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VERLAG PHILIPP VON ZABERN · Gegründet 1785 · MAINZ
**Watercraft of the Lower Sea**

(Plate 42 g)

Daniel T. Potts

'Ships from Meluhha, (mā Me-luh-ha[k]) Magan (mā Má-gan[k]), and Dilmun (mā Dilmun[k]) made fast at the dock of Akkad' — Sargon b 2.

**Introduction**

In the late 4th century B.C., Alexander the Great’s admiral Androsthenes visited Tylos (ancient Bahrain) in his attempt to circumnavigate the Arabian peninsula. Androsthenes was accompanied by men who were skilled observers, men who left behind detailed descriptions of the flora of Tylos, parts of which survive in the works of Theophrastus and Pliny. Almost exactly two millennia earlier, in the late 24th century B.C., ships from Meluhha, Magan, and Dilmun visited Akkad, the as yet undiscovered capital of the first great Oriental empire. Unfortunately, the cuneiform record of that visit is terse to a degree, identifying the ships in question only by their country of origin. No firsthand observations, such as those made by Androsthenes’ staff, survive to give us even an inkling as to what the ships of those foreign lands looked like. The purpose of this short contribution is to add an archaeological and iconographic dimension to the well-known statement of Sargon of Akkad quoted above, and in so doing to discuss some of the associated problems which remain to be resolved. It is written with great affection for a man who has never failed to give the author the benefit of his profound knowledge of all things Near Eastern, and who has done so much to further the field during the past thirty years. Twenty years ago Rainer Michael Boehmer examined the similarities and differences between Mesopotamian and Egyptian seacraft. I hope he finds something here to rekindle his interest in this subject.

**Premise**

Studies of early watercraft have a strong cross-cultural bias. In 1938, just as H.A. Winkler was comparing the depictions of ships in Egyptian rock art with those found on Sumerian cylinder seals, E.H. Mackay was discussing the ship representations from Mohenjo-Daro in light of Minoan, Egyptian, and Sumerian ship iconography. Similarly, when P. Johnstone reviewed the development of seacraft in prehistory, he drew Egyptian material into his discussion of the depictions of ships from the Harappan and Dilmunite areas, and pointed to the 13th century A.D. manuscript illustration in al-Hariri’s Maqamat as showing a close parallel to a ship found on a stamp seal from Failaka. Whatever cross-cultural comparisons may prove to be valid, whether for technological or iconographic reasons, the fact remains that before such comparisons can be made, a detailed inspection and description of the watercraft being compared must be undertaken. Only in this way will it be possible to define the styles of watercraft used in ancient Meluhha, Magan, and Dilmun, with a view to ascertaining those significant similarities and/or differences which characterized the ancient watercraft of the Lower Sea. The extant repertoire of iconographic representations from this region is small, but it deserves to be reviewed carefully.

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The small corpus of Harappan ship representations comes from Mackay's work at Mohenjo-Daro (1927-1931); S.R. Rao's excavations at Lohthal (1955-1962); and the renewed investigations at Mohenjo-Daro on behalf of the University Museum directed by the late G.F. Dales (1964-65). In spite of the fact that the body of material has not grown appreciably during the past sixty years, some progress has been achieved, notably with respect to the glyptic finds which are now available in excellent photographs thanks to the work of A. Parpola and his colleagues. The relevant material is listed here in order of discovery.

1. M-1349 (DK 10355) - Fig. 1 - 33.5 x 16 x 10 mm. - Mohenjo-Daro, DK Area, G Section, Block 21, House II, Rm 87. - 4.4 fl.

Publ. Mackay, Further Excavations at Mohenjo-Daro (1938) 340-341, Pl. LXXXIXA.

A rectangular stone seal with no boss, perforated through one of its long sides and engraved on one face with the image of a ship. Mackay originally published a somewhat indistinct photograph of the impression of this seal. None of the published drawings of this impression is accurate, a fact revealed by the recently published colour enlargement of the original seal by Shah and Parpola. The ship on this seal is a double-ended vessel. The hull as shown is crescentic but not deep. Except for its mid-section, the hull is shown hatched with parallel, vertical lines (interrupted by a single diagonal line) running across the stem, and roughly parallel horizontal lines, topped by a series of parallel, vertical lines in the bow, the top of which is flat. In contrast, the stem is sharp and pointed. A rectangular structure appears in the middle of the deck. It consists of vertical 'pillars' at either end, marked with parallel, horizontal lines; and two rows of triangles decorating the central side facing the viewer. Each of the 'pillars' is topped by a straight 'standard' ending in two curves like horns mounted on the ends of poles. An oversized platform, upon which a human figure is shown seated, appears like a poop deck in the stem of the ship. The figure appears to be holding a pair of steering oars or punting poles.

The hatched lines on the hull and 'pillars' of this vessel have been interpreted by most scholars as the lashings which hold together the hull and cabin frame of a reed ship. Mackay compared the mastless vessel with central cabin shown here to the boats used by fishermen on the Indus River in the early 20th century, a view recently reiterated by Franke-Vogt. During Caspers, on the other hand, interpreted the cabin as a square sail, suggesting further that 'the presence of two side-rudders suggests that we are dealing with sea-going ships since the latter had to be fitted with two side-rudders because if there was any wind on the beam the rudder on the windward side might be clean out of the water or not deep enough to have any effect'. The new photographs make it clear that we are dealing with a cabin and not with a sail. Moreover, two rudders are not required for double-ended, sea-going craft.

2. Further Excavations Pl. LXIX.4 (DK 6986) - Fig. 2 - c. 108 x 69.5 x 7.6 mm. - Mohenjo-Daro, DK Area, G Section, Block 9, House VI, Rm 38. - 9.4 fl.


A graffito on a light red-slipped sherd (no further details of paste available). In contrast to no. 1, the hull is deep. It is not shown in profile, but rather from slightly above. For this reason, the line


6 For the terminology I follow the classification proposed by J. Hornell, MM 28 (1942) 22.

7 During Caspers, Mesopotamia 7 (1972) 174.

8 In Oman: a seafaring nation (1979), 112, we read, 'In antiquity and early Islamic times, the only type of rudder known was the side rudder or steering oar. Arab ocean-going ships had to have only one, even for effective use in heavy weather, since their ships were double-ended and the steering oar, fixed to the pointed stern piece, ran no risk of being pulled out of the water when the vessel rolled'.

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representing the upper edge of the hull is paralleled by a second, curving line which depicts the further side of the ship. The bow is sharp, but as the end of the stern is not shown we cannot tell whether the vessel is double-ended or square-stemmed. A mast is clearly visible. Close to it is a pair of lines which join into a single line cross-cutting two diagonal lines above. This has been interpreted hesitantly as a person by Franke-Vogt, but it seems more likely that the lines represent the rigging cables of the mast. The two diagonal lines represent the yard, running just beneath the mast head, and the sail itself. A steering oar or side rudder can be seen in the stern of the ship.

3. M-1429 B (UPM/MD 602) - Fig. 3 – Mohenjo-Daro.

An impression on one side of a twisted, triangular, prism-shaped clay 'tablet'. The impression shows a double-ended vessel with a shallow hull, hatched in parallel, vertical lines. A pair of steering oars or side rudders is visible at the stern. A cabin composed of two compartments, indicated by flaring sided squares framed within a rectangle, sits in the center of the deck. On either side of it is a tall pole with a pair of curving shapes emanating from it. Two birds, facing fore and aft, are shown above the hull to the right and left of the cabin.


Rao has published four terracotta fragments which he believes come from boat models, as well as one intact specimen. Here we shall consider only the intact vessel. Judging by the published photographs (no drawings are available), the vessel was square-stemmed, with a sharp bow. A perforation through the bow has been interpreted as a fitting for the rigging, while a second one in the middle of the upper edge of the hull is seen as an oar rest.

Preliminary Conclusions

Sparse as the material may be, we can see that the three representations of ships and the one model belong to two clearly defined and very different ship types. Nos. 1 and 3 are both double-ended vessels; probably made of reeds bundled with lashings; and propelled by two punting poles (an identification which I favour over that of steering oars). Each supports a small cabin in the center of the deck. Nos. 2 and 4, on the other hand, are square-stemmed, single-masted vessels. Without a sail, the ships in the first category would not be capable of undertaking voyages in open water, whereas the latter ones are clearly the sort which could have performed long journeys.

mā Mā-garānki

With the exception of the much later, pre-modern rock art depictions of ships⁹ found in Oman, the only iconographic representation of a ship from the area of ancient Māgan is found on an Iron Age pendant from Tell Abraq (see below). Several discoveries of bitumen at sites of the 4th and 3rd millennium B.C., however, bear on the question of early watercraft in the region.

Ras al-Hamra

In the winter of 1984/85 the Italian Archaeological Expedition working at RH5 (Qurm), near Muscat, recovered fragments of a black burnished, carinated ceramic vessel with bitumen adhering to its interior surface¹⁰. The sherds come from a pit (HWE/II) dug into Layer 0. Two other pits (HXF and HXP-B) in the same layer have yielded C14 dates of 4760 BP ± 100 years (Bln-3140) or 3670-3390 cal. ± 1st BC and

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4940 BP ± 60 years (Bla-3401) or 3794-3679 cal. ± 1σ BC, S. Cleuziou and M. Tosi have suggested that the vessel in question was used as a container for heating bitumen, pointing to the possibility of using bitumen for the buoyancy of watercrafts, allowing the assemblage of plankwood boats for the first time.

Ras al-Junayz

Since late 1985 excavations by the Joint Hadd Project in Building I (period II) at RJ-2, near the easternmost tip of Oman, have recovered quantities of bitumen mixed with straw in lumps of varying size. These not infrequently bear mat and rope impressions as well as barnacle incrustations. J.B. Bacquart and S. Cleuziou write, 'The presence of barnacles may be granted as the result of a long immersion of the pieces in seawater, only one face of the bitumen being in contact with the water, and these pieces can be considered as the remains of the caulking of a reed boat'. S. Cleuziou has recently suggested a date of c. 2300-2100 B.C. for the mudbrick buildings of period II at RJ-2.

Preliminary Conclusions

In their discussion of the RJ-2 bitumen and early seacraft, Bacquart and Cleuziou made reference to the Sumerian cultic text *Manna-Suen’s Journey to Nippur* in which reed mats and bitumen are mentioned in a description of the construction of the moon god’s boat. Yet a more relevant economic text which should be considered is CT 7, 31, an Ur III text from Girsu, where 4260 bundles (sa) of 'sid-reed', 12384 bundles of gi-zi, and 3170 gur of asphalt (esir-lufe) for the caulking of a Magan-ship (ma-M^gan du-g-d6) are listed. The amount of reed and asphalt/bitumen prescribed is staggering. H. Waetzoldt estimates the weight of a reed bundle at between 1.5 and 3 kgs. This means that the amount of sid-reed called for is 6.39-12.78 tons, while no less than 18.376-37.152 tons were required of gi-zi. As for the bitumen involved, if we use the standard Akkadian through Old Babylonian gur of 300 sila = 300 l., then we are faced with the massive figure of 931,000 l. of bitumen. The quantity of bitumen and reeds called for in this text is extraordinary, and must refer to an entire fleet of ships. For the sake of comparison, we may take the Old Babylonian text YOS V 231, from Larsa (Rim Sin 12, or c. 1810 B.C.), a record of asphalt (esir-es) and bitumen (esir) allotments for two 20 gur (6000 l.) ships, one of which was a Dilmun ship. In addition to mentioning 4 gur of asphalt for the Dilmun ship, it lists 150 l. of bitumen (or c. .5 gin) for the coating of the interior and exterior of the two vessels. If we take this text as paradigmatic, then we can assume that at least 4.25 gur (1275 l.) of asphalt/bitumen were needed for a 20 gur Dilmun ship. If the Magan ships in CT 7, 31 were of a comparable size, then the amount of asphalt specified would have sufficed to caulk 745 ships. That this is purely hypothetical, however, is clear, for in the Ur III period texts such as UET III 272 mention ships varying in size from 1 to 300 gur. and as T. Gomi has recently pointed out, 'no clue is offered by these texts to estimate the relationship between the size of a ship and the amount of cargo on board. In other words we do not know whether a ship of 180 gur could carry 180 gin (ca. 54,000 liters)'.

The presumed use of bitumen for caulking at Ras al-Junayz is interesting, not least because it is at variance with the traditional, ethnohistorically documented caulking methods employed in the region. All

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16 H. Waetzoldt, BSA 6 (1992) 130-132, calls this ‘Spaltrohr’ and notes that it was used particularly for the manufacture of baskets and mats.
17 H. Waetzoldt, BSA 6 (1992) 129-130, calls this ‘Fussbeecher, grunes Rohr’ and identifies it with *Phragmites australis* and *Arundo donax*.
available sources from the area report the use of various concoctions of oil and lime for caulking wooden ships. This has included the use of raw fish oil\(^{22}\); shark-oil\(^{23}\); or whale oil\(^{24}\) applied with a rag or by hand to the deck and topsides; and coconut oil (although fish or vegetable oil is acceptable) mixed with lime made from ground up shells\(^{25}\), as well as a tallow and lime mixture was sometimes used on ships' hulls to resist marine boring worms\(^{26}\). Bitumen from Hit, on the other hand, has traditionally been used in Iraq\(^{27}\), while early 19th century accounts report that a type of bitumen called *gogul*, was 'much used at Bombay, Bengal, and other parts of India, for painting the bottoms of ships, it being superior to any thing else for that purpose, and wood covered with it, resists the worm a long time\(^{28}\). This might suggest that the bitumen fragments from Ras al-Junayz came off of ships from the Indus Valley and/or Mesopotamia. Given the other finds made at the site, their Harappan origin is more likely. On the other hand, it should also be stressed that, just because recent records give no hint of the use of bitumen in the Gulf region for caulking, this does not necessarily mean that such has always been the case. Moreover, contrary to popular opinion, bitumen sources are known in the Gulf region. At Qairiyah, in the 'Adan district of Kuwait just north of Burgan, J. G. Lorimer noted at the beginning of this century that, "The depression contains numerous wells, also springs of bitumen or *Qir*, whence the name\(^{29}\). Bitumen deposits are also known at *Qir*, on Bahrain\(^{30}\). In this connection it is instructive to recall the Larsa text *YOS V 231* in which 4 gur (c. 1200 l) of Dilmun asphalt are attested\(^{31}\).


\(^{27}\) E. Ochensschlager, *BSA* 6 (1992) 52. 'New bitumen, which is said to come from Hit, can be purchased in Chabahil or Basra (about 80 kilos for one dinar), but it is not often needed in large quantities for bitumen can be used again and again and is usually salvaged from an old boat (as are most of the wooden boards) to build a new one. If a boat is leaking from small cracks and the bitumen coating is still in good condition, the cracks can sometimes be sealed by heating them with a length of burning reeds and then rolling the area with a short section of reed. Ordinarily a boat is stripped of its bitumen with a hammer and chisel every year and its hull is repaired. The old bitumen, with whatever new bitumen is necessary, is heated to liquid consistency and stirred occasionally with a stick. A shovel full of liquid bitumen is distributed over its surface like a large pancake and carried to the repaired boat. One or two workmen spread the bitumen evenly over the surface with sobay, wooden rollers with conical ends. They frequently moisten the rollers with water and pick out lumps of extraneous material or unmelted bitumen. The exterior of the boat is coated in sections, the bottom first, next one side, then the other. Two or more layers are usually applied until the protective coating is as thick as three cm. thick. One man quickly spreads wet mud from the canal bank over each section as it is finished, while another throws cane of water over the mud to keep it moist and pliable. The mud, according to informants, fuses to the bitumen and gives the coating extra strength. When the bottom and sides are completed the boot is turned upright and layers of bitumen are spread over the decks, the top of the prow and stern, and the edges of the boat's sides. The final stage is packing the bitumen in the interior rib joins or wherever a large crack in the wood or a poor joint seems to require it. The boat is usually allowed to dry overnight before launching'.

\(^{28}\) W. Milburn, *Oriental Commerce* (1813) 137.


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5. TA 493 – Fig. 4 – 26 x 23 x 6 mm. – Tell Abraq – coordinates 120.68/139.60 – elev. 6.88

Publ. D.T. Potts, Further Excavations at Tell Abraq (1991), 98 and Figs. 142-143.

A small, roughly sub-rectangular pendant, pierced at one end, made of black soft-stone. The obverse is carved with an image which I take to be that of a ship, while the reverse has a lightly etched, generally radial pattern of incised lines. The incised image appears to be that of a square-sterned vessel with sharp bow. Above it is an elongated, triangular sail. Both sail and hull are crossed by a series of parallel, vertical lines.

As on the Harappan exemplars thought to show reed boats (Nos. 1 and 3), the vertical lines on the hull originally led me to interpret the ship on TA 493 as a sewn reed boat. At the same time, I believed that the artist who made the carving simply ran the lines from the hull through the sail for no apparent reason. On reflection, this may be true, yet another possibility suggests itself as well. It could be that we are dealing with a sewn plank boat, for in the case of the sewn sambuq of Dhofar, the stitching is done such that the stitches linking each plank as one moves from the bottom of the hull upwards are located directly above those below them. When viewed from a distance, it appears as though parallel, vertical lines were running perpendicular to the line of the hull, exactly as in the case of the Tell Abraq pendant. By the same token, the sails of Gulf ships were traditionally made of several cloths sewn parallel to each other in strips. This may be what is depicted on our pendant as well.

Preliminary Conclusions

It is impossible to confirm whether or not the hull of the Tell Abraq ship was a sewn plank or reed construction. Nevertheless, there seems little doubt that we are dealing with a triangular sail, the forepart of which ends in a point at the bow. This is none other than a lateen, or settee sail, about which so much has been written in historical discussions of nautical evolution. As H.H. Brindley wrote some seventy years ago, ‘Whether the lateen of the Mediterranean was adopted from the Arabs, who have certainly used it for a very long time, or whether it separately was evolved from the square-sail in Southern Europe we do not know; the former suggestion is possibly on the whole the more probable. We can only say with certainty that there is no evidence that the ancient Egyptians, Greeks, or Romans used the lateen. Its history in the Indian Ocean is quite obscure. Did the Arabs introduce it into India or did they obtain it from the East?’ 32 Recent opinion suggests that the fully-developed lateen was in use in the eastern Mediterranean by 900 A.D., while the Arab lateen ‘was probably developed around the Gulf, Arabian Sea and Red Sea before Islam, at least as early as the Sassanid period’. 33 The depiction of a lateen sail on an Iron Age pendant from the Oman peninsula which must date to c. 1100-700 B.C. is thus nothing short of revolutionary from the standpoint of the history of maritime technology.

mā Dilmunī

During the reign of Šarkallābari (c. 2217-2193 B.C.) 34, onions were disbursed by officials of the ‘Onion office’ at Nippur to various individuals for services rendered. On two occasions sacks (the numbers are unfortunately illegible) of onions were given to ‘Ilum-dân, the draft [recruiting] officer’ with an accompanying note 35. Westenholz reads ‘mā-Dilmun du-ri-ru-a’ which he translates as ‘when he caulked the Dilmun ship’, but recently Steinkeller has argued that this is ‘grammatically impossible’, suggesting the reading ‘mā-Dilmun gūa-ri-ru-a’, ‘[when] he brought the Dilmun-boat upstream’ 36. On a third occasion 240 bundles of onions were given to ‘the Dilmun boatman’ (mā-DU Dilmun) 37. We can gain some impression of what a Dilmun ship may have looked like from representations found on seven stamp seals from Failaka and two from Bahrain.

33 Oman: a seafaring nation (1979) 114.
6. Failaka - Fig. 5 - 26 mm. dia., 12.5 mm. thick - F3, trench AA, sq. O:7, level 7.11


A stamp seal of glazed grey soft-stone. The engraved scene shows three figures standing above the deck of a double-ended ship with curving keel, high bow and angular stem. The bow is marked by two sharp points emanating from its upper surface, and a further two lines running almost vertically out of its front edge. Four incised lines mark the center of the hull.

7. Failaka - Fig. 6 - 13 x 21 x 9 mm. (fragmentary) - F3, trench AF, sq. P:4-5, level 6.67


A stamp seal of glazed, dark grey soft-stone. Only the lower third of the seal is preserved. This shows a ship with double-ended ship and curving keel; high, almost vertical bow marked by two slight projections; and lower, angular stem.

8. Failaka - Fig. 7 - 24 mm. dia., 12 mm. thick - F6, trench F2, sq. K:3, level -1.99


A stamp seal of glazed, brown-grey soft-stone. The seal shows a double-ended vessel with high, angular stem; high, pointed prow marked by two sharp points emanating from the upper surface and two pendant, slightly curving lines running off the end of the bow; and a mast in the center of the deck. A furled sail can be seen at the top of the mast. Two figures are shown flanking the mast, either in the act of taking in or letting out the sail. The flat, slightly undulating surface of the hull bottom represents the water line.

9. Failaka - Fig. 8 - 28 x 19 x 11.5 mm. (rectangular) - F6


A stamp seal of grey-brown soft-stone. Although somewhat indistinct, the raised, angular bow; high prow with projecting, curving lines; and mast (minus the sail), as on no. 8, are all clear. The underside of the hull is straight, possibly because it is virtually at the edge of this rectangular seal.

10. Failaka - Fig. 9 - 20 x 19 x 10 mm. (flat square) - F6


A stamp seal of glazed soft-stone. The ship is generally comparable to that seen on no. 9 without, however, the mast. The underside of the hull is straight, running parallel to the lower edge of this almost perfectly square seal.

11. Failaka - Fig. 10 - 16 mm. dia., 4.5 mm. thick - F3, trench Y, sq. O:5, level 6.67


A stamp seal of dark grey stone. This crudely incised seal shows a ship much like the others described above with high prow marked by upward and outward emanating pairs of lines; steep, angular stem; and central mast. There is a triangular indentation at the top of the mast which might be meant to suggest a furled sail.

12. Failaka - Fig. 11 - 30 mm. dia., 8.5 mm. thick - F6, trench 2, sq. L:3, level -0.63


A stamp seal of grey-black stone. One side shows two figures in a ship. The vessel sits lower in the water, waves lapping at its sides. It is double-ended, with a curving prow above which a bird (?) can be seen, and a triangular seat in the stem topped by two curving lines. The stem seat is comparable to that seen on no. 1 from Mohenjo-Daro. On the seat is a seated figure who holds onto a cable running to the top of a central mast, secured to the deck by rigging running off either side of it. A
sail appears to dangle down the other side of the mast. It is shown with rows of parallel lines running the length of the sail, divided by cross-lines. This is no doubt meant to represent the sewn strips of cloth of which the sail was made*

Preliminary Conclusions

Johnstone interpreted the lines across the hull of no. 6 as 'lashings ... which suggest this was a reed-bundle craft'. Given the fact, however, that similar clusters of lines can be seen at the bottom of the garments worn by the two largest figures in the scene, it is also possible that their occurrence on the hull of the ship was more for the sake of decorative symmetry than as an indication of the structural nature of the vessel. This is all the more likely in that the ship on no. 6 shows strong similarities to those found on all of the other seals from Failaka, none of which has any lines suggestive of bundled reeds. In sum, I would suggest that we are dealing not with a reed boat, but with a plank-built one.

Both the high stem with diagonally sloping upper surface and the prow with emanating lines are found on all of the Failaka seals. One can scarcely resist drawing comparisons with modern watercraft in the Gulf region. Thus, the Kumzari batils photographed by P. Costa* (Fig. 12) show a similar, raised stern with a diagonally sloping, slightly curved, upper edge. Their bows, moreover, are characterized by a single, carved piece of wood resembling a pair of cattle horns (Fig. 13). These run perpendicular to, i.e. across, the end of the bow and although decorated with carving, were used to fasten the forward rigging cables. What the two pendant strokes from the bow are meant to represent on the Failaka seals is unclear. The Kumzari batils were adorned with strings of cowrie shells which were fastened onto the end of a goat-skin covering placed over the bow. Whether this or some similar decoration is implied by the two strokes suspended from the bow on the Failaka seals must remain a subject for speculation**.

Preliminary Conclusions

Iconographically the two Bahrain seals present a very different form of watercraft from the quite consistent portrayal seen on the Failaka seals. In each case, bow and stern end in similar, symmetrical curves, whereas most of the Failaka ships show an angular stern and a sharp, raised bow. This difference between the heartland of Dilmun (Bahrain) and its principal northern outpost (Failaka) may reflect a basic technological and design distinction, as opposed to a diversity in artistic representation.

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* M.-C. de Gracce, The Ships of the Ancient Near East, OLA 7 (1981) 183, believes this represents an early type of long and narrow sail which pre-dated the square sail.


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Final Observations

This review of the available evidence for watercraft from the Lower Sea has revealed a strong degree of heterogeneity across the Indus Valley, Oman peninsula, Bahrain, and Failaka in which the following distinctive shapes can be identified:

- double-ended, reed vessels (Indus Valley, nos. 1 and 3)
- double-ended, plank-built vessels with raised bow and angular stern (Failaka nos. 6-12)
- double-ended vessels with identically raised and curved bow and stern (Bahrain nos. 13-14)
- square-stemmed vessels (Indus Valley, nos. 2[?] and 4; Oman peninsula, no. 5).

Thus there is a much greater variety in the material than might at first appear to have been the case. In view of this, I think it unwise to gloss over the details pointed out above, and assume, as various scholars have, a) that the vessels represented on the Failaka seals can be used to get an idea of what sort of vessels sailed between Mesopotamia and the Indus Valley\(^41\); b) to compare the Failaka vessels with the one shown in the graffito from Mohenjo-Daro\(^42\); or c) to describe the Failaka vessels as 'exactly similar' to the modern Arab bum\(^43\). Rather, I suggest that a closer inspection of the available material reveals significant differences which must have given the ships of Meluhha, Magan, and Dilmun recognizably different silhouettes as they lay at the quay of Akkad. Indeed, over a century ago T.G. Pinches wrote in 'The Babylonians and Assyrians as Maritime Nations' that the evidence of the bilingual lexical lists then available, in which Mari, Assyrian, Ur, Akkadian, Dilmunite, Maganite, and Meluhhaite ships were listed, suggested that these separate regions 'most likely had a distinct build of ship'\(^44\). Moreover, their distinctiveness vis-à-vis each other may have been visible right down to such details as choice of material used for caulking (e.g., fish, shark or whale oil vs. bitumen).

The question of whether or not sewn reed boats, like those shown in the Mohenjo-Daro glyptic, could have undertaken a sea voyage to Magan, Dilmun or Mesopotamia is perhaps academic, particularly in view of the discoveries of reed-impressed bitumen at Ras al-Hamra and Ras al-Junayz. Nevertheless, the related question of where the timber was acquired for the construction of plank-built Dilmun (and Magan?) boats is an important and, it must be said, misunderstood one. Johnstone and others have claimed, 'Local wood suitable for shipbuilding is virtually non-existent in Mesopotamia and the Arabian Gulf\(^45\). As even a glance at the relevant shipbuilding texts will show, this is patently not the case in Mesopotamia. Thus, for example, at Umma, texts record the delivery of 810 boat's ribs and 59,290 pegs of mansu-wood, all of which can be shown to have been made from timber grown in the local gallay forest\(^46\). For Lagas, Powell notes that the handles (?) of steering oars (kul qisal) were manufactured from asal\(^2\) (Populus euphratica?), gi gid and gul-bu (both unidentified trees). Planks for short or deep-draft boats (eme sig ma lugud-da, eme sig ma gur-ra) were made from asal\(^3\) while ships' timbers, both wide and narrow, steering oars, oars or punting poles, and mooring apparatus were all manufactured from u-suh\(^5\) (some kind of pine?)\(^47\).

The prevailing notion that the Gulf region lacked wood suitable for shipbuilding is equally mistaken. Theophrastus, Hist. Plant. 5.4.7-8 contains a famous statement concerning Bahrain. 'In the island of Tylos off the Arabian coast they say that there is a kind of wood of which they build their ships, and that in seawater this is almost proof against decay; for it lasts more than 200 years if it is kept under water, while, if it is kept out of water, it decays sooner, though not for some time'. Many scholars have been inclined to doubt the veracity of this statement, seeing in it a confusion of mangrove with imported teak\(^48\). An inspection in January, 1994, of the large stand of mangrove at Khor Kalba (emirate of Sharjah, U.A.E.)

\(^44\) T.G. Pinches, The Babylonian and Oriental Record I (1886-1887) 41.
\(^46\) P. Steinkeillner in: M. Powell (ed.), Labor in the Ancient Near East, AOS 68 (1987) 106, s.v. 27 and 112, s.v. 47.
\(^47\) M. Powell, BSA 6 (1992) 109-110.
\(^48\) For refs. and bibliography see D.T. Potts, The Arabian Gulf in Antiquity II (1990) 131 n. 166.
revealed the existence of enormous mangrove trees (Fig. 15). After seeing these, the archaeobotanist G. Willcox confirmed that they would have been more than suitable for boat-building.

Finally, as noted above with reference to the text concerning the Magan boat(s), we are only once given any precise information on the capacities of the ships which plied the Lower Sea. YOS V 231 mentions a 20 gur Dilmun ship, but if we try to convert this to cubic capacity we find the following: 20 gur = 6000 l. = 6 cu. m. If, for the sake of argument, we assume a weight/volume ratio for copper like that of bitumen, i.e. 1 mina: 1 silla/litre, then a ship of this capacity could carry maximally 6000 minas = 100 talents = 3 tons. With crew and supplies on board this figure would have to be much reduced. If a copper cargo ship carried even 1-2 tons of goods, it would only have taken some 9-18 vessels to transport the 611 talents (c. 18.33 tons) of copper from Dilmun to Ur mentioned in UET V 796.

Watercraft of the Lower Sea

Figure 1  Cat. no. 1.

Figure 2  Cat. no. 2.

Figure 3  Cat. no. 3.

Figure 4  Cat. no. 5.
Figure 5 Cat. no. 6.
Figure 6 Cat. no. 7.
Figure 7 Cat. no. 8.
Figure 8 Cat. no. 9.
Figure 9 Cat. no. 10.
Figure 10 Cat. no. 11.
Figure 11 Cat. no. 12.


Figure 14. Cat. no. 13.
A Mangrove tree at Khor Kalba, United Arab Emirates.