

WARSHIPS OF THE ANCIENT MEDITERRANEAN

Many types of warship in the ancient Mediterranean had names which incorporated a number. The English words bireme, trireme and quadrireme imply the numbers two, three and four. So do the Greek and Latin words from which the English is derived. It has always been thought that the numbers referred to *half* the number of oarsmen in each cross-section of that particular type of ship: a bireme has been thought of as having had four oarsmen in each cross-section, a trireme six, and so on. The nub of this paper is that the number in the name originally referred to the whole number of oarsmen in a cross-section, and in particular that the original triremes had three, not six, oarsmen in each cross-section. This amounts to a radical revision of ideas on ancient Mediterranean warships.

First it is necessary to clarify English rowing nomenclature. In the *Oxford English Dictionary* and in English seamanship manuals, a boat with a single line of oarsmen, such as the eight-oared boats that compete in the modern Olympic games, is called "single banked". Double-banked boats are those with two lines of oarsmen. They have a port oarsman and a starboard oarsman on each rowing bench.

Oddly enough, most writers on the subject of ancient ships call a double-banked boat "single-banked", e.g. Tarn (1905, 145) and Anderson (1962, 13). It is the same with the word "room", introduced into the English language from Scandinavia to describe a single unit in the oared craft. In his book *The Ship*, Landström (1961, 64) rightly explained that in Scandinavia "... the size of a ship was measured by the number of *rooms* as they called them Each of these *rooms* on a fighting ship meant a pair of oars, and for each pair of oars there was a thwart". In *Greek Oared Ships*, Professor Morrison (1968, 339) described a trireme as "... a ship in which there were three oarsmen to each unitary division

or “room”, called in Latin *interscalmium* ...”. These words are in accordance with the hypothesis put forward in this paper: on the other hand, the diagrams in the book make it clear that *six* men in each room was what the author had in mind. This linguistic confusion has, I believe, been the main reason for keeping the triereme problem so long unsolved.

Iconography

As well as disagreement over nomenclature, there is disagreement as to the accuracy with which ancient artists depicted ships. Many writers have suggested that when it came to nautical subjects, the iconography is not to be relied upon. For example, M. Basch (1976, 231) wrote “Most of the galleys painted on Attic black figured vases of the sixth century are but copies made from a few originals and certainly not the product of direct observation of the real thing”.

I am more inclined to a later view expressed by M. Basch (1988, 177): “Whereas geometric art abounds in iconographic conventions, especially in matters of perspective, ever since the seventh century Greek art required, especially in the case of ships, an almost photographic realism”.

But in this paper it is intended to avoid all disagreement as to the quality of the ancient evidence, by eschewing any claim to prove anything. It is only suggested that the theory put forward is in accordance with the evidence, not that it is true.

The siren vase

Consider the Siren Vase (Fig. 1) made here in Athens about 480 BC but now in the British Museum. Four port-side oarsmen can be seen, each pulling an oar. Few people would doubt that the artist had in mind four starboard-side oarsmen, hidden by the men we can see. But there are six oars (not counting the steering oars) where you would expect to see only four. An extra oar appears to go under the arms of the aftermost oarsman, the one who is looking over his shoulder. It runs across his midriff, presumably into the hands of a man we cannot see. The next man is not encumbered by an extra oar. The next again, the man whose head obscures his captain’s knee, is like the first oarsman we considered - he is pulling one oar and there is another which he is not using himself, but which seems to run across his chest. The last oarsmen, the bow oar, is not associated with any oar apart from his own, but there is an extra, empty oarport, well placed for the sort of extra oar associated with two of his shipmates.

If M. Basch is right (as I think he is) about “almost photographic accuracy” there should be an answer other than artistic error or whimsy. The boat is triple banked, like this (Fig. 2). The empty oarport allows the foremost centre-line oarsman to row on either side. There is no difficulty in rowing triple-banked, Siren Vase fashion. I tried it in this boat (Fig. 3) originally a double-banked naval cutter, modified by cutting extra oarports (or more precisely “rowlocks”) to allow a third line of oarsmen between the other two.

It is hard to say how widely the idea that the Siren Vase shows a vessel with three oarsmen on each bench has been accepted. It has not to my knowledge been criticised in print, though since it was first published in 1970 it has always been ignored in discussions on ancient ships. It did meet with approval in a book on experimental archaeology (Coles, 1973, 103-106). In order to borrow the boat for the experiment it was necessary to convince many naval people, from Admiral to Ordinary Seaman, and no one doubted the idea once he had seen a photograph of the Siren Vase and compared it with the view from above “decoding” it (Fig. 2). At first, Professor Morrison thought the suggestion was interesting and original and quite likely to be right, but I believe he has since changed his views about it.

It is a question which I very much hope will be considered by the participants in this symposium. Is it a triple-banked vessel? Or did the artist paint oars at random, producing just by chance a hitherto unknown but entirely practical rowing system - one which might actually have been useful to seamen, had it not been for the tiresome invention of the internal combustion engine.

Apart from the arrangement of oars, almost every detail of the Siren Vase ship has been accepted as accurate and informative. In *The Athenian Trireme* (Morrison and Coates, 1986, 174) the oars themselves are regarded as exceptionally carefully drawn. The report of the 1987 *Olympias* sea trials (Morrison and Coates (Ed), 1989, 15) cites the Siren Vase ship for its metal-sheathed ram, for the fitting at the mast-head, which appears to have been drawn by an artist who understood nautical technicalities, and for oars not carved from a single piece of timber, but with fitted blades. Thus it is difficult (though no doubt not impossible) to assess the Siren Vase painter’s arrangement of oars as mere whimsy, or to regard its resemblance to a triple-banked boat as mere chance. The system he shows is, I suggest, that used by the first Athenian triremes. I do not, of course, suggest that triremes were only four benches long. I believe they were generally 30 benches long. As this is so close to the general view, I will not go into it further in this paper.

The Victory of Samothrace

The method of rowing shown on the Siren Vase is exactly suited to the ship on which the Victory of Samothrace stands. On either side the ship has a pair of oarports close together, the after one a little higher than the other (Fig. 4). The width between the thole pins (oar pivots) is 2.4m. These arrangements and dimensions are exactly suited to three men abreast, each with his own oar, as on the Siren Vase. This stone ship has always been considered life-size, or nearly so, and it has been a puzzle that the width is too little for the four men abreast suggested by the four oarports. The Siren Vase, you remember, gives the three foremost oarsmen four oarports, the man in the middle having the choice of rowing either to port or to starboard. I think it would be well worth making a partial replica of the Victory of Samothrace ship, to test these rowing arrangements.

Other ways of rowing triple banked

The method shown on the Siren Vase and the Samothrace sculpture is not, of course, the only way of rowing triple banked. A Japanese print shows whaling boats with three rows of oarsmen who stood and pushed, one-man oars and two-man oars alternating. Another triple-banked system was published by M. Basch (1975, Fig. 16) though not in connexion with triremes. A nineteenth-century engraving shows a Sicilian fishing boat in which a man amidships adds his efforts via the oars of the rowers on either side of him, one hand on each oar. The method originally used in triremes was, I believe, rather like that.

Two-level ships

One of the great difficulties with the three-level trireme theory is that during the era in which the ancient historians tell us that the trireme was being introduced, the ancient artists depicted two-level ships (and, of course, one-level ships) but not three-level ships. As Davison (1947, 23) put it: 'There are no signs of anything which anyone has tried to identify as a trireme on any vase, plaque or relief of the sixth century or earlier'. If one compares the iconography with the written history, without the preconceived idea that the trireme had oars at three levels, one is led to the conclusion that the trireme had oars at two levels. This (Fig. 5) shows a Phoenician vessel of about 700 BC, which is some time after Thucydides (I 13-14) tells us that triremes were in service. Lethbridge (1952, 114) called this Phoenician vessel 'a great war canoe' and considered that it was propelled by two single lines of men, one above the other, each man using an oar in either hand

(Fig. 6). Most other writers have envisaged four men in cross-section, each man using a single oar (Fig. 7). I suggest an arrangement somewhere between the two (Fig. 8) - on the lower level a single line of men with an oar in either hand, and on the upper level, two lines of men with one oar each. Instead of sitting and pulling, the men on the lower level may well have stood and pushed, like the Maltese dghaisa-man.

Dr. Fanouria Dakoronia's paper at this symposium yesterday was centred on sherds which seem to show standing oarsmen facing the bows in ships which she suggested most convincingly were probably built especially for war.

The three-man cross-section (Fig. 8) fits the shape of the hull better than cross-sections with the same number of men at each level, because (it is generally agreed) the hull widens out above the incised line that the artist has drawn just below the oars. As M. Basch (1969, 149) wrote: "Such a widening would have been intended to let two rowers occupy about the same space as one without increasing the beam at the water-line."

This arrangement (Fig. 8) would have had advantages for a warship that needed to manoeuvre violently in battles in which the ram was a major weapon. When an oared craft moving ahead at speed has to make the sharpest possible turn, the rudder or steering oars play little part. The propulsive oars on the inside of the turn are held in the water to act as brakes. It is no easy matter. Inexperienced oarsmen ordered to 'hold water' (as the use of oars as brakes is called) may be swept off their benches, unable to hold on against the adverse leverage. With strong, determined but inexperienced oarsmen, oars are often broken. In craft with oars arranged as I suggest (Fig. 8) the men with two oars could have let go of one in order to use both hands and their full strength on the other. With two-thirds of her oarsmen holding water on the inside of a turn, a ship like this would have turned more sharply than a comparable ship having only one oar for each man.

A Corinthian ship of the 6th century BC is shown here (Fig. 9). The oars appear to be out of time with each other. I suggest that the ship's oars were arranged as in Fig. 8. What is this ship's crew trying to do? I have never read a rational explanation.

The *keleustes* (the man standing up) is making a different gesture with each arm. He is the man in charge of the oarsmen, and would not, while on duty, wave his arms about at random. He is signalling orders to the crew, the two dissimilar gestures implying two different orders. He would not want the upper level to row

forwards and the lower level backwards, as that would make no sense. The need for two different orders arises when the oarsmen on one side are to do something different from the oarsmen on the other side. Though he is not the helmsman, the gestures of this *keleustes* are those of a helmsman in a ship steered like the *Olympias* when he wants to turn to port (to the left). His right arm pushes the starboard tiller forward, while his left arm pulls the port tiller back. Used by the *keleustes*, these gestures order the starboard oarsmen to row on ahead, and order the port oarsmen to hold water. We can see that the upper starboard-side oarsmen row strongly ahead. Unseen on the other side of the ship, the upper port-side oarsmen are, I suggest, holding water. The unseen lower oarsmen (a single line) are also holding water to port, using both hands and all their strength on their port oars. The starboard oars which they have let go are those we can see, trailing in the water. The assumption that the ship is triple banked as in Fig. 8 is, I believe, the only one that will provide a rational explanation for the behaviour of the ship in Fig. 9. Here is the explanation for the presence of two-level ships and the absence of three-level ships in the iconography of the trireme era: the two-level ships are triple-banked triremes.

Four-banked systems

Each of the two triple-banked rowing systems just described (Fig. 2 and Fig. 8) would very easily have developed into four banks. The man who invented either triple-banked system might (given a suitable hull) have produced the corresponding four-fold system the same afternoon. We know from Plutarch (*Life of Cimon*, XII 2) that the ships which fought at Salamis were afterwards widened by Cimon. To widen a triple-banked vessel with oars arranged as in Fig. 2 would make room for a fourth row of oarsmen. After Cimon's alterations, I suggest that triremes were often, but not always, rowed with four banks of oars; and that the earlier sort of trireme (Fig. 8) was also given a fourth bank of oars and was usually rowed as in Fig. 7.

Thus for the trireme problem, I put forward the following solution:

- a. Triremes were originally triple banked, some using the system in Fig. 8 and others the system in Fig. 2.
- b. Later triremes were four banked.
- c. The full crew of a later trireme consisted of:
30 officers, petty officers and marines

120 oarsmen

A support group, the *hyperesia*, consisting of 50 men under the command of the *pentekontarchos*.

- d. The three classes of oarsmen sat forward, amidships and aft.

Comparison

Now I will compare the evidence concerning *triremes* with

- a. my solution to the *trireme* problem.
b. the six-banked *trireme*.

No one piece of evidence proves anything: it is always possible to beat down evidence by postulating error or omission on the part of the ancient artist or author. Each piece of evidence, however, suggest that my solution is right. The evidence is underlined.

There are no representations dating from the trireme era of oars at three levels.

The *Olympias* militates against Professor Morrison's suggestion (1968, 169) that triremes were so difficult to draw that '..... artists in general had been avoiding the task'. Drawing the *Olympias* presents no special difficulty to modern artists. The posters we were kindly given yesterday on board the ship show oars at three levels with complete clarity.

If there is any doubt about it, trials could be undertaken to establish how many artists, if offered their usual fee, would avoid the task on the grounds that the ship was too complicated a subject to depict.

There are representations dating from the trireme era of triple-banked ships.

The representations of triple-banked ships correspond perfectly as to time and place with what the ancient historians say about triremes.

The ancient historians make no mention of a type of warship intermediate between the pentekontor with two oarsmen one each of 25 benches, and the trireme.

My solution requires no intermediate type, unlike the six-banked solutions.

The word "dieres" is absent from ancient literature until the Roman period.

If the word *dieres* described four-banked, two-level ships, as the six-banked

trireme theory requires, then its absence is extraordinary, as all modern writers on the subject (e.g. Morrison and Coates, 1986, 32) find two-level ships remarkable. If, on the other hand, *dieres* means (as my theory requires) the commonplace arrangement of a port oarsman and a starboard oarsman on each bench, then its absence is not remarkable. This simple arrangement can be assumed unless the ship-type name implies something more complicated.

A type of merchant vessel called a "phaselos" could be converted in an emergency into a "phaselos trieretikos".

The word *trieretikos*, like the Greek and Latin words for trireme, implies a three-fold arrangement. No one supposes that a *phaselos trieretikos* had six banks of oars (Casson 1971, 168). The likely explanation is that an ordinary merchant *phaselos* was double banked and became *trieretikos* when a third bank of oarsmen was added down the middle, as I modified the naval cutter in Fig. 3.

The "tetreres" (quadrireme in English), named after the number four, was the first type of warship to have had oars worked by more than one man.

The innovation is likely to have been introduced in its simplest possible form: I know only too well how hard it is for a radically different idea on how to row ancient warships to gain acceptance. As Professor Morrison (1968, 291) said: 'The *tetreres* could then have had four men to each "room" rowing two men to each of two oars'. A *tetreres* like that supports my theory. Professor Morrison no doubt meant to write eight men and four oars to each room, as the six-banked trireme theory requires. But that is too complicated to be likely.

In Italian, a double-banked boat is said to have "doppio ordine di remi", the word "doppio" implying the number two, and the word ordine implying lines.

This suggests that the Latin word *ordo* used in connexion with oarsmen, meant one line (as required by my theory) not two lines as the six-banked trireme theory requires.

In modern Greek, a double-banked boat is called "diplokopos", diplo implying the number two.

This suggests that the ancient Greek word *dikrotos* meant double-banked, as my theory requires, not four-banked, as the six-banked trireme theory requires.

One of the trireme's officers was the "pentekontarchos", whose title implies that he was the leader of 50 men.

Six-banked trireme theories have no group of 50 men, and admit (Morrison 1968, 268) that the title *pentekontarchos* is '..... completely obscure for a single officer on a *trieres*'. My solution to the trireme problem gives the *pentekontarchos* the 50 men that his title implies.

Some part of a trireme's crew was collectively known as "hyperesia".

The title *hyperesia* implies a group of people of low status (Jordan 1975, 249). In the six-banked trireme theory, the title has to be allocated to the ship's officers and marines, for which it is unsuitable. In my theory, the *hyperesia* consist of low-status support personnel.

The capital ship that preceded the "trireme" was the "pentekontor".

Nobody doubts that the *pentekontor* originally had two oarsmen on each of 25 thwarts. In order to provide a link between this sort of ship and the supposed six-banked, 170-oared trireme, current theories assume another sort of *pentekontor* with four oarsmen to each room. No such development is mentioned by any ancient author. Quite apart from that difficulty, a 50-oared ship of 13 rooms is clearly inadequate as a link with the supposed 170-oared trireme with over 30 rooms. This is not a new opinion or mine alone. Anderson (1962, 5) made the point in his book *Oared Fighting Ships*. The difficulty was ignored in 1968 in *Greek Oared Ships*. I included it in an article in 1976, and it was ignored in Professor Morrison's reply in 1978. It was, I think, ignored in the discussions which preceded the building of the *Olympias*.

By contrast, there are no improbabilities in the evolutionary sequence that I suggest.

Conclusion

It may seem shocking to conclude that centuries of scholarship have given an entirely wrong answer to the trireme problem, while two minutes spent looking up the meaning of 'double banked' in the *Oxford English Dictionary* (or the equivalent phrase in a German, French, Spanish, Italian or modern Greek dictionary) indicates the right answer.

But there will be advantages. One need no longer believe that the triremes which Athenian shipwrights could build in such numbers and Athenian seamen row with such immortal success, were too difficult for ancient artists to portray.

Nor need we continue to believe that the two-level ships which artists of the trireme era painted so often and so lovingly were totally ignored by the authors of their time.

The maritime history of the era will seem no more paradoxical than history in general.

A.F. Tilley
Fieldfare, East Street
Hambledon, Hampshire PO7 6RX
England

REFERENCES

- Anderson, R.C. 1962. *Oared fighting ships*. London.
- Basch, L. 1969. Phoenician oared ships. *The Mariner's Mirror* 55: 139-62; 227-45.
- 1975. De la survivance des traditions navales phéniciennes dans la Méditerranée de nos jours. *The Mariner's Mirror* 61: 229-53.
- 1976. One aspect of the problems which arise from the interpretation of representations of ancient ships. *The Mariner's Mirror* 62: 231-3.
- 1988. The Eleusis museum trireme and the Athenian trireme. *The Mariner's Mirror* 74: 163-97.
- Casson, L. 1971. *Ships and seamanship in the ancient world*. Princeton.
- Coles, J. 1973. *Archaeology by experiment*. London.
- Davison, J.A. 1947. The first Greek triremes. *The Classical Quarterly* 41: 18-24.
- Jordan, B. 1975. *The Athenian navy in the Classical period*. California.
- Landstrom, B. 1961. *The ship*. London.
- Lethbridge, T.C. 1952. *Boats and boatmen*. London.
- Morrison, J.S. 1978. Rowing the trireme. *The Mariner's Mirror* 64: 203-8.
- Morrison, J.S. and J.F. Coates. 1986. *The Athenian trireme*. Cambridge.
- (Ed). 1989. *An Athenian trireme reconstructed*. Oxford.
- Morrison, J.S. and R.T. Williams. 1968. *Greek oared ships 900 - 322 BC* Cambridge.
- Tarn, W.W. 1905. The Greek warship. *The Journal of Hellenic Studies* 25: 137-56; 204-18.
- Tilley, A.F. 1970. The ship of Odysseus. *Antiquity* 44: 100-4.
- 1976. Rowing the trireme. *The Mariner's Mirror* 62: 357-69.