950, pl. 69: no. 10089; Wachsmann 1998, 54, 55: fig. 3.21. On representations of vessels derived from models rather than the actual prototypes, see Reich 1991; Wachsmann 1998, 52–54.
33. Wachsmann 1998, 63–64, 65: figs. 4.5–6, 66: figs. 4.7–9, and additional bibliography.
34. On Cypriot ship models, see Westerberg 1983; Basch 1987, 70–74, 148–151, 249–262; Wachsmann 1998, 61–67. On firedogs from Cyprus, see Karageorghis 1963, 277: figs. 17–18, 278: fig. 19, 292–294; Karageorghis 1967, 343: fig. 148, 344; Basch 1987, 188, 189: figs. 396–397, 258, 260: fig. 562. Similar firedogs have been found in Argos (Courbin 1957, 369: fig. 54, 370, 371: figs. 55–57, 372–373, 374: figs. 58–62, 375, 376: figs. 63–65, 377–385). Karageorghis (1963, 292) believes the firedogs found on Cyprus arrived there from Greece.
35. Doumas 1992, 71–72: fig. 36; Spathari 1995, 44: fig. 44; Wachsmann 1998, 93: fig. 6.16.
36. Evans 1964 vol. 2, 953: fig. 923; vol. 4; Alexiou 1969, 114: fig. 56; Casson 1995, fig. 51; Basch 1987, 102: fig. C15.
37. Wachsmann 1998, 93: fig. 6.17, 94.
38. Renfrew 1967, 5, 18: pls. 1, 12, 3, 12–14; Basch 1987, 78, 79: figs. 153–156; Wachsmann 1998, 69, 70: fig. 5.1.
39. Caskey 1964, 327: pl. 56, C; Long 1974, 48: pl 24, fig. 69; Göttlicher 1978, 64: Taf. 25, 335; Johnston 1985, 26–27 (BA17); Wachsmann 1998, 102: figs. 6.34–35, 104. There has been some confusion in the past as to whether one or two metal ship models were found at Keos. There is, indeed, only one model (Wedde 2000, 309: no. 310).
40. Doumas 1992, 63: fig. 29 [partial], 71–74: fig. 36, 75–77: fig. 37, 80: fig. 39, 81: fig. 40, Wachsmann 1998, 93: fig. 6.14, 94: fig. 6.19, 99: fig. 6.27.
41. Basch 1986, 421: fig. 5, 422: fig. 7; Wachsmann 1998, 77, 80, 82: fig. 5.24, A.

42. Casson 1995, 41–42, 445–446; Basch 1987, 98: figs. B1–2, 99: figs. B3–4, 6–7, 102: figs. D1–2, 4, 6, 103: figs. D7–9, 106: fig. G3; Wachsmann 1998, 100: fig. 29, A–C, G–K).
43. Wachsmann 1998, 92: fig. 6.13, 93: fig. 6.14, 106, and additional bibliography.
44. Wachsmann 1987, 60–61: pls. XXVII: B, XXIX: 3, XXXVI: A: 5, LV: 6, LVI: 5. For discussions on the items brought by Minoans in the Theban tombs, see Vercoutter 1954, 121–127, 134–135, 153–156; Vercoutter 1956, 305–366: pls. XXV–LXVII; Wachsmann 1987, 49–92: pls. LIV–LVIII.
45. Warren 1995, 5.
46. Breasted 1906, §1–12; Vandersleyen 1971, 30–40; Redford 1992, 115, 120–122, 125–129; 1997, 13–16: docs. 68–70; Rainey and Notley 2006, 63–64.
47. Habachi 1972, 36–37: ll. 12–15; translation quoted here from Redford 1997, 14: no. 69, ll. 12–15.
48. Bietak 1995; 1996, 73–81: color pls. III–VIII, pl. 33; 2008; Bietak, Marinatos, and Palyvou 2000; Bietak, Marinatos, Palivou, et al. 2007; Morgan 1995.
49. Bietak 1992, 26–28; 1996, 68.
50. Cline 1998; Niemeier and Niemeier 2000, 764–765; Bietak 2000.
51. Niemeier 1991; Niemeier and Niemeier 2000, 765–767.
52. Evans 1964, vol. 1, 18, 26, 297, 319, 380, 418, 419: fig. 304b, 420–422, 553; vol. 2, 220, 303, 357: n. 1, 360; vol. 3, 9; vol. 4, 1, 130; Redford 1992, 120: n. 120; Warren 1995, 3.
53. The *interscalmium* in the classical world was the distance measured between thole-pins, believed to be about 1 m (Vitruvius 1.2.4; Morrison, Coates, and Rankov 2000, 133, 245–246).
54. Säve-Söderbergh 1946, 43–50; Vercoutter 1954, 165–166; 1956, 53–55; Wachsmann 1998, 51–52. Bietak (2005) identifies *Prw-nfr* with the harbor of Avaris/Tell el-Dab'a. Barber (1998, 15) offers a unique interpretation for *Keftiu* ships; she identifies them as vessels "that use colorful fabrics on a frame cabin to shield passengers from the elements during the voyage," thus connecting the name to the Aegean patterned cloth covering used on some Nile ships.
55. Winlock 1947, 153–157, 170; McLeod 1958, 397: n. 5, and additional bibliography; Yadin 1963, 86; Littauer and Crouwel 1979a, 56, 76; Hayes 1990, 193.
56. Yadin 1963, 186–189, 191–194, 200, 202.
57. Yadin 1963, 86–90, 190, 192–193, 200, 206, 210, 211–217, 220–221; Littauer and Crouwel 1979b.

References

Alexiou, S. 1969. *Minoan civilization.* Trans. C. Ridley. Heraklion: V. Kouvidis – V. Manouras Co.

Barber, E. J. W. 1998. Aegean ornaments and designs in Egypt. In *The Aegean and the Orient in the second millennium (Proceedings of the 50th Anniversary Symposium, Cincinnati, 18–20 April 1997). (Aegaeum 18).* E. H. Cline and D. Harris-Cline, eds. Liège: Université de Liège. pp. 13–17.

Basch, L. 1986. The Aegina pirate ships of c. B.C. 1700. *Mariner's Mirror* 72:415–438.

Basch, L. 1987. *Le musée imaginaire de la marine antique.* Athens: Hellenic Institute for the Preservation of Nautical Tradition.

Biers, J. C. and J. Terry, eds. 2004. *Testament of time: Selected objects from the collection of Palestinian antiquities in the Museum of Art and Archaeology, University of Missouri – Columbia.* Madison: Fairleigh Dickinson University Press.

Bietak, M. 1992. Minoan wall-paintings unearthed at ancient Avaris. *Egyptian Archaeology* 2:26–38.

Bietak, M. 1995. Connections between Egypt and the Minoan world: New results from Tell el-Dab'a/Avaris. In *Egypt, the Aegean and the Levant: Interconnections in the second millennium B.C.* W. V. Davies and L. Schofield, eds. London: British Museum Press. pp. 19–28, pls. 1–4, 14–17.

Bietak, M. 1996. *Avaris, the capital of the Hyksos: Recent excavations at Tell el-Dab'a (The First Raymond and Beverly Sackler Foundation Distinguished Lecture in Egyptology).* London: British Museum Press.

Bietak, M. 2000. "Rich beyond the dreams of Avaris: Tell el-Dabʿa and the Aegean world—A guide for the perplexed": A response to Eric H. Cline. *Annual of the British School at Athens* 95:185–205, pls. A–C.

Bietak, M. 2005. The Thutmoside stronghold of Perunefer. *Egyptian Archaeology* 26:13–17.

Bietak, M. 2008. Minoan artists at the court of Avaris (Tell el-Dab'a). In *Beyond Babylon: Art, trade, and diplomacy in the second millennium B.C.* J. Aruz, K. Benzel, and J. M. Evans, eds. New York: Metropolitan Museum of Art. pp. 130–131.

Bietak, M., N. Marinatos, C. Palivou, and A. Brysbaert. 2007. *Taureador scenes in Tell El-Dabʿa (Avaris) and Knossos.* (*Denkschriften der Gesamtakademie* Bd. 43.) Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Bietak, M., N. Marinatos, and C. Palyvou. 2000. The maze tableau from Tell el Dabʿa. In *Proceedings of the First International Symposium, The Wall Paintings of Thera*. Vol. 1. S. Sherratt, ed. Athens, Thera Foundation. pp. 77–90.

Breasted, J. H., ed. 1906. *The Eighteenth Dynasty*. Vol. 2 of *Ancient records of Egypt*. Reprint, London: Histories & Mysteries, Ltd., 1988.

Brunton, G. and R. Engelbach. 1927. *Gurob.* London: British School of Archaeology in Egypt and Bernard Quaritch.

Caskey, J. L. 1964. Investigations in Keos, 1963. *Hesperia* 33:314–335.

Casson, L. 1970. *Ships and seamanship in the ancient world.* Reprint with addenda and corrigenda, Baltimore and London: Johns Hopkins University Press, 1995.

Cline, E. H. 1998. Rich beyond the dreams of Avaris: Tell el-Dabʿa and the Aegean world—A guide for the perplexed. *Annual of the British School at Athens* 93:199–219.

Courbin, P. 1957. Une tombe géometrique d'Argos. *Bulletin de correspondance hellénique* 81:322–386.

Creasman, P. P. and N. Doyle. 2010. Overland boat transportation during the pharaonic period: Archaeology and iconography. *Journal of Ancient Egyptian Interconnections* 2.3:1–17. This issue.

Daressy, G. 1895. Une flottille phénicienne d'apres une peinture récente. *Revue Archéologique* 27:286–292, pls. XIV–XV.

Davies, N. d. G. and R. O. Faulkner. 1947. A Syrian trading venture in Egypt. *Journal of Egyptian Archaeology* 33:40–46, pl. 8.

Doumas, C. 1983. *Thera: Pompeii of the ancient Aegean*. London: Thames and Hudson.

Doumas, C. 1992. *The wall-paintings of Thera.* Trans. A. Doumas. Athens: The Thera Foundation.

Doyle, N. 1998. Iconography and the interpretation of ancient Egyptian watercraft. MA thesis, Texas A&M University.

Dunand, M. 1950. *Fouilles de Byblos II: 1933–1938 (Atlas).* Paris: P. Geuthner.

Dunand, M. 1954. *Fouilles de Byblos II: 1933–1938.* Paris: P. Geuthner.

Edgerton, W. F. 1927. Ancient Egyptian steering gear. *American Journal of Semitic Languages and Literatures* 43:255–265.

Evans, A. 1964. *The Palace of Minos.* 4 vols. London: Biblo and Tannen.

Göttlicher, A. 1978. *Materialien für ein Corpus der Schiffsmodelle im Altertum.* Mainz am Rhein: Philipp von Zabern.

Habachi, L. 1972. *The Second Stela of Kamose and his struggle against the Hyksos ruler and his capital.* Adhandlungen des Detschen Archäologischen Institutes Kairo, Ägytologische Reihe 8. Glükstadt: Verlag J. J. Augustin.

Hayes, W. C. 1990. *The scepter of Egypt: A background for the study of the Egyptian antiquities in the Metropolitan Museum of Art. Part I: From the earliest times to the end of the Middle Kingdom.* New York: Metropolitan Museum of Art.

Johnston, P. F. 1985. *Ship and boat models in ancient Greece.* Annapolis: Naval Institute Press.

Jones, D. 1990. *Model boats from the tomb of Tut'ankhamun.* Tut'ankhamun's Tomb Series 9. Oxford: Griffith Institute.

Jones, D. 1995. *Egyptian bookshelf: Boats.* Austin: University of Texas Press.

Karageorghis, V. 1963. Une tomb de guerrier à Palaepaphos. *Bulletin de correspondance hellénique* 87:265–300.

Karageorghis, V. 1967. Chronique des fouilles à Chypre en 1966. *Bulletin de correspondance hellénique* 91:275–370.

Landström, B. 1970. *Ships of the pharaohs.* Garden City: Doubleday & Company, Inc.

Littauer, M. A. and J. H. Crouwel. 1979a. *Wheeled vehicles and ridden animals in the ancient Near East.* Leiden: E. J. Brill.

Littauer, M. A. and J. H. Crouwel. 1979b. An Egyptian wheel in Brooklyn. *Journal of Egyptian Archaeology* 65:107–120, pls. XII–XVI.

Long, C. R. 1974. *The Ayia Triadha sarcophagus: A study of Late Minoan and Mycenaean funerary practices and reliefs.* Studies in Mediterranean Archaeology 41. Göteborg: P. Åstrom.

Maspero, G. 1892. *Egyptian archaeology.* Trans. A. A. Edwards. 2nd ed. New York: Putnam's Sons.

Maspero, G. 1915. *Guide du visiteur au Musée du Caire.* Cairo: Institute française archéologie orientale.

McLeod, W. E., 1958. An unpublished Egyptian composite bow in the Brooklyn Museum. *American Journal of Archaeology* 62:397–401.

Morgan, L. 1995. Minoan painting and Egypt: The case of Tell el-Dab'a. In *Egypt, the Aegean and the Levant: Interconnections in the second millennium B.C.* W. V. Davies and L. Schofield, eds. London: British Museum Press. pp. 29–53, pl. 18.

Morrison, J. S., J. F. Coates, and N. B. Rankov. 2000. *The Athenian trireme: The history and reconstruction of an ancient Greek warship.* 2nd ed. Cambridge: Cambridge University Press.

Niemeier, B. and W.-D. Niemeier. 2000. Aegean frescoes in Syria-Palestine: Alalakh and Tel Kabri. In *Proceedings of the First International Symposium, The Wall Paintings of Thera.* Vol. 2. S. Sherratt, ed. Athens: Thera Foundation. pp. 763–802.

Niemeier, W.-D. 1991. Minoan artisans traveling overseas: The Alalakh frescoes and the painted plaster floor at Tel Kabri (Western Galilee). In *Thalassa: L'Égée préhistorique et la mer (Actes de la troisième Recontre égéenne internationale de l'Université de Liège, Station de recherches sous-marines et océanographiques [StaReSO], Clavi, Corse [23–25 avril 1990]).* R. Laffineur and L. Basch, eds. Liege: Université de Liège. pp. 189–201, pls. 46–51.

Petrie, W. M. F. 1933. Egyptian shipping. Part 2. *Ancient Egypt and the East* (Vols. 3–4, September–December). pp. 65–75.

Rainey, A. F. and R. S. Notley. 2006. *The sacred bridge: Carta's atlas of the biblical world.* Jerusalem: Carta.

Redford, D. B. 1992. *Egypt, Canaan and Israel in ancient times.* Princeton: Princeton University Press.

Redford, D. B. 1997. Textual sources for the Hyksos Period. In *The Hyksos: New historical and archaeological perspectives.* University Museum Monograph 96: University Museum Symposium Series 8. E. D. Oren, ed. Philadelphia: The University Museum, University of Pennsylvania. pp. 1–44.

Reich, R. 1991. A note on the Roman mosaic at Magdala on the Sea of Galilee. *Liber Annuus* 41:455–458, pls. 53–54.

Reisner, G. A. 1913. *Models of ships and boats.* Cairo: Institut français d'archéologie orientale.

Renfrew, C. 1967. Cycladic metallurgy and the Aegean Early Bronze Age. *American Journal of Archaeology* 71:1–20, pls. 1–10.

Säve-Söderbergh, T. 1946. *The navy of the Eighteenth Dynasty.* Uppsala: Lundequistska Bokhandeln.

Spathari, E. 1995. *Sailing through time: The ship in Greek art.* Trans. D. Hardy. Athens: Kapon Editions.

van Walsem, R. 1997. *The coffin of Djedmonthuiufankh in the National Museum of Antqiuties at Leiden.* Leiden: Nederlands Instituut voor het Nabije Oosten.

Vandersleyen, C. 1971. *Les guerres d'Amosis fondatuer de la XVIIIe dynastie.* Monographies de la Fondation égyptologique Reine Élisabeth 1. Brussels: Fondation égyptologique Reine Élisabeth.

Vercoutter, J. 1954. *Essai sur les relations entre Égyptiens et Préhellènes.* L'Orient illustré 6. Paris: Librie A. Maisonneuve.

Vercoutter, J. 1956. *L'Égypt et le monde égéen préhellénique.* Biblioteque d'étude 22. Cairo: Institut francais d'archeologie orientale.

Vernier, É. 1927a. *Bijoux et Orfèvreries. (Musée des antiquités égyptiennes, Catalogue géneral nos. 52640–53171)* Vol. 1: *Texte.* Cairo: L'Institut français d'archéologie orientale de Caire.

Vernier, É. 1927b. *Bijoux et Orfèvreries. (Musée des antiquités égyptiennes, Catalogue géneral nos. 52640–53171)* Vol. 2: *Index et Planches.* Cairo: L'Institut français d'archéologie orientale de Caire.

von Bissing, F. W. 1900. *Ein thebanischer Grabfunde, aus dem Anfang des neuen Reichs.* Berlin: Alexander Duncker.

Wachsmann, S. 1987. *Aegeans in the Theban tombs.* (*Orientalia Lovaniensia Analecta* 20.) Leuven: Uitgeverij Peters.

Wachsmann, S. 1995. Paddled and oared ships before the Iron Age. In *The age of the galley: Mediterranean oared vessels since Pre-Classical times.* Conway's history of the ship. R. Gardiner and J. Morrison, eds. London: Naval Institute Press. pp. 10–35.

Wachsmann, S. 1998. *Seagoing ships and seamanship in the Bronze Age Levant.* College Station and London: Texas A&M University Press and Chatham Press.

Wachsmann, S. In press. *The Gurob ship-cart model and its Mediterranean context.* College Station: Texas A&M University Press.

Warren, P. 1995. Minoan Crete and pharaonic Egypt. In *Egypt, the Aegean and the Levant: Interconnections in the second millennium B.C.* W. V. Davies and L. Schofield, eds. London: British Museum Press. pp. 1–18.

Wedde, M. 2000. *Towards a hermeneutics of Aegean Bronze Age ship imagery.* Mannheim and Möhnesee: Bibliopolis.

Westerberg, K. 1983. *Cypriote ships from the Bronze Age to c. 500 B.C.* Gothenberg: Paul Åströms förlag.

Winlock, H. E. 1924. The tombs of the kings of the Seventeenth Dynasty at Thebes. *Journal of Egyptian Archaeology* 10:217–277.

Winlock, H. E. 1947. *The rise and the fall of the Middle Kingdom in Thebes.* New York: Macmillan.

Yadin, Y. 1963. *The art of warfare in biblical lands, in the light of archaeological study.* Trans. M. Pearlman. London: Weidenfeld and Nicolson.