

## THE OARAGE OF PHOENICIAN BIREMES

### **A question of confidence**

The Phoenician oared ships of c. 700 BC are known to us because they were depicted in low relief on slabs of limestone in Sennacherib's "Palace without Rival" in Nineveh. These depictions were brought to light by A.H. Layard in 1848, but of the dozen or so of sculpted images of Phoenician oared ships only a fragment of one such ship's depiction still exists, as an exhibit in the British Museum (B.M. 124722). All others seem to have slowly decayed where they had been uncovered, until they were lost entirely. Fortunately, Layard had made sketches -now in the British Museum- of the low relief images, and a number of these drawings were reproduced as engravings in his book "Monuments of Nineveh" (1849). Much later, in 1903-04, some of the now lost low relief representations of ships -already much deteriorated- were photographed by L.W. King (Russell, 1991).

The aim of this communication is to present some conclusions concerning the shape of the hulls of these ships and the seating arrangements for their oarsmen which are based on a close examination of the available iconography. Consequently, the question of the trustworthiness of these pictures of ships is of vital importance for the results of this investigation. Basch (1987), whose work forms the principal basis for the present investigation, was concerned about the same problem. He concluded that the drawings are reasonably reliable, in spite of some departures from the originals due to Layard's tendency to "correct" these, by reducing the number of arms of octopi from nine to eight, or supplying an oar which evidently had not been manned.

That, of course, has no bearing on the question of the reliability of the Assyrian originals. A suggestion that these too merit confidence, is provided by the pictures (Fig. 1) of Assyrian soldiers carrying away statuettes of Phoenician gods (Slabs 1-3, Room LXIV). The latter are all about half the size of the men, which appears to

confirm the description by Herodotus (III. 37) of the "Pataici", images of gods, perhaps related to the Egyptian god Ptah, "which the Phoenicians carried in the prows of their triremes. I will describe it for them who has not seen these figures: it is the likeness of a dwarf". It may be concluded provisionally that these images of Phoenician ships as they have come down to us are at least worthy of serious consideration as primary evidence, but, as Basch remarked earlier and as we shall see further on, occasionally the Assyrian artists followed very peculiar conventions in the representation of reality.

### **Scrutiny and analysis**

The two-banked ships represented in Sennacherib's palace are always seen from the side, which makes it difficult to ascertain what the seating arrangements were for the oarsmen. Salonen (1939) proposed that they were seated side by side, the thalamians under a narrow catwalk over the length of the ship, the zugians in the open in the outrigger shell, a scheme which was worked out somewhat differently by Landström (1961). Basch (1969) presented an alternative, in which the zugians were seated inboard of the thalamians, but at a higher level. In his scheme, all the oars pivoted around working points in the sides of the hull; thus an outrigger was not necessary.

We begin our scrutiny with an examination of the well-known fragment of Slab 11 in Room VIII(w) of Sennacherib's palace (Fig. 2) which is now in the British Museum. The first question, viz. what the level of the deck was on which the soldiers stood, is inspired by the interesting suggestion of Basch (1987) that the lower portion of the bulwarks would in reality have protected the oarsmen, and that the soldiers stood behind the upper portion on a deck between the two. The question of the level of the deck is not easy to answer from the picture itself, because of the peculiar proportions which the Assyrian artists attributed to the human figure. The problem is circumvented by first making a copy of another Assyrian sculpture depicting humans, in this case Aramaic prisoners of war from Slab 10 in Room XXVIII in the palace (B.M. 124956), and subsequently superimposing it on a drawing of the upper structure of the ship (Fig. 3). It may be observed that the parts of these P.O.W.'s above the bulwark correspond closely to those of the soldiers in the ship, and that their feet would have stood on a deck at the level immediately above the heads of the oarsmen. Although there is a certain latitude possible in the relative scale of reproduction of the two sculptures, and therefore of the level of the deck, the finding cannot be reconciled with Basch's suggestion, although it does

not invalidate his point about the exposed position of the oarsmen in the reconstitutions of Salonen and Landström.

The second point of investigation concerns the thin horizontal line on the side of the ship depicted in Fig. 2. It appears to have indicated a sharp break in the slope of the side, as when an outrigger had been present. But the unusual working position of the foremost zugian oar would seem to contradict this interpretation. In contrast to all other zugian oars in the ship, this oar did not pivot on the gunwale but in an oarport some distance below it.

The following explanation is based on the assumption of the sides having a considerable amount of tumble-home. At the position of the first oar, the sides of the ship had to turn towards the stem, and so had the gunwale, on which the zugian oars pivoted. On the other hand, there existed a minimum for the distance of the working points of the zugian oars from the centre-line of the ship. If the gunwale was at a distance which was less than this minimum for the position of the foremost zugian oar, that oar might still pivot around a point at that minimum distance on the inward sloping side below the gunwale. The geometry is illustrated in the diagram presented in Fig. 4, in which the minimum distances of the working points of the zugian and thaliamian oars are represented by  $d_{zug}$  and  $d_{thal}$ . This stratagem would have allowed the use of an extra pair of zugian oars. The conclusion is that the unusual oarport of the first oar is indicative of a dividing line on the hull representing the abrupt transition of the side to a pronounced tumble-home, very similar to what is seen in many traditional watercraft in Holland. Tumble-home of the sides is a necessary condition in the explanation. An alternative to it, in which a flaring outrigger is assumed, cannot be made to fit the evidence.

The seating arrangement which gave rise to this peculiar form of the hull is very similar to the one proposed by Basch (1969), with the zugians being seated at a higher level than the thaliamians and inward of them. They would have pulled oars which were longer than those of the thaliamians, but the length ratio would not have needed to be in excess of the maximum 7 to 6 ratio attested for Renaissance galleys (Anderson, 1962), if the working points of the zugian oars were set back inward relative to those of the thaliamian oars. In Fig. 5 it is schematically shown how the resulting seating arrangement might have fitted on board of a bireme of a type which would accord with the side view given in Fig. 2. In the reconstitution it was assumed that the oarsmen sat on long benches in the alongships direction, and that, in order to limit the top-hamper, the deck on which the soldiers stood was as low as possible, i.e. just above the heads of the thaliamians. The zugians were

seated in a well in the deck; an awning, or perhaps a light deck, might have protected them from the sun and the rain.

But scrutiny of Layard's (1849) engraving of Slab 14 in Room I, which represents oared ships off the Phoenician coast assisting king Luli II's escape from Tyre before Sennacherib's army (Fig. 6), leads to a result which seemingly does not accord with this oarage. In order to discuss this problem methodically, Basch's (1969) system is followed in designating the ships in this picture, i.e. Arabic numerals for the "naval" ships equipped with rams, capital letters for the "civilian" ships.

To begin with, there can be little doubt that ships Nos. 1 and 2 both possessed an outrigger, and not a tumble-home side. For ship No. 1, it is the configuration of the attachment of the outrigger to the stem which cannot be interpreted otherwise. For ship No. 2 the conclusion is based on a detail - see Fig. 6a - showing that the artist presented the position of the hand and the end of the loom as being outside both the outrigger and the main part of the hull. Although the artistic convention of representing the hand handling the oar as being near the thole would nowadays be regarded as highly unrealistic, there can be little doubt of the artist's conception of the upper part of the side of ship No. 2 being a structure outside of the hull proper, i.e. an outrigger.

For the other ships shown in this picture the evidence is not as direct, but nevertheless it should be possible to distinguish "inrigged" oared ships, such as the one depicted in Fig. 2, from "outrigged" ones, by comparing the numbers of zugian and thalamian oars on board of each ship. These numbers will as a rule be different, because the lines close to the centre line of a tapering hull generally turn earlier towards stem and stern than those farther away. The larger the minimum distance of the tholes of a category of oars is from the centre-line of a ship, the greater the number of such oars which can be accommodated. We may expect, therefore, that on board of an inrigged ship the number of oars of the thalamians would exceed that of the zugians, and that in an outrigged ship it would be the other way around.

It is, of course, easy to verify this. The numbers of oars are presented in the accompanying table, as are the numbers of soldiers and women on deck. Added to the data on the ships in Fig. 6 are those of the two other known representations of biremes in which all oars are shown, viz, the one in Fig. 2, and one of a civilian breme on a fragment of the slab adjacent to that shown in Fig. 6.

It may be noted that for four of the ships the absence of a dividing line on the hull indicates that either it flared outwards or gradually acquired a certain amount of tumble-home above the waterline. The assumption of a flared hull instead of an

outrigger would perhaps explain the relatively low number of zugian oars if we would classify the biremes Nos. A and B among those with outriggers, which would make all civilian biremes belong to this class.

**Table of numbers of oars, passengers etc. in Phoenician biremes**

ship no.	zug.> thal.	zug.= thal.	zug.< thal.	div. line	soldiers + women	hull type	
1		4	4	+	4 + 3	o	
2	5	4		+	4 + 2	o	
3			5	6	-	4 + 0	i
4	5	4		+	4 + 1	o	
5			5	6	+	2? + 0?	i
6		8(+1)	8	+	6? + 0?	i	
A		4	4	-	3 + 3	o?	
B		4	4	-	2 + 3	o?	
C	5	4		+	3 + 2	o	
D	5	4		+	5 + 2	o	
E	5	4(-1)		+	4 + 2	o	
F	5	4		-	4 + 3	o	

*Note: No. 6 is the ship from Room VIII (w) in Fig. 2, which was analysed as being inrigged, No. F is a civilian vessel of which the stern is just visible in the lower right-hand corner of Fig. 6, and of which the remaining part was represented on the adjacent slab. The letters "i" and "o" indicate the type of hull, inrigged or outriggered, which is concluded from our analysis. The presence or absence of a dividing line on the hull is indicated by "+" or "-". According to King's photograph, in ship No. E one thalamian oar clearly had not been manned. Layard supplied the missing oar in his drawing.*

There would have been depicted then on these slabs, three distinct classes of biremes: 1. naval ships (i.e. equipped with a ram) with outriggers; 2. inrigged naval ships, and 3. outriggered civilian vessels. The oarage of the inrigged naval bireme was already shown schematically in Fig. 5; that of the naval biremes with outriggers is presented in Fig. 7. It may be remarked that for the naval biremes it has been assumed that the deck reached to the sides, both to protect the oarsmen and to allow the soldiers to approach their enemies as closely as possible during a naval fight.

A full-length narrow central catwalk seems out of place in a naval ship, but may well have been present in an outriggered civilian bireme, as schematically shown in Fig. 8. Her deck might have been located at a relatively low level just above the heads of the thalamians, which would explain why the bulwarks of the civilian biremes in Fig. 6 are represented as being lower than those of the naval vessels. The oarsmen in such a ship were seated in a much more exposed position than in her naval counterpart, reflecting the different uses which were made of these ships.

### Discussion

The top-hamper for the three classes of biremes as here reconstituted appears to have been very different. If we compare naval and civilian ships, it would seem that the civilian vessels would have been inherently the most stable, and would therefore have carried the smallest amount of ballast, and the largest payload. The ballasting of the warships would have been especially necessary because the situation that all soldiers stood on deck on the same side would have occurred frequently, and even then the ship should have listed only a little to that side. The relatively heavy ballasting of the naval ships allowed them to be equipped with mast and sail. It would have helped too, that the men on deck could be ordered to the luff side. For civilian vessels these possibilities were more remote, which may have been the principal reason why the civilian biremes in Fig. 6 did not carry mast and sail.

There was one bireme among those drawn by Layard (from Slab 12 in Room VIII (w)) which does not fit in our classification; it is shown in Fig. 9. It was a ship fitted with a ram, but which apparently had her bulwarks as low as the civilian biremes in Fig. 6. From the disposition of the oars it would seem probable that the zugian oars were carried on an outrigger. Comparing the ship with the naval vessels shown in Fig. 6, it would seem that if she carried mast and sail, the fore stay would have been visible above the bulwarks, as in the other fighting ships, which is not so. Except for the ram, the ship seems to have possessed all the characteristics of a civilian bireme. Perhaps she was the equivalent of the auxiliary cruiser of our times.

The specific terminology for oarsmen in Phoenician biremes is not known. The terms “zugian” and “thalamian” used here, referred originally to the two lowest banks of oarsmen in Greek triremes. The choice of the terms—alternatively, the names for the two highest banks of oarsmen in the Greek trireme might have been chosen—is based on the idea that the trireme resulted from adding a bank of thranites to the bireme, as held by e.g. Casson (1971), rather than a bank of thalamians, as advocated by Wallinga (1993).

In favour of the latter opinion is the fact that if an outrigger on a ship is shown in Layard's engraving (Fig. 6), both categories of oars are seen to emerge from it, similar to the oars of the two upper banks in the Greek trireme. On the other hand, if we consider how the bireme may have evolved from the monoreme, it seems more probable that that was the result of adding a bank of thalamians to the zugians rather than a bank of thranites.

The odd bireme reconstruction proposed by Salonen and Landström, in which the outer oarsmen would have had a very wet seat in the outrigger shell, is evidently the result of a postulated addition of thranites to the original monoreme. Wallinga (1993) has proposed an improved reconstitution in which the zugians are seated in the hull. The outrigger is supported by timbers on which spray screens are fastened; these are pierced by the thalamian oars. It would seem, however, that the necessary oarports in the screens would have been much larger than indicated in any of the images.

If, on the other hand, the bireme resulted from adding a bank of thalamians -seated at approximately waterline level, with the working points of their oars in the sides- to the bank of zugians in the monoreme, these would have had to shift away from the row of additional oarsmen. That sideways shift would have moved the working points of their oars too, which could have been accommodated by providing either an outrigger (or a flared hull) or tumble-home of the sides, depending on whether the additional thalamians were seated to the inside or the outside of the zugians. In either case, all the oarsmen were seated within the hull, as may be seen in Figs. 5, 7, and 8.

That the outrigger cannot have been a decisive attribute, may be concluded not only from the fact that in three of the eleven biremes depicted on Slabs 14 and 15 in Room I the sides had tumble-home instead, but also from that in three of the others the function of the outrigger was provided by a flared hull.

It may be remarked that the two naval ships numbered 3 and 5 are the only ones on these slabs which pointed towards the shore, and that no women are to be seen on their decks (although this may be an artifact due to damage to the slabs). One could suppose that they were on their way to pick up refugees, but the indication that these naval ships were of exceptional construction compared to the others, viz. with an inrigged hull, suggests a better explanation, viz. that they, as a special class, had been assigned the important task of covering the evacuation of Tyre by the other ships.

The findings on Phoenician biremes have a bearing on the Punic trireme represented by the Erment model of perhaps the 4th century BC, which was fully described by Basch (1987). Its oarage may be derived simply from the reconstituted irrigged Phoenician bireme in Fig. 5, by adding rows of thranites who were seated above the thalamians at deck level. This arrangement is explained more fully in Sleswyk (1994). Relevant in the present context seems the conclusion that the type of irrigged bireme with a cross-section as presented in Fig. 5, when viewed abeam, would have been indistinguishable from a trireme of the Erment type of which the thranite oars had not been manned. That may frequently have been the case, as Wallinga (1993) has argued.

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**ILLUSTRATIONS**

- Fig. 1 Sennacherib's campaign to the Mediterranean coast. Soldiers carrying away images of gods. Slab 1, Room LXIV, upper part. British Museum, WAA, Or. Dr. IV, 32 (Photo: Trustees of the British Museum).
- Fig. 2 Fragment of Slab 11, Room VIII (w), with two banked Phoenician ship. (B.M. 124722). (Photo: author).
- Fig. 3 Comparison of human figures in Assyrian sculptures, as explained in the text.
- Fig. 4 Part of the hull of the ship in Fig. 2, viewed from above. The tumble-home of the sides explains why the foremost zugian oar pivoted in an oar port.
- Fig. 5 Schematic reconstruction of the oarage and the hull of the ship in Fig. 2. The zugians were seated in a well in the deck under an awning.
- Fig. 6, 6a Engraving after a sketch by Layard of Slab 14, Room 1, from "Monuments of Nineveh" (1849). It shows Phoenician ships off the harbour of Tyre. The ships are numbered according to the convention introduced by Basch (1987).
- Fig. 7 Reconstitution of the naval ships Nos. 1, 2 and 4 in Fig. 6 as outriggered biremes.
- Fig. 8 The civilian biremes in Fig. 6 would have differed from the outriggered fighting ships by having a central catwalk at a lower level than the deck in Fig. 7, which would have resulted in greater stability and less ballast.
- Fig. 9 Bireme which appears to have been a civilian ship fitted with a ram. Drawing by Layard of Slab 12, Room I. British Museum, WAA, Or. Dr. IV, 68 (Photo: Trustees of the British Museum).

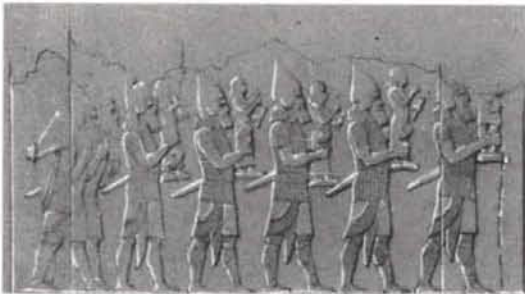


Fig. 1



Fig. 2



Fig. 3

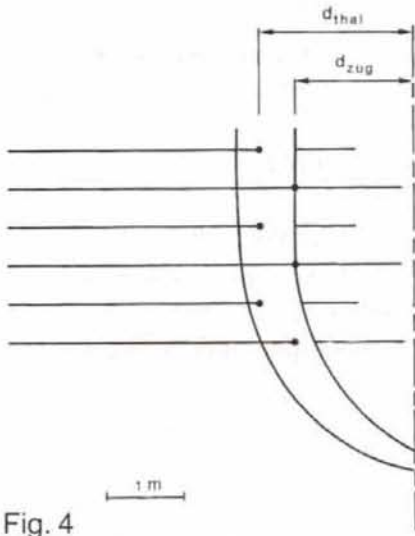


Fig. 4

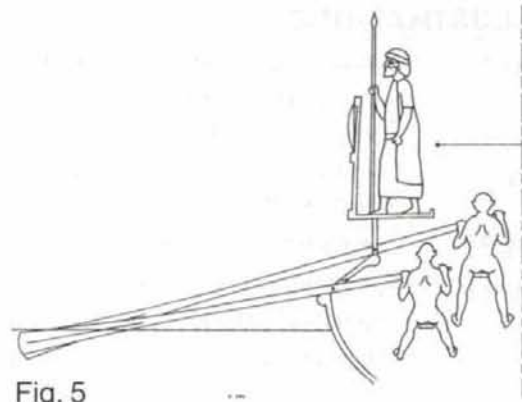


Fig. 5

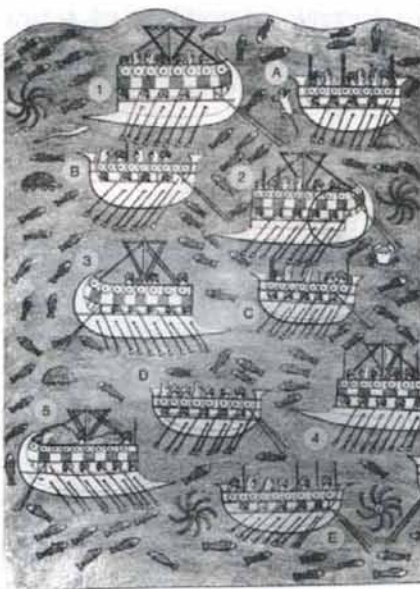


Fig. 6

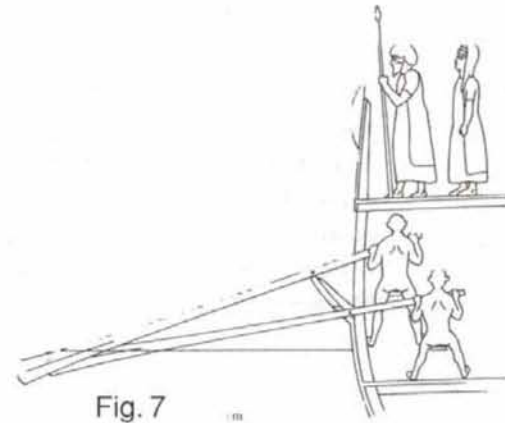


Fig. 7

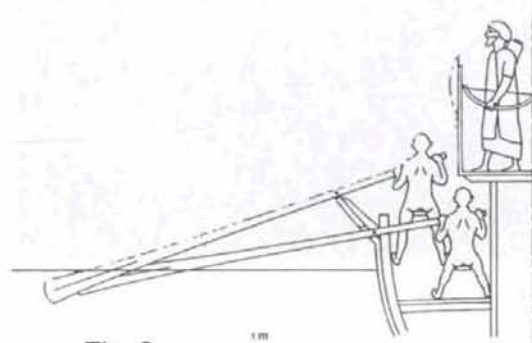


Fig. 8

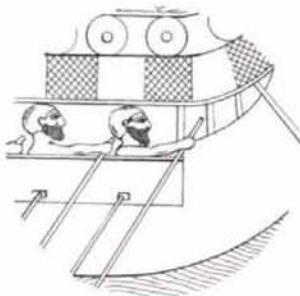


Fig. 6a

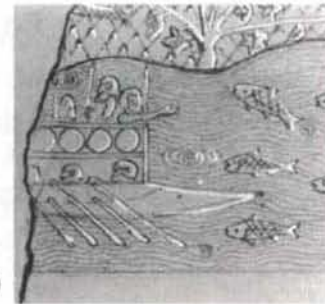


Fig. 9