was protected by the ascoma or leather bag which fitted close over the oar, closing the aperture without impeding the action of the oar. The zygite oar ports were 4¼, the thranite 5½ feet above the water. The vertical distance between the oar ports was about 15 inches, the distance obliquely measured on the ship's side 21 inches. The seats of the rowers were supported on benches, three feet long, or thereabouts, which ran from the ship's side to beams which rose from the floor, and reached up to the under surface of the deck. These beams were inclined at an angle of 64° towards the stern, and were at a distance of four feet apart. They were technically called the *Diaphragma*. This Diaphragma, viewed from inside the vessel, presented the appearance of a succession of staircases, the steps of which were the benches between it and the ship's side. The space between the diaphragmata on either side constituted that part of the vessel in which stood the masts, and in which stowage was possible. It was in the Attic trireme seven feet wide. The length of the oars used in the trireme has been calculated as follows:—We know from the Attic table the length of the oars used by the seamen or supernumerary oarsmen when there was need. These were the longest in the trireme, and they varyed from 13 feet 6 inches to 14 feet 3 inches in length. The thranite oars must have been nearly of the same length, but could not have exceeded 14 feet under any circumstances. The zygite oars were 10½ feet. The thalamite 7½ feet. The rowers, where the space of eight square feet was allowed per man, had a vertical space of 1 foot 3 inches allowed for the rise and depression of the handle in rowing, and a space horizontally of 2 feet 6 inches for its forward and backward motion. It is, however, probable that there was hardly any motion forward of the body, the work being done carefully backwards from the perpendicular. In all cases the oars used by the regular rowers preserved nearly the same proportion of one third inboard to twothirds outboard. In the case of the gigantic oars of the *Tesseraconteres* of Potlemy, a vessel of the size of the *Agincourt*, we are expressly informed that the handles were weighted with lead, so as to bring the oar inboard and outboard nearly to an equilibrium. The oars of the upper ranks projected at the point where they reached the water 2 feet 6 inches beyond those of the next lowest tier. Let us now proceed to consider the construction of the vessel itself. In the cataphract class, the floor was one foot above the water line. Below this was the hold, which contained a certain amount of ballast. Through the floor into the hold, past the pumps, which were pretty constantly worked in ancient vessels, as the use of the word both by the poets and orators in metaphor expressing labour and sorrow, amply attests. The keel (tropis), of the early ancient ship appears to have had considerable "camber." Under this was a strong false keel (chelusma), which was very necessary in vessels that had frequently to be drawn up on shore. Above the keel was the kelson (druoclion, columba), into which the ends of the ribs were fastened. Above the kelson lay the (deutera tropis) upper false keel, in which the mast was stepped. The stem (teira) rose from the keel at an angle of 69° to the water. Within was an apron (phalkis) giving solidity to the bows, which had to stand the weight of the beak and its concussion. The stem was carried upwards and curved generally backwards above the forecastle, terminating in an ornament which was called the akrostolion. The sternpost rose at the same angle as the stern, and was carried high over the poop, curving inwards, and finishing in the aplustre, an ornament which may be likened to the feathers on the head of an angry cockatoo; and behind this curved backwards the cheniscus or goose-head, symbolising the floating powers of the vessel. Round the hull of the vessel horizontally at about the level of the feet of each bank of rowers, stretched waling pieces called nomies, and in the case of the Attic triremes, these were again strengthened by hypozomata, long cables, which were bound round the ship from stem to stern, and tightened and shrinking when wet, which gave additional security to the vessel, which from her length and narrowness was apt to strain much in bad weather. From the side of the vessel below the level of the thranitic bench projecting the gangway (parodus, fori), for a space of 1 foot 6 inches, giving a passage of 3 feet in all. This was supported by (hiacha) brackets fitted below and springing from the ribs of the vessel. The gangway was fenced in by an upright bulwark extending the whole length of the space occupied in the ship by the rowers. Here, in the "Parodus," the perineo (seamen) had their station in action as light armed troops; who also, when needed upon special occasions, rowed as supernumerary oarsmen with the long oars already mentioned. The ribs of the vessel from the point where the bracket fitted to them curved upwards and inwards to a height which was 10 inches above the heads of the thranitic oarsmen. Upon them at this height were placed the cross beams called stroteris, which supported the katastroma, constratum or deck, was thus a clear 3 feet above the gangway, allowing the marines, or epibatai, in action, free play for their javelins over the heads of the seamen in the Parodus. Beyond the space occupied by the rowers, there was the Parexeiresia, a space of eleven feet in the bows and fourteen feet at the stern, which included the (ikria) fighting deck already noticed in the Homeric vessels. On either side and of the main deck rose the cancelli, an open lattice work, and seen as such in the Apbract ships, but in the Cataphracts usually covered with hides or with the (cilicium) goats' hair curtains of that manufacture, at which St. Paul and Aquila and Priscilla used to labour, working with their hands. This served both as a protection against the waves and to a certain extent against the darts of the enemy. At the bow and stern, towers, especially in the Roman vessels, were often erected which gave a vantage height from which to shower missiles on the enemy's deck. In very early times we find the elevated forecastle, of which the very name is significant, and which, in some cases, strikingly reminds us of the structure erected at the bows of the *Devastation*, serving to protect the fore deck from the waves, and the crew and the marines from a raking fire as they approached the enemy. On either side the forecastle was figured the eye of the vessel, the centre of which was formed by an aperture which served has a hawse hole. At the stern was a raised quarterdeck, on which was a kind of cabin or deck house forming a shelter for the chief officer and the helmsman. This quarter deck was the sacred part of the ship. Here was the image of the patron god, not to be confused with the parasemon, or badge of the vessel figured near the bows. Behind the deckhouse rose the flagstaff, on which was hoisted the pennant (œnia) and probably in the case of the admiral's ship, the red flag that was the signal for going into action, and such other signals as were from time to time required. On either side the bow catheads (epotides) projected, which in the case of the earlier Athenian triremes seem to have been merely sufficient to hold the anchor. The Corinthians however, who, as as we have seen, were enterprising and clever shipwrights, by strengthening greatly these catheads, were able to receive a blow from the enemy's ram in such a way as to inflict the damage they were intended to receive, an invention which cost the Athenians dear, both in the Corinthian Gulf and in the great harbour of Syracuse. Between the catheads, and in front of the stem projected two beams, one above the other, at some distance apart, headed generally with metal fashioned as a ram's head, or the head of some other animal which were called respectively proembolion and proembolis. The purpose of those seems to have been to give a racking blow to any vessel pierced by the beak, which projected much further below, and thus to cause her to heel over and shake off, making it easier for the impinging vessel to disentangle herself by backing water. Underneath was the rostrum or beak, answering to that which we now call the ram, which was a long spur, and in the latter periods, usually divided into three teeth. Of this we shall speak more fully hereafter. The trireme was steered by two rudders, one on either side of the stern of the vessel, to the tillers of which, under the deck, was attached to a rope, which, passing through a block on either side and over two wheels on the quarter-deck, enabled the helmsman to turn the two rudders which way he pleased by a single effort. In the mid space of 7 feet, which we have already mentioned, as lying between the diaphragmata, stood the main, or great mast, which was square rigged, and before and behind in the two acati; foremast and mizenmast, which carried lateen sails. The ancients, however, did not use sails in action, trusting then entirely to their oars, so that I will not enter further into the question of the rigging. The total length (exclusive of the beak, for which we must add nearly 10 feet), was 140 feet, of which 25 feet belong to the parexeiresiæ (11 to the bows and 14 to the stern) and 124 feet to the space occupied by the rowers. The greatest breadth (which has been calculated in an ingenious manner from the thickness of the hawsers employed for anchoring the vessel, (a detail preserved to us in the Attic Tables) at the water line was 14 feet above, at the broadest part of the beam 18 feet, and with the gangways added 21 feet. The space between the diaphragmata was 7 feet. The height of the deck in cataphract ships above water was 11 feet. The draught 8½ feet. Total height, 19½ feet. Thus leaving 10½ feet for the hold. The height of the apbract trireme from water to the top of the gunwale is calculated at 8 feet. The capacity of the cataphract trireme, calculated according to the modern formula of measurement gives, 232½ tons, As all the Attic triremes appear to have been built on one and the same model, their gear was intrenchangeable. It is obvious that such an arrangement in a fleet of from 300 to 400 vessels would offer great facilities in refitting. The regular crew of an Attic trireme consisted probably of 225 persons in all. Of these 174 were employed in rowing, disposed as follows:—54 thalamites, 58 zygites, 62 thranites, the upper oars being the most numerous, as the construction of the vessel near the bow and stern towards afforded less space for the lower tiers. Besides the rowers, there was a force of 10 marines, heavy armed soldiers, and 20 seamen. The number of marines seem to have varied greatly, and depended much on the style of fighting preferred. Where, as in the case of the Athenians, speed and dexterity in the use of the