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Appendix 1

Persian and Greek Naval Warfare: The *diekplous*

THE beginning of wisdom¹ is provided by Thucydides' account of the battle of Sybota in 433 (1. 49). Having recounted the dispositions of the opposed navies, he went on: 'When the signal was given on each side, they engaged and began the naval battle. Both sides had a large number of hoplites on the decks, and a large number of archers and javelin-throwers, for they were still equipped rather crudely in the old-fashioned way. The sea-battle was fierce, though not remarkable for naval skill, being more like a land-battle. For when they attacked each other, they did not easily get away by reason of the number and the mass of the ships, and they somewhat more relied for the victory on the hoplites on the deck; they stood and fought while the ships lay still. There were no *diekploi*, but they fought the sea-battle relying more on determination and strength than on expertise.' This is a very remarkable statement.

It would seem

1. that the old-fashioned method of fighting a sea-battle was to go alongside the enemy and leave the decision to the marines fighting hand to hand, the result being that the successful party captured the ship of the enemy;
2. that as late as 433 BC two major naval powers, Corinth and Corcyra and their allies were still practising this old-fashioned method rather than the modern method to be displayed by the Athenians in 429 (Thuc. 2. 89), the small Athenian squadron at Sybota having held back from the main battle and so abstained from 'ramming' (Thuc. 1. 49. 7),
3. that the old-fashioned method called for a large number of marines on the decks, on whom the victory depended and not on naval manoeuvring, principally the *diekplous*.

But did Thucydides know what he was talking about? There were *diekploi* in the battle of Lade in 494 BC (Hdt. 6. 12. 1, 15. 2). At Salamis there was a good deal of ramming (Hdt. 8. 84, 87. 2 and 4, 90. 2, 92.

1 and 2). At Artemisium *diekplous* was to be expected (Hdt. 8. 9), and in Herodotus' account of the battle of Alalia in c.540 BC the Phocaeen ships are said to have had their rams (*emboloi*) buckled (1. 166. 2).² But if ramming was widespread practice by the time of the Persian Wars, why did the Corinthian and Corcyran navies not choose to employ it in 433 BC? The development of naval warfare has in general been constantly in the direction of longer-range weapons—boarding to ramming, broadsides to longer range naval artillery, many guns to fewer longer-range sixteen pounders, carrier-based aircraft to land-based bombers, and on to intercontinental ballistic missiles. So some explanation is called for as to why the Greeks having seen the future in at Salamis reverted to older methods at Sybota.

The tactic of *diekplous* is nicely delineated in the *Suda* s.v. *diekploi* thus: 'ramming and splitting up the enemy's formation and again wheeling round and ramming once more'. Two passages in Polybius exemplify it well (1. 51. 9, 16. 4. 13–14), showing that it continued into the second century BC to be 'highly effective in naval warfare' and the way to avoid heavily armed marines fighting in close combat. Who began it?

It might be thought, on the strength of Herodotus' account of the Greeks training for the battle of Lade in 494 BC and of the battle itself (6. 12. 1 and 15), that it originated in Ionia,³ but this was probably not the case. Certainly Dionysius of Phocaea knew about the *diekplous* and tried to train the Greek crews, who jibbed at the effort, and in the battle the Chians did carry out *diekploi*, but the commander of a squadron of only three ships (6. 8. 2) being given command of the whole Ionian fleet is very odd. One would expect either that the commander of the largest contingent would be put in charge of the whole or that command would rotate. The exceptional position of Dionysius might have been due to his persuading the Greeks to try his bright idea of *diekplous*. Equally it may have been the case that he had had previous experience of Phoenician tactics⁴ and it was generally accepted that his knowledge was the Greeks' best hope. At Artemisium in 480 BC the Greeks clearly regarded the *diekplous* as the regular tactic of the Persian fleet. In the preliminary stage of that naval encounter Herodotus has the Greek fleet go against the barbarians, because they wanted to test the barbarians' 'method of fighting including the *diekplous*' (8. 9). Whether the method of countering this tactic ascribed by the historian Sosylus, to Heraclides of Mylasa (*FGH* 176 Fr) belongs to 480 has been much and fruitlessly discussed,⁵ but Sosylus who is alleged to have instructed Hannibal in Greek literature (Nepos, *Hannibal* 13. 3), was probably

well enough informed about Carthaginian, that is, Phoenician, naval matters and when he spoke of the tactics of *diekplous* as Phoenician, he is worthy of attention. But what above all suggests that the Persian fleet were in 480 deemed to hold the trump-card is that after the battle of Artemisium, in which according to Herodotus (8. 16–18) the two sides were evenly matched but in which Greek losses of ships and men were great, with half the Athenian contingent damaged, the Greeks were simply reluctant to face the Persian fleet in open water (8. 70) where the *diekplous* could have been exploited, and the Persian fleet went in to the confined waters between Salamis and Attica in great confidence and with disastrous consequences.

It is remarkable that before Salamis we hear nothing of ramming. Both at Lade and at Artemisium it is the 'capture' of ships that is recorded. The Chians at Lade 'were doing the *diekplous* and engaging in battle until they captured many enemy and lost most of their own' (Hdt. 6. 15). They had to put on each ship forty picked men from the city as marines. Clearly the climax of the *diekplous* was for them the sort of standing battle between the two sets of heavily armed marines,⁶ just the sort of naval warfare Thucydides described as 'old-fashioned' (1. 49. 1–3). It was the same sort of operation Herodotus envisaged in the case of the ten ships Xerxes sent to reconnoitre round Sciathus (7. 179–81); two of the three Greek ships on guard there were captured, their marines variously treated. In the operations off Artemisium the Persians are represented by Herodotus as expecting to capture Greek ships (8. 6. 1, 10. 1 and 3), and the Greeks are claimed to have captured thirty of the enemy ships in the first engagement (8. 11. 2). In the decisive engagement the Egyptians are said to have captured five Greek ships with all hands (8. 17). There were, it is true, a good number of damaged and wrecked ships (8. 16. 3 and 18), but that could have been the result of head-on collisions⁷ rather than of beam-ends ramming.

At Salamis although the Persian navy captured Greek ships (8. 85. 2) and the Greeks would have liked, according to Herodotus, to capture Artemisia (8. 93. 1), the emphasis is on ramming, and ramming by Greek ships (cf. 8. 84, 87, 90, 92). So too in Aeschylus' picture of the battle the Greeks win by ramming (*Persae* 408–20); there is no mention of marines fighting marines in hand-to-hand combat.⁸ On the face of it, it would seem that at Salamis there was an important development in tactics.

From an early date Greek ships had been provided with rams and presumably they were used. At Alalia (Hdt. 1. 166) the twenty surviving

Phocaeen ships were, after their rams were damaged, 'useless', and although that is the only indication we are given of the nature of a naval battle in the mid-sixth century, it is likely enough that the Phocaeen tactics in 540 BC were typical.⁹ Why then do we not hear of ramming in 480 BC before the battle of Salamis?

One answer to this question is that although Herodotus did not mention the use of the ram at Artemisium it is to be presumed. Thus in Herodotus' statement (8. 11. 2) that the Greeks 'captured thirty ships', 'captured' is glossed 'i.e. towed away after ramming'.¹⁰ But why did he not say as much when at Salamis he is so insistent on ramming but makes little mention of capturing? There is no reason to think that the accounts of the two battles were written at a great interval between them. In any case the purpose of ramming was to sink ships, not to capture them. When Artemisia rammed the Kalyndian ship, it sank and there were no survivors (8. 87. 4, 88. 3). Likewise when the Samothracian ship, as the story went, rammed an Athenian ship, it began to sink, and when the Samothracian ship was rammed by an Aeginetan, it too sank but not before the Samothracian javelineers had driven the marines from the Aeginetan and got hold of the Aeginetan (8. 90. 2); that is, the rammer, not the rammed was 'captured'. Ships that had been rammed were not in any case worth capturing, certainly not in the middle of the battle. Towing away ships that were awash would be hard and timetaking work. Insofar as ships were captured in 480, it may safely be affirmed that generally speaking they had not been damaged by ramming.¹¹ Indeed Herodotus' narrative makes plain that ships were in general disabled or destroyed (8. 86. 1, 90. 1), not captured. Salamis and Artemisium were 'clean different'.

It must, further, be noted that no mention is made by Herodotus in his account of Salamis of the manoeuvre of *diekplous*. The account is very scrappy and unsystematic and it may be that he just happened not to describe any incident of the battle in which a *diekplous* was involved. It may also be that the waters between the island of Salamis and the coast of Attica were too confined. There is, however, another possibility. According to Plutarch in his *Life of Themistocles* (14. 3), Themistocles did not attack the Persian fleet until the hour of the day which always brought fresh wind from the sea and a swell through the narrows; this did not affect the Greek ships which lay lower in the water but did mightily affect the Barbarians' ships which were much higher and which could be slewed round by the wind. In this way they could have been exposed to Greek attacks. This passage has been almost univer-

sally despised and rejected.¹² If Plutarch has here preserved, whether distorted or not, a genuine piece of information, it would certainly explain why there is no mention of *diekplous* amid all this ramming.

All in all, the battle of Salamis was a freak. The Greeks rammed and won, but when Cimon went out to confront the Persian fleet at Eurymedon a decade or so later, he adapted the Athenian ships to carry a large number of hoplites (Plut. *Cim.* 12. 2). The Persian fleet in 480, according to Herodotus, carried over thirty marines (7. 184. 2) armed with hoplite equipment (7. 100. 3), and this accords with his statement (6. 15. 1) that at Lade the Chians, trained by Dionysius of Phocaea to play the Persian fleet at their own game, had forty marines on each ship, equipped as hoplites (6. 12. 1). So at Eurymedon Cimon fought the battle not as Themistocles had fought at Salamis but in the Oriental fashion, and Greece in general as the battle of Sybota was to show remained wedded to the 'old-fashioned way'. Only the Athenians, so constantly active with their fleet, got ahead and achieved a dreaded mastery of the open seas. History temporarily went into reverse at the final battle in the Great Harbour at Syracuse in 413 BC, when they had to fight in confined space (Thuc. 7. 62 and 66. 2), a battle which like Salamis was a freak.

The only instance of *diekplous* known before the Peloponnesian War is that of the Chian ships at Lade, which, Herodotus declares, led to the capture of numerous ships of the enemy¹³ and to the capture of the majority of their own and the disabling of a number of others (6. 15. 2-16. 1). Perhaps the Chians rammed some of the enemy but that was hardly a satisfactory way of *capturing* ships. Since they had had forty hoplite marines on each ship, the Chians must have been seeking the sort of battle that Sybota was, namely, 'trusting for the victory in the hoplites on the deck who stood and fought with the ships lying still' (Thuc. 1. 49. 3).

But how did the Persian fleet fight? Phoenician ships were of heavier construction than Greek triremes¹⁴ and with their heavy complement of marines it is surprising that they could move faster than the Greeks. Yet they certainly did. Not only does Herodotus explicitly assert that Xerxes' ships moved faster (8. 10. 1), but his narrative recounts how of three Greek ships on guard off Sciathus two were quickly caught up and, after hand-to-hand fighting among the marines, captured, while the third, an Athenian trireme, headed north away from the combat to the mouth of the river Peneius and so its crew escaped by way of Thes-saly (7. 178-82). The only explanation of why the heavier ships moved

faster that presents itself is that at this stage of naval development the Oriental crews were better trained. Athenian naval superiority was to be won later, and only by long practice during the decades after the invasion of Xerxes.¹⁵ In 480 many Athenians rowing must perforce have been very little used to rowing in a trireme, and since according to Herodotus (8. 42. 2) the Athenian ships were the fastest in the Greek fleet, the Greeks generally lacked experience and skill.

How then did the Persians use this advantage of speed? No doubt there would have been head-on collisions but to get alongside an enemy ship and give the marines scope for using their weapons the most satisfactory method must have been, at that date as later, to catch up from the stern, and then, while ships carried a large number of marines, get alongside and use grappling irons, long familiar in eastern waters, to hold the enemy fast.¹⁶ In this way the Phoenicians could employ their tactic of *diekplous*, for which Dionysius of Phocaea had sought to train the Ionians (Hdt. 6. 12. 1) and which the Greek fleet at Artemisium had been eager to test (8. 9. 1). All that the tactic required was ample open water, which was precisely what Themistocles at Salamis insisted on the Greeks denying them (8. 60α).

None of the sea-battles between the Greeks and the Royal fleets between 480 and the making of the Peace of Callias is more than sketchily described, but there seems to have been an important change between the battle of Eurymedon in 469 and Cimon's last campaign in 450. In 469 Cimon sought, as has already been remarked, to play the Persian fleet at their own game, loading his ships with heavy-armed marines (Plut. *Cim.* 12. 2). In 450, according to Diodorus (12. 2), there was a battle in which the Greek triremes 'sank' many of the enemy's ships. This was perhaps the beginning of the supremacy of the Athenian navy based on the superiority of their skill and their tactics¹⁷ as the early years of the Peloponnesian War would make plain.

Outside the pages of Thucydides the only moment in the pre-Hellenistic period where the tactic of *diekplous* is mentioned is in Xenophon's account of the battle of Arginusae (*Hell.* 1. 6. 31). There defence against it is made by the Athenian commanders and one might wonder whether it went out of use as the Greek world constructed ever bigger ships. However, Polybius' account of the sea-battle off Drepanum in 249 BC (1. 51. 9) speaks of it as a 'most effective' manoeuvre. Whether the Phoenician navy continued to employ it is quite unclear. Not only was there no detailed account of a battle involving the Phoenicians and Greeks after 450. Save for Cnidus in 394 there was no battle at all. The

two nautical systems kept their distance from each other. Alexander declined to take on the Persian navy (Arr. *Anab.* 1. 20. 1). He thought that his Greek fleet would be no match for them. He may have feared their superiority in more than mere numbers.¹⁸

Indeed were it not for Thucydides' account of the operations in the Corinthian Gulf in 429 (2. 83-92) and of the battles in the Great Harbour of Syracuse in 413 (7. 39-41 and 7. 60-71) we would have a very feeble notion of naval warfare in classical Greece. Herodotus is no naval historian. His account of the battle of Salamis is ludicrously inadequate. Only the Phoenicians and the Greek subjects of the King play any part. The latter feature in the heroic exploits of the ruler of Herodotus' native city (8. 85) and in the account of an incident involving a Samothracian ship which turned out unlucky for some of the Phoenicians; they, allegedly, left the battle to complain to the King about his Greeks but he, seeing the Samothracians at that moment turning on a good show, ordered the decapitation of the complaining Phoenicians (8. 87-8, 90). On the Greek side only the Athenians and the Aeginetans appear to have fought. The Corinthian dead, whose epitaph we have (ML 24), died unrecorded by Herodotus, who reported Athenian slander (8. 94) but did not bother to discuss what the Corinthians actually did. All in all, a quite inadequate performance.

To sum up. One can speak only tentatively of the development of naval warfare before the Peloponnesian War. However, it is here proposed that the Phoenicians led the way. They could outrow Greek crews until after the battle of Salamis, even though their ships were heavier and carrying a large number of marines. They developed the manoeuvre of *diekplous* as an effective way of getting alongside an enemy ship and giving their marines the opportunity to board and capture. The Greeks endeavoured to imitate at the battle of Lade, 'capturing many ships and losing the majority of their own' (Hdt. 6. 15); but as late as 480 at the battle of Artemisium they were uncertain what to expect (8. 9). There may have been, to some degree, *diekploi* but no hint of it emerges in Herodotus. The Egyptians 'captured' five Greek ships, but the damage done to ships and the destruction may, for all we know, have been caused by ships colliding prow to prow, the manner in which in 334 BC Alexander ordered ten of his ships at Miletus to attack five ships of the Persian fleet (*ἐμβάλλειν ἀντιπρώρους* Arr. *Anab.* 1. 19. 10), the very manner in which the Corinthians attacked the Athenians near the entrance to the Gulf of Corinth in 413 (*ἀντίπρωροι ἐμβαλλόμεναι* Thuc. 7. 34. 5). Then came Salamis and abundance of

ramming. But it was a freak battle. To confront the Persian fleet at Eurymedon Cimon took out ships laden with hoplites, decks adapted for making best use of them in the close-quarters fighting. By the beginning of the Peloponnesian War the Athenian fleet and no doubt the ships of the ship-contributing allies were highly trained and highly skilled, their main tactic being the *diekplous*, which demanded speed and skill for the ramming, while the rest of Greece was still following out-of-date practice (Thuc. 1. 49). In 429 Peloponnesian forces were plainly terrified of the Athenian *diekplous*, crowding together as a mere twenty Athenian ships circled around them like a stoat around a rabbit, and bent above all on avoiding open water where the Athenians could deploy their skills (Thuc. 2. 83–92, esp. 83. 5, 86. 5, 89. 8). That was the age of the fully developed *diekplous*, the Athenian speciality. In the confines of the Great Harbour of Syracuse it was back to head-on ramming (Thuc. 7. 36. 3–4, 40. 5). The Athenians sought to make the best of an old-fashioned job and sought to grip the enemy's ships with grapples and to rely on their marines to finish the business (Thuc. 7. 62. 3–4, 70. 3–5). But this reversion was temporary. At Arginusae in 406 BC the Athenian generals had to adapt their formation to prevent the Peloponnesians' sailing through (Xen. *Hell.* 1. 6. 31).

NOTES

1. However, Wallinga 1993: 172–3 presumes that at Sybota both Corinth and Corcyra *chose* to put to sea with their ships undermanned, which meant that neither could employ *diekplous* but committed themselves to seeking to decide the battle by close-quarters fighting between marines. He omits to explain how it came about that both sides fixed on the same tactic. The battle was not in confined waters where such tactics would be more effective (cf. Phormio's remarks in 429 BC—Thuc. 2. 89. 8), and a smaller force of fast ships dashing in to perform the *diekplous* against a fleet of undermanned sitting ducks would have been more to be expected from one side or the other at least. Wallinga argues that neither Corcyra nor Corinth had the manpower fully to man the large numbers of ships each possessed in 433, but that is equally true of Athens, the majority of whose rowers were mercenary (Thuc. 1. 121. 3, and 143. 1, *pace* S. Hornblower's scepticism). As Thucydides shows (1. 31. 1 and 35. 3), Corinth certainly assembled rowers from other places, evidence belittled by Wallinga on the grounds that at the battle of Sybota both Corinth and Corcyra fought

in 'the old-fashioned way' (1. 49. 1); why, he wonders, would they have chosen to fight in this way? The obvious explanation is that only Athens had 'modernized', that the rest were still trusting to the tactics Cimon expected to follow at Eurymedon thirty or so years previously.

Wallinga is persuaded that 'in the Athenian navy undermanning was habitual' (p. 174). His evidence is not impressive. Certainly Conon in 407 did concentrate his force of rowers from one hundred ships on to seventy (Xen. *Hell.* 1. 5. 20) but at that late date in the war when Athens, and the trierarchic class in particular, as the institution of the syntrierarchy shows (Lys. 32. 24 of 410 is the first recorded instance), was becoming even poorer, it was possible for Peloponnesian commanders to do what the Corinthians are alleged to have advocated just before the outbreak of war (Thuc. 1. 121. 3), namely, to lure oarsmen from Athenian ships for higher pay, as Xenophon (*Hell.* 1. 5. 4) notes. Likewise, the Sicilian Expedition was exceptional. No doubt the troop-carriers (Thuc. 6. 43) had a skeleton rowing force, for otherwise the five thousand one hundred hoplites could not have been accommodated in the forty ships, and once the hoplites had landed in Sicily, both the ships and their limited crews had to be employed, though Thucydides does not inform us how. Such mixed expeditions of fighting ships and troop-carriers may have been familiar enough. The Potidaea campaign of 432–429 BC, for instance, involved four thousand hoplites (Thuc. 2. 58. 3) and thirty (1. 59. 1) and, later, forty ships (2. 61. 1). But whatever use was made of sparsely manned troop-carriers after their primary purpose was fulfilled, it seems wholly improbable that if there was to be serious fighting at sea the 'fast-sailing' ships should be slowed by having some of their rowers taken away, especially considering the efforts that trierarchs made to excel in speed (cf. Thuc. 6. 31. 3). In any case, the Sicilian Expedition was exceptional. Major naval engagements were not to be expected. It would be unsafe to generalize from it.

Speed was all-important in the developed naval tactics of the Athenian navy, and no general would be so stupid as to take out ships undermanned if he could possibly help it, whether there were to be close-combat between marines or not. Of course, in any set of oared ships some would have 'sailed better' than others. Training made all the difference. It was not a matter of whether they were fully manned or not. (When Wallinga calls in a remark in Xenophon's *Oeconomicus* (8. 8) to support his case, he misunderstands. Xenophon, beginning with §3 of that chapter, was arguing that orderly arrangement was all important in armies as also in a ship loaded with men who do everything *ἐν τάξει*, which is the reason for their formidable, admirable speed.)

All in all, it was not by choice that both sides at Sybota fought in the 'old-fashioned manner'. They did not know any other.

2. Nowhere else do we hear of rams being 'buckled' (*ἀπεστράφατο*). The

Phocaeans at Alalia must have been very ineptly applied. Perhaps the pentekonteres which carried the Phocaeans west in 546 BC did not have bronze rams fitted (cf. Morrison and Williams 1968: 280). Indeed since Herodotus chose to term the Phoenician fleet mere 'boats' (πλοῖα), one wonders how fighting-fit they were. He said that the Phocaeans won a 'Cadmean victory' with forty ships destroyed and the remaining twenty rendered 'useless' and afterwards they gathered up the women and children and moved to Rhegium, which looks very much like a crushing defeat and not a triumph of Greeks over Phoenicians. Thuc. 1. 13. 6 speaks of a Phocaean victory but it is questionable whether he was referring to Alalia (see S. Hornblower 1991 ad loc.). Herodotus omits to say that the Phocaeans, having been not totally destroyed, counted that a triumph. The buckling of the Phocaean rams may have been in head-on collisions.

3. Speaking of the naval operations of 480, Hammond in *CAH* iv² 553-4 said, 'The chief difference between the Greek fleet . . . and the Persian fleet was in tactics. The Greeks had developed to a fine art the tactics suited to ramming, one of which was the *diekplous*, and they carried only a small number of marines.' Later he remarks 'The Phoenicians may well have invented that manoeuvre . . .'. There seems some confusion.
4. There were Ionians and Aeolians in the forces which Cambyses took against Egypt, including a Mytilenean trireme (Hdt. 3. 1. 13. 1 and 14. 4 and 5, which proves the ship had a complement of two hundred).
5. Cf. Hignett 1963: 393-6.
6. I take the phrase καὶ τοὺς ἐπιβάτας ὀπλίσειε at Hdt. 6. 12 to mean 'and use the marines as hoplites'.
7. V.i. p. 228.
8. At 8. 92 an Aeginetan ship rammed a ship of Sidon, which was taken rather than sunk. In what state the ship was after being rammed is unclear. Its being 'taken' may mean no more than that the Persians (and the valiant Greek captured off Sciathus) were taken on the Aeginetan ship and the disabled Sidonian left to flounder. There was hardly time in the middle of the battle to tow a hulk ashore. The problem of the Persian marines may have been abruptly disposed of.
9. V.s. n. 2.
10. The gloss is made in Morrison, Coates, and Rankov 2000: 54.
11. But v.s. n. 8.
12. Aeschylus' *Persae* 386 has battle commence at dawn which is not to be pressed literally (cf. Pelling 1997: 3-5). In Herodotus (8. 83) there is time for Themistocles to address an assemblage of marines. It is indeed credible that the Persian fleet should have moved under cover of darkness into a position to confront the Greek fleet, for to move by daylight into the bay in defile would have been dangerously to expose to attack their leading ships, but they had to wait for the Greeks to come forward. So it is

credible that the Greek commanders waited until the suitable moment to advance. It may be true that 'it is impossible to predict weather with any degree of certainty anywhere in the Aegean' (Frost 1980: 154) but if it did indeed happen to start blowing before the advance was made, Themistocles would naturally have been said to have waited for the wind. That he was commended for far-seeing cunning would be no surprise.

A more troubling question arises over what Plutarch says about the Greek ships, namely, that they were lighter and lay lower in the water. The evidence for the Phoenician ships is not very substantial but seems to justify the view of Basch 1969, esp. 160-2, that they stood higher out of the water. According to Thucydides (1. 14. 3), Greek ships were not fully decked at that stage, whereas Herodotus (8. 118) tells a story which implies the opposite about Phoenician ships, and which is consistent with what Plutarch says of them. The real difficulty lies in the remark Herodotus attributes to Themistocles (8. 60α), namely, that the Greek ships are heavier (βαρυτέρας). Does this not show that Plutarch did not know what he was talking about? Not necessarily so. The weight of the Greek ships was not relevant to Themistocles' argument. He should have been saying that they would be disadvantaged in open water by their comparative slowness. Indeed it looks as if Herodotus was making Themistocles talk as Herodotus had made the Persians think at Artemisium, that the Persian fleet would outnumber and 'outsail' the Greeks (8. 10. 1), and there is much to be said for Stein's suggestion of βραδυτέρας in place of βαρυτέρας. Perhaps then Herodotus' text should not in this matter have the last word. Plutarch's evidence cannot be so lightly dismissed. That Plutarch proceeds to name Ariamenes as the Persian admiral who was killed in the battle when Herodotus had named Ariabignes (8. 89, 7. 97) seems no great fault. Herodotus had named an Ariamenes in connection with the battle and in a somewhat mysterious sentence (8. 90. 4, for which cf. Macan 1908).

13. Herodotus' statements about enemy losses arouse scepticism. If the Chians did indeed 'take many ships' of the Persian fleet (6. 15. 2), what became of them? Likewise at Artemisium the Greeks 'took thirty ships' (8. 11. 2), but we hear nothing more about them nor about their crews. Did they all jump overboard except for the brother of the king of Salamis? At 8. 14. 2 the Greeks 'attacked Cilician ships' and destroyed them. In the final engagement (8. 16. 3) 'although many ships of the Greeks were destroyed, far more still of the barbarians were destroyed and far more men.' One wonders whether at least some of these glittering successes were achieved against supply ships, 'the Phoenician merchant men' (γαῦλοι), (cf. 8. 97. 1, 6. 17). Losses at Salamis were not recorded save for the statement that 'the majority of the ships were damaged' (8. 86; cf. 91), though after the battle the Greeks 'expected that the King would still use his surviving

ships for another sea-battle' (8. 96. 1) and in 8. 97 he is found preparing for another sea-battle, as indeed at 108. 1 are the Greeks. One could wish for a fuller account of the Ionians' success in 498 against 'the Phoenicians' (5. 109. 1), the force which had transported 'a large Persian army' from Cilicia to Cyprus (5. 108. 1) and which after landing the army and rounding the north-east cape of Cyprus, evidently making for Salamis (as was the army) ran into the fleet sent by the Ionians (5. 109. 3) who got the better of them (*ὑπερεβάλοντο*). How many were transports and how large a force of Phoenicians was involved Herodotus did not say. One may be pardoned for scepticism.

14. Cf. Basch 1969 (but see Morrison, Coates, and Rankov 2000: 45).
15. Presumably the Athenian ships of 480 BC were no differently constructed from those of other Greek states, but Herodotus declared that they 'moved faster' (8. 42. 2), a remark which may have been more true of his own day. Corinthian optimism in 432 about matching Athenian naval skill in the Peloponnesian War was firmly dismissed by Pericles who declared that Peloponnesian landlubbers would not find it easy to catch up the Athenians who had been practising uncontested ever since the Persian Wars (Thuc. 1. 121. 4 and 142. 5-7).
16. Head-on collisions were always possible, as in the battle of Chios of 201 BC (Polyb. 16. 4. 11). For grappling irons, Casson 1971: 121 n. 87; Thucydides makes Nicias in 413 speak as if grappling irons were new (7. 62. 3) but their use was casually mentioned in 425 (4. 25. 4) and they could well have been in use much earlier.
17. Cf. Livy 37. 30. 2, who remarks: '*robore navium et virtute militum Romani longe Rhodios praestabant, Rhodiae naves agilitate et arte gubernatorum et scientia remigum.*'
18. *CAH* vi² 330.