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## Appendix G: Trireme Warfare in Thucydides

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## APPENDIX G

### Trireme Warfare in Thucydides

§1. Ships, sea battles, and naval policy are key features in Thucydides' account of the Peloponnesian War. Thucydides—who served as a general and commanded a squadron of *triremes* himself (4.104.4–5; 4.106.3)—clearly viewed naval power as the key to supremacy in the Aegean (1.15); Athens' rise to empire and fall from glory was inextricably bound with her fortunes at sea.

§2. The opening years of the Peloponnesian War saw the Athenian navy at the height of its glory: her ships were the fastest and most efficient afloat, and her oarsmen were superior in executing the complicated maneuvers by which sea battles were fought and won. But by the end of the war, the Athenian navy had collapsed: her generals had been outsmarted, her men were exhausted or dead, her ships were outmoded and defeated more than once by new tactics of naval warfare. Thucydides had a dramatic story to tell.

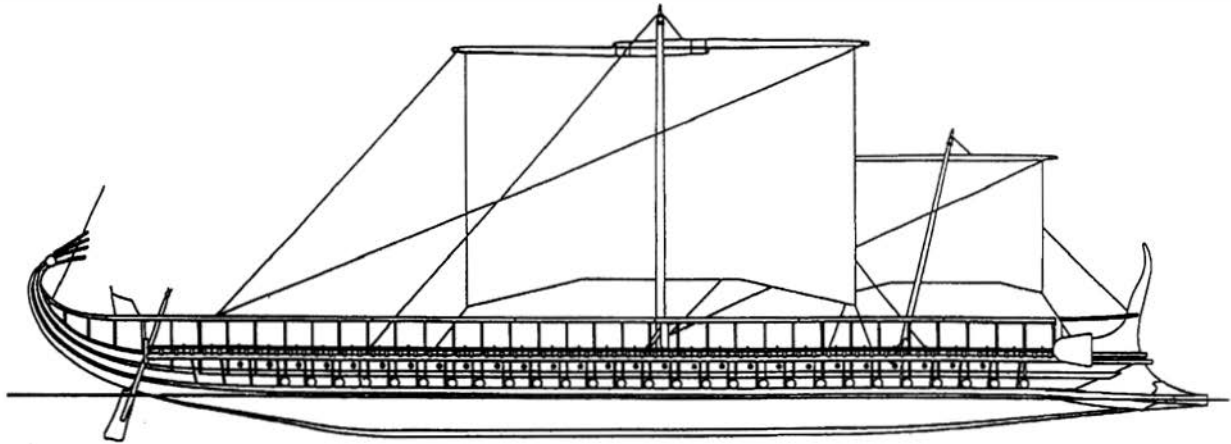
§3. He told it in snapshots—a moment of battle, an orator's defense of a certain naval policy, the snippet of a commander's exhortation to his men—and wrote for an audience intimately familiar with the ships, men, and often the localities and the battles themselves. These factors sometimes make it difficult for us to understand the details of what he is describing, though the general outlines are clear.

§4. The building of specialized warships already had a long history by Thucydides' day, and both warship design and naval fighting tactics had evolved substantially over the centuries. In earliest times, when fleets were used primarily for transport and the battle itself took place on land, warships were built to quickly carry as many men as possible to battle. Eventually confrontations took place at sea, but at first these earliest naval skirmishes hardly differed from the kind of fighting done on land: ships served simply as vehicles to get soldiers within close range of their enemy. Archers, javelin throwers, and hand-to-hand combat decided the outcome of battle. Gradually the ships themselves began to be used as weapons, and speed, maneuverability, and hull strength superseded the importance of transport capacity in warship design. By the time of the Peloponnesian War, naval strategy centered on the offensive capabilities of the trireme, a warship

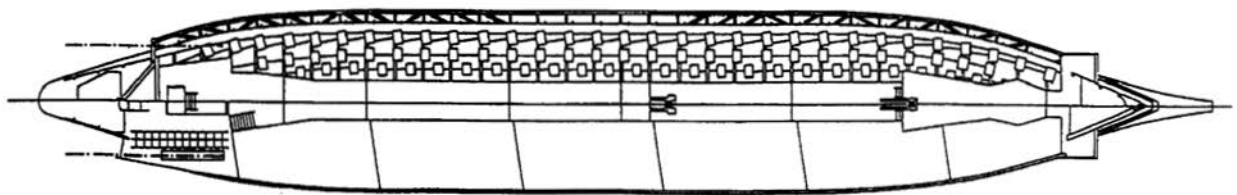
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APPENDIX G

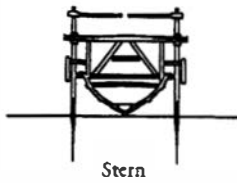
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Side view



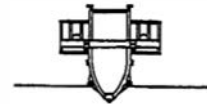
Top view



Stern



Mid-ship



Bow

Cross-sections

APPENDIX G ILLUSTRATION  
DIAGRAM OF THE MODERN TRIREME OLYMPIAS

whose main weapon was the ram mounted upon her prow. Success at sea depended on a strong crew of rowers skilled in carrying out ramming tactics.

§5. Long and sleek, with a length-to-beam ratio of 9 to 1, the trireme took its name from the arrangement of rowers. The hull enclosed two levels of rowers: the *thalamites* in the depths of the hold and the *zygites* seated on the hull's crossbeams (thwarts). A third row of oarsmen, the *thranites*, sat in outriggers mounted along the topsides of the hull. Thranites were the key members of the crew, since only they were in a position to see the oar blades enter the water. For this reason each thranite was responsible for guiding the zygite and thalamite immediately next to and below him to adjust their stroke to fit the general cadence. Thus the trireme crew worked in teams of three, and this is why the Greeks referred to these warships as *trieres*, "three-fitted." (*Trireme* is an Anglicized and Latinized version of the Greek.) This configuration packed 170 rowers into a hull only about 120 feet long and 15 feet wide, and optimized the balance of power, speed, and maneuverability: a longer boat with more rowers would have been heavier and more difficult to maneuver without gaining much in the way of increased speed; a smaller boat with fewer rowers would have lacked speed and striking power. Since ramming was the primary offensive technique, and since lightness and speed were paramount, the rest of the crew was pared down to a bare minimum. In addition to the rowers, the standard complement for an Athenian trireme during the Peloponnesian War consisted of only ten *hoplites* (marines), four archers, and about sixteen other crew to sail the boat.

§6. Like the hulls of modern racing shells, the hull of a trireme was built to be as strong but light as possible, and this is reflected in its design as well as in the techniques and materials used in its construction. The elaborate shipsheds built around the Piraeus harbors to dry-dock warships also bear eloquent testimony to the Athenians' concern for light hulls. Since a dry ship was both faster and less apt to rot than a waterlogged one, crews regularly pulled their triremes out of the water when they weren't in use. The lightweight, shallow-drafted ships were relatively easy to beach and carried rollers to help haul them onto the shore and supports to stabilize them once there. During the Sicilian expedition, when the constant danger of attack required the Athenian fleet to be ever battle-ready, drying out the hulls was of paramount concern. A note of real desperation creeps into Nicias' letter to the Athenians as he describes the impossibility of pulling his sodden ships out of the water (7.12.3–5).

§7. Because triremes were designed to maximize speed and minimize weight, almost every inch of space was used to accommodate rowers. There was hardly room for stretching, much less for sleeping or preparing and serving food. Thus, in addition to the necessity of regular beaching, triremes were constrained to travel along the coast (and put in at night so that the crew could eat and rest (1.52; 4.26; 6.44)).<sup>7a</sup> These logistical considerations affected the strategy and tactics, the pace, and sometimes even the outcome of battles. Fighting usually ceased at sunset—sometimes even at midday—in order to rest and feed crews quickly fatigued by their exertions in the stifling heat of cramped, closely packed quarters baked under the

G7a It was this constraint that made the nonstop voyage at the second trireme to Mytilene so remarkable

that Thucydides felt the need to explain how the crew did it (3.49).

Mediterranean sun. In fact, several “naval” battles were won by one fleet surprising its enemy’s crews ashore while they were on dinner break (7.40). Beaches where boats could put in and the crew could disembark for eating and sleeping were so vital to naval combat that the Spartans at Pylos could plan to drive away the Athenian fleet simply by denying it access to all local landing places (4.8).

§8. A shore camp was also vital as a repository. Although a trireme carried masts and sails for long-distance travel, as well as anchors, spare oars, cooking equipment, and other supplies, when the ship entered combat all dead weight was left ashore or in an emergency jettisoned. Finally, the shore station served as both a refuge and a base from which to organize a new attack in the event of defeat. For these reasons, “naval battles” were often amphibious affairs that included fiercely fought battles on land for control of the shore (7.24). The loss of a base camp was a serious setback even for a fleet undefeated on the water.

§9. The trireme’s light and slender hull can be likened to the shaft of an arrow; its point, the warship’s offensive weapon, was the bronze-clad ram mounted on its prow. One such prow—the only ancient ram ever found—has been excavated off the coast of Israel, near Athlit. A warship with its buoyant wooden construction was slow to sink, and long after the battle had ended the victorious fleet scoured the waters for flooded and capsized hulls to tow off as war booty (1.54). At the very least, long timbers and the bronze ram could be salvaged and reused. The Athlit ram, although from a ship larger and later than the fifth-century triremes, provides a fascinating glimpse into the engineering and cost invested in a Greek warship. The ram itself, a hollow casing weighing half a ton, was cast in a single pouring—a feat that impresses even modern bronzesmiths. Its tip flared into fins rather than coming to a point in order to prevent it from getting wedged in the hull of its opponent, and the timbers that the bronze casing covered were carefully designed to distribute the shock of impact over the entire length of the light hull. Like our sophisticated military technology today, the ancient warship was an example of contemporary engineering at its highest level.

§10. The prow, then, with its ram and heavy buildup of timbers, was both the offensive weapon and the best protected area of the ship. The stern and sides were her vulnerable quarters. As long as a warship kept her prow toward the enemy, she was poised for both offensive and defensive action. Consequently, in the vicinity of land, the most advantageous position was a battle line drawn up parallel to the shore with prows facing seaward against the enemy (2.90). This position also had the advantage of protecting a place on the beach for the fleet to store all nonessential equipment stripped from a warship before going into battle. In open seas, a fleet achieved a defensive position by forming a circle with sterns toward the center and prows bristling outward (2.83.5; 3.78.1). A confrontation between two evenly matched fleets usually began with warships ranged in two parallel lines, prows facing one another.

§11. Only a commander with fast ships and skilled rowers could successfully take aggressive action. A commander less sure of his forces would simply wait for the at-

tack, hoping to escape by means of evasive action. If the attacker faltered within close range, marine hoplites threw grappling irons to secure the enemy ship alongside and close-range fighting commenced between the crews of the two ships. The skilled Athenians, however, had a reputation for aggressiveness and were particularly proficient at executing two standard attack maneuvers. In the *periplous* (“sailing around”) the faster Athenian ships outflanked the enemy, turned quickly, and struck from behind. Alternately, in the *diekplous* (“sailing through”), the Athenian ships broke through gaps between the enemy ships and then either immediately rammed their sides or turned quickly and battered their sterns. Ramming itself required great skill, for the enemy hull had to be hit with enough force to cause significant damage but not so much as to entangle the attacking ship in the splintered hull, preventing its crew from backing their ship away to safety. The triremes of all navies were theoretically capable of these maneuvers, but at the outset of the Peloponnesian War it seems that only Athenian crews had the expertise and discipline necessary to execute such tactics effectively.

§12. Swift confusion could descend upon even well-trained rowers once an engagement commenced and more than once turned the tide of battle (2.91, 3.77). Therefore, skilled and experienced crews were a prime commodity and rival navies competed fiercely for personnel. Rowers were generally free men hired on at decent wages; slaves were employed only in unusual circumstances (1.55; 8.15). Thucydides tells us that Athenian (6.31) and Corinthian (1.31) *trierarchs* (trireme commanders) offered substantial bonuses in an effort to lure well-trained crews, and that desertion from one navy to another was frequent (7.13). In an effort to keep her crews intact, the Athenian custom was to pay half in advance and the remainder upon completion of the voyage (8.45). The going rate in Athens was one *drachma* per day—the standard workman’s wage—to row in the lower two levels of a trireme (the thalamite and zygitic positions). Thranites received an additional bonus. At these rates (along with the wages of the rest of the crew), it cost about one *talent* per month to operate each trireme (for *drachma* and *talent*, see Appendix J). One major advantage of Athens’ imperial income was that it allowed her to maintain fleets at sea every year and thereby bring her crews to a decisively superior level of skill in relation to those of her opponents.

§13. Their navy was an evocative symbol of the power and discipline of the democratic state for all ranks of Athenians. Even members of the upper class actively participated in the maintenance and operation of her fleet. Wealthy and powerful individuals were assigned one-year commissions as commanders (*trierarchs*) of triremes. Their appointment served as a form of tax, for while the state provided an empty ship and the crew’s wages, the trierarch was responsible for outfitting and maintaining the vessel with funds from his own pocket. Their financial investment gave the upper class a powerful voice in setting naval policy, and many decisions made by Athenian commanders had at least as much to do with domestic politics as with field strategies.

§14. Of course, Thucydides, an Athenian, wrote a history of Athens, and his story is clearest in its portrayal of Athenian policy. Yet many other states—Corinth,

Syracuse, and Corcyra, among others—had powerful navies and, like Athens, their ship-of-the-line was the trireme. All triremes were basically alike in design, so that the crew of an Athenian trireme could comfortably operate a Peloponnesian or a Phoenician trireme, and vice versa. But certainly the number of warships and skilled rowers a state could muster varied greatly. At least in the early decades of the war, few could directly challenge the fleets and experienced crews of the Athenians. Thucydides' battle descriptions give us an indication of the tactics developed by Athens' enemies to counteract her superior might at sea. For example, since the classic Athenian naval maneuvers required plenty of sea room (2.89), one straightforward measure taken by her enemies was to avoid engaging in battle on the open seas. Whenever possible, they took advantage of topography and challenged the Athenian fleet in confined waters such as the harbors of Pylos and Syracuse, where it was impossible to execute the periplous or diekplous. Confinement not only prevented the Athenians from employing their prowess at rowing but also increased the ever-present danger of ships running afoul of one another. Once fleets were locked in a standstill, fighting was reduced to hand-to-hand combat and tactics and weapons differed little from those used on land (1.48). The Corinthians (7.34) and the Syracusans (7.36) carried this strategy one step further and rebuilt their navy to suit the new demands of warfare based on strong hulls and brute force. Thucydides' description is too brief for us to understand the exact nature of the alterations, but it is clear that they redesigned their prows so that the force of collision would be aimed against the Athenians' unprotected outriggers. Rowers rather than hulls were damaged, but the effect was the same: with their wings clipped, the Athenian triremes became sitting ducks and were easily overcome by the heavily manned ships of their enemies. Over the course of the war, tactics developed to counteract Athenian rowing prowess became standard battle strategy. For navies relying on such strategies, hull strength and capacity to carry marines became more important than speed and maneuverability, and the design and operation of the classic Athenian trireme was eventually superseded by the demands of new kinds of warfare.

§15. Athens ruled the sea during the period when she alone, due to her imperial system, could finance the training, manning, and sustained operation of large numbers of triremes capable of executing sophisticated maneuvers. Thucydides eloquently described this heyday of Athenian naval might. But as the war dragged on, Athens' opponents developed new strategies and modified their ships to gain a major victory in Sicily, and then obtained financial support from Persia with which to challenge Athenian supremacy in the Aegean, and ultimately to destroy it. Almost a century would pass before the final eclipse of the trireme, but Thucydides' account heralds the beginning of the end.

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