

THE EVOLUTION OF THE NAVAL RAM



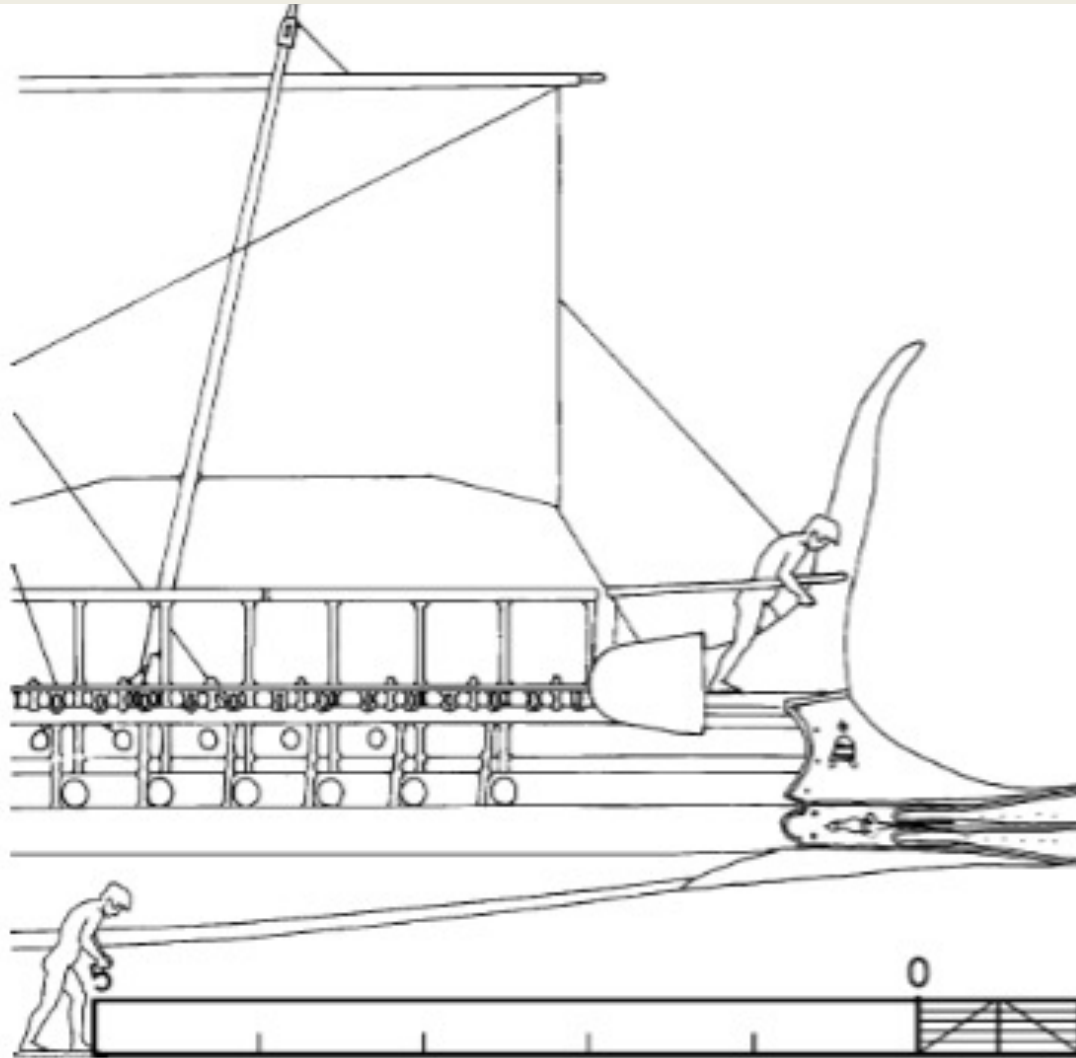


Fig. 3. An artistic rendering illustrating the position of the Athlit ram on the bow of its warship. (Illustration by Bilge Güneşdoğdu Akman and the author)

What is a naval ram?

- A primarily **offensive weapon** associated with ancient naval warfare.
- Battering an enemy **hull** to incapacitate or **sink** it.
- A strong wooden protrusion, sheathed in metal and **integrated into the bow** of a warship.
- Must withstand the force it generates.

Important Parts of the Naval Ram

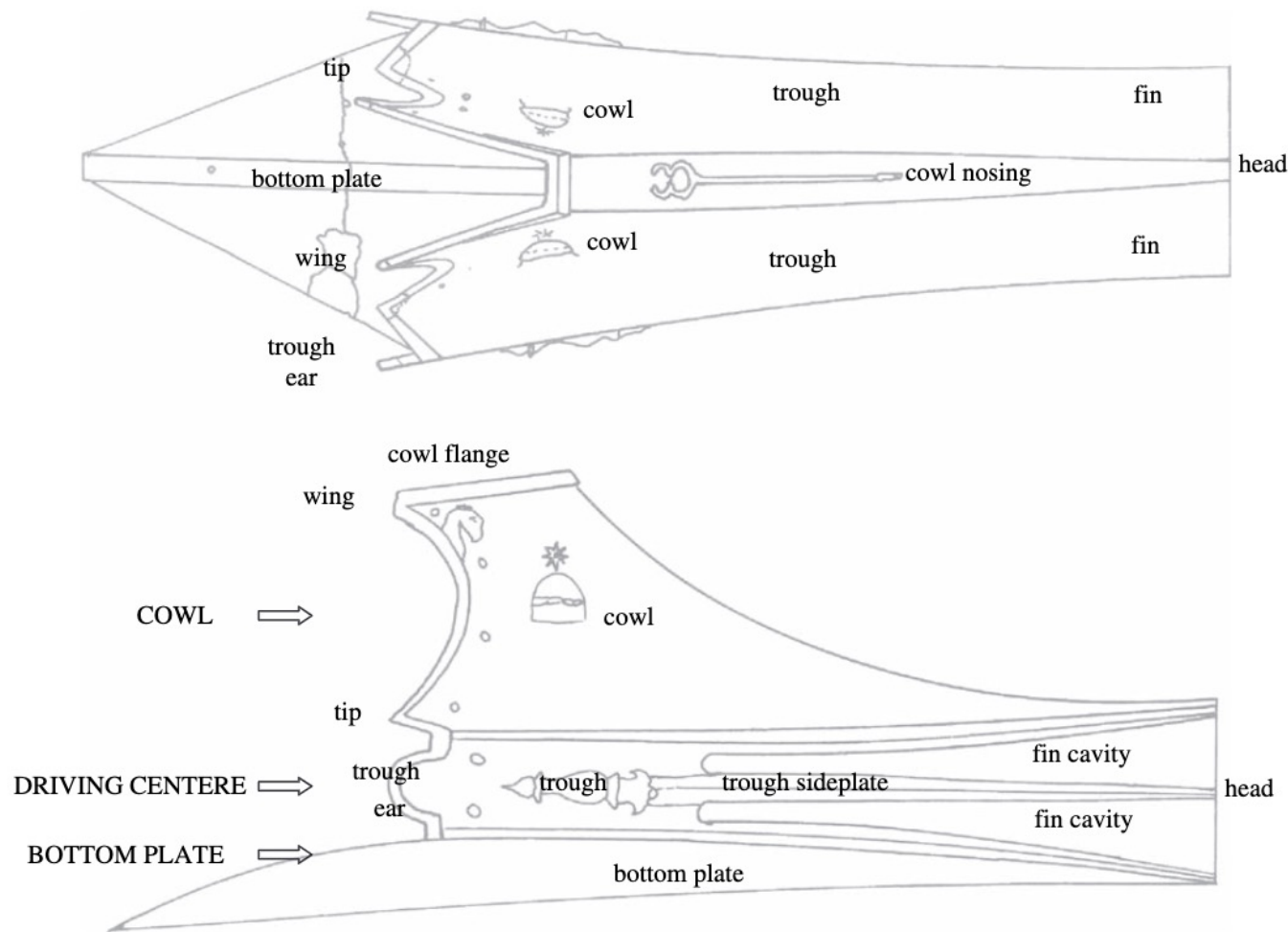
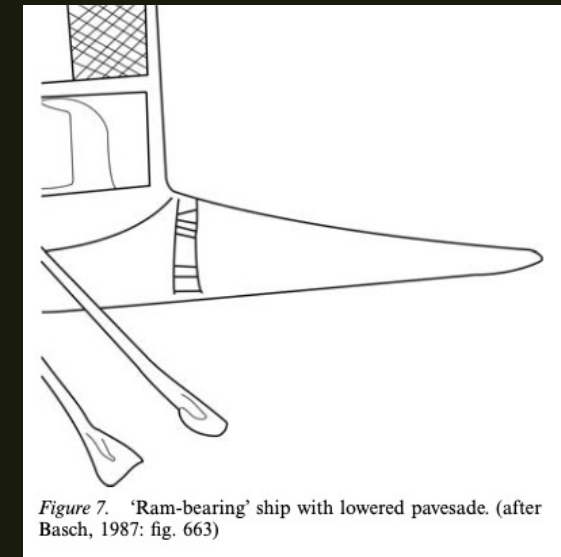
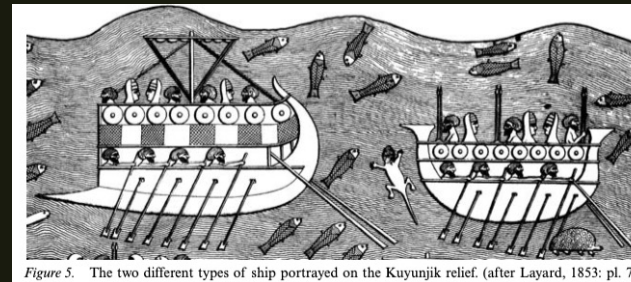
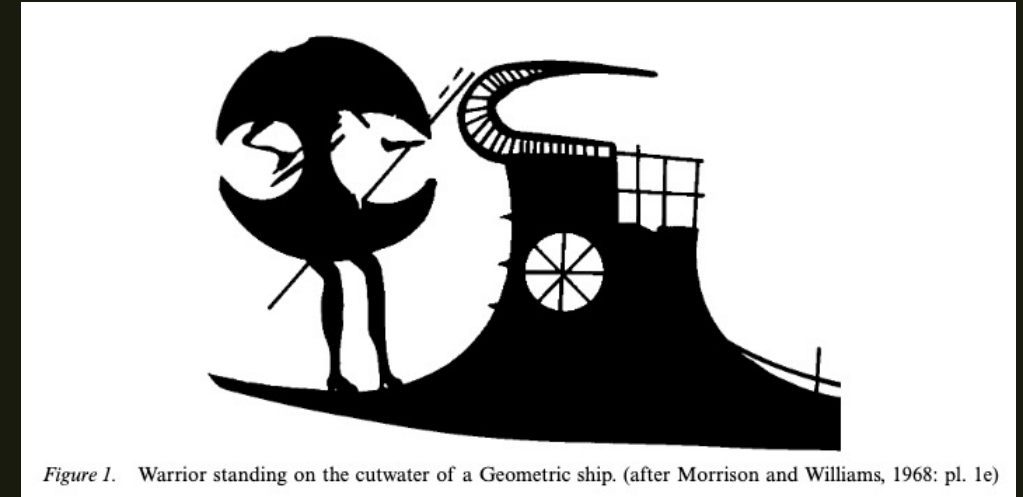


Fig. 2. Identification of the ram areas. (After Steffy [28:fig. 2.7])

- Driving centre: housed the main horizontal bow timbers and delivered the ramming blow.
- Bottom plate: an undecorated concave cover for the bow's lower timbers that reinforces the ramming head.
- Cowl: Sheathed the vertical bow timbers.

Origin of the naval ram

- Agreement that it first appeared in Greece c.1000-900 BC and not during c.750-713 BC
 - *Based on Homeric epics lack of mentioning these powerful weapons*
 - *Omission of data*
 - Phoenician ships with long conical rams dating to 705-687 BC
 - Conical cutwaters



Important Notes on Naval Rams

- Must match any asymmetry in the ship's bow
- Cast and pour technique
- Actian Victory Monument
→ 27 sockets left
- 10 different classes for the size of a ram

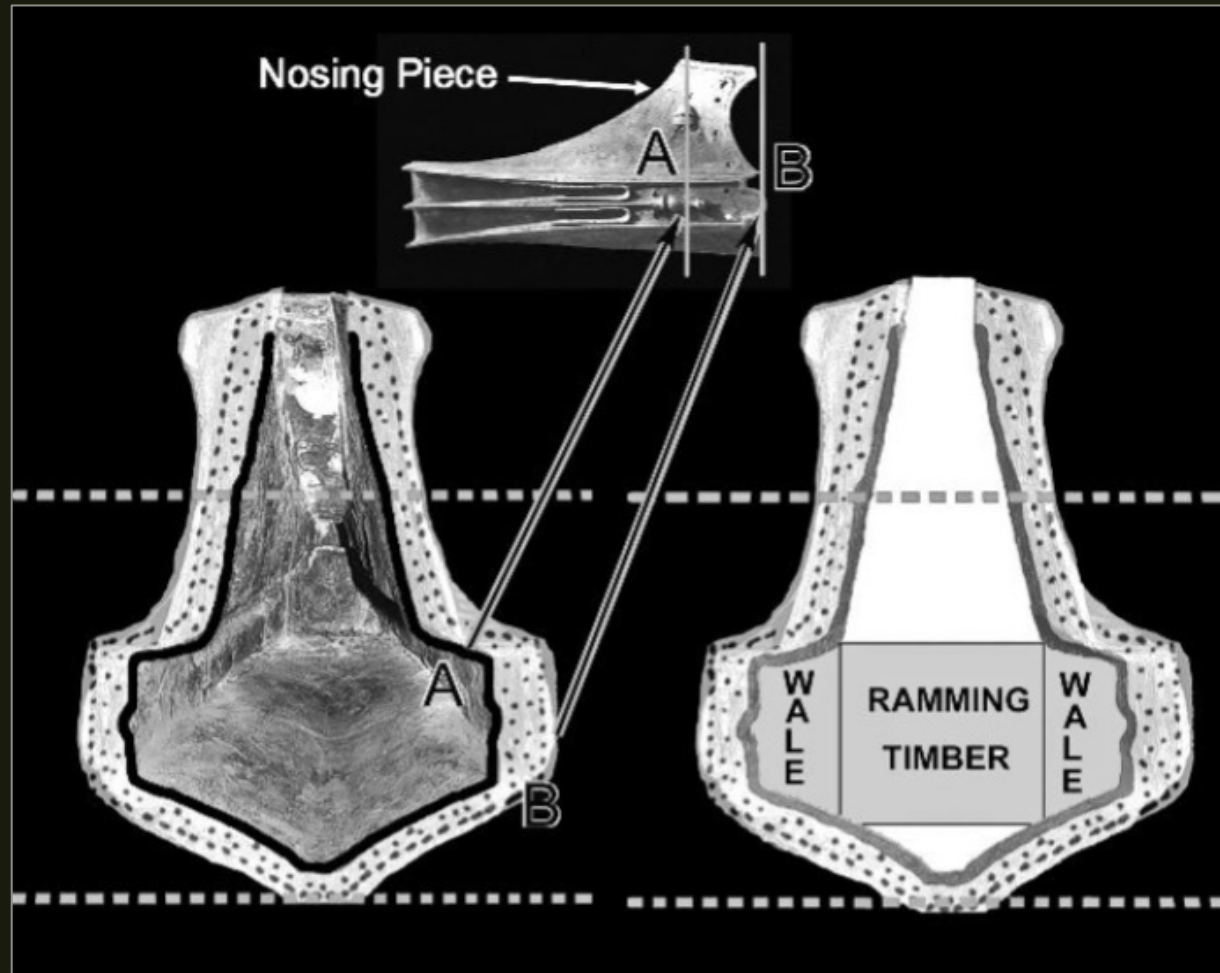
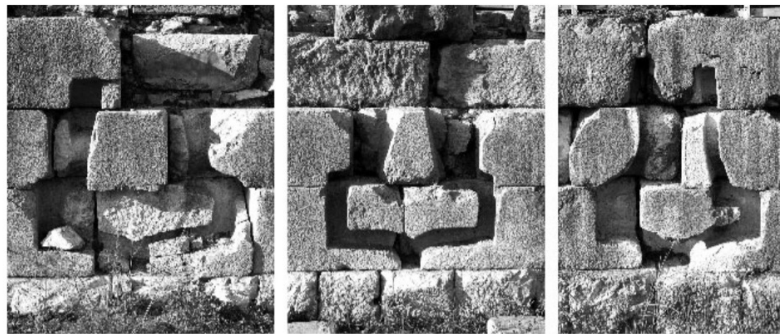


FIGURE 2.9 (Left): Hypothetical socket to fit the Athlit ram. (Right): Core of hypothetical socket showing configuration of timbers.

Action Victory Monument



4

6

8



11



13



18

FIGURE 2.6 Action Victory Monument, different sizes of sockets.

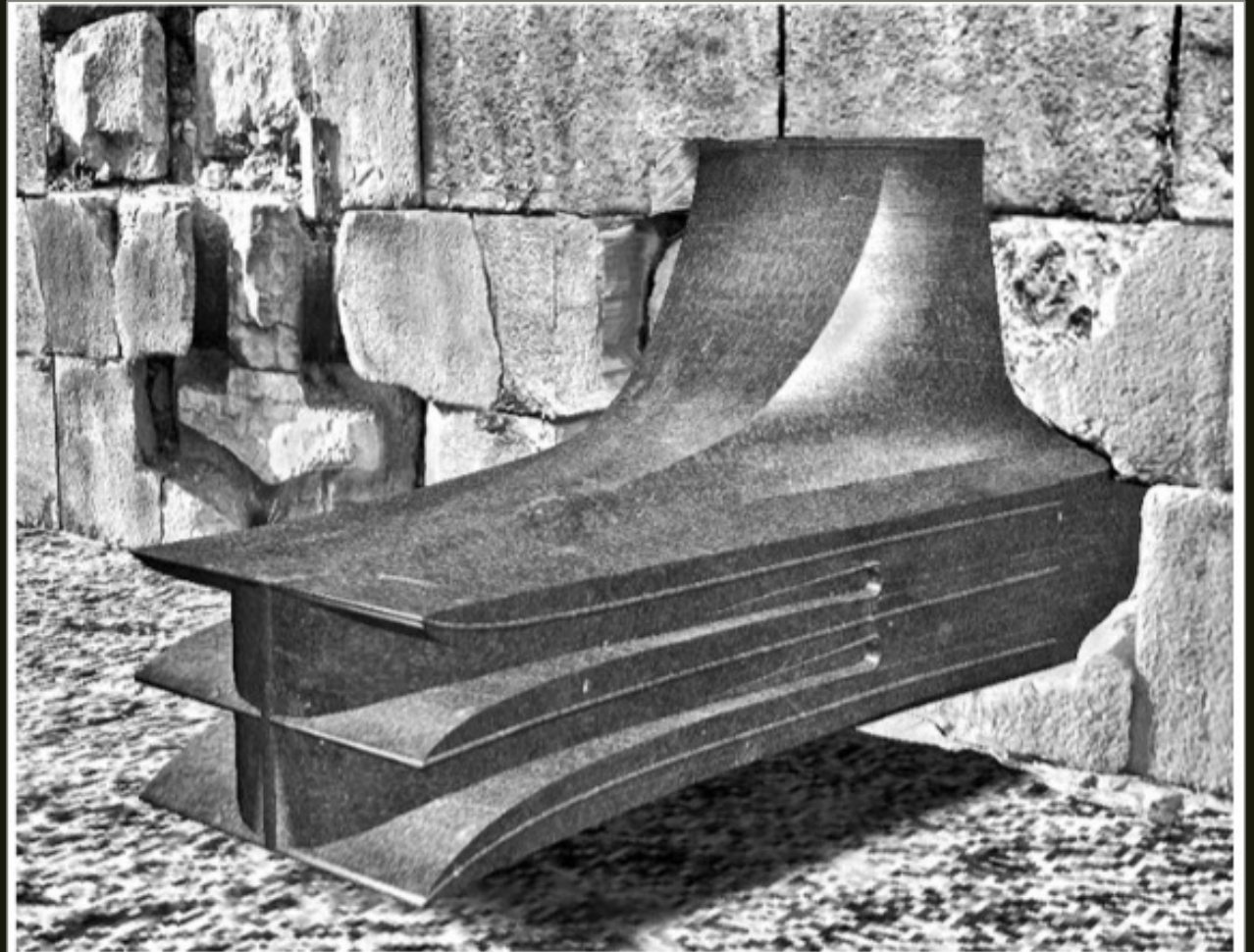
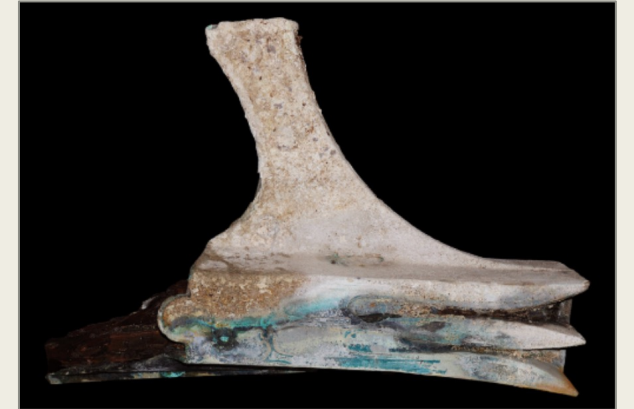
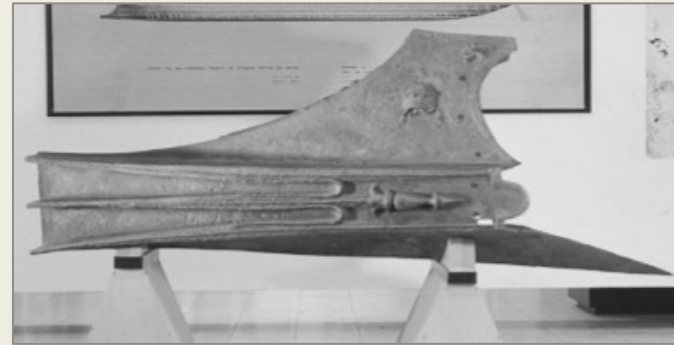


FIGURE 2.13 Hypothetical ram for socket #4. Model created by W. M. Murray and the Institute for the Visualization of History under the supervision of K. L. Zachos.

Finding of Warships and Naval Rams

- Warships are:

- *Sunk*
- *Salvaged*
- *Reused*



- Warship wrecks of this era:

- *Punic ship & sister ship | Marsala*
- *Athlit Ram | Ptolemaic*
- *Piraeus Ram | Unknown*
- *Acqualadroni Ram | Roman*
- *Belgammel Ram | Unknown*
- *Bremerhaven Ram | Unknown*
- *Follonica Ram | Unknown*
- *23 Egadi Ram | Egadi islands*

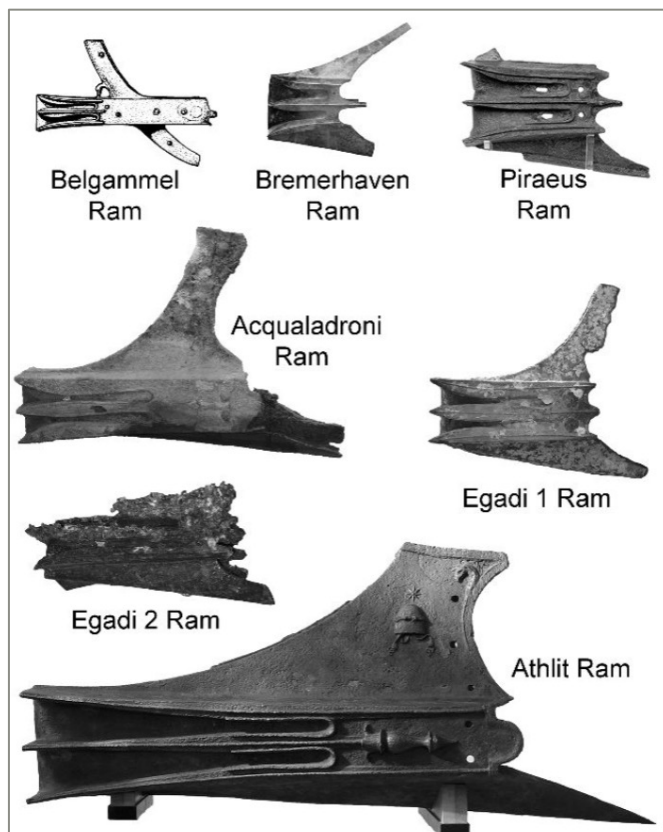


FIGURE 2.12 Authentic three-bladed waterline rams (cf. Table 2.1). *Belgammel Ram* (*Fitzwilliam Ram*): Museum of Libya, Tripoli. *Bremerhaven Ram*: Deutsches Schiffahrtsmuseum, Bremerhaven. *Piraeus Ram*: Piraeus Archaeological Museum. *Acqualadroni Ram*: Currently undergoing conservation and study by the Soprintendenza del Mare of Sicily. *Egadi 1 (Trapani) Ram*: Currently undergoing study by the Soprintendenza del Mare of Sicily. *Egadi 2 (Catherine D) Ram*: Currently undergoing conservation and study by the Soprintendenza del Mare of Sicily. *Athlit Ram*: National Maritime Museum, Haifa.

Table 2.2 Authentic Three-Bladed Waterline Rams—Dimensions (in cm.) and Weights (in kg.).¹

(max = maximum; H = height; L = length; W = width; est = estimated dimension)

Dimensions	Belgammel	Bremerhaven	Piraeus	Egadi 1	Egadi 2	Acqualadroni	Athlit
max H of ram	44.1	62.6	NA	80 (est)	NA	?	95
max L of ram	64	66.9	74	89 (display label)	76.5	?	226
H, ramming head	13.1	27.5	35	23 (est)	25 (est)	?	41.1
W, upper fin, ramming head	12.6	26	36 (est)	40 (est)	31.8 (est)	?	44.2
H of trough, after end interior:	?	21 (est)	21 (est)	?	?	?	23
max. H of trough, after end exterior	9.4	22	23.5 (est)	20 (est)	17.4	?	24.5
H of preserved wale at after end of ram	NA	NA	NA	NA	NA	?	20
max L of driving center	64	43.5	59	57 (display label)	67	?	168
W of ram, rear, starboard to port trough	18 (est)	23.5	33–35 (est)	32 (est)	38.5	?	76
weight of ram casting in kg. (* = with wood)	19.7	53	80 (est.)	100–125 ?? (est)	?	200? *300?	465 *600
area (cm ²), wale-ramming timber unit	169.2	517.00	822.50	656.00 (est)	670.00	?	1824.00
H/L ratio: (L of driving center) ÷ (H of trough)	6.8	1.98	2.51	2.78	3.85	4.62	7

1. The weights and dimensions of the Belgammel (Fitzwilliam), Piraeus, and Athlit rams can be found in the literature cited in Table 2.1. Information for the Bremerhaven ram was kindly supplied by D. Ellmers (personal communication, 1988) and R. Bockius (personal communication, 2008); and for the Egadi 2 (Catherine D) ram by J. Royal (personal communication, 2009). Dimensions for the Egadi 1 (Trapani) ram have been secured from an exhibition display label and estimated from published photographs that included scales, so they represent estimates only. The same is true for the Acqualadroni ram. These weapons, plus those recently discovered during the Egadi Islands Survey, will add considerably to our knowledge of smaller rams when they are fully published; see n. 26.

Size of Warships

- Smaller Warship:
 - *Speed and Maneuverability*
 - *Avoid prow-to-prow ramming attacks*
 - *Smaller ram, smaller wales, and a lack of cowls*
- Larger Warship:
 - *Categories 4+*
 - *Capable prow-to-prow ramming attacks*
 - *Longer ram, heavier wales, deeper cowls and pockets to distribute shock from ramming*

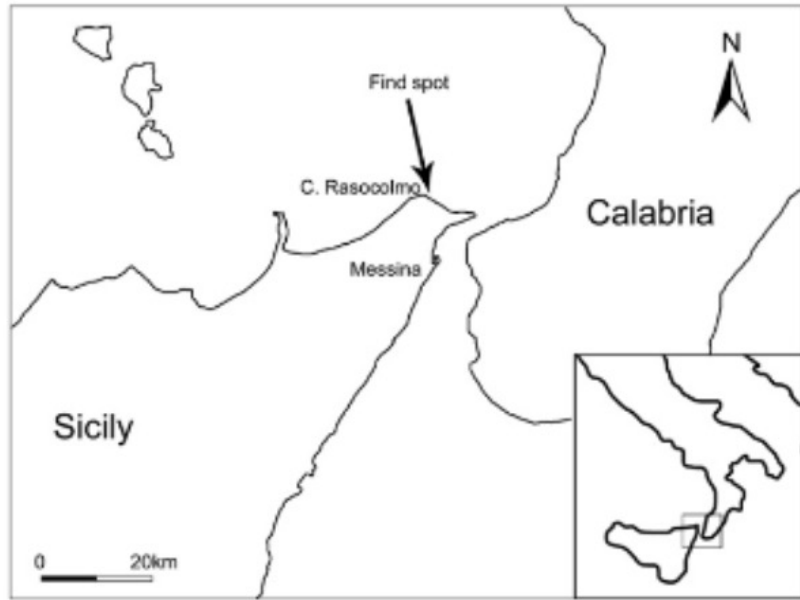


Figure 1. NE corner of Sicily showing the site where the Acqualadroni Ram was found. (Authors)

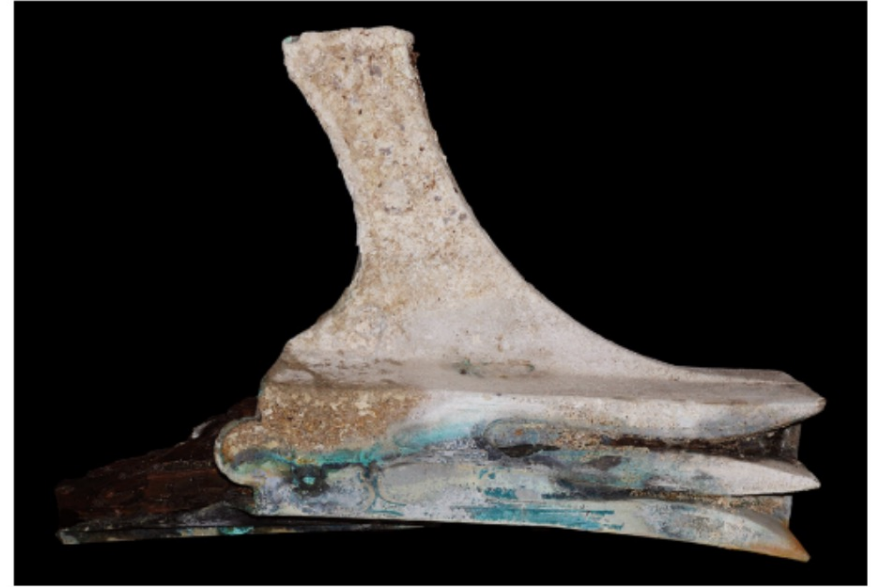


Figure 2. The Acqualadroni Ram before conservation. The length of the ram is c. 135 cm. (C. Curaci)

ACQUALADRONI RAM

2008 discovery of a bronze ram on the Tyrrhenian coast

Discovery

- Coastguard divers found the ram
 - *Visible above the sandy, rock-scattered sea-floor*
 - *306m offshore at a depth of 7.5m*
- Likely used around the end of the Punic Wars
- Radiocarbon dating of timber:
 - *mid-2nd century BC*
- Analysis of decorative features:
 - *Second half of 1st century BC*

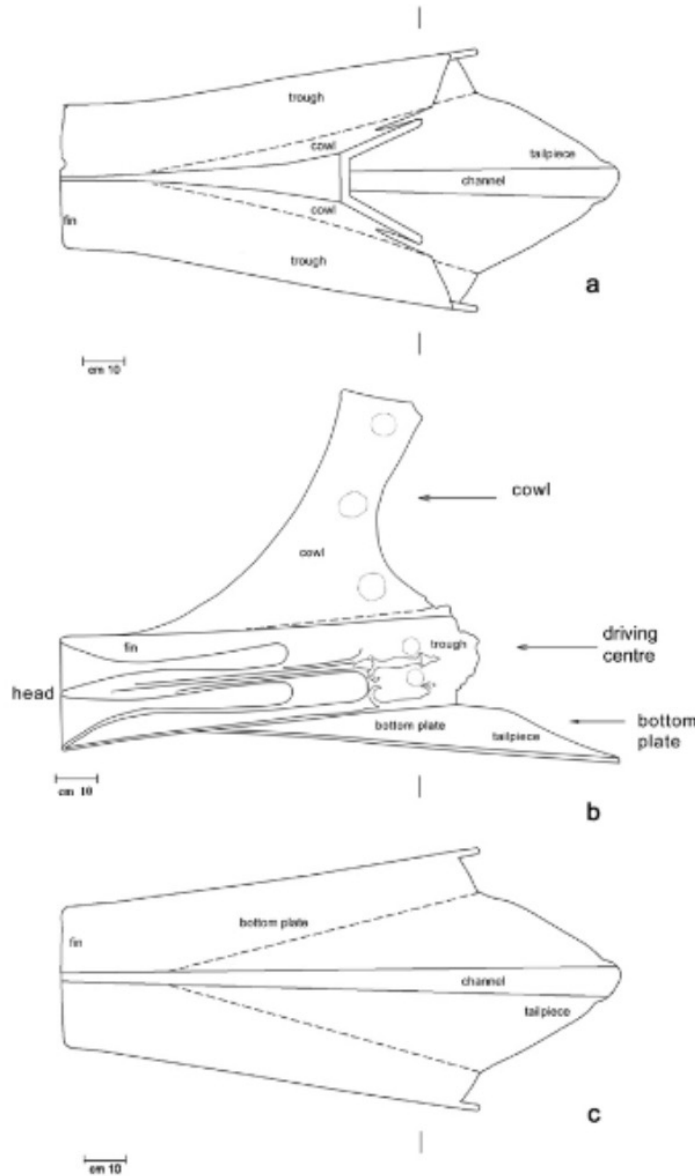


Figure 3. a) Top view of Acqualadroni Ram. Driving centre width of the ram tapers significantly. In the top fin there is a recess produced by impact or by a casting anomaly; b) Acqualadroni Ram with terminology used; c) Bottom view of Acqualadroni Ram where the two triangles of the protruding section are visible. (Drawings by C. A. Buccellato)

Acqualadroni Features

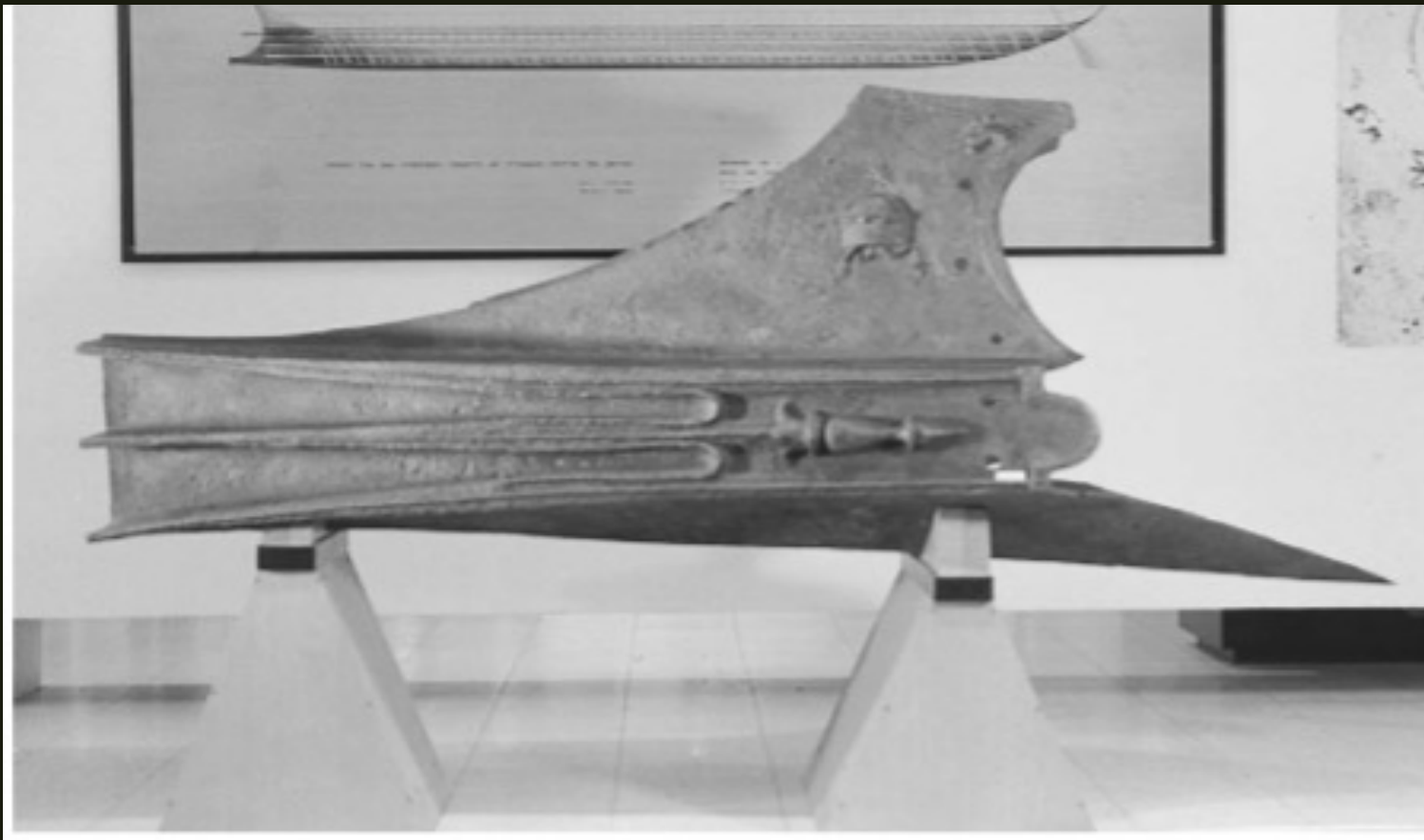
- Dimensions: 135cm in length, 90 cm in height, and 62 cm in width
- Weight: 300 kg.
- Material: bronze
- Category: 4
- Note: Inclusion of detailed swords
 - Greek *kopis* or *makaira*: high status
 - Double-edged sword: Iberians, Celts and Romans
 - The Roman *gladius hispaniensis*: ram sculptures



Figure 4. The hilt of the central sword represented on the Acqualadroni Ram. (C. Curaci)

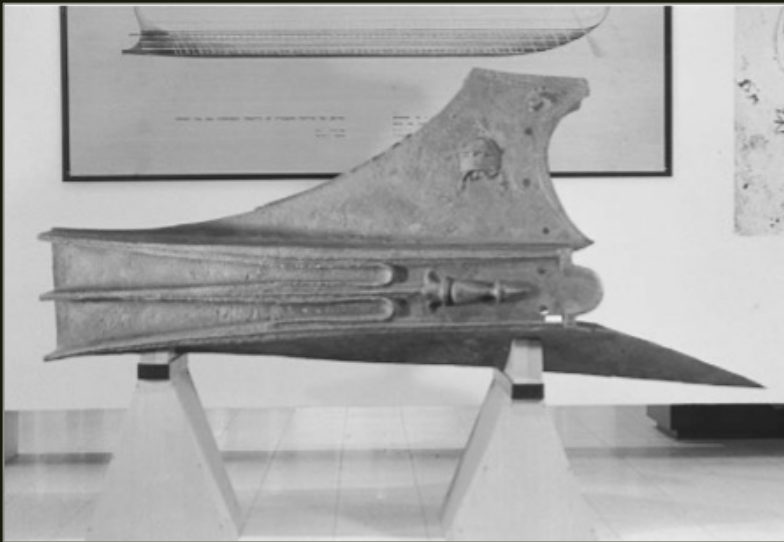


Figure 5. One of the sword hilts on the upper and lower fins shows the marine animal with the head of an eagle (or *hippocampus*?) (Authors)



ATHLIT RAM

1980 discovery of a Hellenistic naval ram in Athlit Bay, Israel



Athlit Discovery

- Yehoshua Ramon, while snorkeling, noticed the corner of the ram.
 - *200m offshore at a depth of 3m*
- Extraction occurred over a period of ~18 months by J. Richard Steffy and a team of Israeli conservators
- Hypothesized casting in the Ptolemaic fleet
 - *End of 3rd century or beginning of 2nd century*

Athlit Features

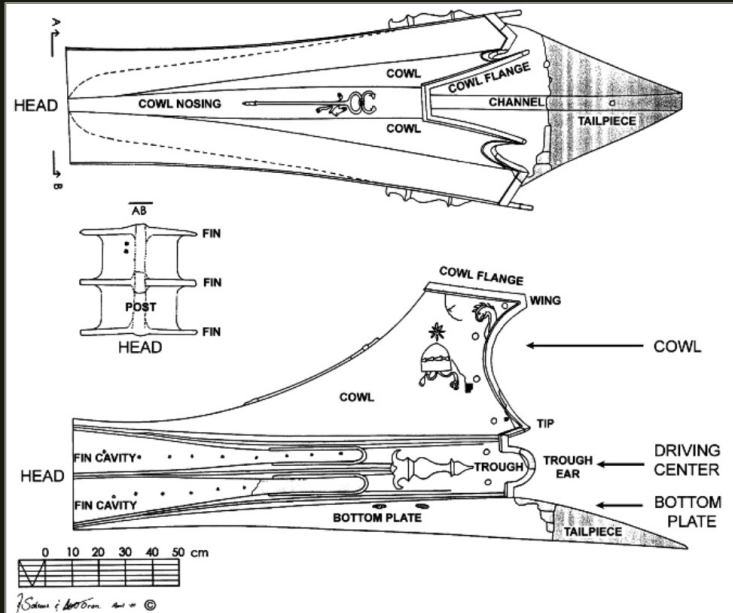


FIGURE 2.1 The Athlit ram. Adapted from line drawing by A. Oron and A. Shreuer.

- Dimensions: 226.cm in length, 95 cm. in height, and 76 cm. in width
- Weight: 426 kg.
- Material: high grade bronze with a 9:1 copper to tin ratio
- Category: a relatively small Hellenistic capital ship size 4-5
- Note: Casted in a single pour

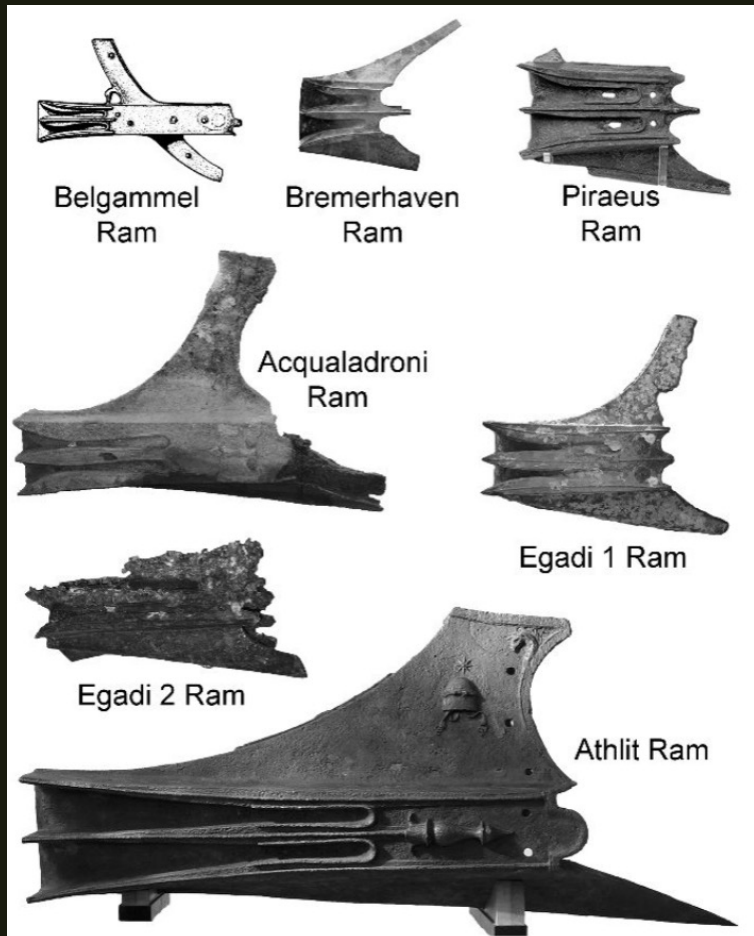


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QUESTIONS?