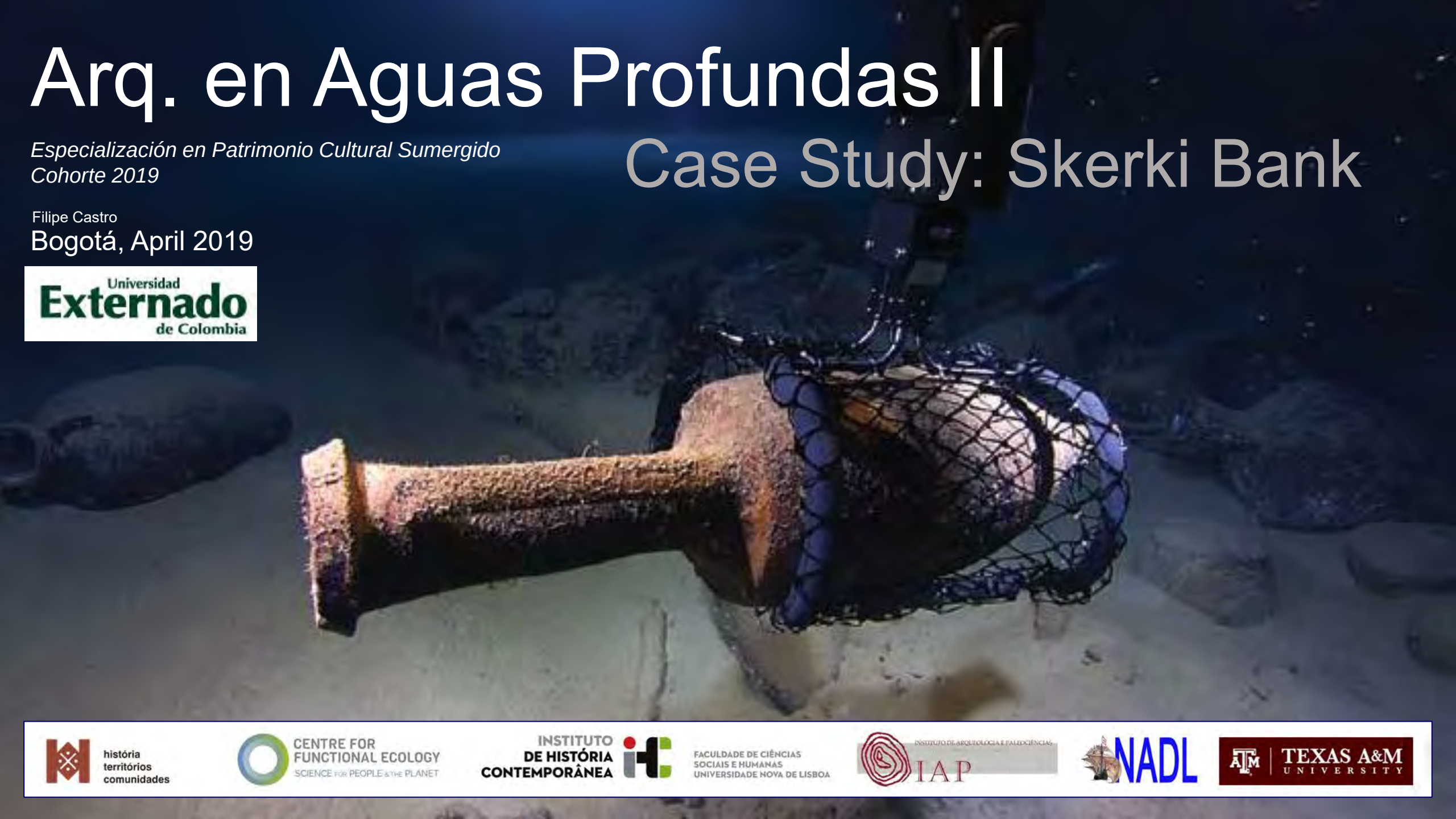
Arq. en Aguas Profundas II

Case Study: Skerki Bank

Especialización en Patrimonio Cultural Sumergido
Cohorte 2019

Filipe Castro

Bogotá, April 2019



Universidad Externado de Colombia

história territórios comunidades

CENTRE FOR FUNCTIONAL ECOLOGY
SCIENCE FOR PEOPLE & THE PLANET

INSTITUTO DE HISTÓRIA CONTEMPORÂNEA

FACULDADE DE CIÊNCIAS SOCIAIS E HUMANAS
UNIVERSIDADE NOVA DE LISBOA

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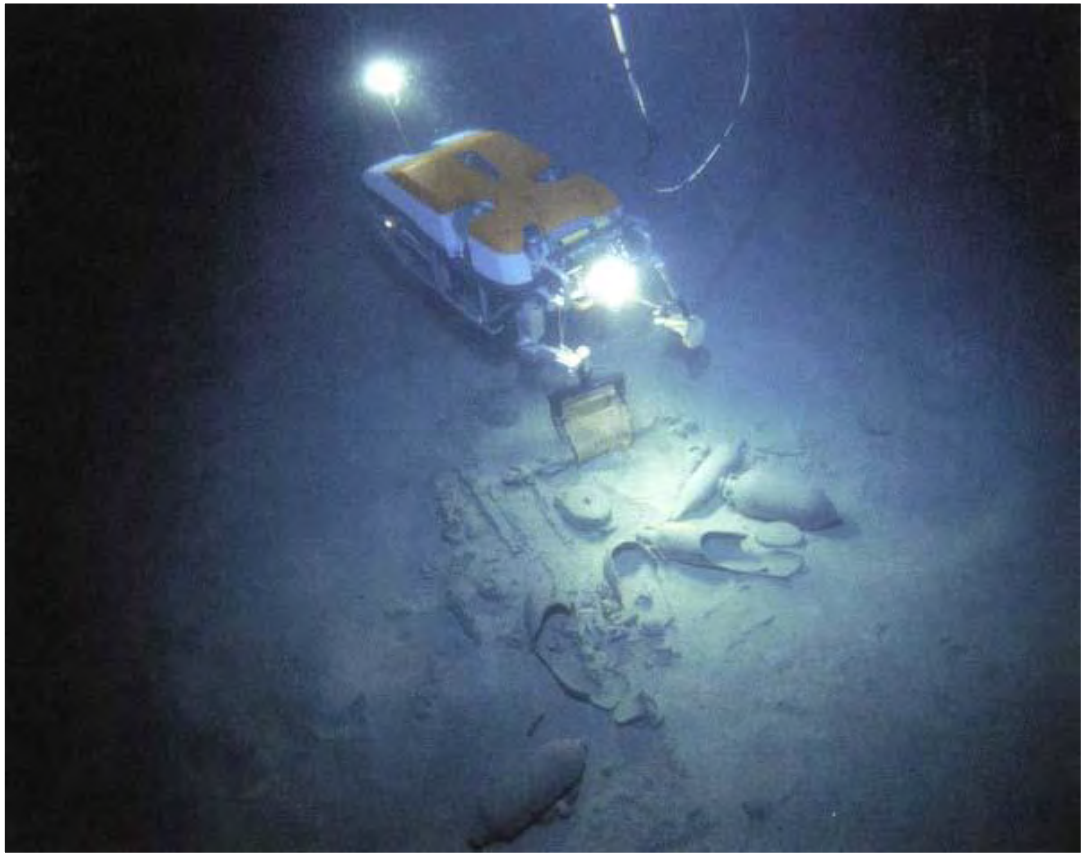
Late Roman Shipwrecks at Skerki Bank



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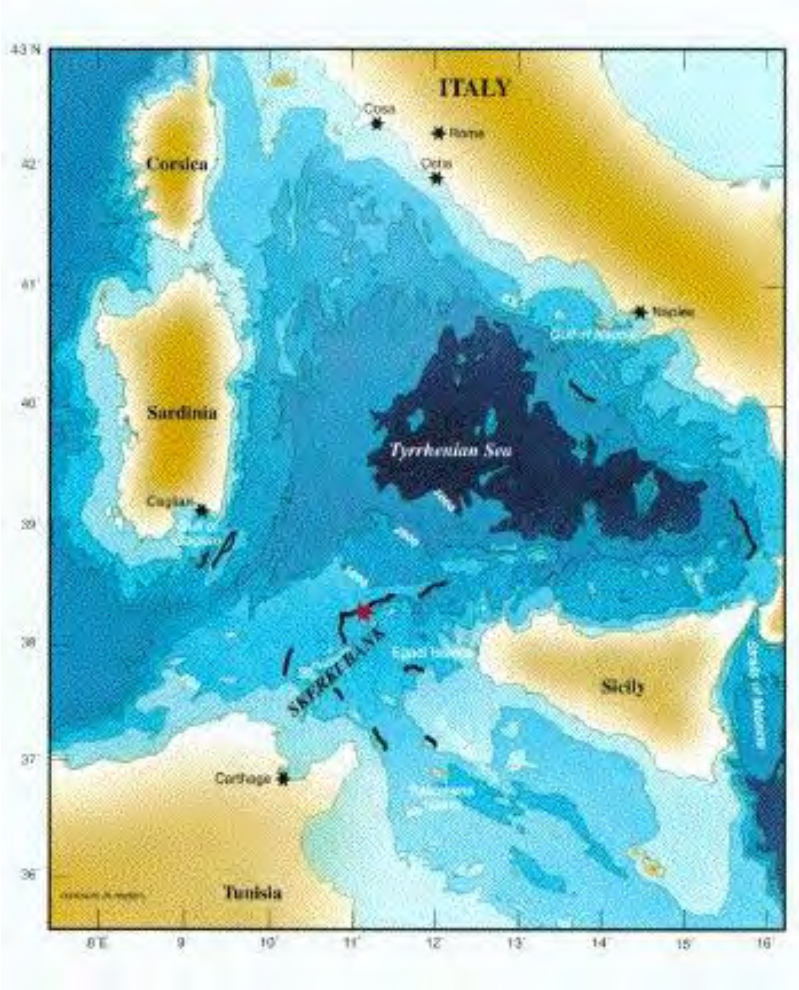

Between 1988 and 2003 Dr. Robert D. Ballard and the Institute for Exploration surveyed the Skerki Bank, located between Carthage, Sardinia, and Sicily, in the Tyrrhenian Sea, and found eight shipwrecks about 800 m deep. Five were dated to between 100 BC and AD 400.

Dr. Ballard chose this area for a number of reasons. The entirety of Skerki Bank is in international waters, making it easier to conduct scientific research.

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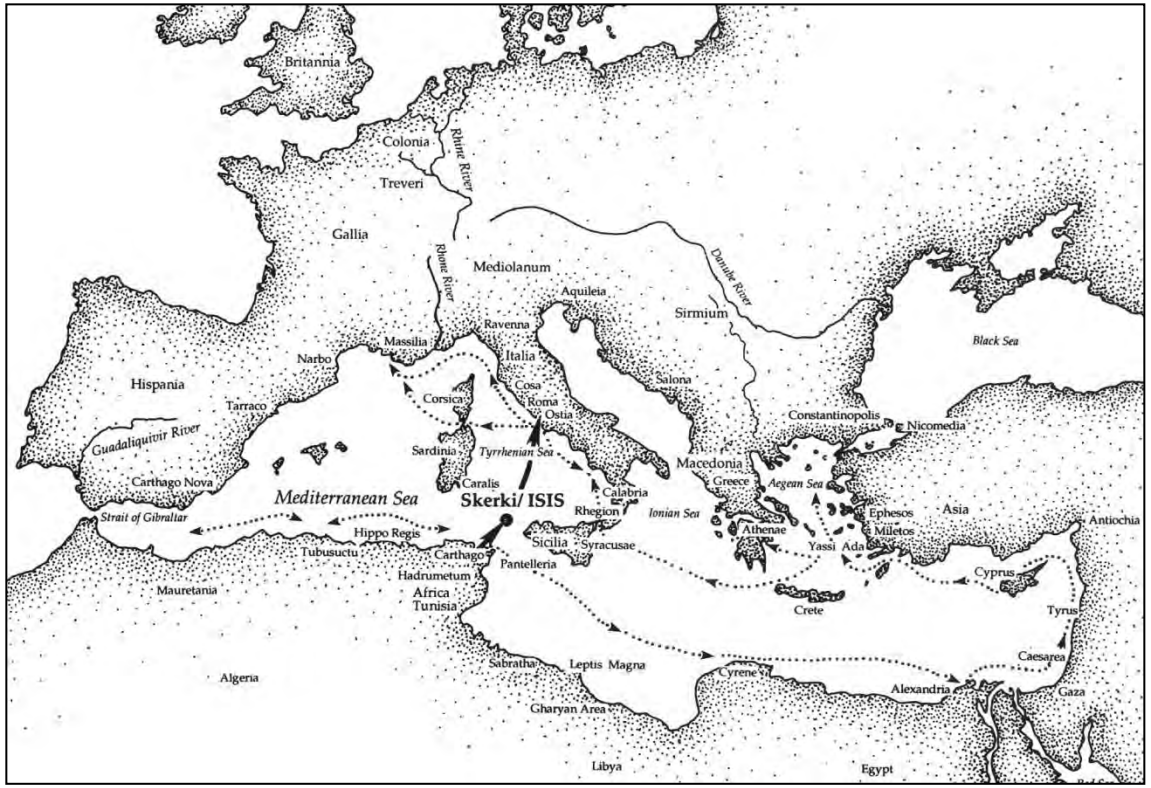
The area is known to sailors and fishermen as very dangerous during storms. Dr. Ballard also picked it because of it's location between Carthage and Rome. He wanted to know if there was evidence for deep sea trade routes. So many authors supported the theory that ships sailed mainly along the coasts. About 95% of all excavated shipwrecks were found within 10 miles of land.



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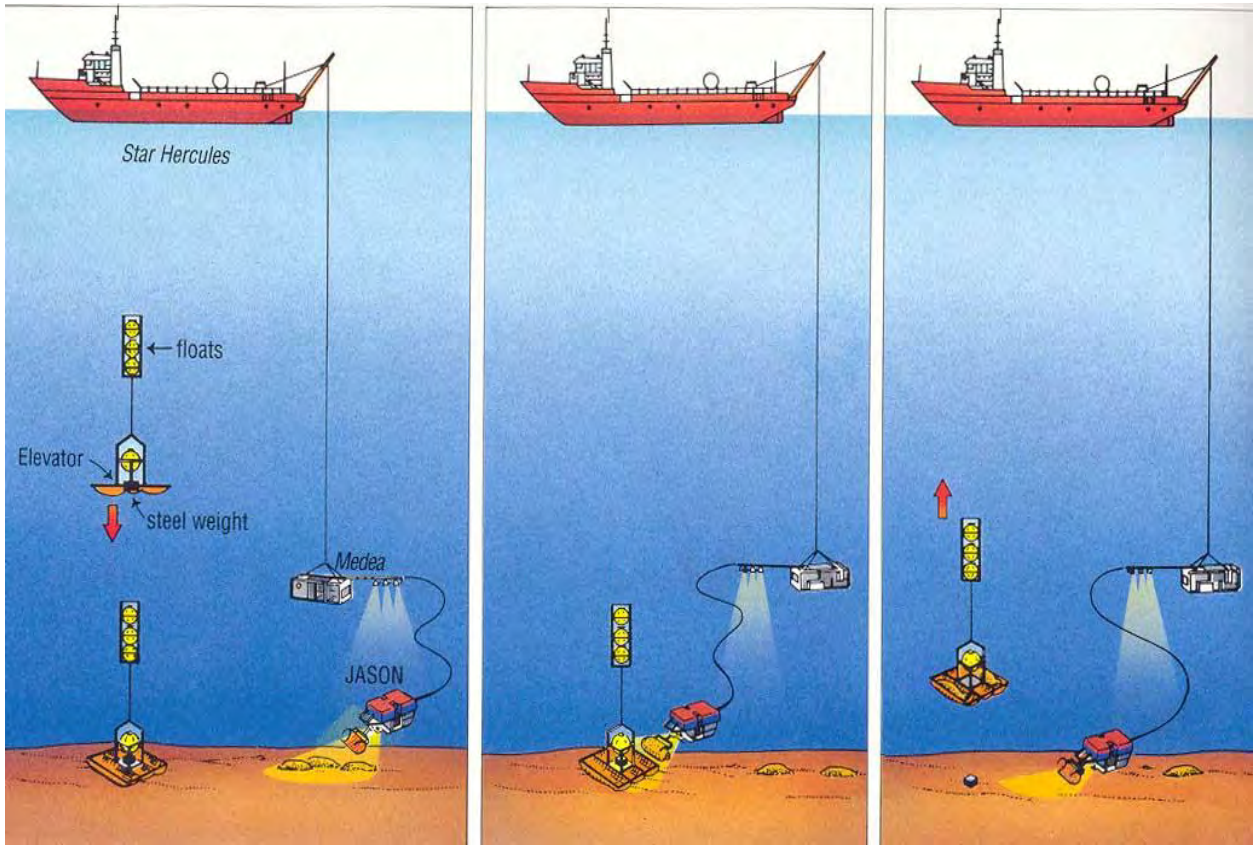
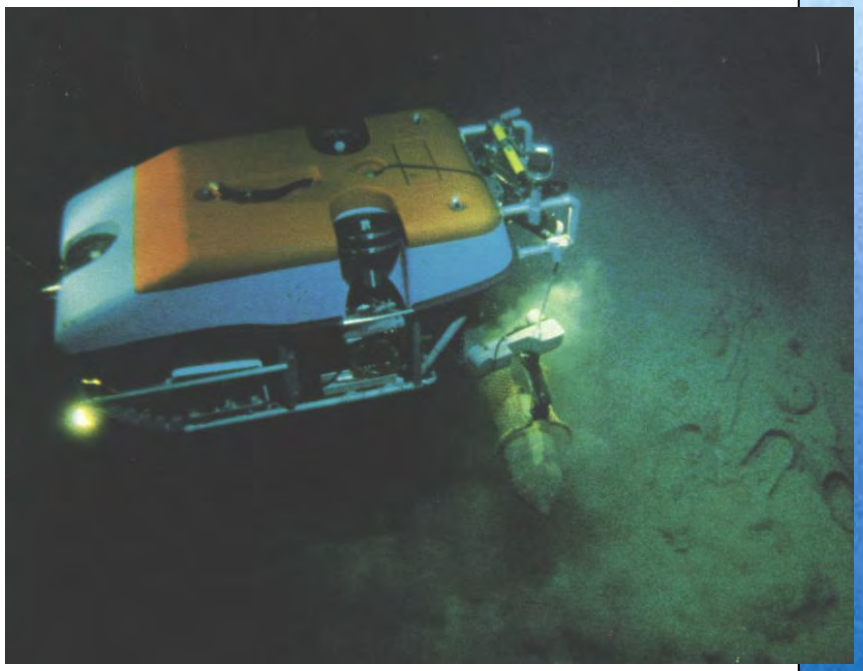
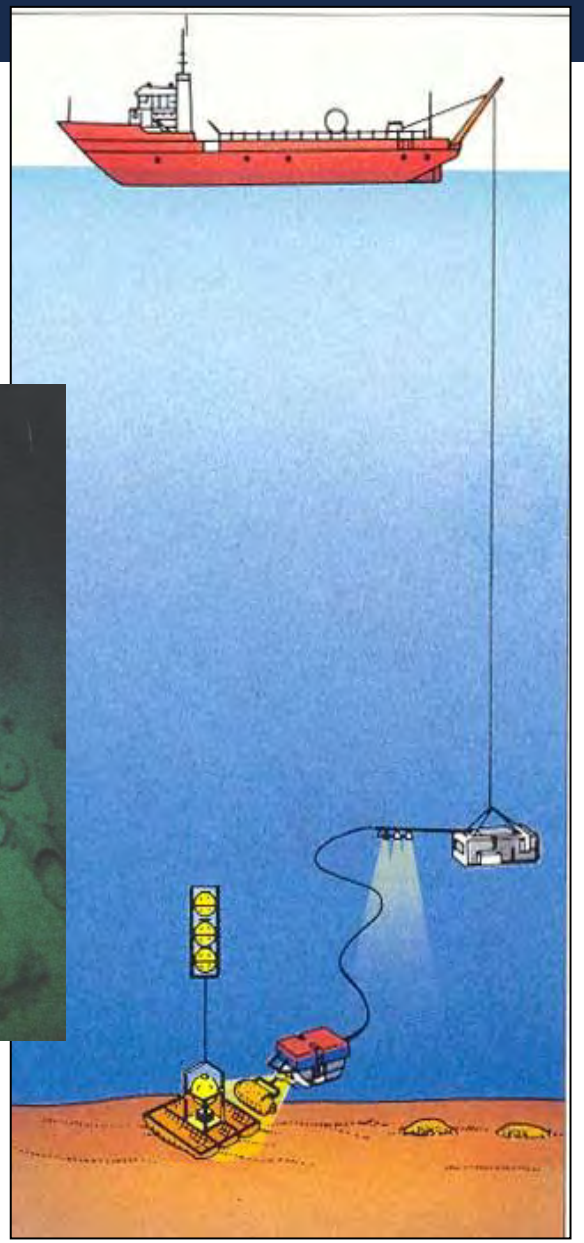
He also wanted to know if archaeologists could use oceanographic and engineering technology to carry out deep water survey and limited excavation at professional levels.



Technology

- ARGO (Camera sled);
- JASON and MEDEA (ROVs);
- Hercules and Little Hercules (ROVs);
- NR-1 (submarine).





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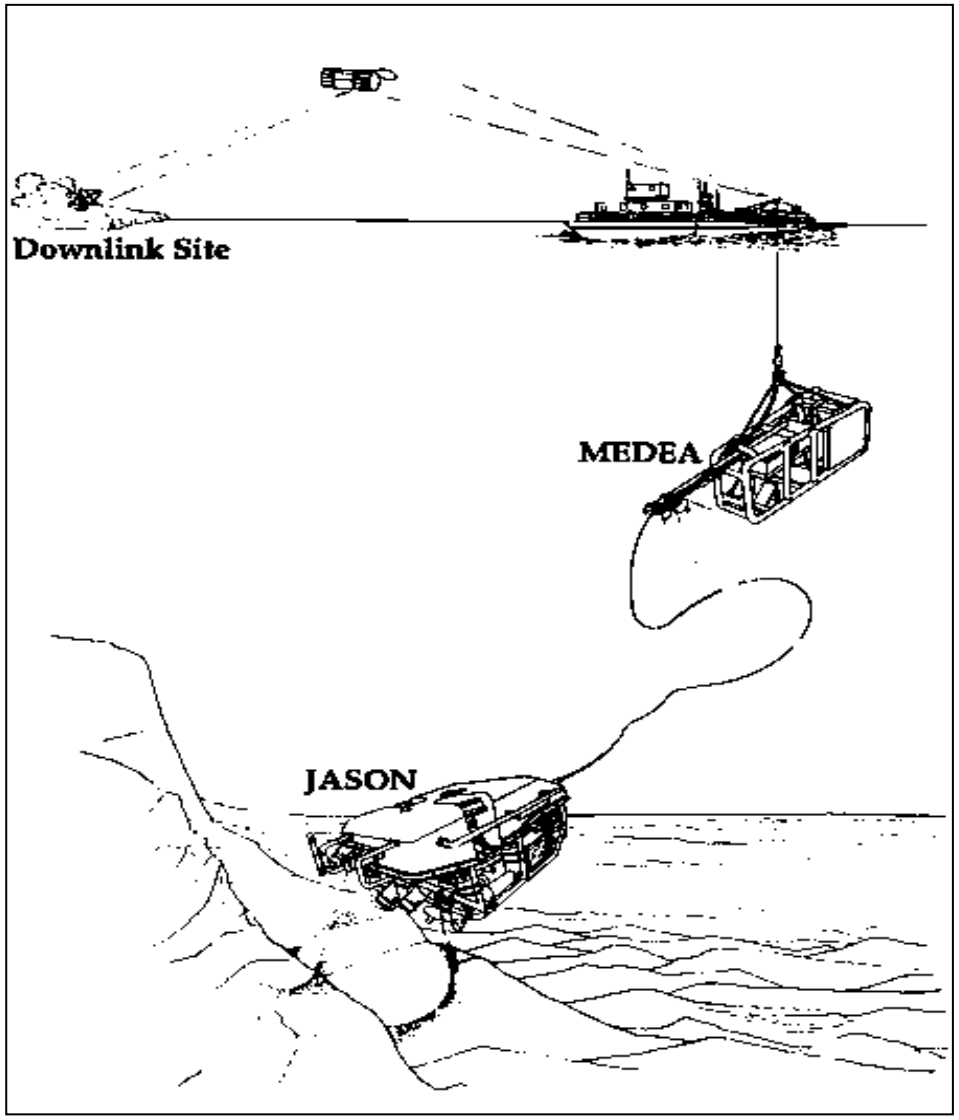

Below a certain level, the tether becomes heavy is pulled by currents, and the ROV is difficult to maneuver from the surface.

That is why sometimes a smaller ROV is used linked to a larger vehicle.

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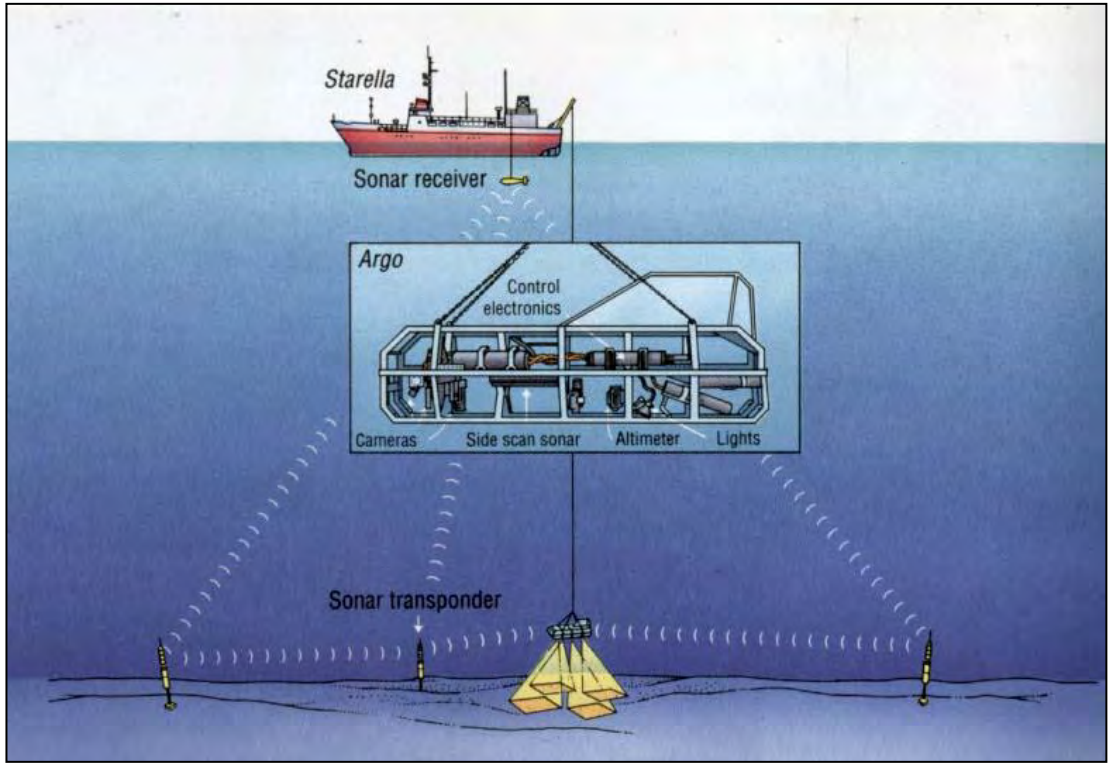
ARGO

- Heavy-duty frame;
- 3 low-light level, black and white video cameras with running lights;
- 35 mm color film camera and strobes;

- Echo-sounder;
- 100 kHz side-scan sonar system, flown at an average altitude of 15 m above the sea floor.



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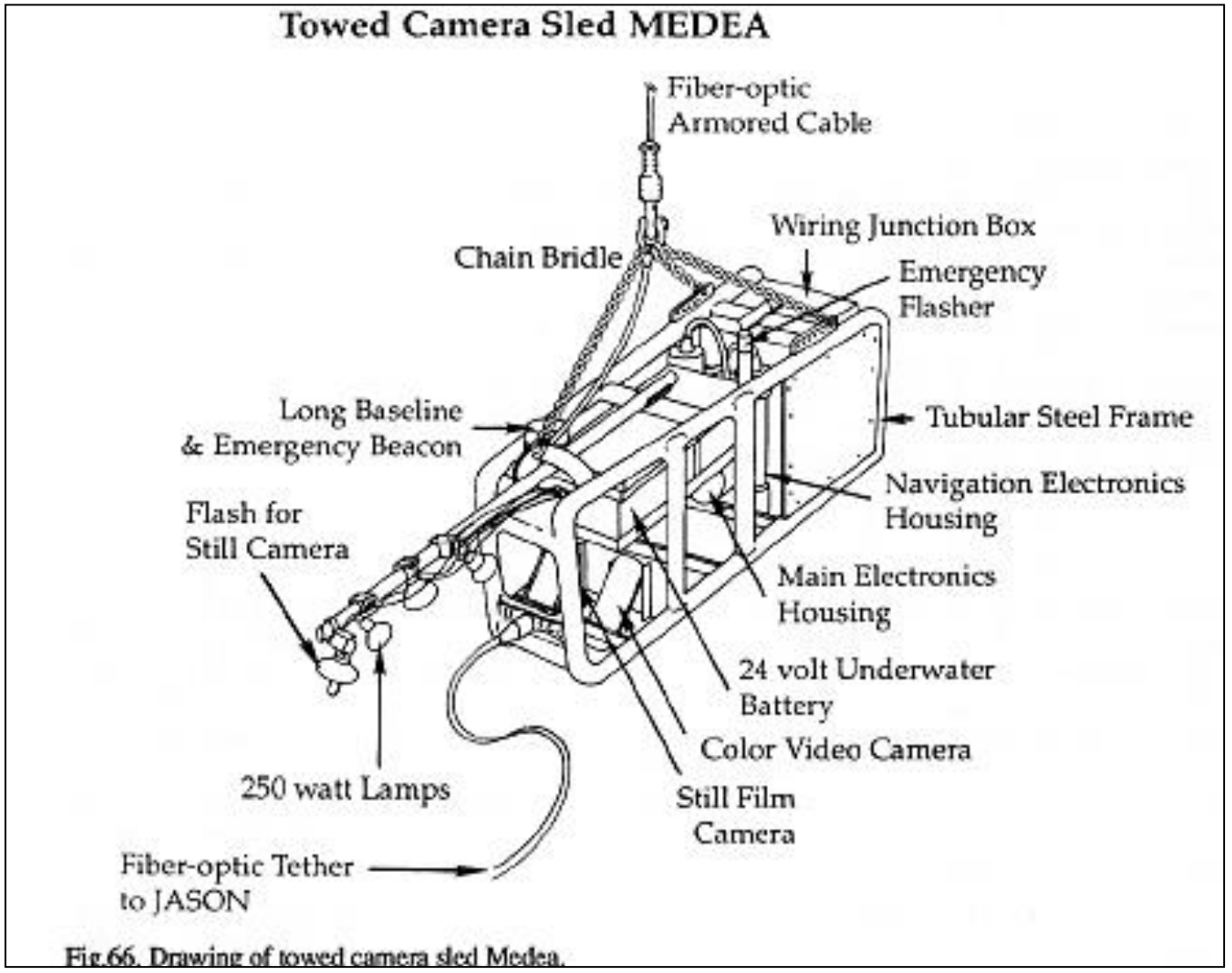

Fig.66. Drawing of towed camera sled Medea.

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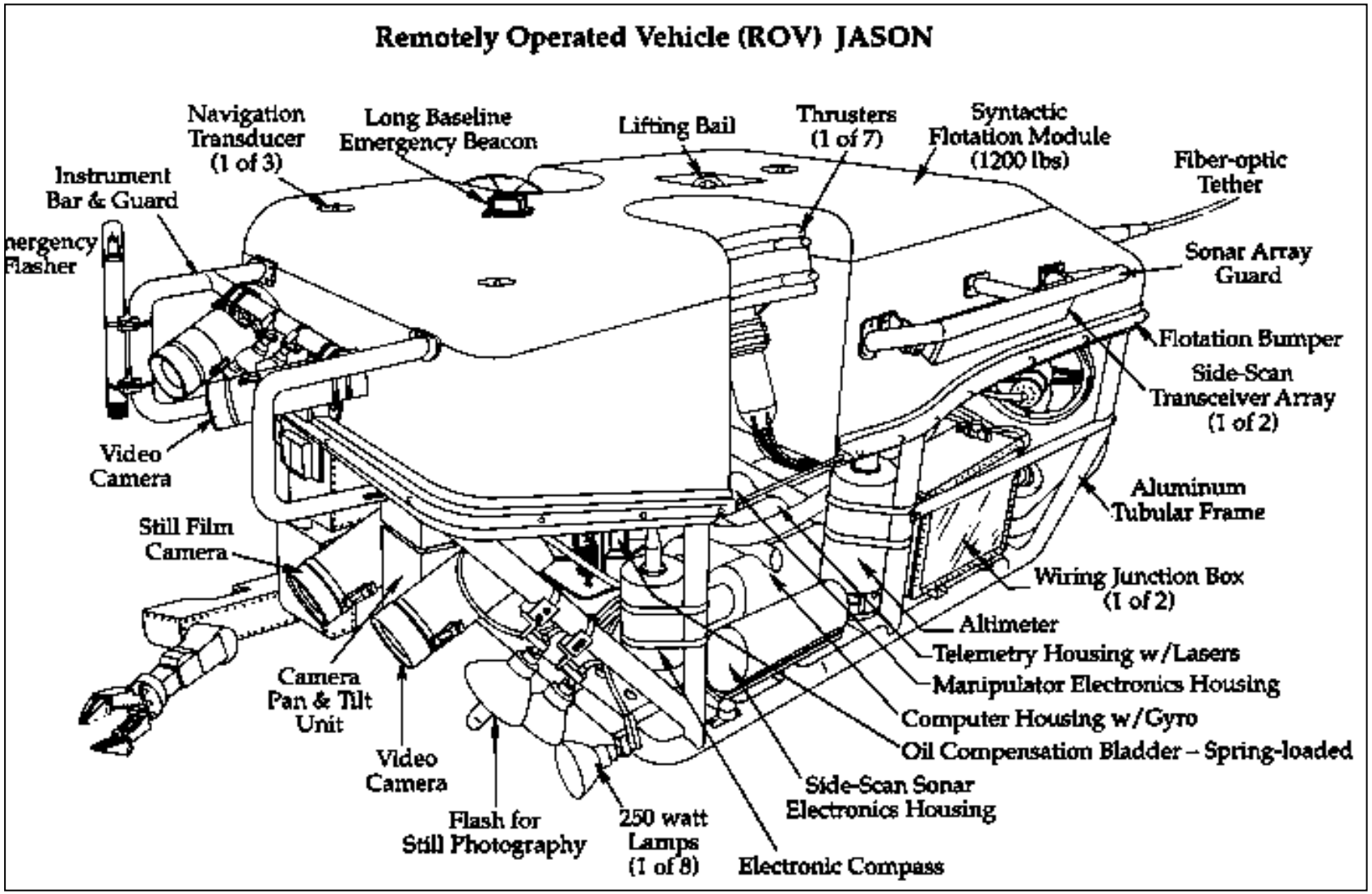
JASON



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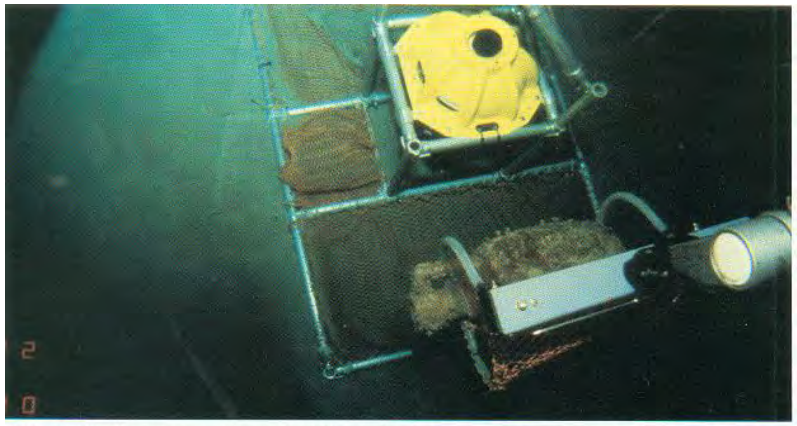
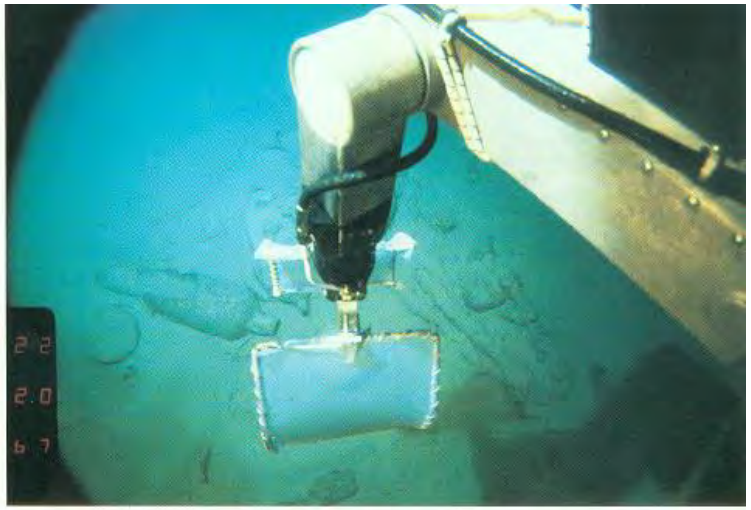
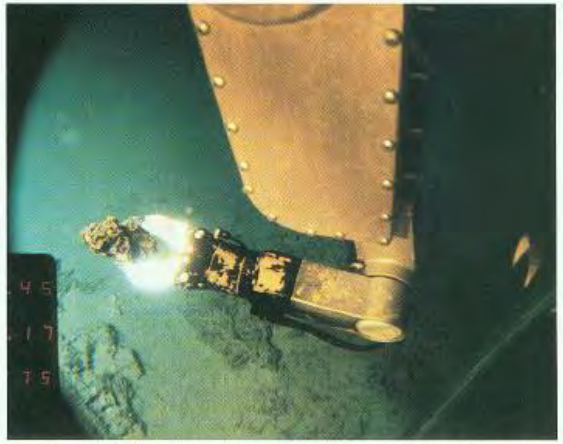


Color fig.27. Elevator on sea floor with ROV Jason's robotic arm bringing an amphora for deposit. Photo: Quest Group, Ltd.

Color fig.28. Elevator on surface with amphoras in netted compartments. Photo: A. M. McCann.



Color fig.24. ROV Jason's robotic arm with netting, going in to pick up amphora. Photo: Quest Group, Ltd.



Color fig.25. ROV Jason's robotic claw with small sample in its grasp. Photo: Quest Group, Ltd.

Case Studies: Skerki Bank

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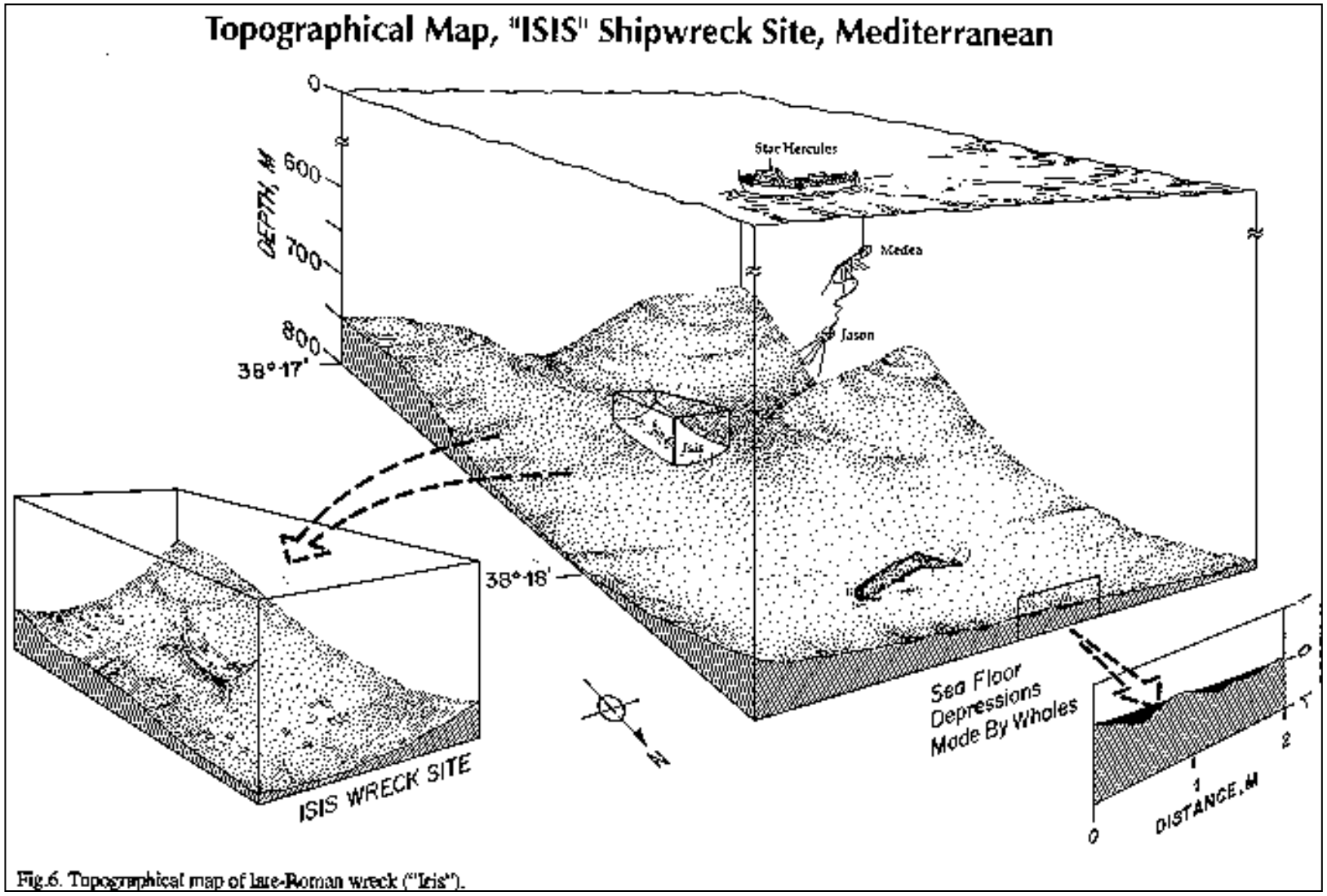

Fig.6. Topographical map of late-Roman wreck ("Isis").

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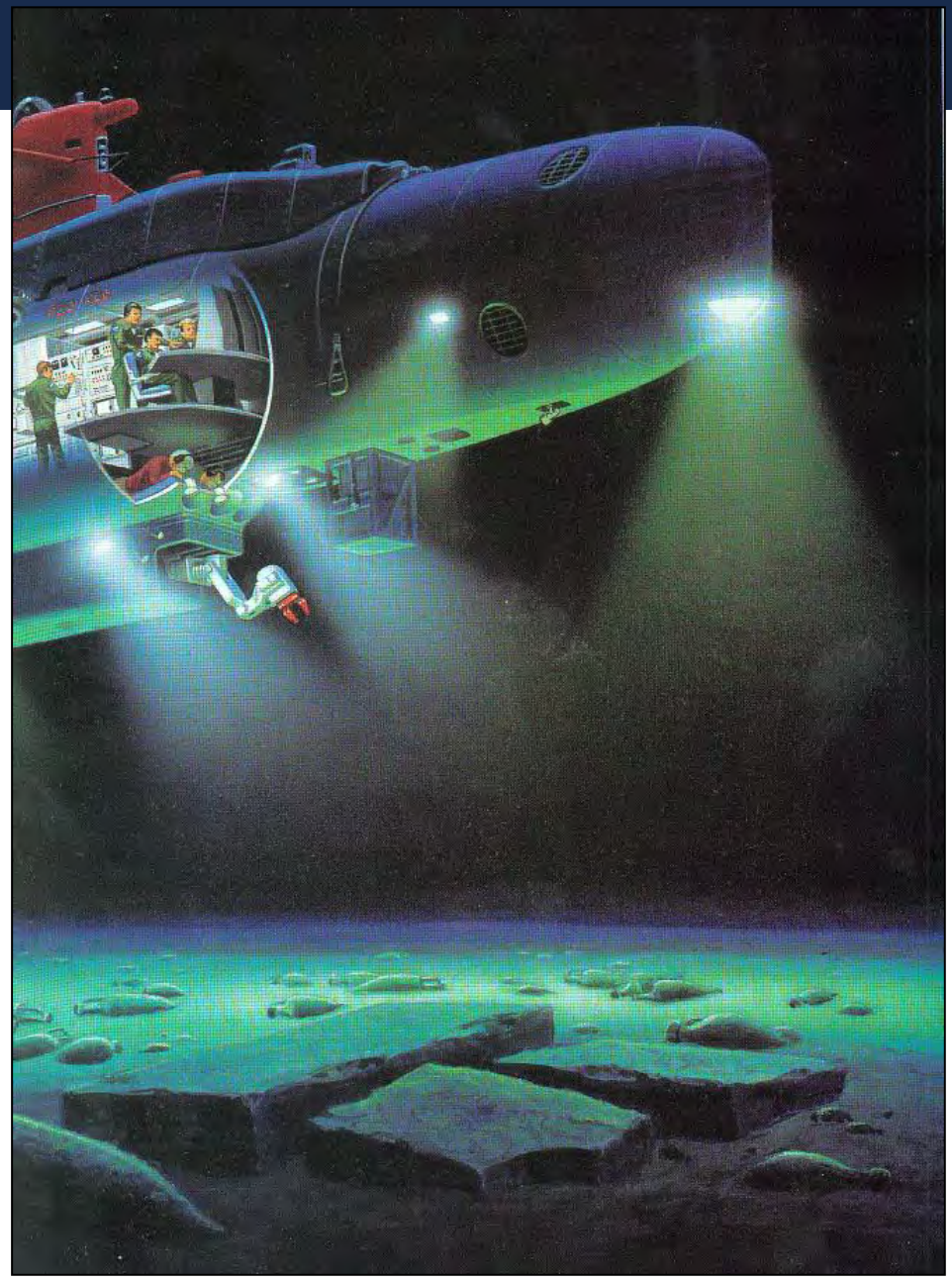
NR-1

Case Studies: Skerki Bank

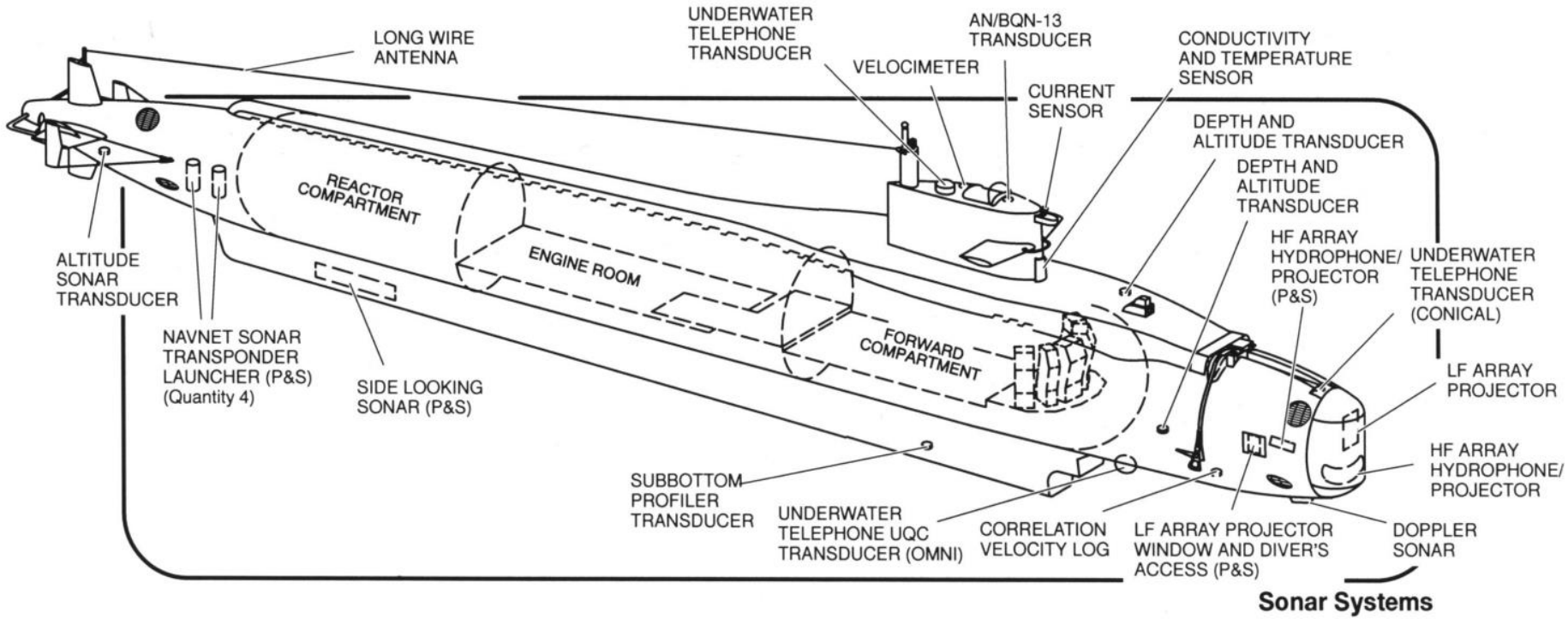
- The NR-1 was the first deep submergence vessel that used nuclear power, launched on January 25, 1969;
- The NR 1 is used for underwater search and recovery, oceanographic research missions and installation and maintenance of underwater equipment, to a depth of almost half a mile;



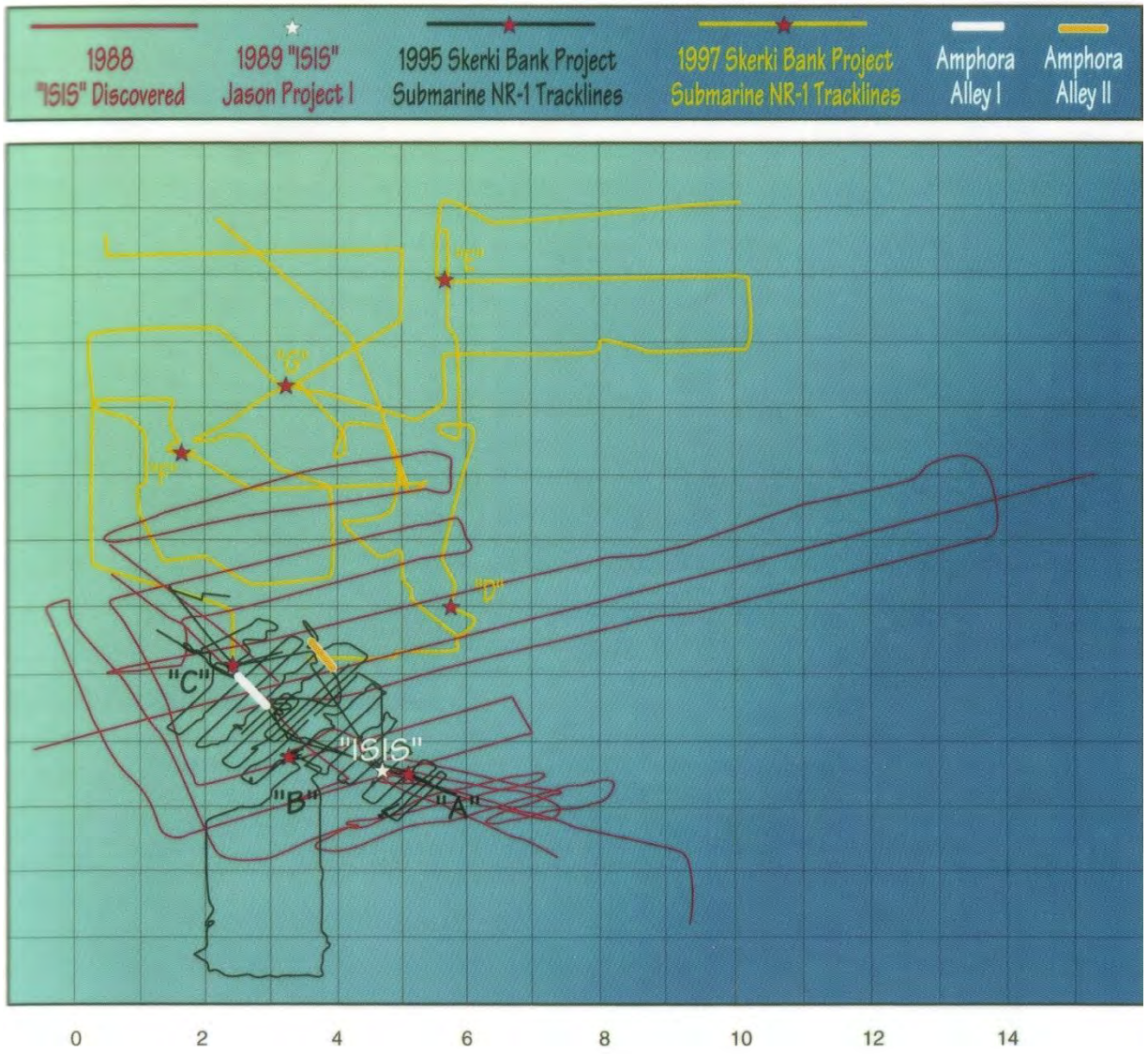
Case Studies: Skerki Bank

- Features include extendable bottoming wheels, three viewing ports, exterior lighting, television, and still cameras for color photography;
- It has an object recovery claw, a manipulator that can be fitted with various gripping and cutting tools and a work basket that can be used in conjunction with the manipulator to deposit or recover items in the sea.

NR-1



Case Studies: Skerki Bank



1988 & 1989

"Isis,"

"Amphora Alley I"

1995

"Amphora Alley II"

Wrecks A, B, C

1997

Wrecks D, E, F, G

2003

No new data…

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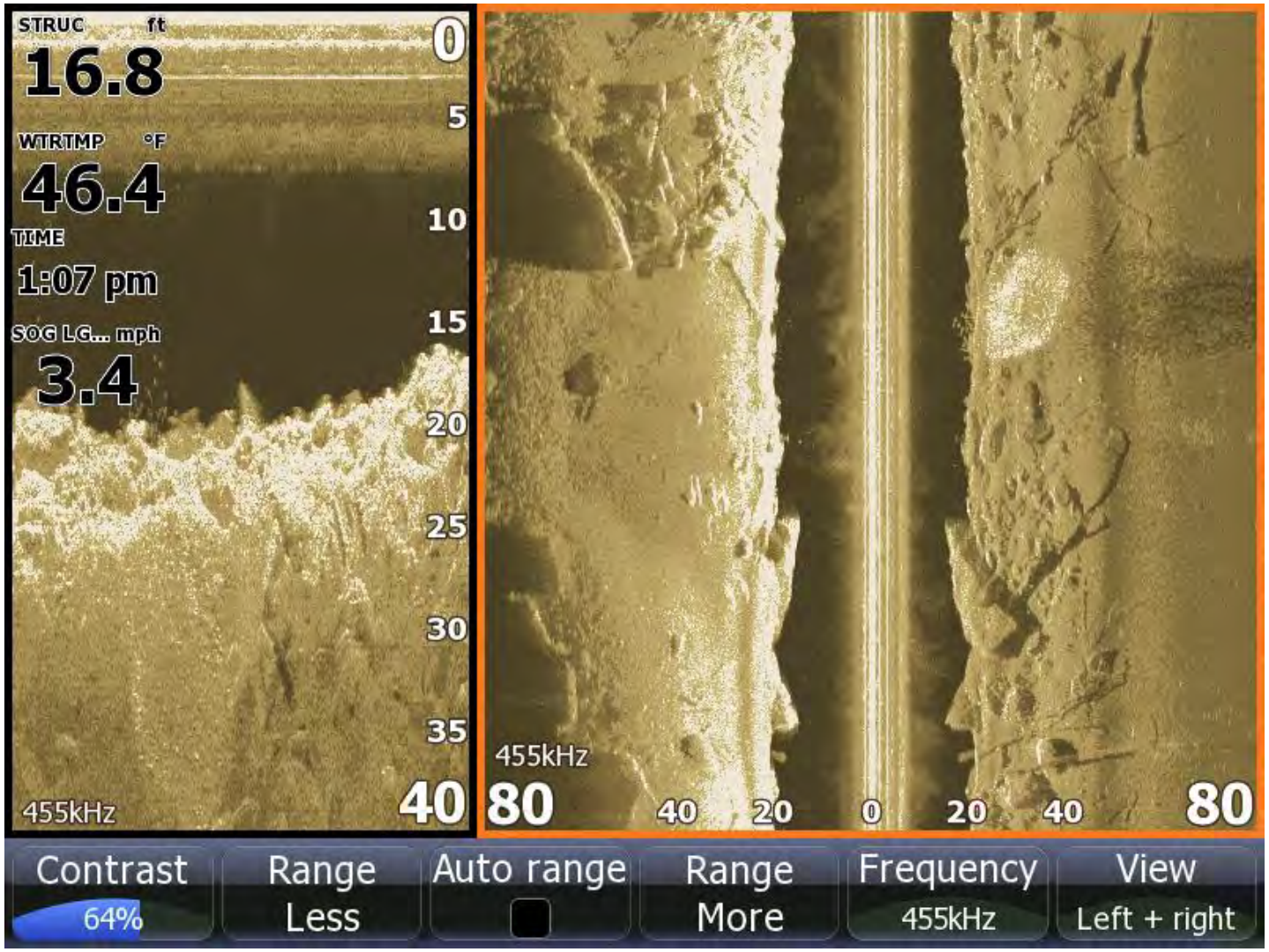
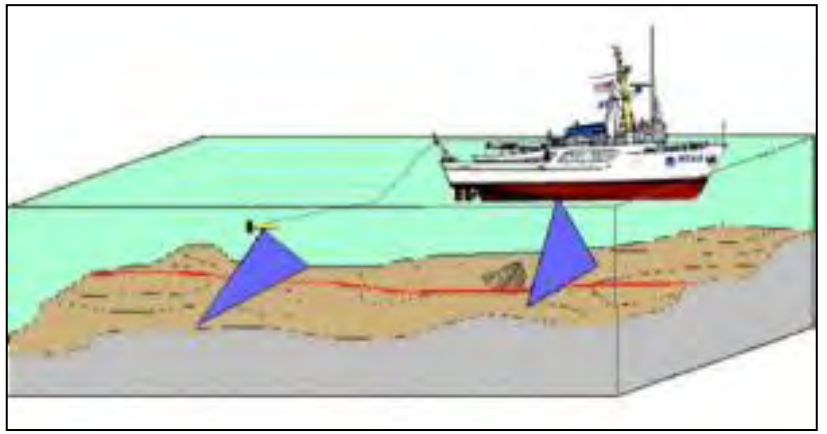
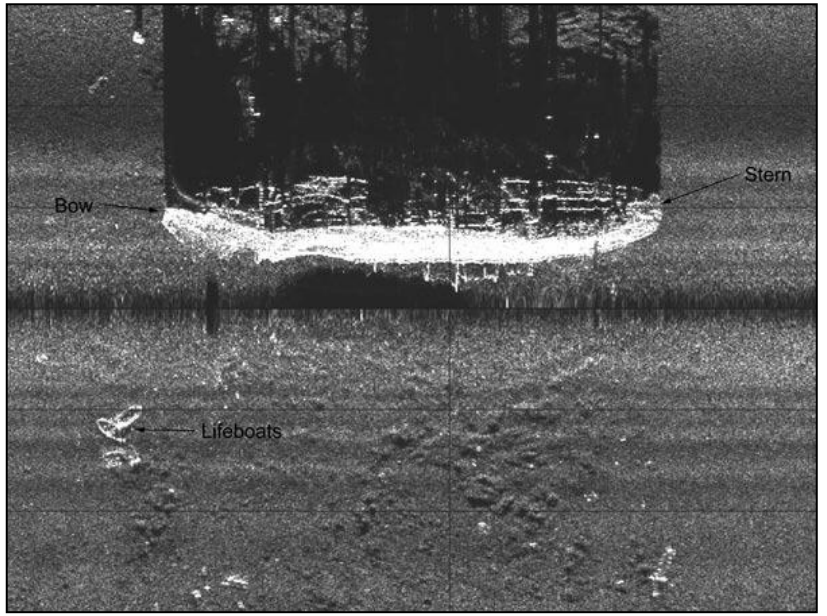




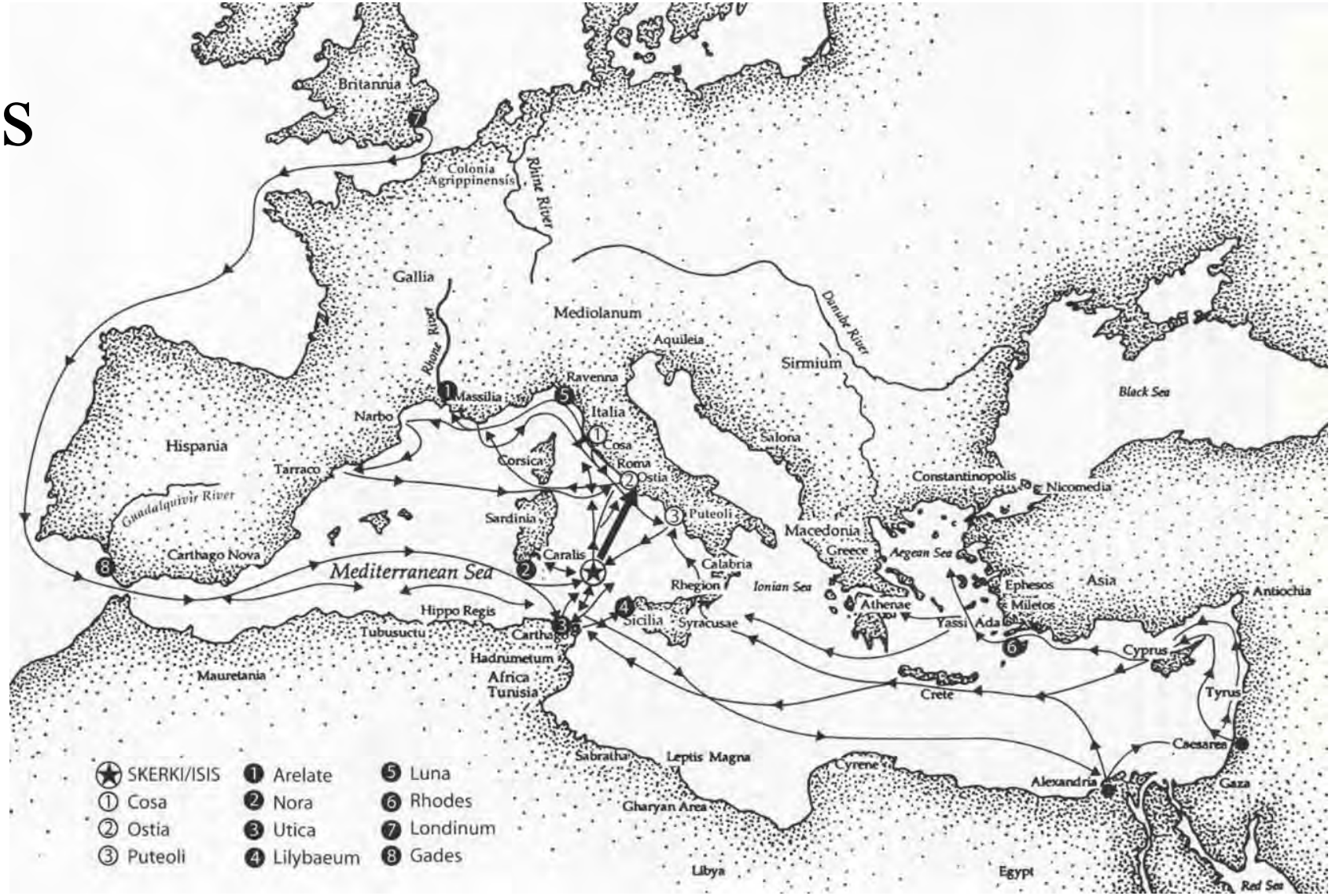


Skerki Bank Shipwrecks

- Wreck D - 80-60 BC
- Wreck G - AD 50
- Wreck F - Mid 1st c. AD
- Wreck B – Late 1st c. AD
- *ISIS* - Late 4th c. AD

- Wreck A – Early 19th century
- Wreck E - 19th c. wooden sailing ship
- Wreck C – Late 19th c. wooden sailing ship

Trade Routes



Skerki D Shipwreck

- Earliest (80 – 60 B.C.) and probably the largest of the Roman shipwrecks;
- Dated by amphorae, kitchen and common ware, fine pottery, bronze table ware, and two lead anchor stocks with one lead anchor strap;
- 35 artifacts total were lifted from the shipwreck;
- At least 10 different forms of amphora are documented (Italy, Gaul, N. Africa and Greece);
- A lot of the cargo is missing, probably floated away or chemically degraded.

Skerki D Shipwreck

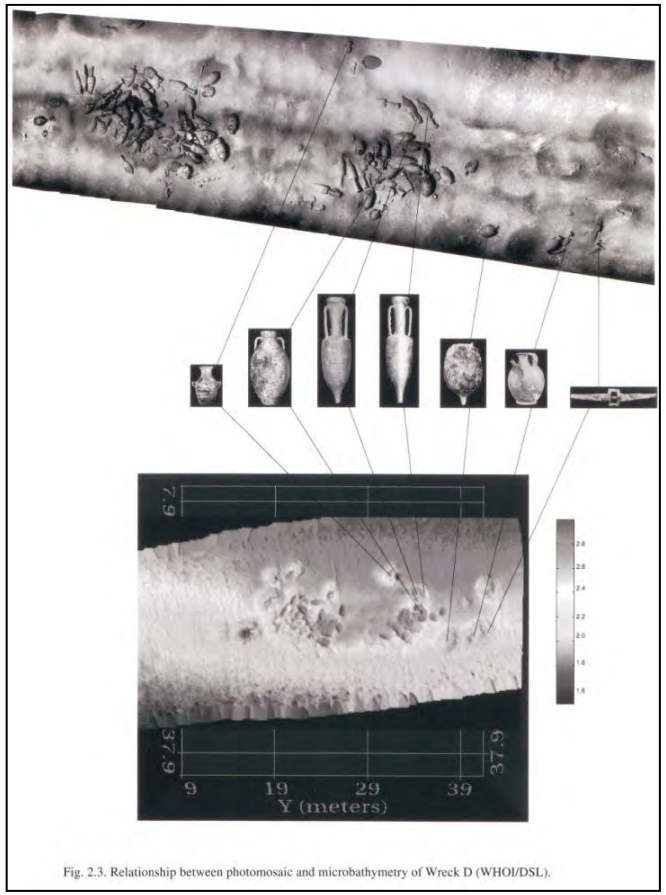
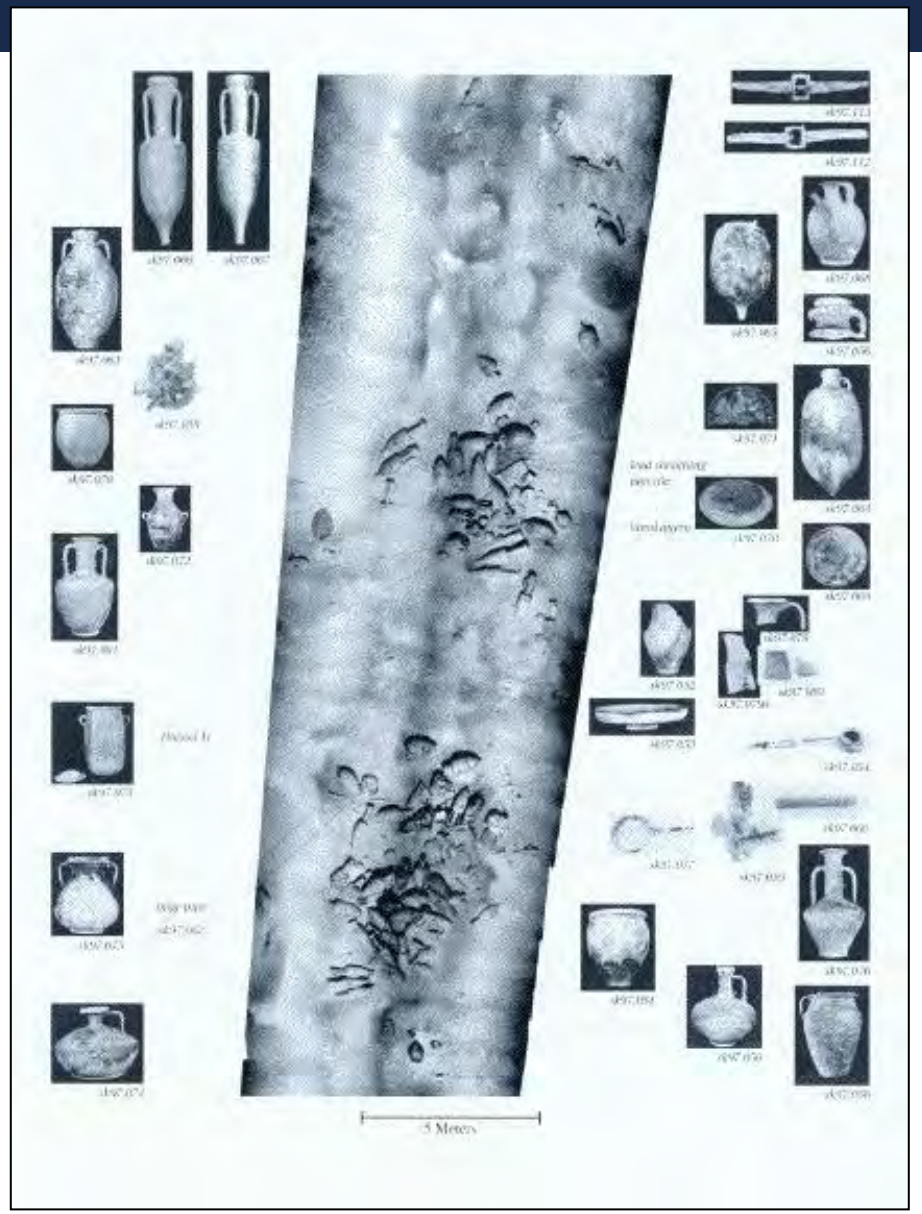


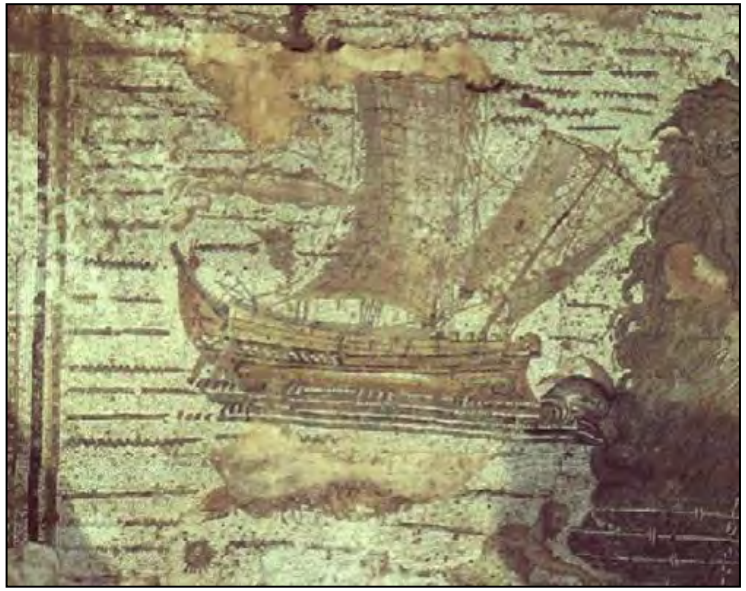
Fig. 2.3. Relationship between photomosaic and microbathymetry of Wreck D (WHOI/DSL).



Skerki D Shipwreck

Skerki D Shipwreck

- This was a large ship, probably 40 m long, as large as the Madrague de Giens;
- Its cargo was varied and probably heading south, to the rich colonies of the North of Africa.



Wreck G

- Dated to about AD 50;
- Artifacts scattered, perhaps during the sinking process;
- Small vessel, the site is around 15 m in length;
- The cargo of Amphorae suggests that carried wine and *garum* from the Tarraconensis province
- Common ware cargo
- Galleyware from Gaul
- Western Mediterranean
- Origin and Trade Route

GARUM

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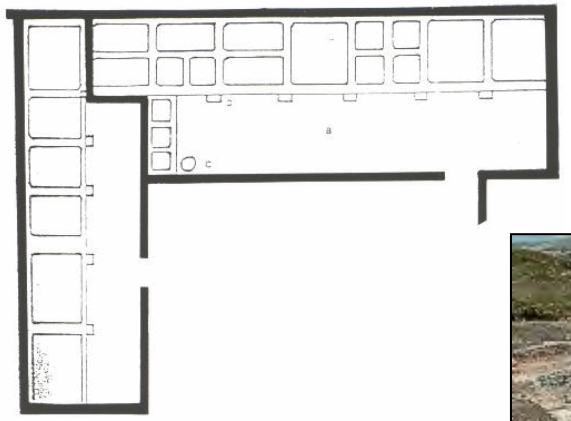


Tróia, Portugal

Fig. 29, Impianti di salagione posti sulle coste a cui si accostano i tonni durante il periodo della riproduzione (dal lavoro di Ponsich e Tarradel).

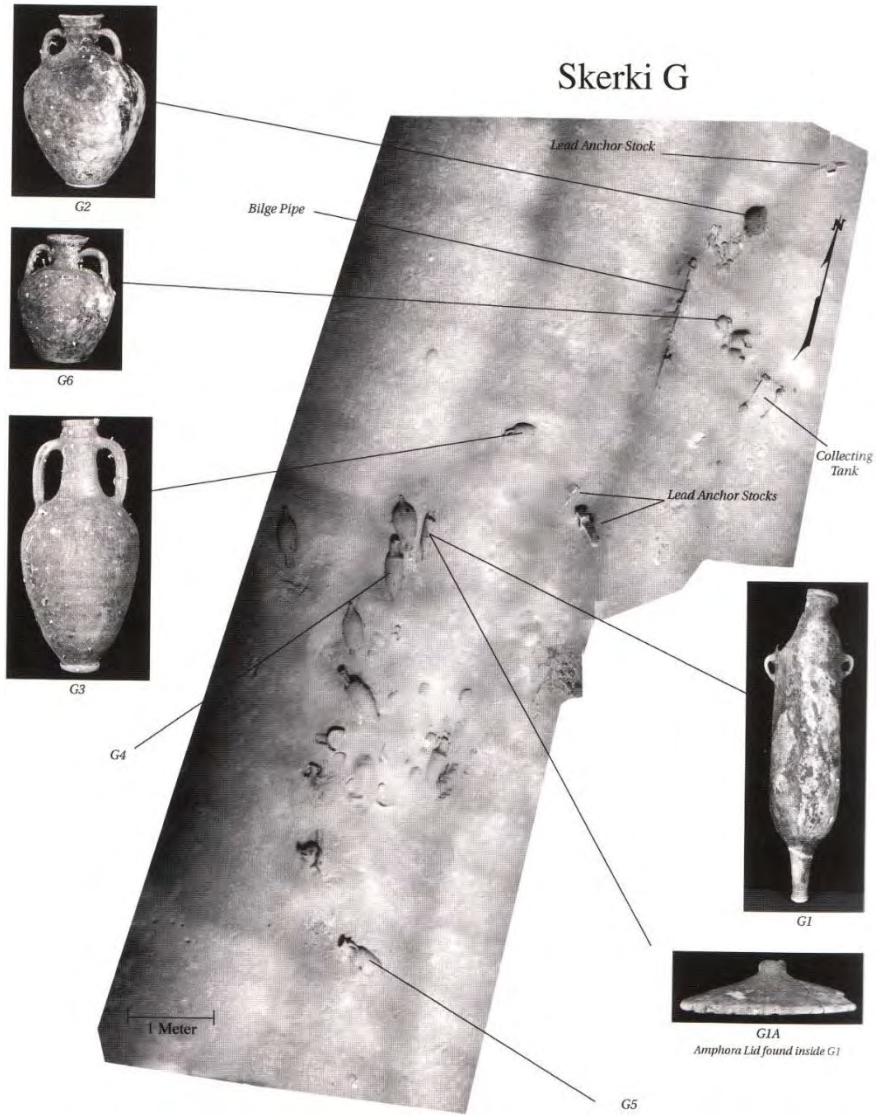
Case Studies: Skerki Bank

Fishing remains an important economic activity.

Wreck G

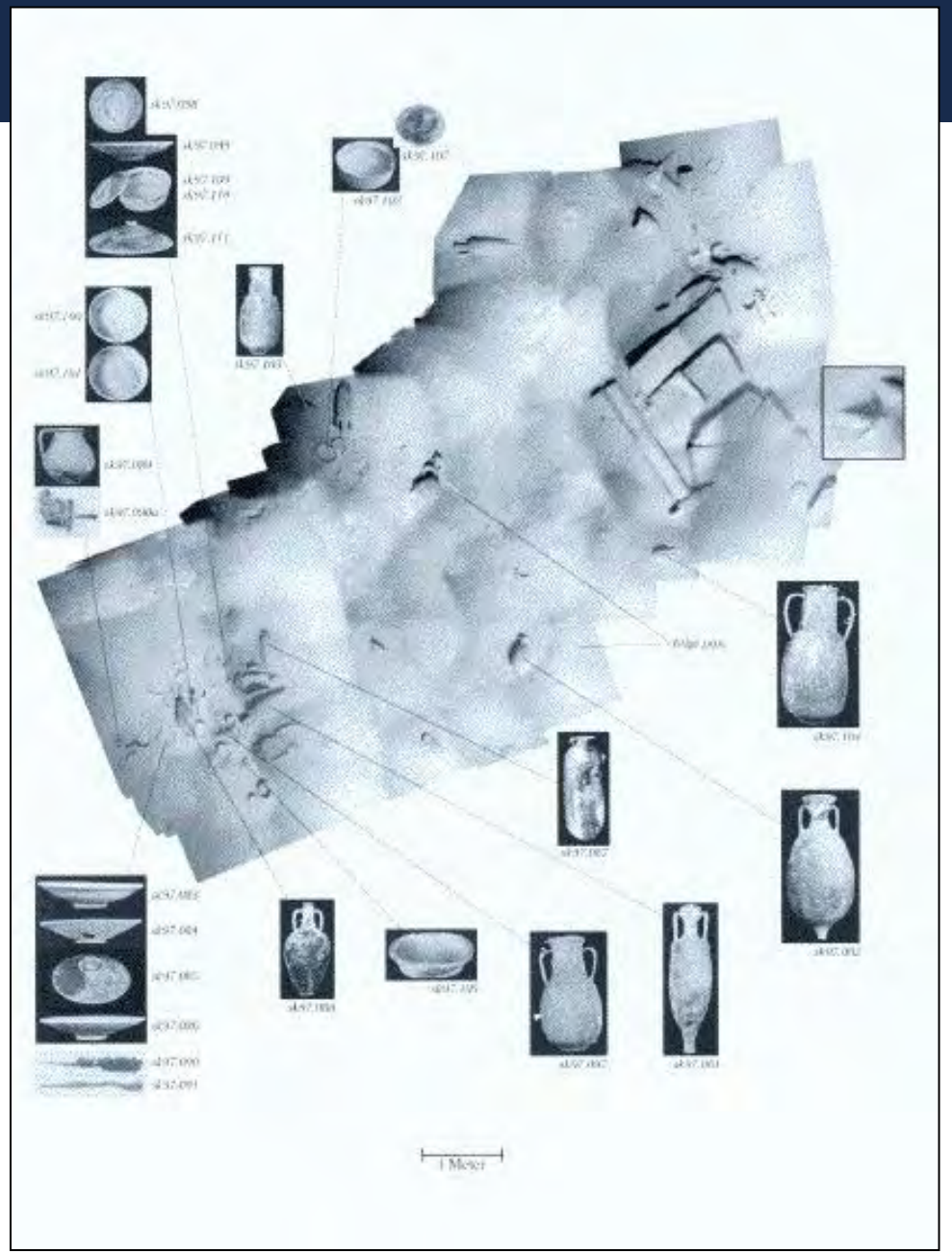
- Other artifacts were spotted, namely common ware cargo, galley ware from Gaul;

- It is believed that this vessel had a Western Mediterranean Origin.

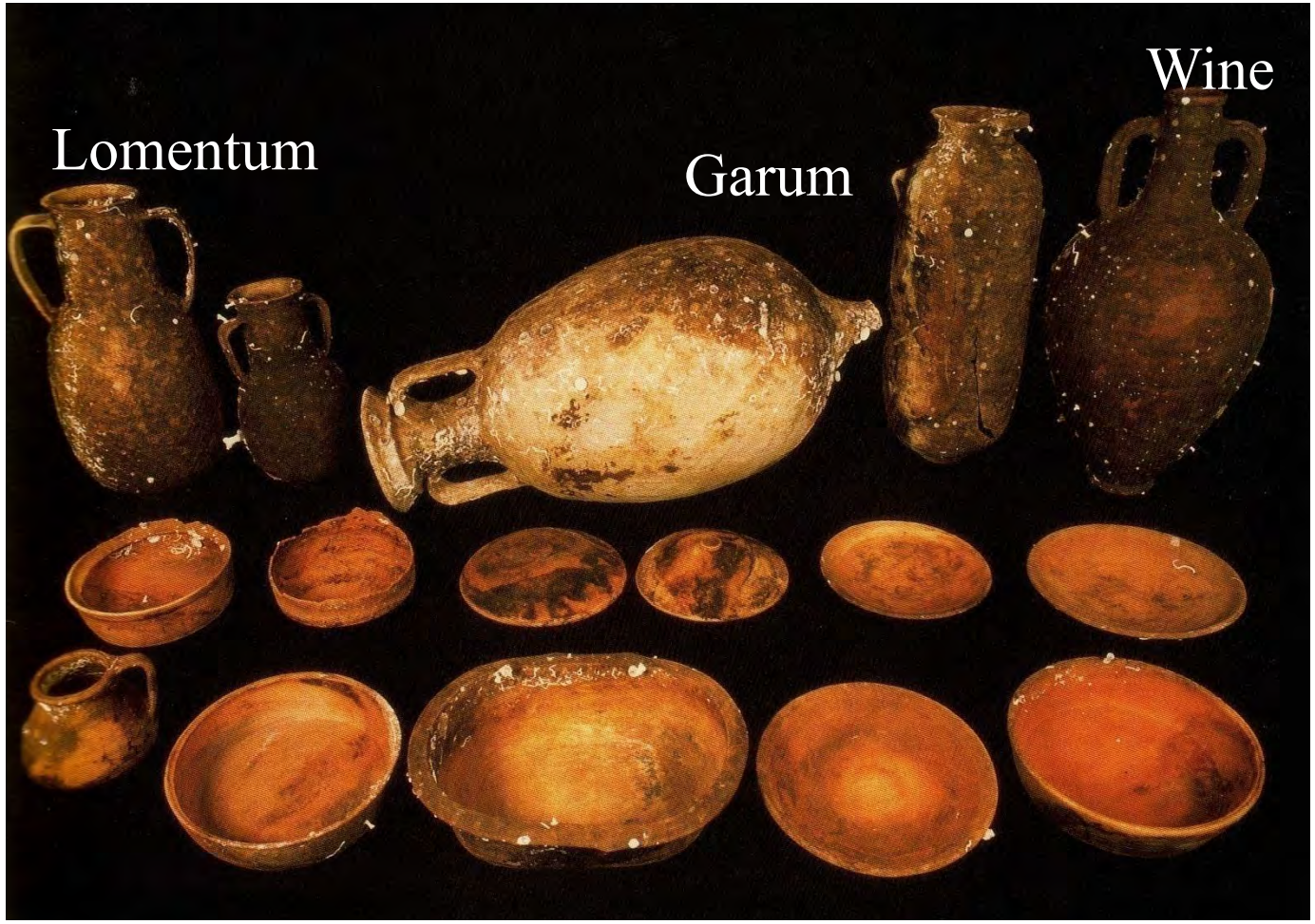


Wreck F

- Was dated to the late 1st century AD;
- When it sunk it was carrying high quality building stones, amphorae for wine and oil, numerous sets of cooking and coarse ware;
- The site is only about 20 m long, but the cargo seems quite heavy, perhaps as much as 250 tons;
- It was possibly sailing from the North of Africa to Italy.



Wreck F - Artifacts



Wreck F Artifacts

Amphorae for wine, oil, and *garum*;

Petrologic analysis suggests origins in Spain and Italy for the wine, and Spain for the *garum*;

Flat bottomed amphorae probably carried *lomentum* – a blue pigment and powder made from soya bean and used as a detergent, cosmetic, and medicine; similar amphorae have been found at Pompeii;

Sets of coarse ware; well defined as cargo and packed separately, probably loaded at Carthage based on petrologic analysis.

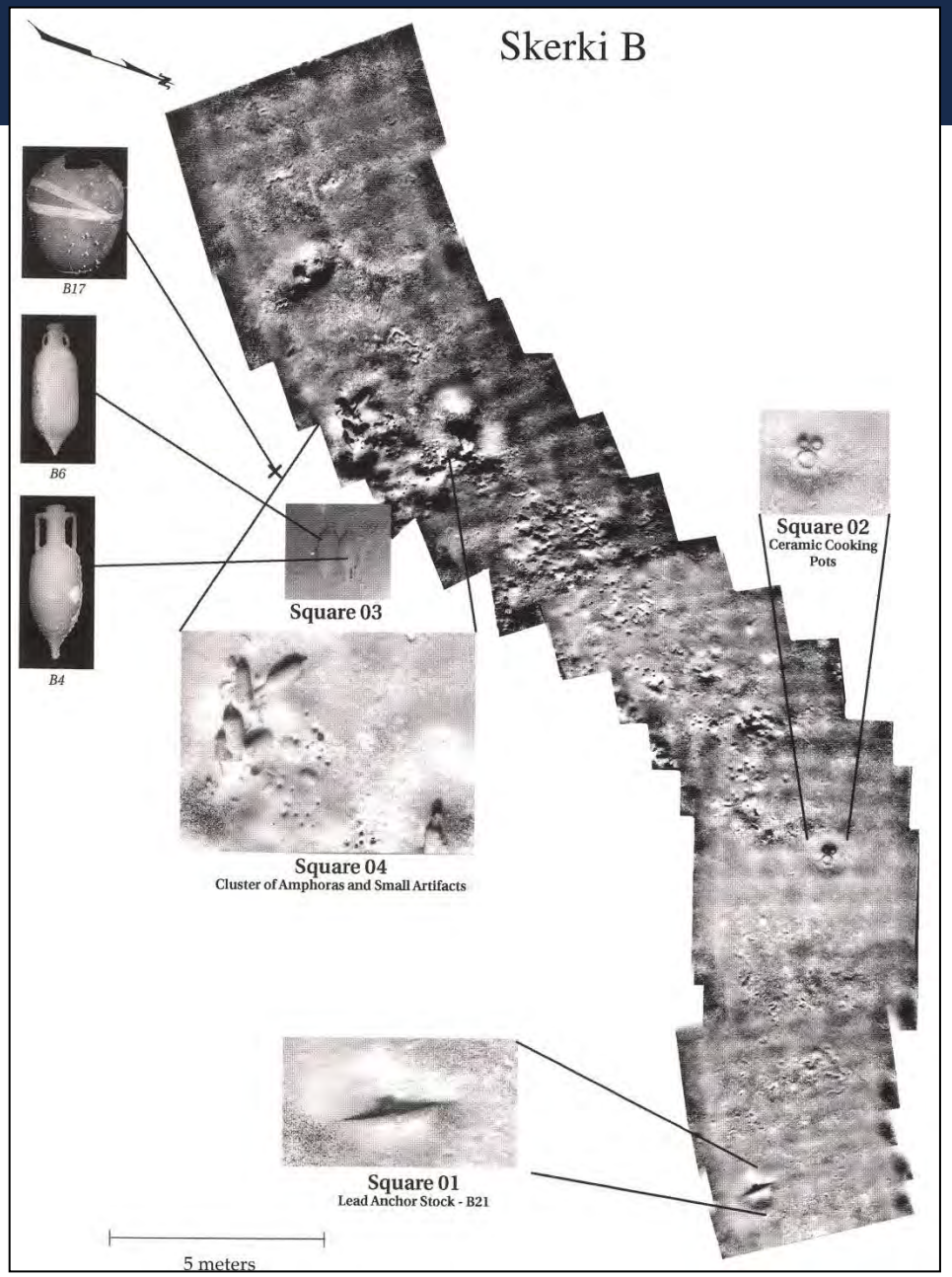
Wreck F - Artifacts

Wreck F - Artifacts

- Main cargo was high quality building stone roughed out for columns;
- Loaded before rest of cargo;
- Probably from the Aswan quarries and loaded in Alexandria;
- Then engaged in cabotage while it hugged the N. African coast and West Med.

Wreck B

- Dated to the last quarter of the 1st century AD;
- The site is 40 m long;
- Scattered artifacts;
- Fragments of hull planking found;
- Lead anchor stock.



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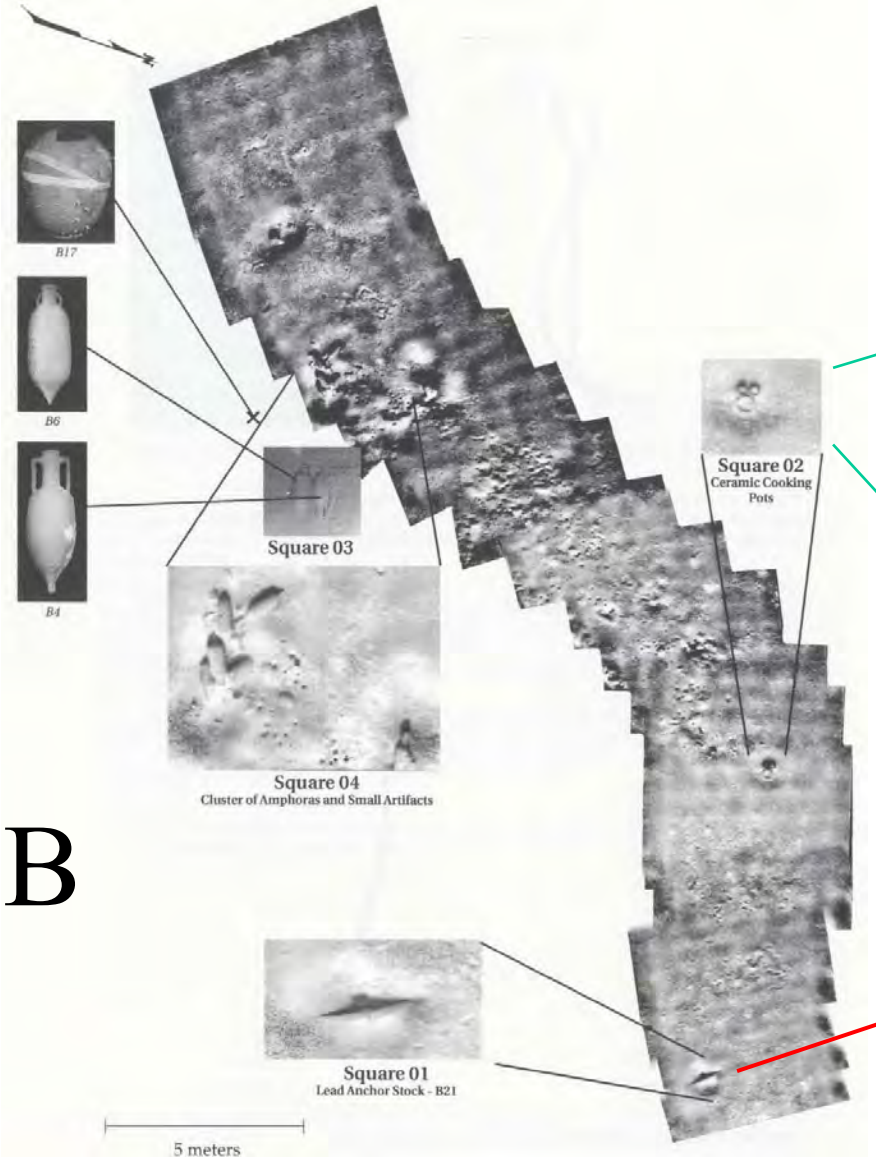
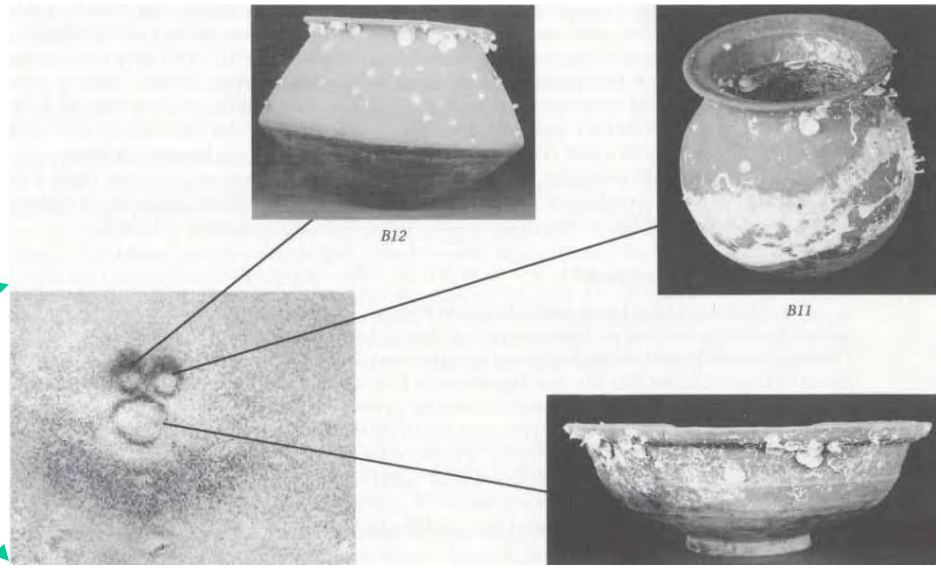
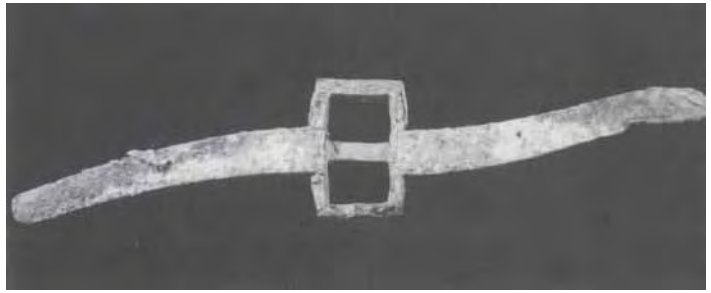




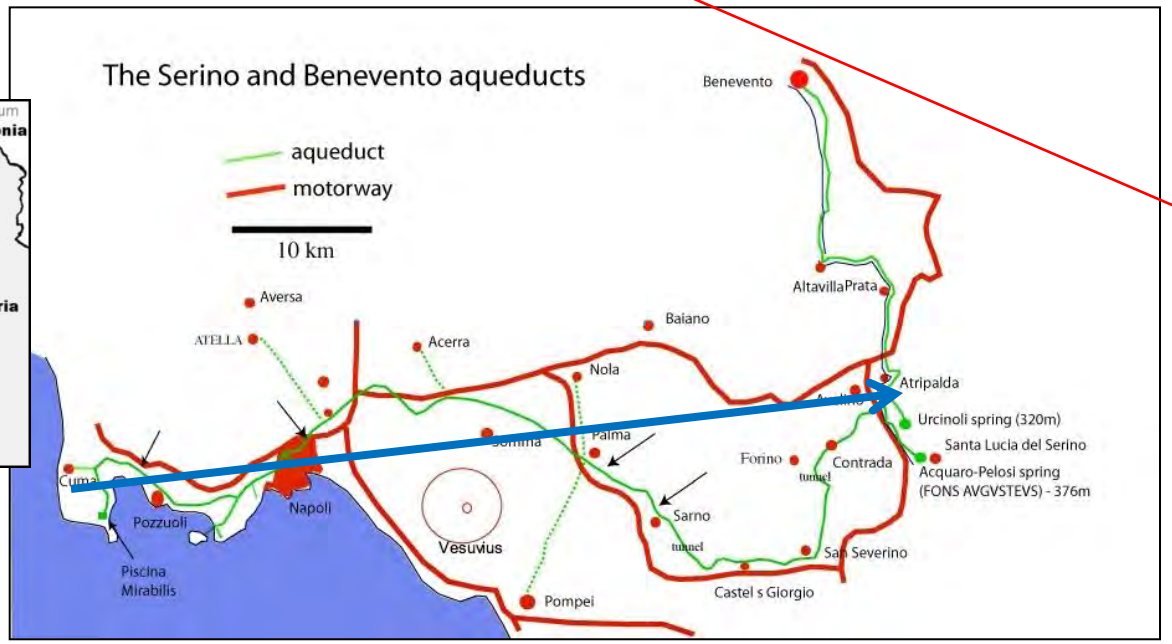


Wreck B

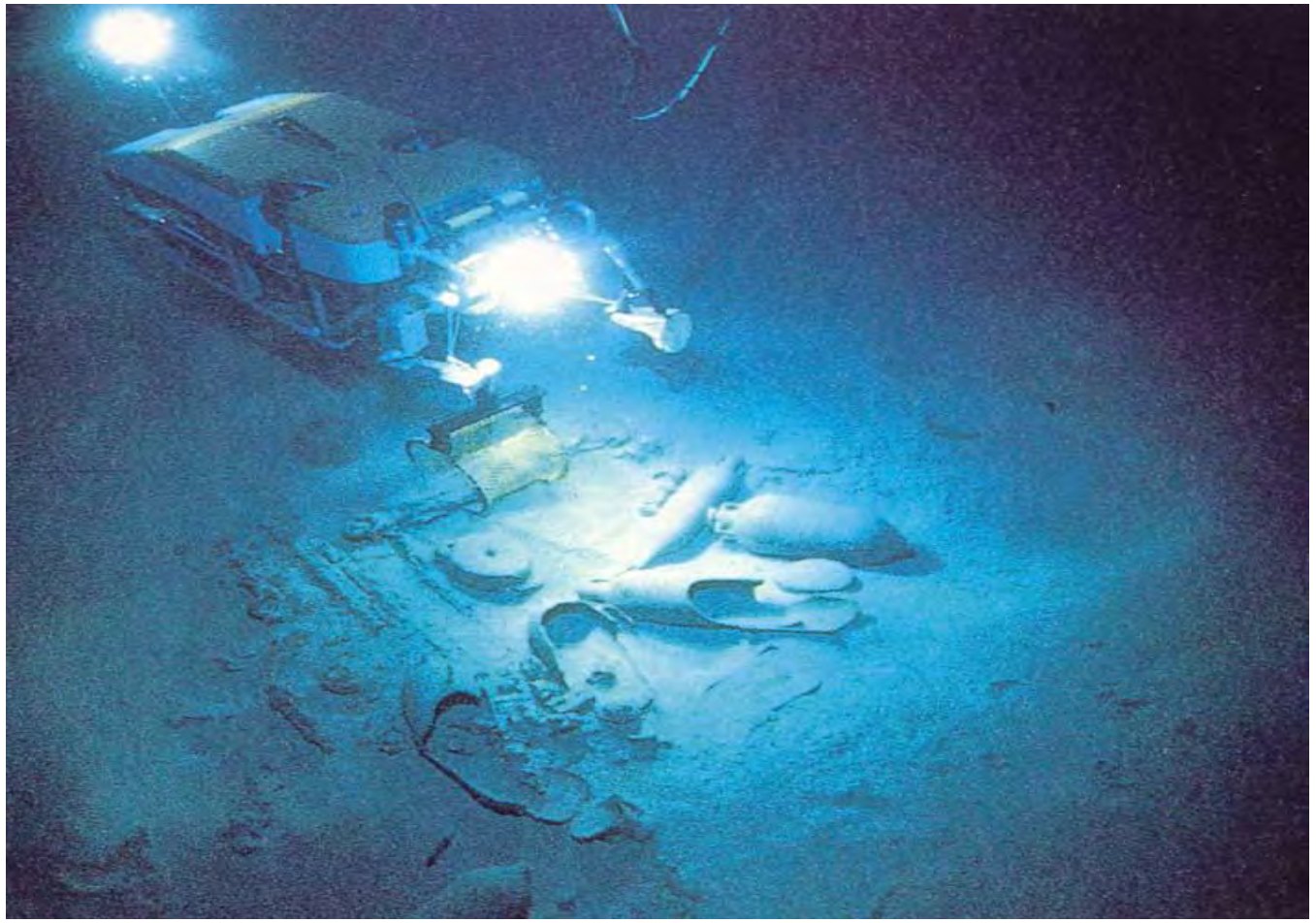
Wreck B Artifacts

Case Studies: Skerki Bank

- Primary cargo seems to have been wine amphorae from Campania, Egypt, and Crete;
- It carried also oil from Tripolitania;
- A lamp and common ware used by crew come from central Italy;
- It probably set sail from Puteoli (Naples) and was doing cabotage trade in the western Mediterranean.



Isis Shipwreck



Isis (4th century AD)

- Discovered in 1988, nicknamed *Isis* after the Egyptian goddess;
- Artifacts scattered;
- Possibly 12 to 15 m long, with a cargo capacity of 30 to 35 tons;
- Had 3 or 4 iron anchors;
- In an iron anchor concretion were found grains of wheat and barley;
- It was possibly a small merchantman, managed by an independent entrepreneur…

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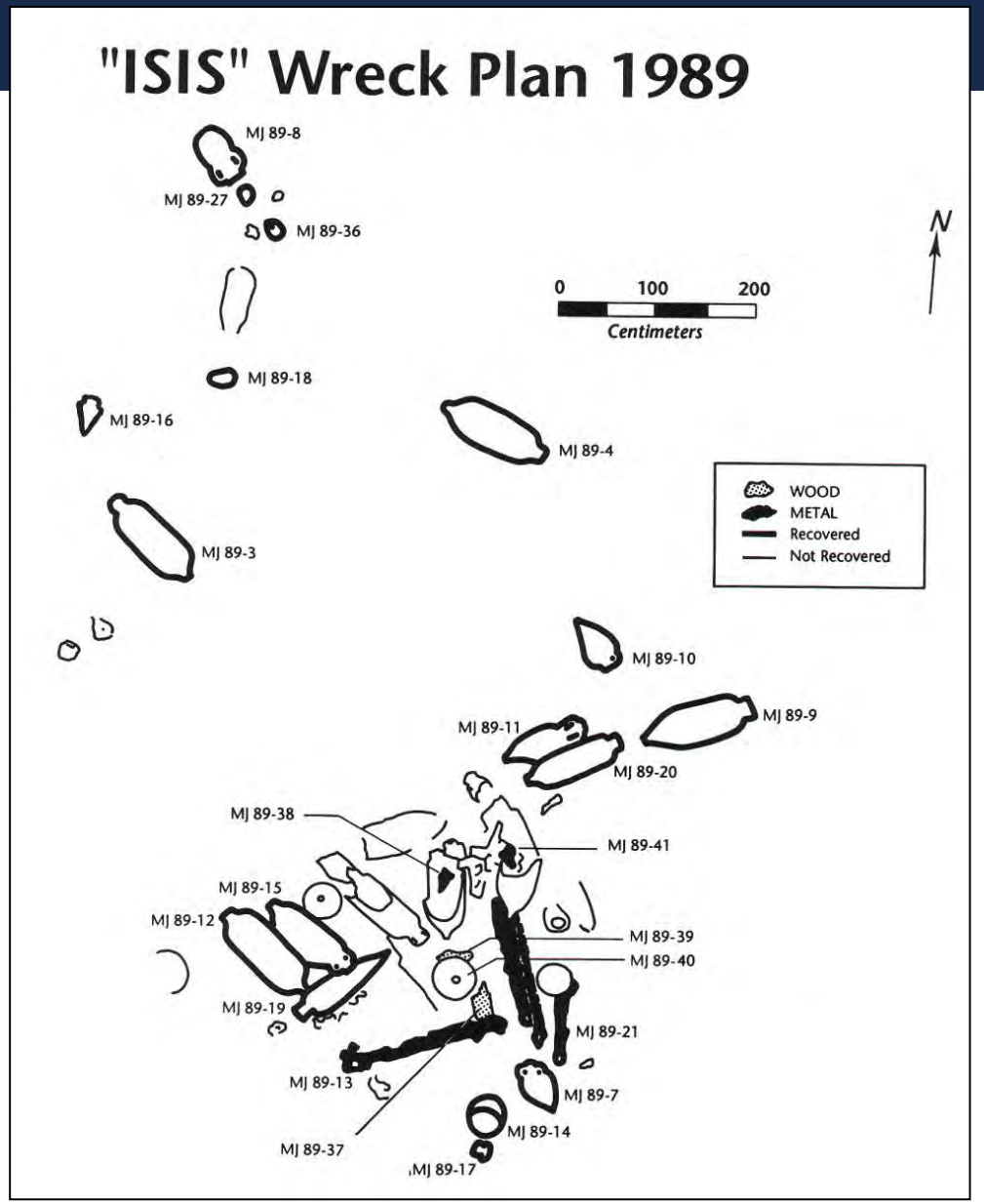

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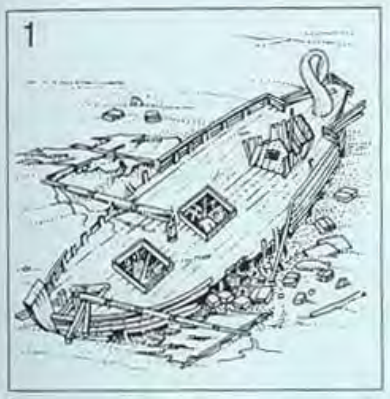
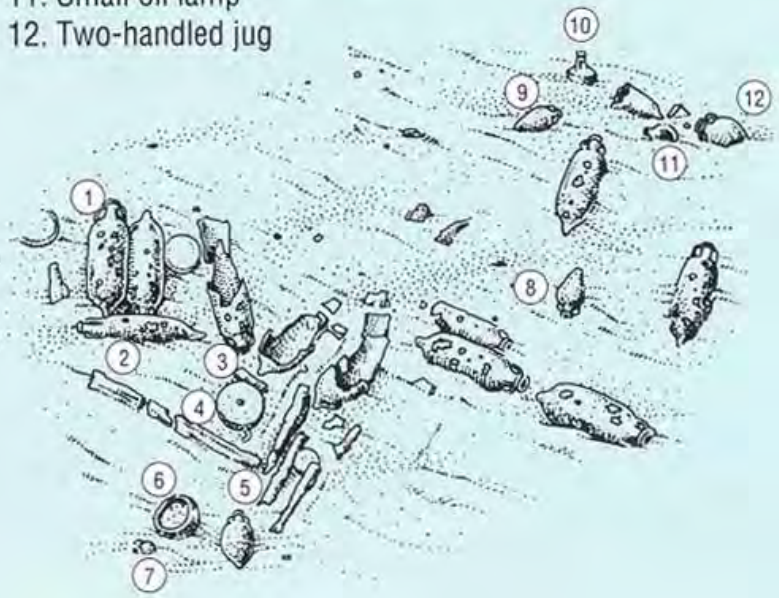


What happens to a ship after it sinks?

1. This picture shows the remains of the *Isis* and its cargo right after sinking.
2. One thousand years later, the leopard, the sails, ropes, cloth goods, sacks of grain, and much of the wood of the ship have disappeared, devoured by marine organisms. Other substances have decomposed more slowly.
3. More than 1,600 years later, very little wood remains, although much more may lie buried beneath the sediment where there are fewer wood-eating marine organisms. Possibly large slabs of marble, ivory and ebony lie beneath the sediment too. The grindstone has survived. Many amphoras and some of the everyday pottery are still intact, although some pieces have been broken by the movement of the seawater or sediment. Corals and other sea life have found a home by clinging to the surface of the pottery.

3 The *Isis* wreck site

1. Amphora—Africana Grande
2. Amphora—Africana Piccolo
3. Remains of metal with wood from ship.
4. Grindstone
5. Metal remains—possibly part of an iron cage,a grill from a stove or an iron anchor.
6. Pot
7. Cup
8. Flat-bottomed amphora
9. Small amphora—may have stood in a tripod and held wine.
10. Jug—possibly for garum.
11. Small oil lamp
12. Two-handled jug



Isis - Artifacts

- Possible cargo of grain;
- 10 amphorae: from Tunisia and Calabria.

Case Studies: Skerki Bank

Isis - Artifacts

- Cooking pot filled with pine tar; different from other pine tars in Roman world - used for caulking.

Isis - Artifacts

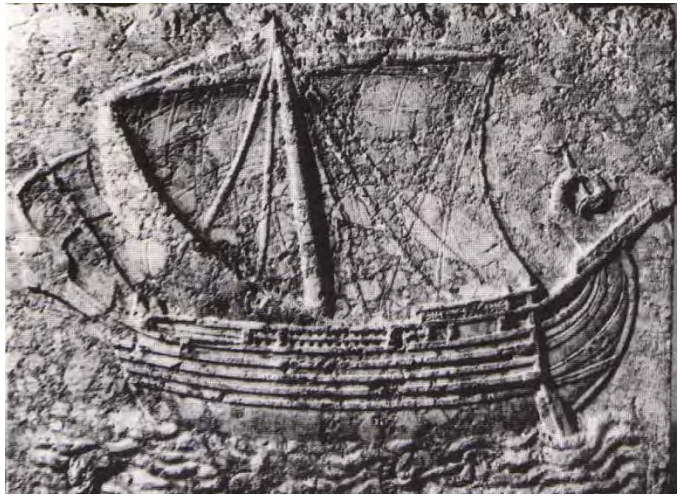
Coin found inside cooking pot (from Constantinus II) provides *terminus post quem* of 355-361. Coin on the left is an equivalent, but in better condition.

Isis - Ship Remains

- Cedar - Deck Plank;
- White Oak - Deck Beam and Tenons;
- Pine - Strake or Plank;
- Pear - Frame or Futtock piece;
- Mortise and tenon construction;
- Iron nails;
- Lead patches;

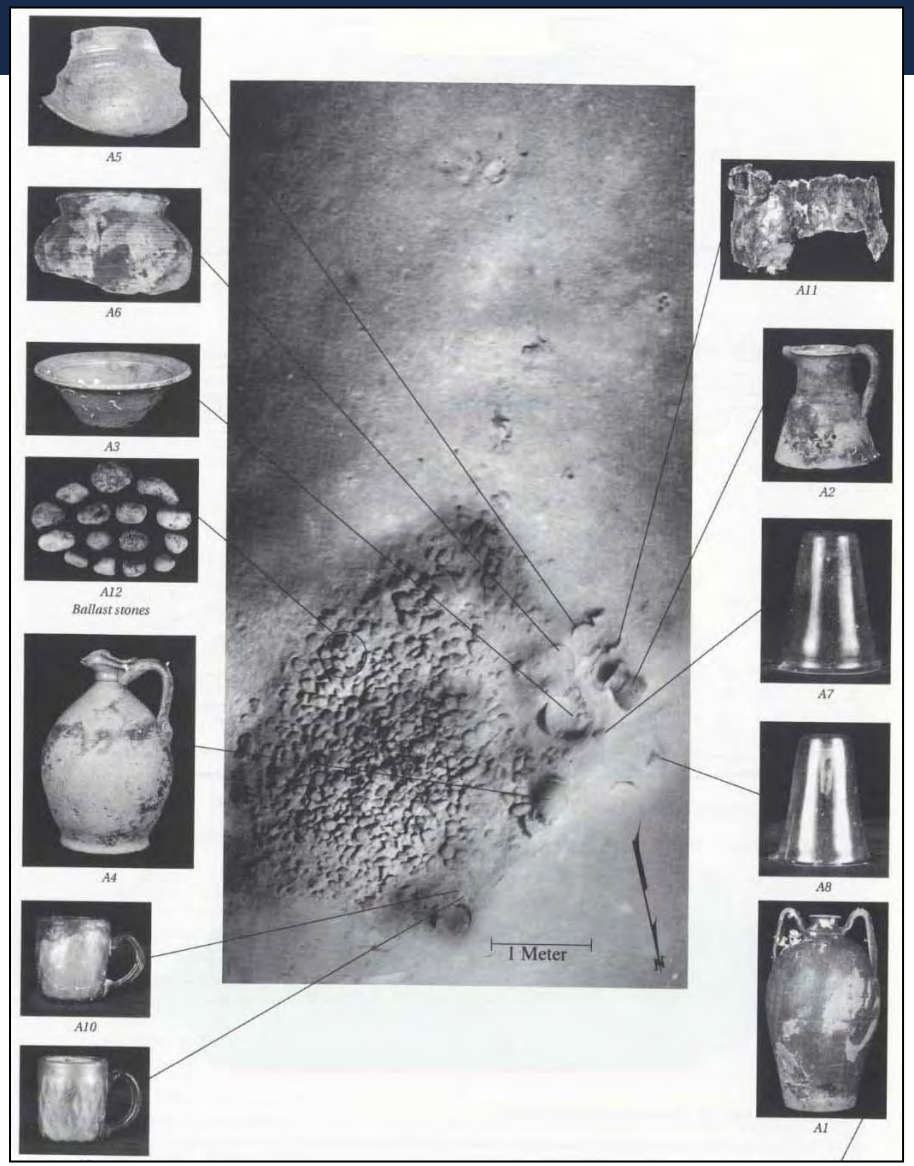
Case Studies: Skerki Bank

So, what did these ships look like?



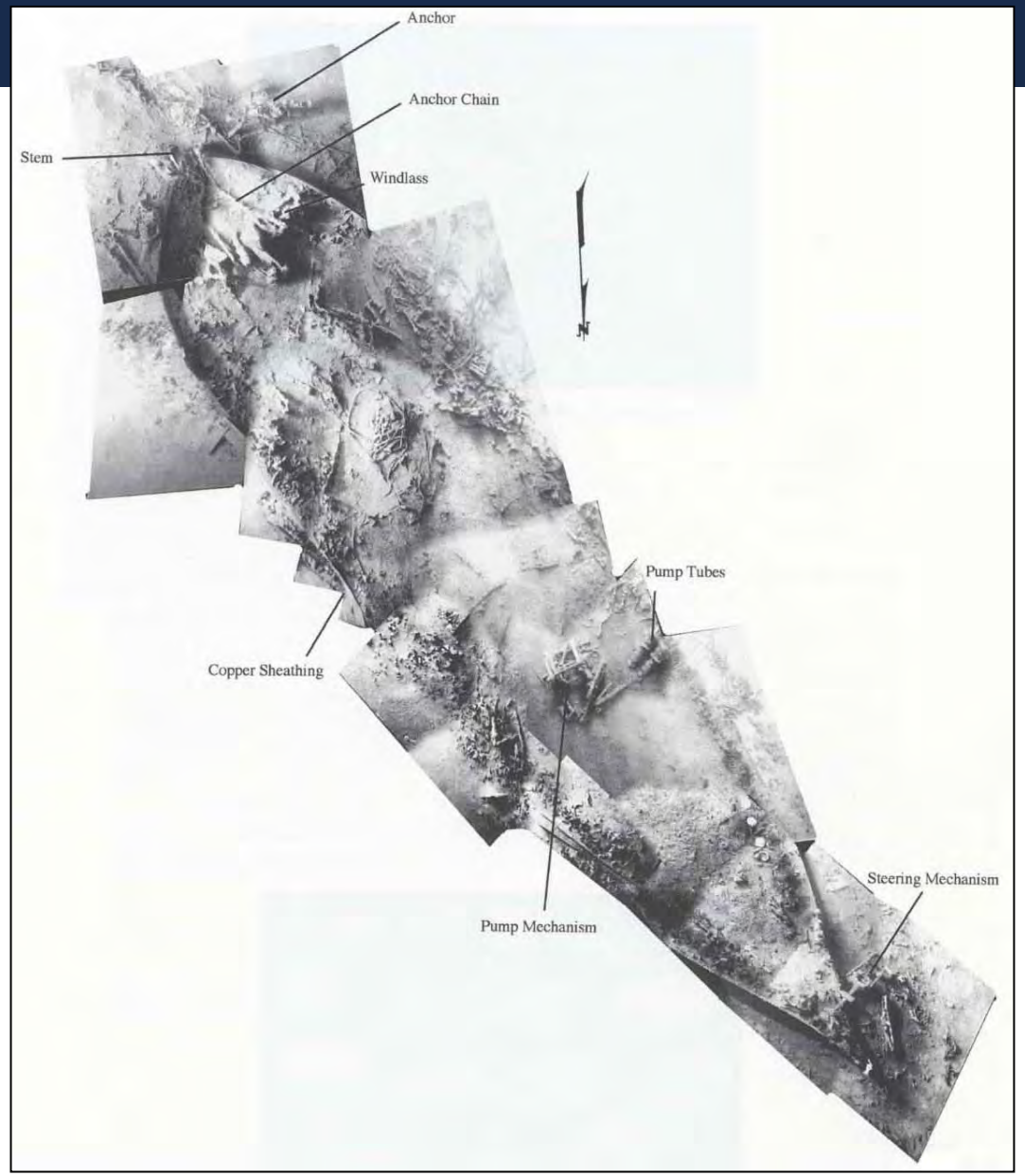
Wreck A

- Islamic, dated to c. 1800;
- Probably a relatively small vessel;
- Not much has been published about it.



Wreck C

- Dated to c. 1900;
- Wooden sailing vessel;
- Not much has been published about it.

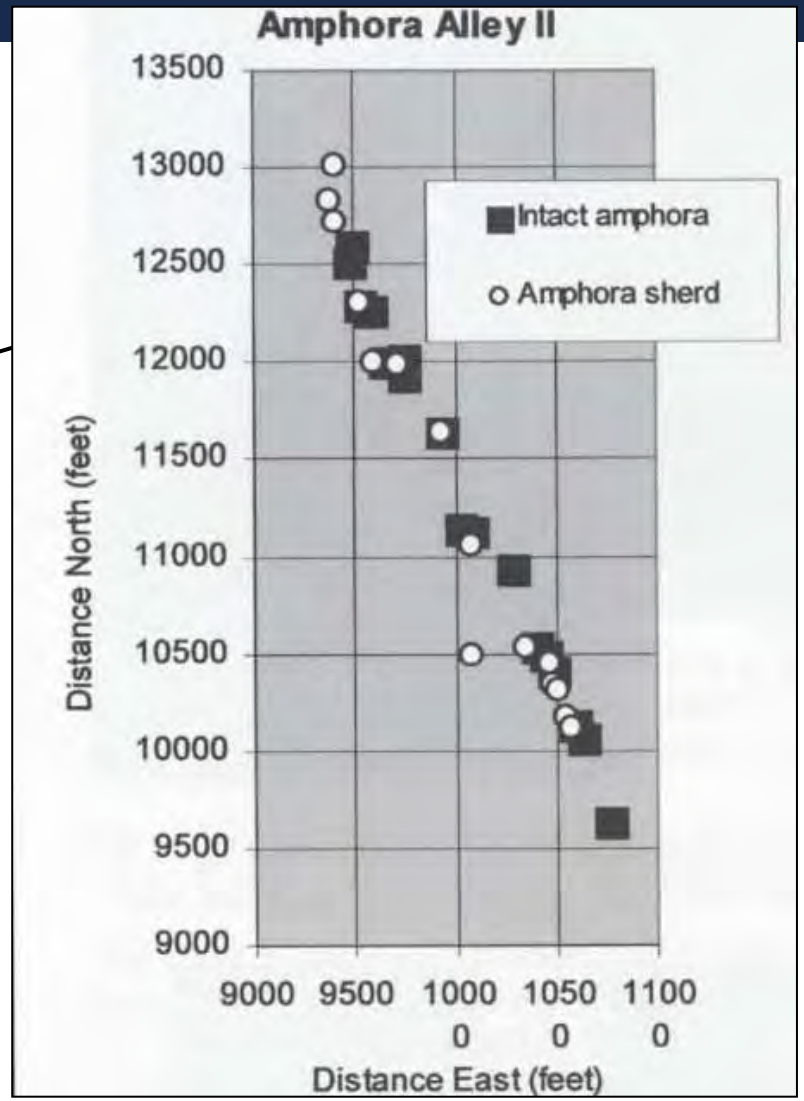


Wreck E

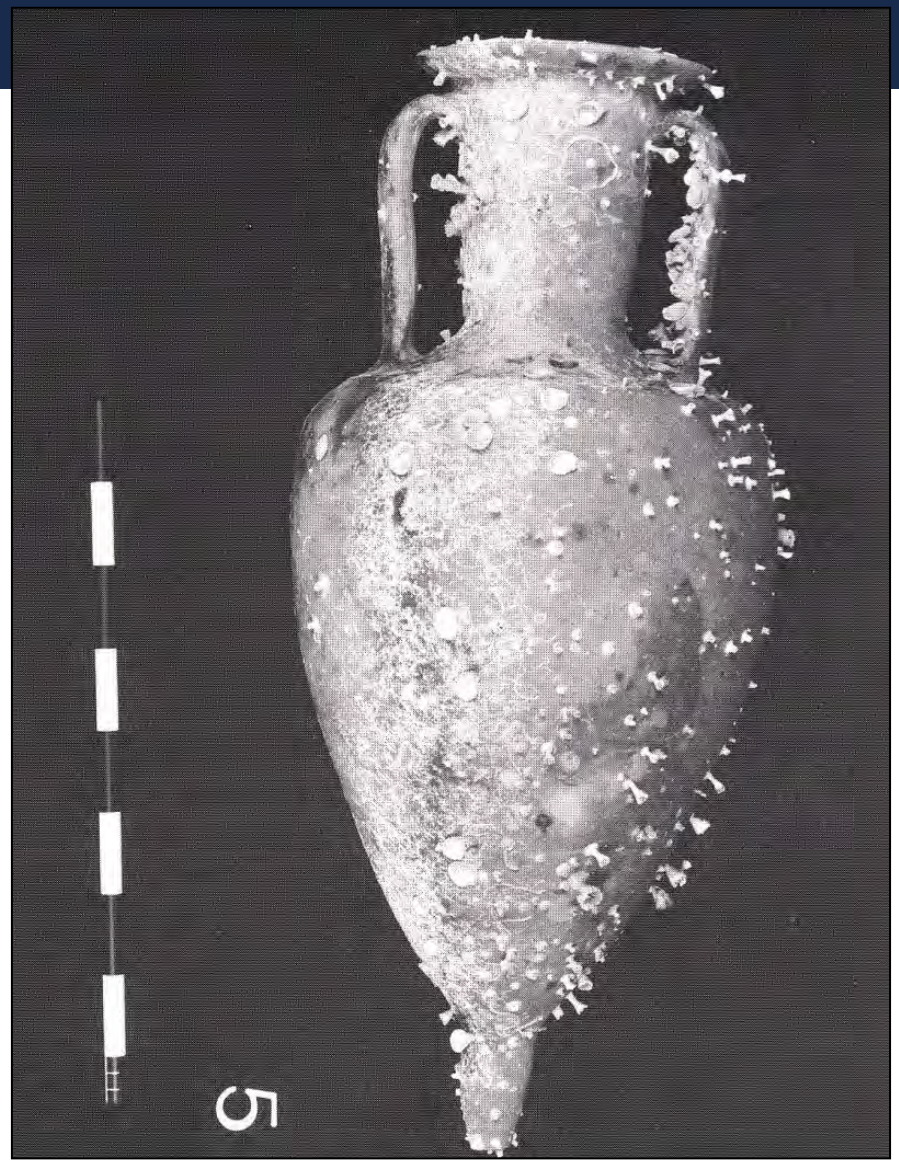
- Dated to c. 1900;
- Wooden sailing vessel;
- Not much has been published about it.

"Amphora Alleys I and II"

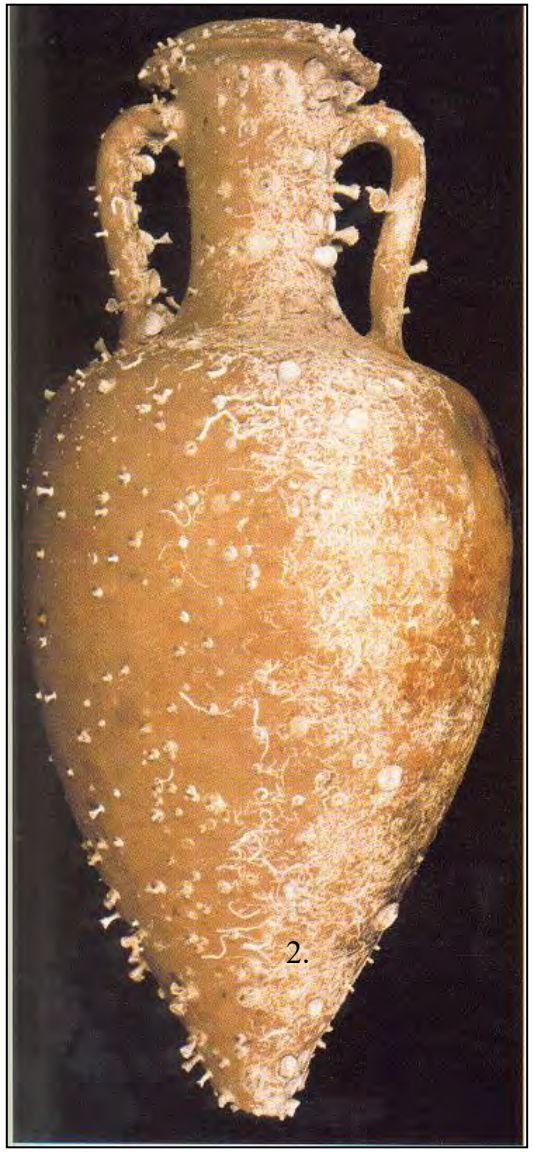
Amphora Alley I



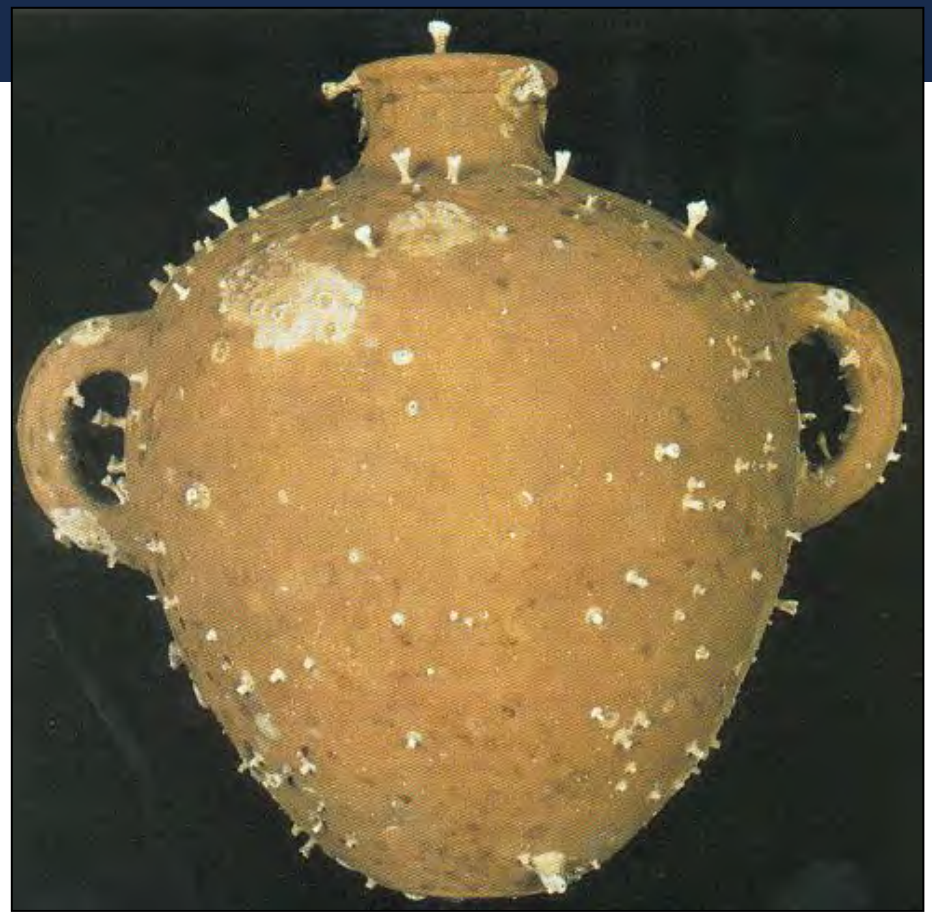
3rd century BC Amphorae



Isolated Amphora Finds



2.



1.

1. “Graeco-Italic” amphora from Cosa, Probably contained wine. Late third century B.C.
2. Medieval Islamic amphora from northern Palestine, c. A.D. 850-1115.

In Sum

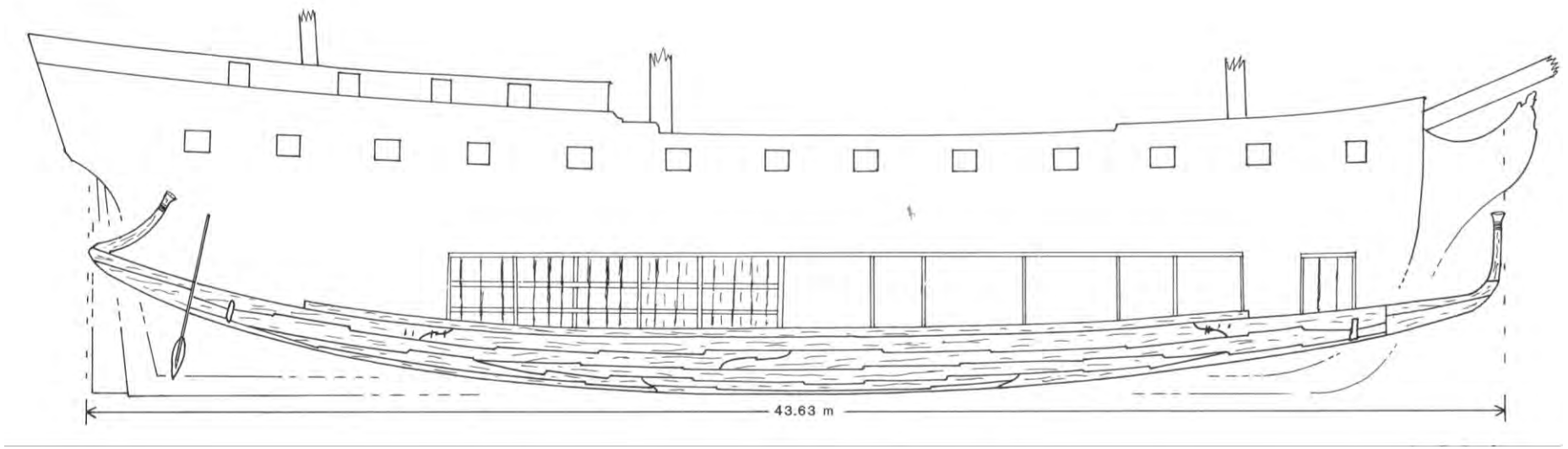
- Only the six oldest of the eight shipwrecks were surveyed with greater detail;
- ISIS and Skerki A, B, D, F and G;
- JASON and MEDEA were used on these shipwrecks to recover artifacts and map the wreck sites.

In Sum

- Carthage-Rome trade route located;
- Possible evidence for an east-west route;
- Small merchantmen with varied cargoes engaged in cabotage;
- Interdisciplinary approach proved valuable;
- Technology used achieved incredible levels in oceanographic mapping and precision survey, but as far as archaeology goes…

Case Studies: Skerki Bank

Can we infer anything from the Skerki bank shipwrecks in relation to ship sizes and typologies in the early Middle Ages?



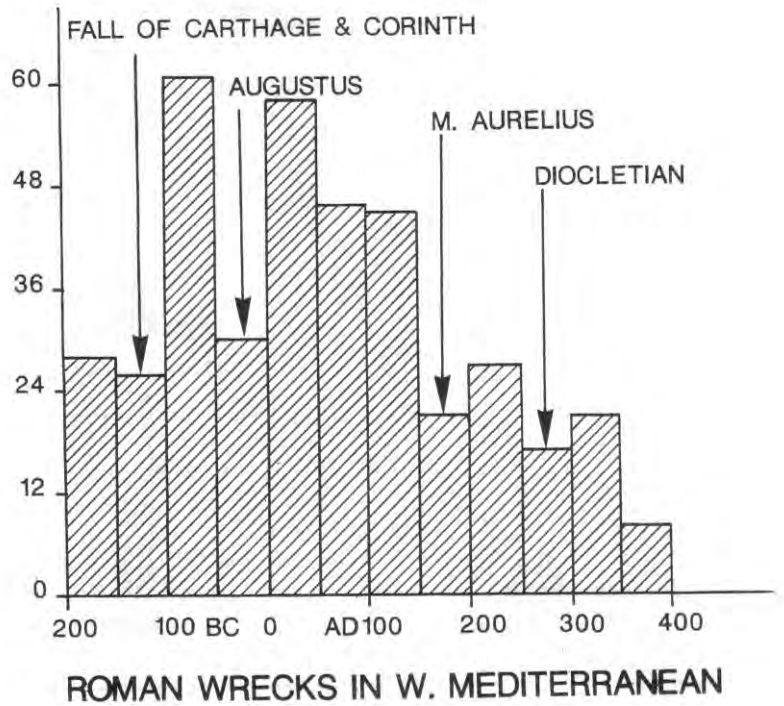
Case Studies: Skerki Bank

A researcher named A. J. Parker gathered all the available data on Roman and Medieval (1992).

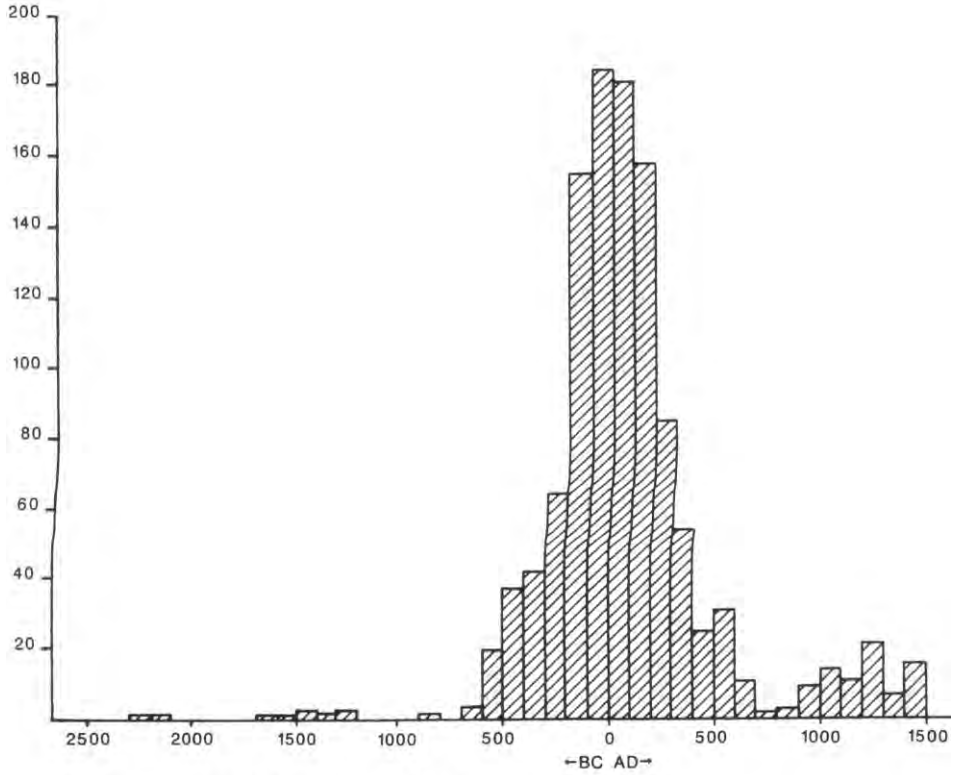
Of a total of 290 shipwrecks only the size of 45 can be estimated.

Date	Century	Name	Country	Hull Size	Cargo or Use
200	3	Capo Taormina	Italy	90-100t	marble
200	3	Cervia	Italy	12-15m	construction materials
200	3	Fiumicino H	Italy	4.4m	
200	3	Fiumicino K	Italy	22m	
205	3	Punta Scifo A	Italy	30-35m	stone blocks
212	3	Giglio Porto	Italy	30m	amphorae
225	3	Marzamemi A	Italy	172t	amphorae, stone
225	3	Methone C	Greece	130t	amphorae, marble
225	3	Monaco A	Monaco	15m	amphora
250	3	Capo Granitola A	Italy	350t	marble blocks
250	3	Giardini	Italy	95t	marble blocks
250	3	Punta Ala	Italy	25m	amphorae
250	3	Torre Castellucia A	Italy	17m	warship
300	4	Fiumicnio D	Italy	12m	
300	4	Fiumicnio G	Italy	24m	
300	4	Isola Delle Correnti	Italy	350t	marble
310	4	Cap Blanc	Spain	16m	amphorae
312	4	Lugue B	France	20m	amphorae and lamps
325	4	Sobra	Croatia	25m	amphorae
350	4	Fiumicnio B	Italy	11.5m	
350	4	Fiumicino C	Italy	13.5m	
350	4	Fiumicino F	Italy	21-22m	
375	4	Acque Chiare	Italy	50m	amphorae
400	5	Dramont F	France	10-12m	amphorae
400	5	Port-Vendres A	France	18-20m	amphorae
400	5	Yassi Ada B	Turkey	20m	amphorae
422	5	Dramont E	France	15-18m	amphorae
550	6	Tantura A	Israel	12m	
587	6	Iskandil Burnu A	Turkey	20m	amphorae
612	7	Saint Gervais B	France	15-18m	wheat
625	7	Pantano Longarini	Italy	30m	
627	7	Yassi Ada A	Turkey	20m	amphorae
870	9	Bozburun	Turkey	20m	amphorae
950	10	Agay	France	20-25m	amphorae
950	10	Bataiguier	France	20m	amphoarae
1025	11	Serci Lamani A	Turkey	14m	glass
1075	11	Nin B	Croatia	9m	
1150	12	Camarina C	Italy	25-30m	galley
1150	12	Pelagos	Greece	100t	pottery, mill-stone
1175	12	Marsala A	Italy	15m	
1175	12	Marsala B	Italy	12m	
1200	13	Brindisi	Italy	20m	amphorae
1225	13	Contarina	Italy	21m	no cargo
1350	14	Emploi	Italy	11m	
1400	15	Pomposa	Italy	50m	
1475	15	Logonovo	Italy	10m	

Case Studies: Skerki Bank



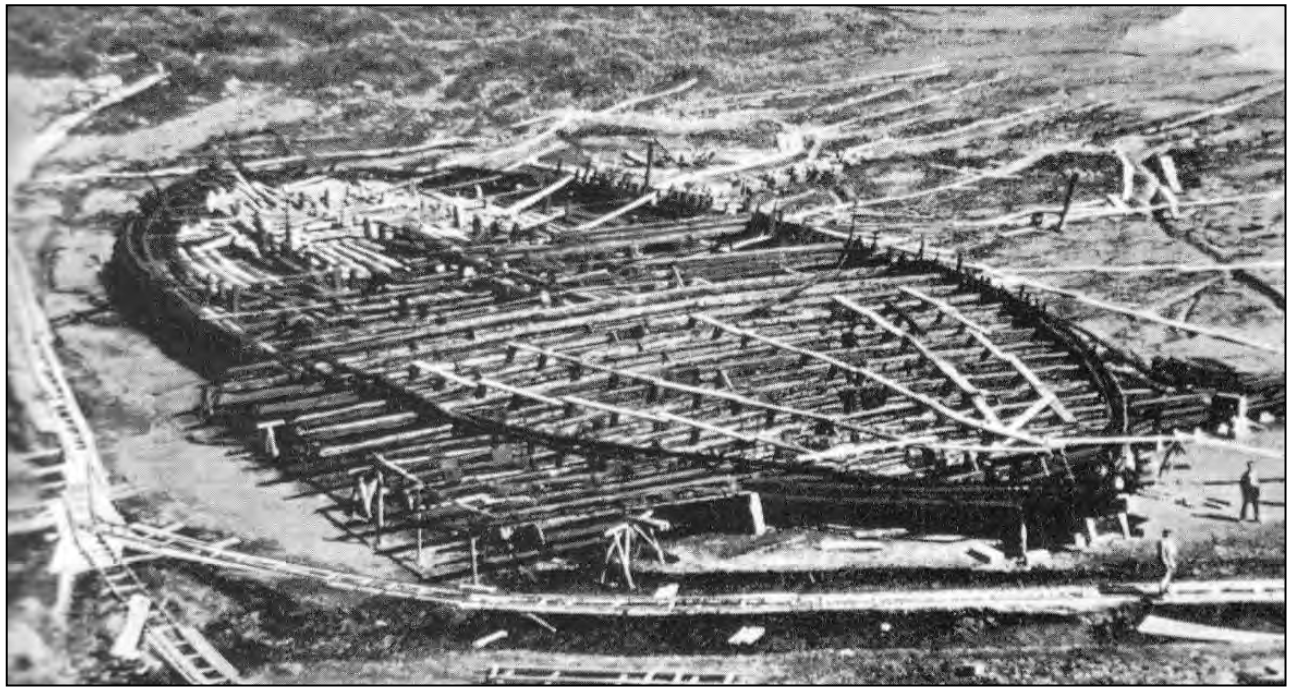
ROMAN WRECKS IN W. MEDITERRANEAN



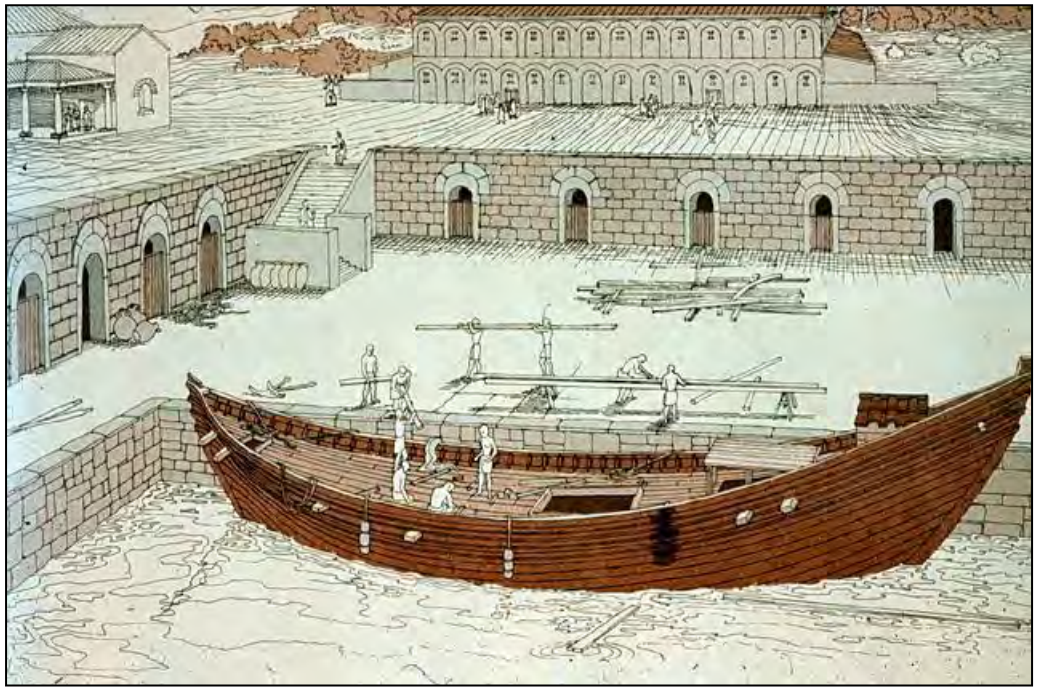
Mediterranean Wrecks by Century

As it should be expected, a clear pattern emerges from the data: the number and size of the ships is related to the health of the economy, and the safety of the environment.

Case Studies: Skerki Bank



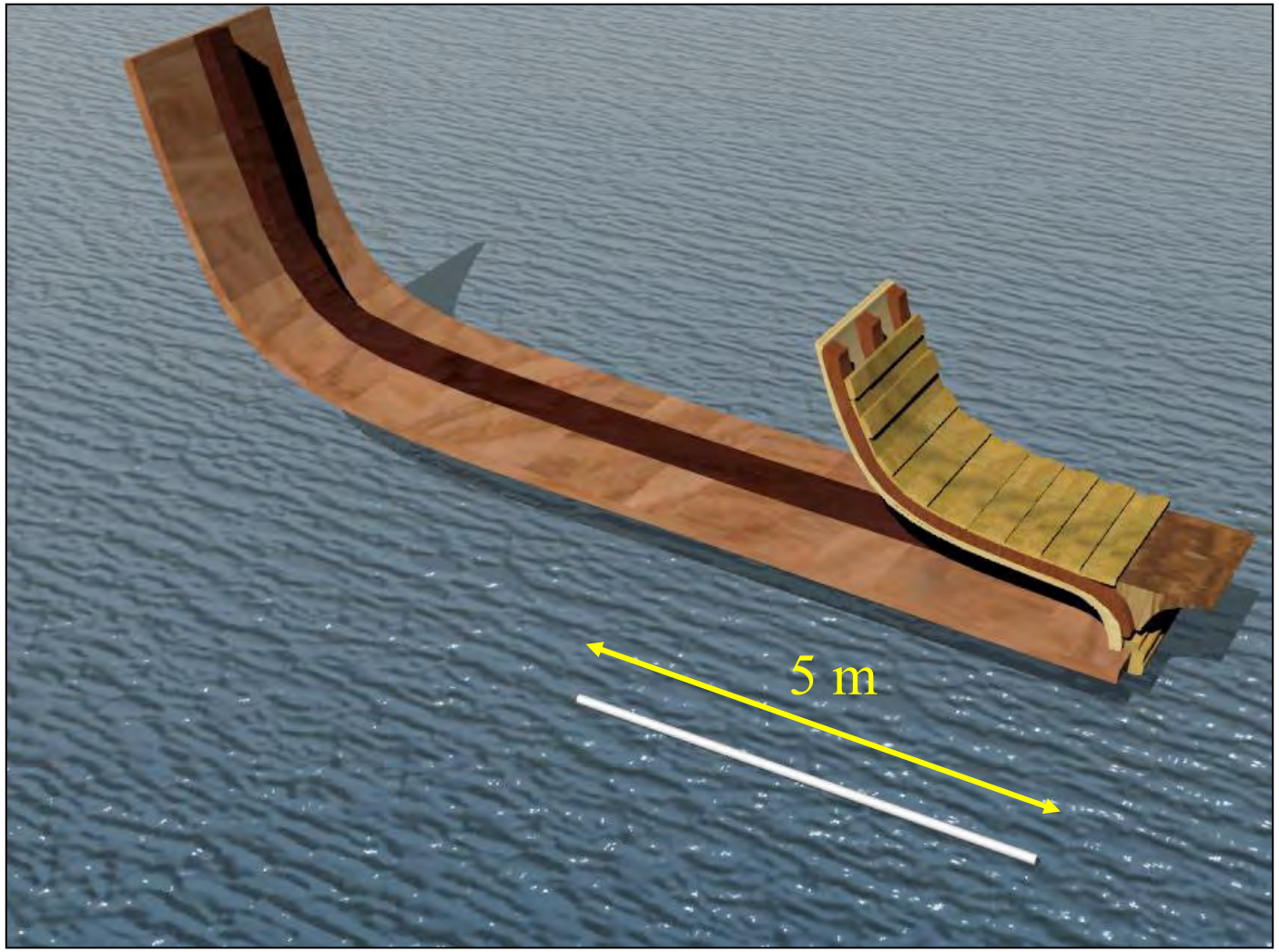
One of Nero's (AD 37-68) floating palaces found on the bottom of Lake Nemi.



Small Byzantine trader of the 7th century found at Yassıada.

Case Studies: Skerki Bank

100 BC to AD 200
Large ships:
Nemi Barge (a palace) &
Madrague de Giens (a large merchantman)



Roman Empire

- Agrarian economy:
  - government subsidies;
  - Long distance trade.

- Large ships in grain trade: Alexandria to Rome:
  - Grain carriers were 65 -325 tons;
  - Obelisk ship at least 40 m in length.

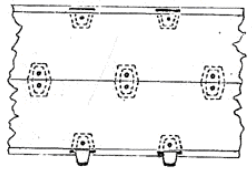
Late Roman Empire

(AD 300 to 600)

- Luxury goods
  - Speed important, not size.
- Decline in population
  - War and plague.
  - No government subsidies.
- Decline in Roads
  - Increase transportation on sea.

Case Studies: Skerki Bank

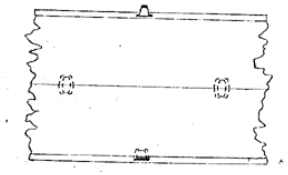
Yassi Ada 4th C.

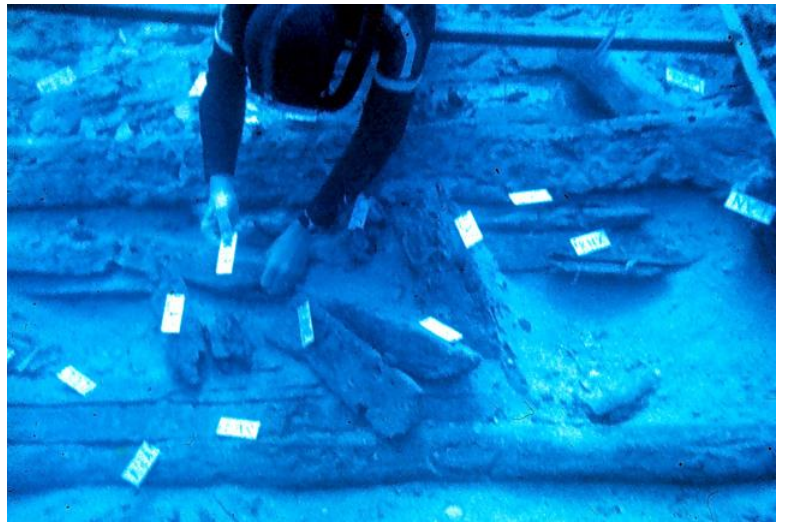


- 19 m
- 1,100 amphorae

Yassi Ada 7th C.

- 21 m
- 900 amphorae
- 60 tons?





- Palestinian monk: ships of 120-200 tons considered large for period; 40 tons was possibly the average size…

Byzantine Naval Ships

- According to their possibility, always aiming at the need to try to maintain order in Mediterranean;
- After Anastasius I (AD 430-518) development of certain types of larger naval ships:
  - Dromon: crew of 100, 40-50m
  - Ousiakos: crew of 108
  - Pamphylos: crew of 162

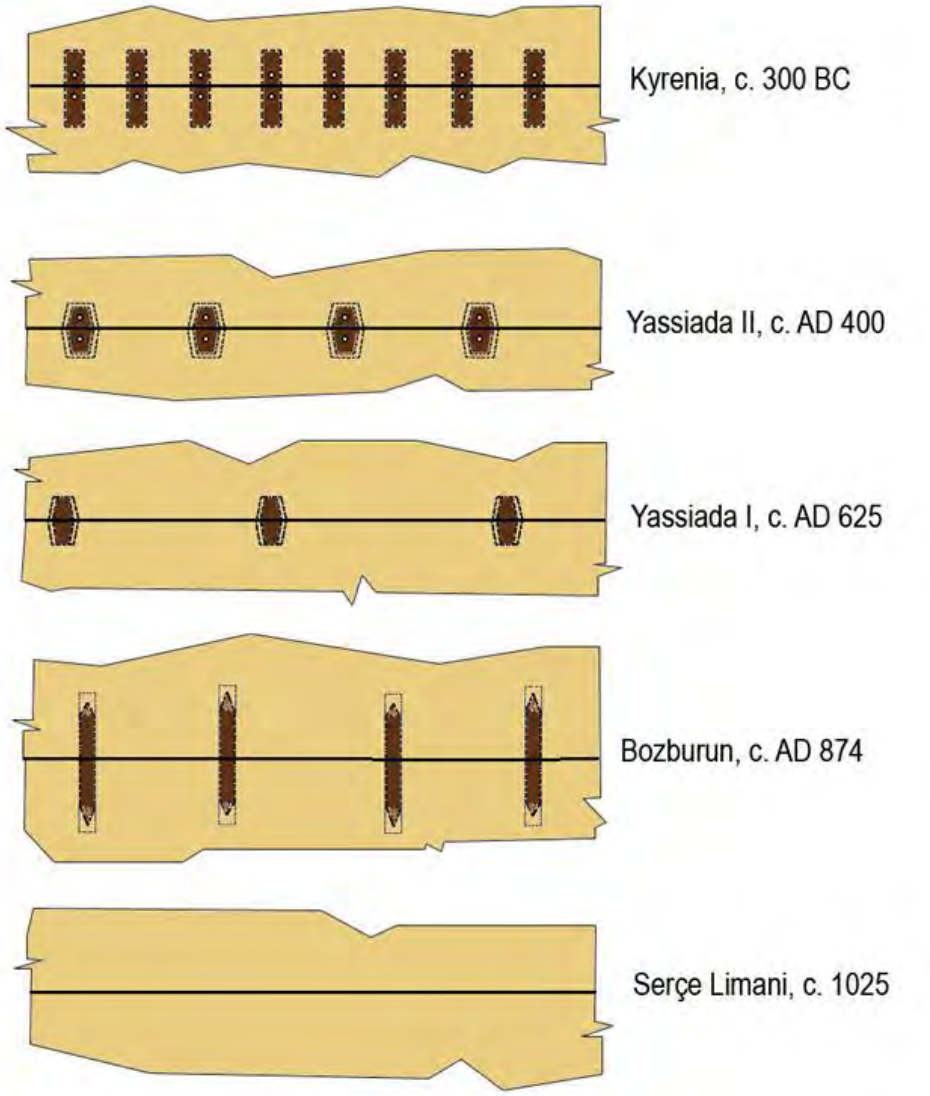
Middle Ages: Arab attacks

- ↓ governmental protection, ↑ piracy, ↓ trade

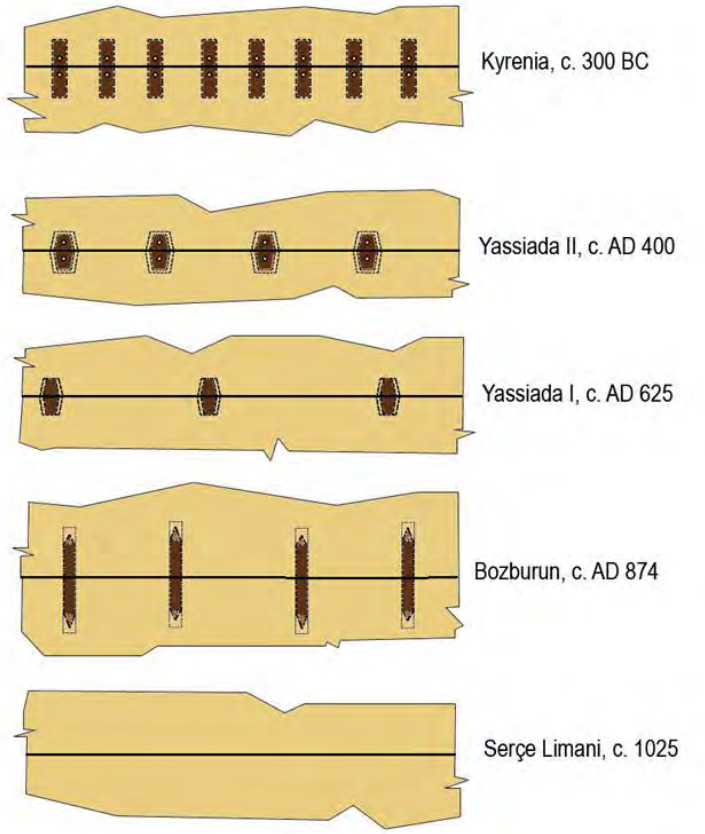
- Roller Coaster Ride
  - –717 Arabs threaten Constantinople: ↓ trade
  - –827 Arabs conquer Crete: ↓ trade
  - –878 Arabs seize Sicily: ↓ trade
  - –961: Byzantines recapture Crete/Cyprus: ↑ ship size
    - –Pamphylon: 200-300 men
    - –Larger galleys: 1000 + men
    - –Fueled by religious pilgrimages to Holy Land

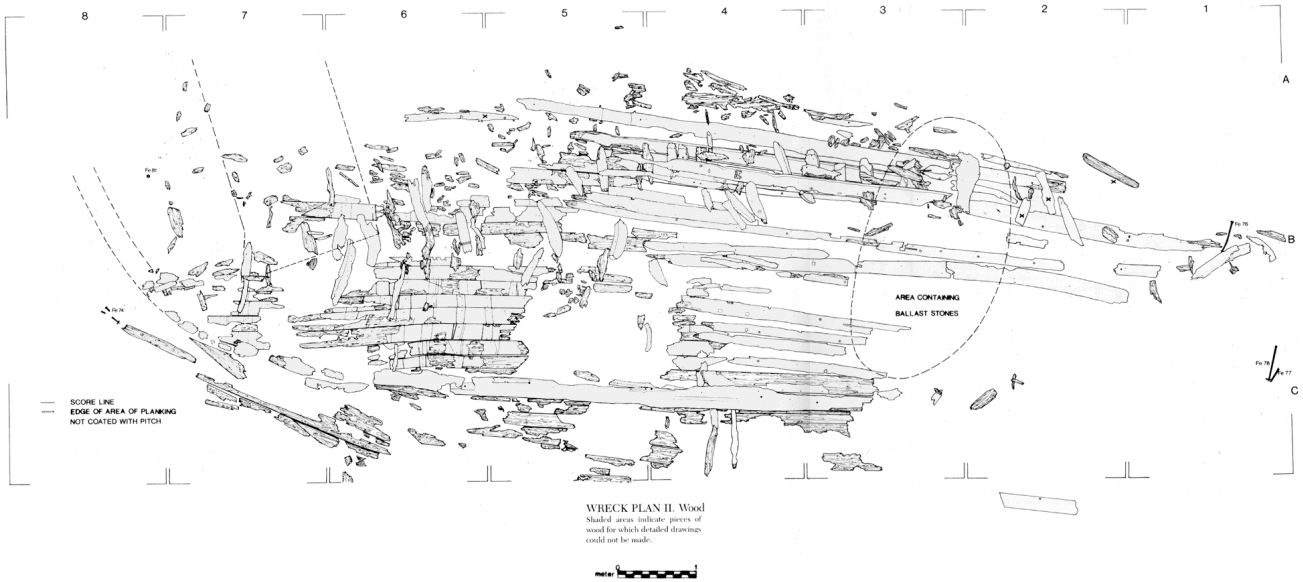
Case Studies: Skerki Bank

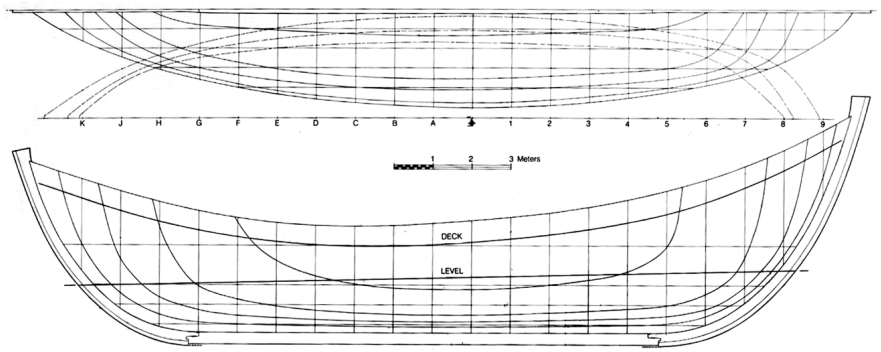
Less slaves possibly meant less skilled labor to build mortise and tenon ships, and perhaps is the main cause for the transition to frame-based construction.

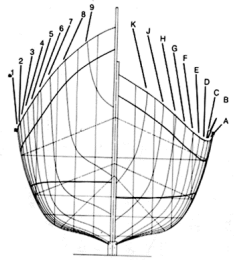


Case Studies: Skerki Bank

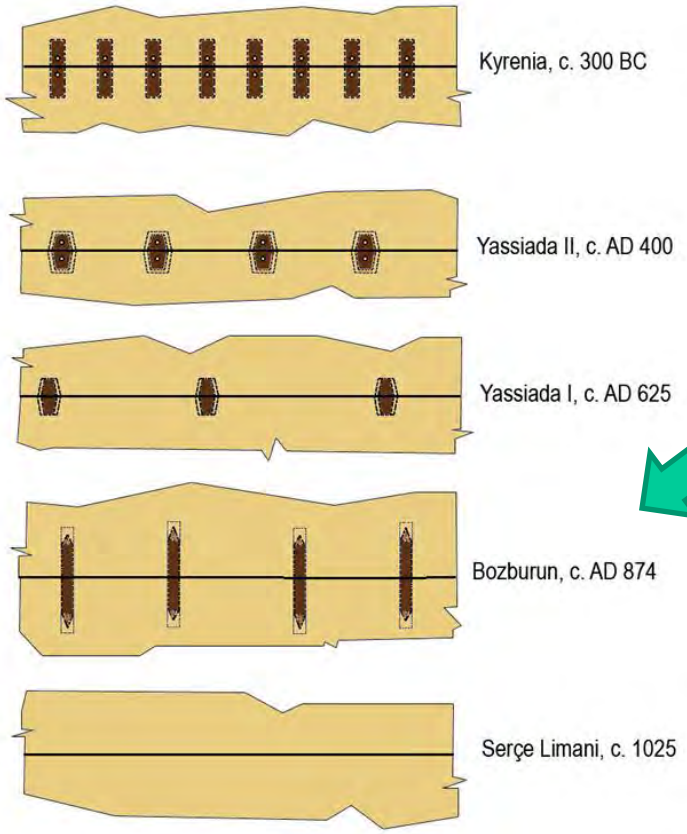


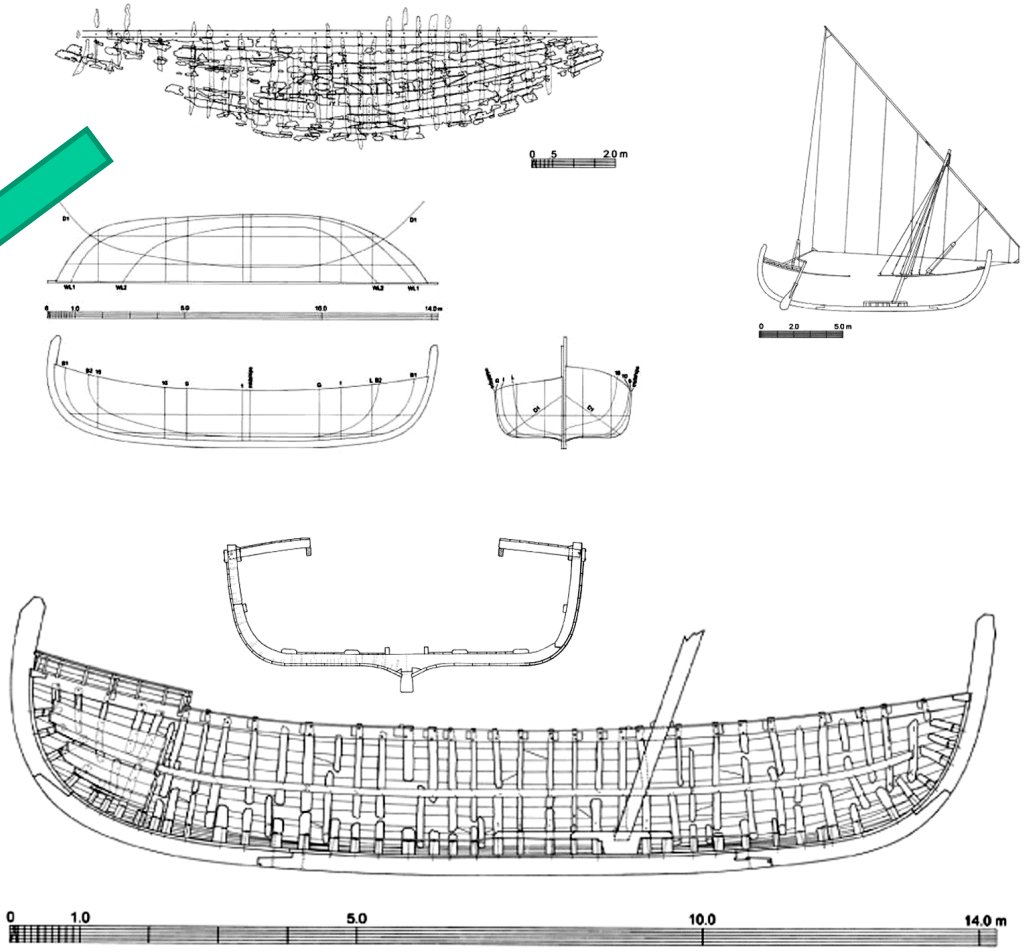






Case Studies: Skerki Bank





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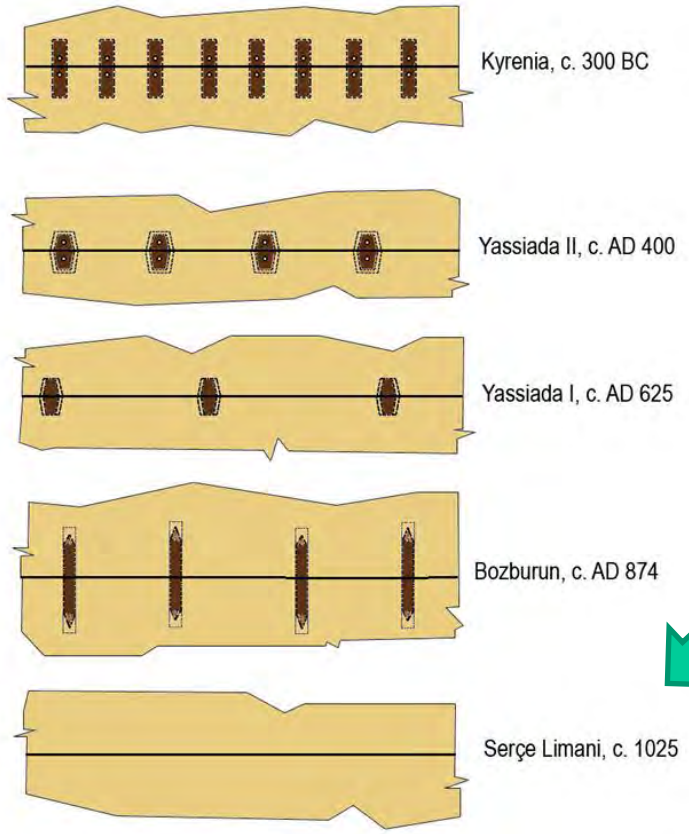

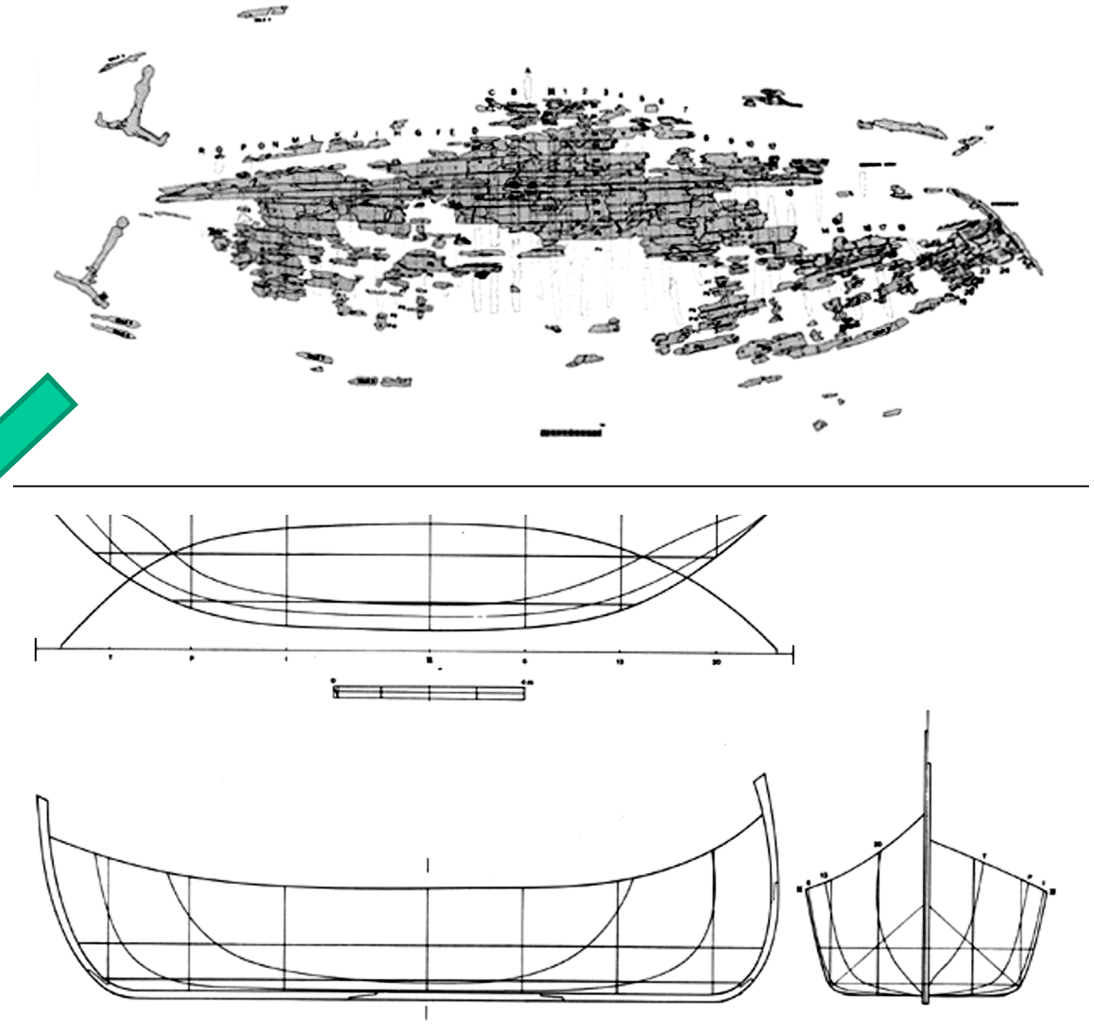

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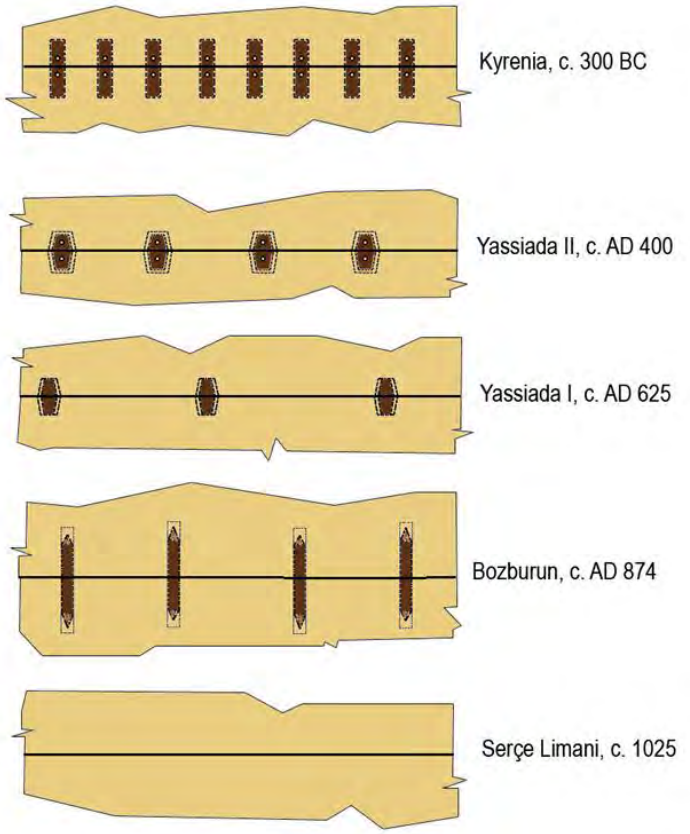

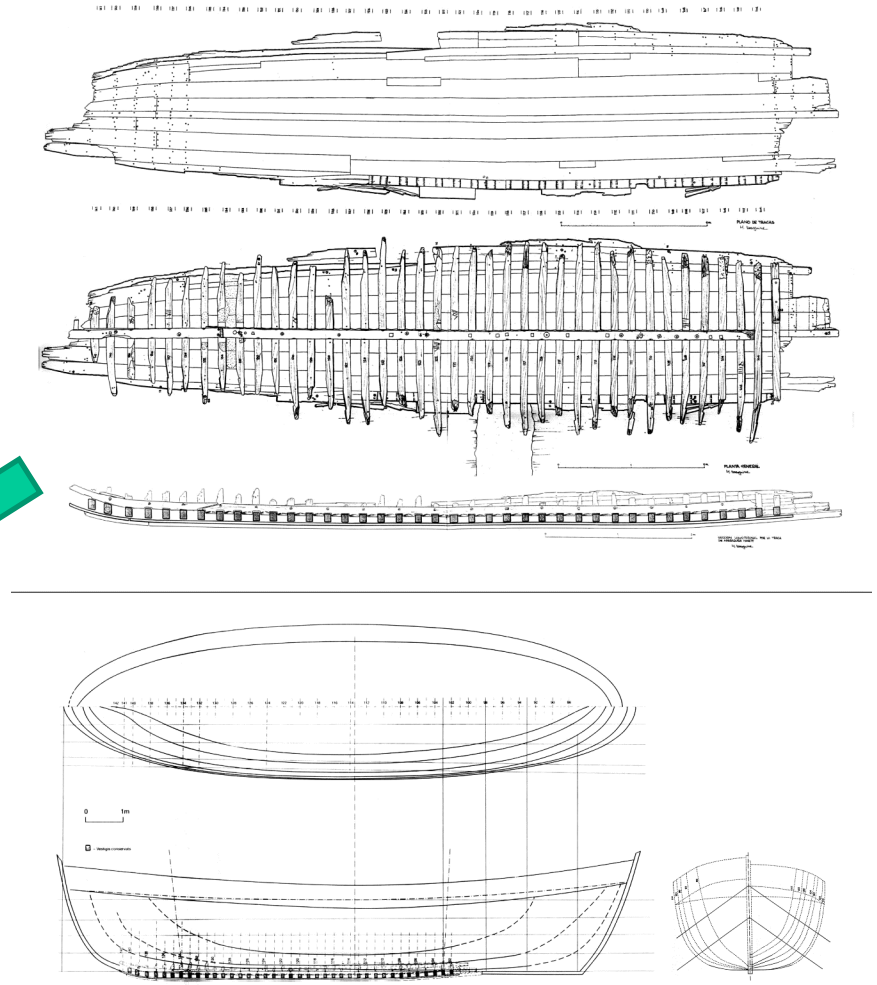

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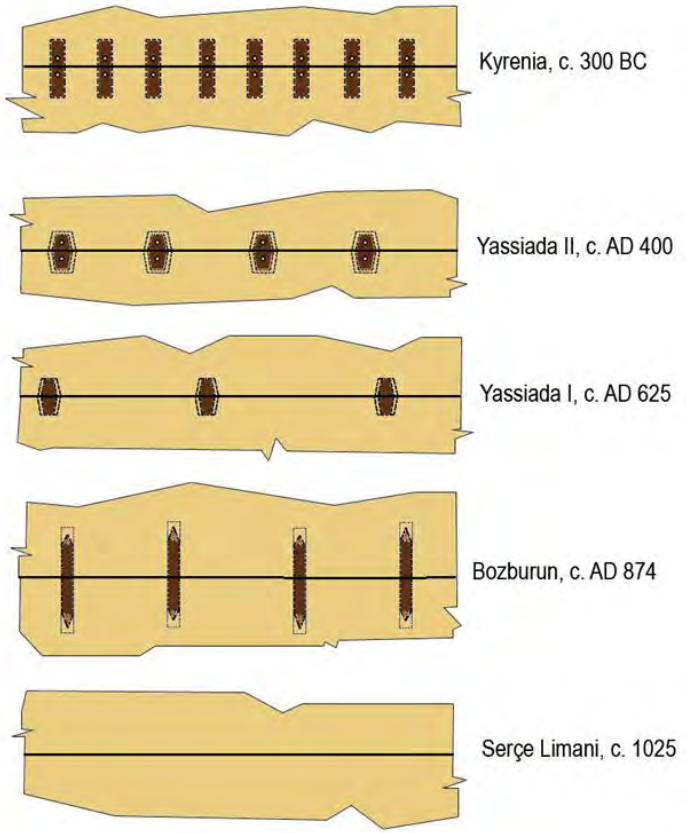

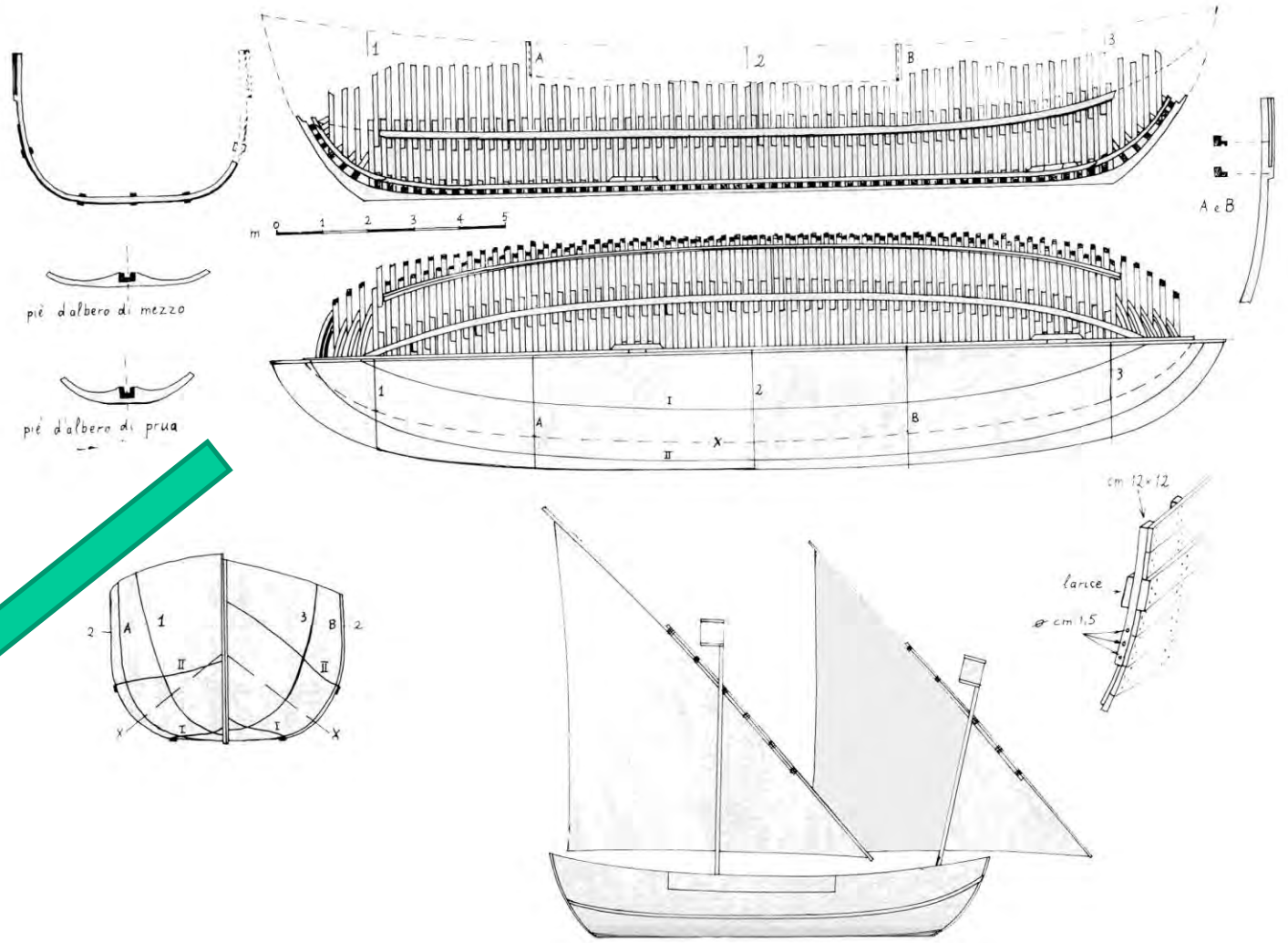

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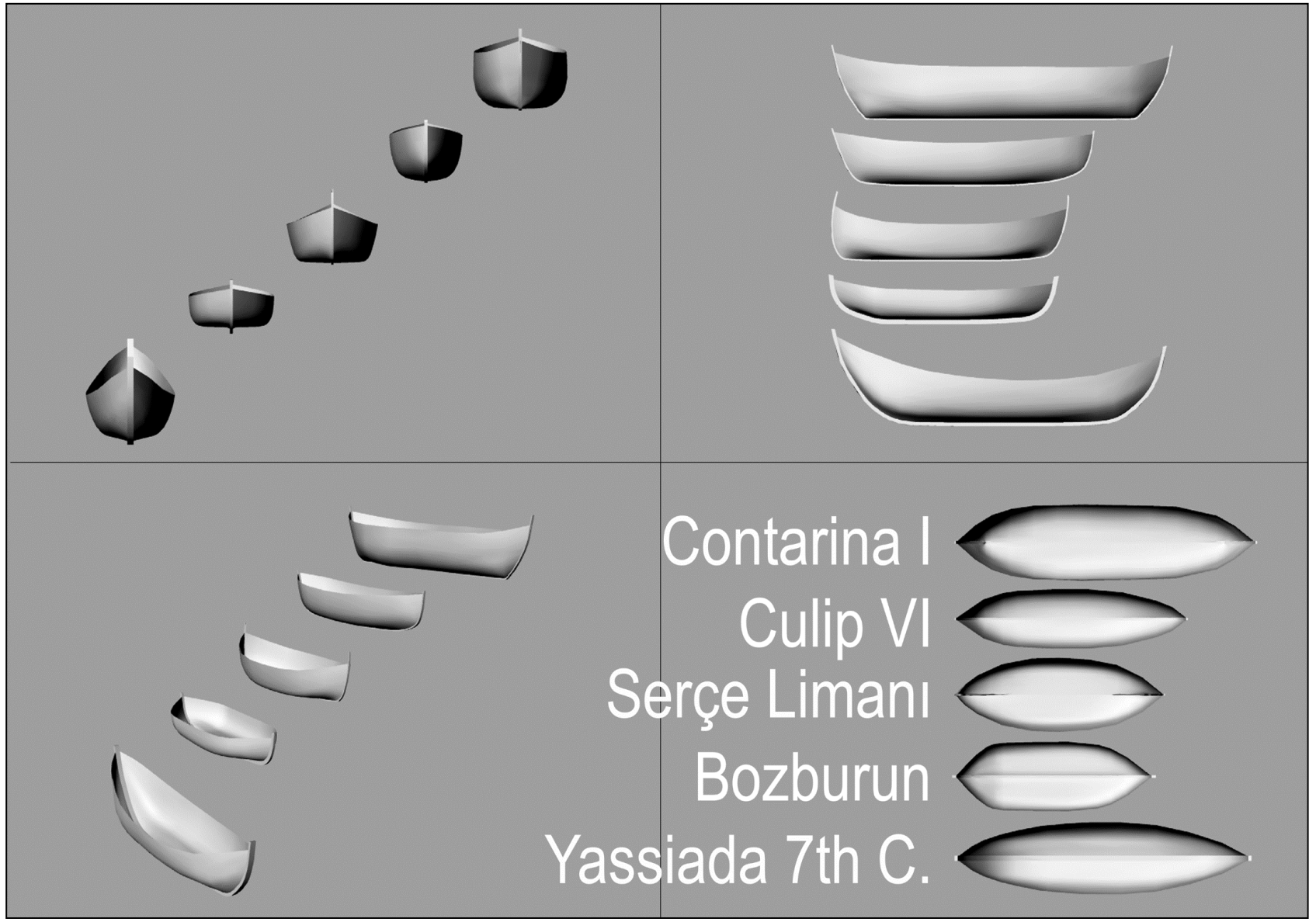

Sizes and shapes did not change much during the lower middle age.

Serçe Limani

- Revival in trade led to larger ships;
- Skeletal construction.

- C. 1025 AD
- 15.6 m
- 30 tons

Case Studies: Skerki Bank

- Classical period: big and small ships, many shipwrecks
  - Capacity important;
  - Economy booming.

- Late Antiquity (AD 300-600): smaller ships, few shipwrecks
  - Speed important;
  - Decline in economy;
  - Change in shipbuilding.

- Middle Ages: Smaller ships, larger warships
  - Defense important;
  - Rise in trade.

Conclusions

- Size closely tied to socio-economic environment and technology
- Difficult to determine
- Many “sources” of data

Questions?