

Rosalba Panvini

The Archaic Greek Ship at Gela



Salvatore Sciascia Editore

REGIONE SICILIANA
ASSESSORATO DEI BENI CULTURALI AMBIENTALI E P.I.
SOPRINTENDENZA PER I BENI CULTURALI E AMBIENTALI DI CALTANISSETTA
SEZIONE PER I BENI ARCHEOLOGICI
MUSEO ARCHEOLOGICO REGIONALE DI GELA

Rosalba Panvini

The Archaic Greek Ship at Gela

(and preliminary exploration of a second Greek shipwreck)

with contributions by

Alessandra Benini

Lavinia Sole

Francesca Terranova and Patrizia Lo Campo

English language translation by

Brian E. McConnell

Salvatore Sciascia Editore

Photographic Illustration:

Giuseppe Castelli, Salvatore Farina, Salvatore Granata, Franco Longo
and the archives of the Soprintendenza BB.CC.AA. di Caltanissetta -
Sezione Archeologica

Graphic Illustration:

Antonio Catalano and Gaspare Ragusa

With thanks to:

Margherita Rizza,
Coordinating director of Gruppo X
Of the Assessorato BB.CC.AA. e P.I.
And the personnel of the same group,
Salvatore Barbera
Carmelo Casano
Vincenzo Cinardi
Salvatore Cinardo
Carmelo Mosca
Rosanna Fiscì
Aldo Schembri
Maurizio Scarlata
And all the security personnel of the
Museo Archeologico Regionale di Gela
And furthermore Dott. Giuseppe Rizza
Of the Soprintendenza BB.CC.AA. di Caltanissetta

English language translation by

Brian E. McConnell of the original *La nave greca arcaica di Gela* by Rosalba Panvini, et al.

Offset printing and composition:

Lussografica Caltanissetta

Cover illustration:

Detail of the Attic red-figure *askos*
With a Silenus and Maenads (500-490 B.C.)

ISBN 88-8241-

© 2001 Regione Siciliana

© 2001 Salvatore Sciascia Editore

Images may be reproduced only with prior permission from the
Soprintendenza BB.CC.AA. di Caltanissetta
in conformity to all current regulations.

Panvini, Rosalba <1953>

The Archaic Greek Ship at Gela (and preliminary exploration of a second Greek shipwreck) with contributions by Alessandra Benini [*et al.*].
Palermo: Regione Siciliana,

Assessorato dei beni culturali e ambientali e della pubblica istruzione, 2001.

1. Navi greche - Gela I. Benini, Alessandra.

93/8 CDD-20

SBN Pal0182997

Cip – Biblioteca centrale della Regione siciliana

For several years now the Assessorato Regionale dei Beni Culturali ed Ambientali has been committed not only to the protection and development of Sicily's archaeological heritage but also to the publication and dissemination of the results which have been obtained from the scientific archaeological research which it has supported. The present volume is published, therefore, in this context, at the moment in which the Regional administration is dedicating itself to the completion of research on one of the most important shipwrecks of the Archaic Period. As soon as it is possible, this ship will be put on display at the site of Bosco Littorio (Gela) in an appropriate structure which will become the Museum for Early Navigation.

This volume offers the reader, including those who are not specialists in the discipline, a complete, first-hand documentation of all the information which has emerged from archaeological exploration performed in the waters along the coast of Gela since 1989. It crowns the achievements of the author and her collaborators not only in several excavation campaigns but above all in the efforts dedicated to displaying the remains which have been recovered, to promoting their cultural value, and to presenting them to the public, both locally and on an international level. In fact, we should recall that the materials found on the ship which sank at Gela at the outset of the fifth century B.C. have been displayed already on the island of Gozo (Malta) in the course of the show arranged by the Sicilian Region and the Ministry of Culture of that island in the Maltese archipelago for the purpose of showing the precious ceramics and the objects which have been recovered by underwater excavation, thus demonstrating the commercial ties which united the peoples of the Mediterranean basin early in history.

The Honorable Fabio Granata
Assessore Regionale dei Beni Culturali
Ambientali e P.I.

It is with great pleasure that I have agreed to introduce this volume which constitutes a precious contribution for those who wish to explore the world of underwater archaeology.

The archaeological riches of the sea-floor around our island, in fact, are well known. Gela alone, for example, has yielded to date the remains of two important and valuable ancient ships which the Assessorato Regionale dei Beni Culturali ed Ambientali has decided to recover and to place on permanent display within an appropriate structure.

We sense, however, that there is also the need to present to a wider public the results of research performed on the two shipwrecks at Gela. The purpose is to present them in a scientific manner and to discuss specific aspects of these investigations which have yielded fundamental data in the field of ancient ship-building, as well as information on aspects of life on-board and the routes across the Mediterranean followed by expert seamen which united, in a commercial context, peoples of different geographical areas.

This volume is a worthy monument to the completion of a first series of scientific investigations, which we hope soon to see fulfilled in the recovery and display of the two Greek ships sunk at Gela, which even today may be considered to unique both for their state of preservation and for the commercial load that they carried on board.

Giuseppe Grado

Director General of the Dipartimento Regionale
dei Beni Culturali Ambientali ed Educazione Permanente

Inasmuch as great interest in the subject of underwater archaeology has arisen in Sicily, this catalogue documents the study and the research conducted along the tract of coastline west of the mouth of the river Gela.

This coastline, which the acropolis of the ancient city surveys, is at the same time a place of memory that holds the key to the recovery of a land known mostly for savage development and the destruction of its natural heritage.

For centuries the sea has treasured extraordinary vessels which the specialists first of the Soprintendenza per i Beni Culturali ed Ambientali di Agrigento and later those of Caltanissetta have studied, analyzed, documented. The knowledge which has been obtained from the identification, the analysis, and the interpretation of the materials which have been discovered there, and from the study of naval construction techniques enables us today to answer the great questions of history.

This work has been done carefully by the person who conceived the catalogue, who with modesty and enthusiasm has collected and documented this information, thus creating the foundations for the recovery of the wrecks and for their appreciation.

Giuseppe Gini

Soprintendente per i Beni Culturali e Ambientali
di Caltanissetta

PREFACE

After five campaigns of archaeological excavation which have been conducted on the Archaic shipwreck at Gela, it seems appropriate to me to bring the results of the various investigations together in a single publication, even though already on several occasions and at several scientific meetings the results of the discoveries have had their first presentation. I consider it worthwhile, furthermore, to re-examine the excavation data and to furnish what I hope is a first thorough analysis of the wooden structures. Certainly it will be necessary to complete the excavation of the area around the bow, and this will begin as soon as the methods for the recovery and the subsequent restoration of the ancient ship have been defined and the means have been decided upon to present the ship in the space which has been prepared in the publicly-owned area today known as Bosco Littorio. This area, located at the foot of the acropolis of ancient Gela, has yielded the remains of an *emporion* of the Archaic Period, which is also under investigation. It is probable that in the tract of coastline opposite this market-place, the shore of which today has been modified significantly by the advance of the sea, there could be the location of the port of the Greek colony. For this reason, the choice of the location for the museum has been made here.

The examination of the materials recovered in the course of the various excavation campaigns (and included in the catalogue which is an integral part of the present volume) permits us to offer a new course for the route followed by the ancient vessel and to paint a more complete picture of the commercial traffic that went on between Gela and the other regions of Greece.

I hope that this work will contribute to our knowledge of commercial traffic in the Mediterranean during the Archaic period, to that of the vessels used for the transport of the products of this commerce, and to that of the life on-board. An important future goal will be the completion of the excavation of the shipwreck and the documentation of all of its structural parts.

The volume also contains contributions by the archeologists and by other scholars who participated in the first excavation campaign of the second wreck found at Gela. I wish to present here our first discoveries as to its methods of construction and the materials which have been recovered, as well as the first analysis of the samples from wooden elements of its structure.

Finally, I would like to express my gratitude to all the personnel of the Museo Archeologico Regionale di Gela, and especially to Lavinia Sole for assistance in the preparation of the catalogue and the revision of the text. I have entrusted the portion of the Catalogue dedicated to transport containers to this young archaeologist who for some time has collaborated with the Soprintendenza.

I dedicate this volume to my children, Pierluca and Francesca, who are constantly by my side.

Rosalba Panvini

Direttore della Sezione Archeologica
della Soprintendenza BB. CC. AA. di Caltanissetta
and Direttore del Museo Archeologico Regionale di Gela

ABBREVIATIONS USED IN THE TEXT

ca.	= <i>circa</i> , about
cat.	= catalogue
S.	= <i>senza</i> , without
BF.	= body fabric
cf.	= comparison
cons.	= preserved
diam.	= diameter
H	= height
I.	= <i>ingobbio</i> , slip
W.	= width
L.	= length
max	= maximum
P.	= paint
var.	= variation

Measurements are given in centimeters.

Part One



The Archaic Greek Ship at Gela

by Rosalba Panvini

*Attic black-figure oinochoe
with a gigantomachy:
Athena vanquishes Enchelados
(first decades of the fifth century B.C.)*



Fig. 1. The tract of coastline in locality Bulala where the wreck lies.

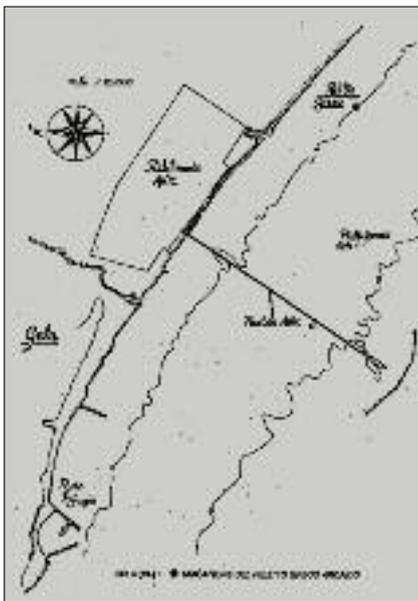


Fig. 2. Location of the Archaic Greek wreck.

THE DISCOVERY

The discovery of a shipwreck of the Greek Archaic Period at Gela dates back to 1988 when two divers turned over to the Museo Archeologico several ancient objects which they had recovered from the sea-floor in the tract of water opposite the shore in contrada Bulala¹.

Among these materials were four terracotta altars, a bronze tripod, and a fragment of a large black-figure cup.

Since then a series of underwater explorations, begun first by the Soprintendenza per i Beni Culturali ed Ambientali di Agrigento which at that time had jurisdiction over the territory of Caltanissetta and continued by that of Caltanissetta, have revealed a submerged vessel with the bow facing the open sea, lying at a depth of four to five meters in several layers of sand, gravel and clay at about 800 meters from the coastline and roughly one kilometer from the ANIC dock² (fig.s 1, 2).

This is what led to the identification of a ship of the Archaic period (500-480 B.C.) which sank in difficult waters just before it reached Gela to leave the cargo that it had brought for sale in the city (fig. 3).

METHODS OF EXCAVATION

The excavation began using traditional excavation techniques – by documenting the original state of the site, and then by excavating and removing the finds. Then, a series of mobile 1.5 square-meter grids were set up over the wreck, appropriately numbered and marked in reference to a general plan, and progressively extended to cover the entire area of the first excavation (fig. 4).

With the progression of the excavation the mobile grid system was substituted with a system of Cartesian coordinates measured from a main axis which was fixed in the water using a steel cable stretched between two large poles set in the sea-floor at about two meters from each extremity of the vessel. Each point was numbered, whether it be an actual

¹ The divers were Sig. Gianni Occhipinti e Sig. Gino Morteo.

² Panvini 1989, pp. 193-200; Fiorentini 1990, pp. 25-37; Freschi 1991, pp. 201-210; Panvini 1996, pp. 77-79; Panvini 1997a, pp. 135-142; Panvini 1997b, pp. 131-137; Panvini 1998, pp. 96-106.

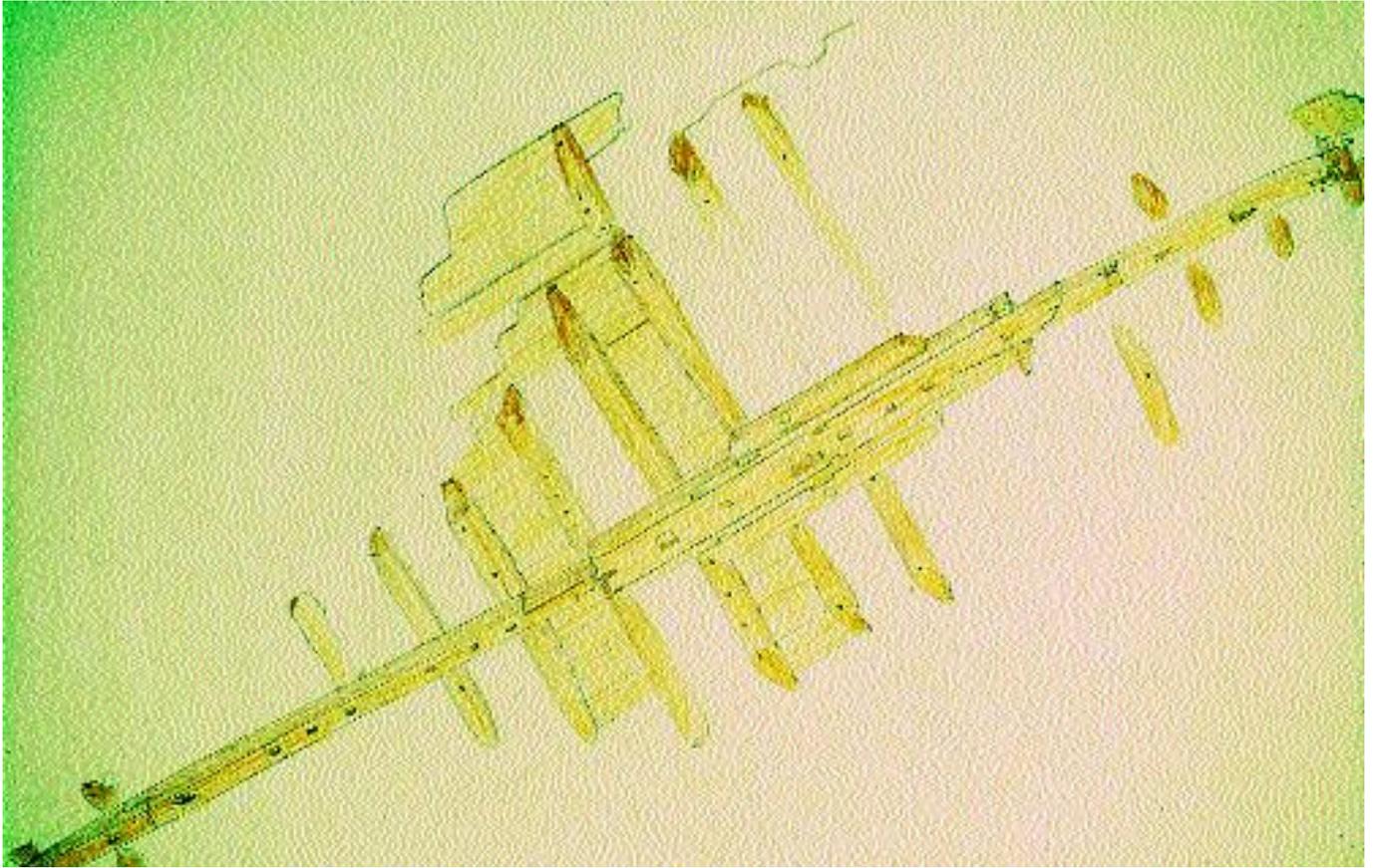


Fig. 3. Axonometric view of the wreck.

archaeological find or a simple point within the excavation area, and its planimetric coordinates and elevation were measured with respect to the steel cable which was level with the surface of the sea (fig. 5).

The overlying stratum of stones then was excavated and photographed. Samples were taken carefully before the stones were removed from the wreck by means of hydrodynamic lifting balloons.

In order to facilitate the excavation a hydropump was employed to sweep away the sand and mud with water and to carry the slurry far away from the wreck through pipes. It was also by this process that minute materials which were not possible to remove before the pumping were recovered in a water-sieve.

With the removal of each stratum of sediment, there was an accurate

Fig. 4. View of the excavation grid set over the wreck for measurement.



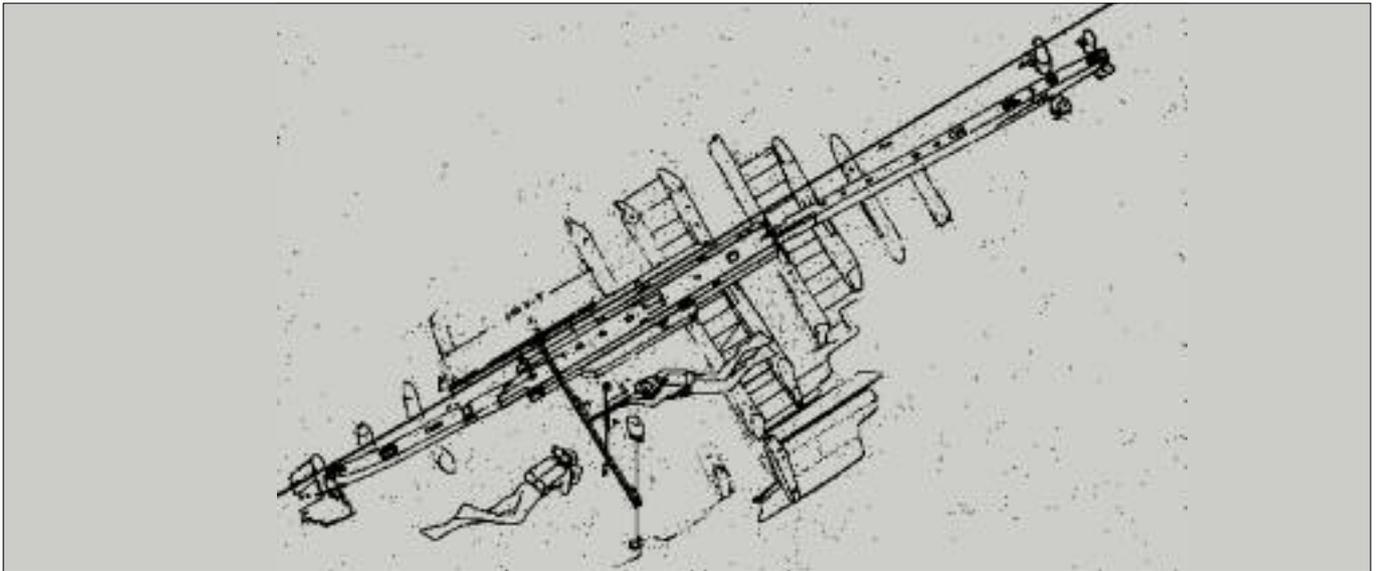


Fig. 5. Diagram showing how measurements were taken for archaeological finds.



Fig. 6. The placement of cement slabs on the bottom.

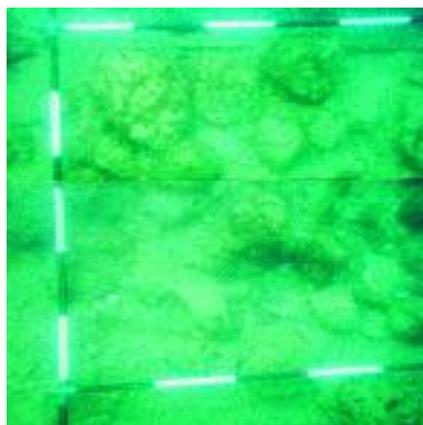


Fig. 7. Detail of the stratum of stones that covered the wreck.

cleaning of the finds and of the vessel's structures which had been revealed. After the phases of graphic illustration and photographic documentation were completed, the archaeological material was brought to the surface.

The position of the individual finds and of the parts of the ship were drawn according to the squares of the reference grid (sometimes these even were laid out materially with taut cables). Then, the transverse and longitudinal sections of the sunken ship were drawn, marking the elevations with respect to the zero-datum of the grid.

The materials which were recovered then were brought on board for a first selection, cleaning and classification; then, they were transferred to the restoration laboratory of the Museo Archeologico di Gela in order to complete their cleaning, photographic documentation and study.

At the end of the excavation campaigns, the wreck was packed with sacks of sand in order to fill in and support the areas most effected by the archaeological investigation. Finally the wreck was covered with a thick stratum of sand, which the sea in time would level, and then with large slabs of cement in order to prevent clandestine exploration and damage from trawling (fig. 6).

UNDERWATER EXCAVATION AND THE CONSTRUCTION TECHNIQUE OF THE WRECK

At the moment of the ship's discovery it was found covered with a uniform stratum of large irregularly shaped stones which were spread across the entire vessel except for the keelson and the step of the mast (fig. 7).

The stones of various kind were from the ballast which had been loaded at different times and in different places as a substitute for cargo in order to ensure the stability of the ship during its voyage. It is probable that the stones were held in bays separated by wooden partitions that were broken when the ship sank. It seems likely that several pieces of granite, typical of the coast of Calabria, had been taken on board during a stop that the ship may have made along that coast of the Italian peninsula. Evidently part of the voyage consisted in cabotage.

The ship at Gela, which measuring 18.00 x 6.80 meters, is of a 'shell' type (fig. 3) — its bearing structure is, in fact, the planking formed from



Fig. 8. Detail of the floor timber along the tract of the bow.

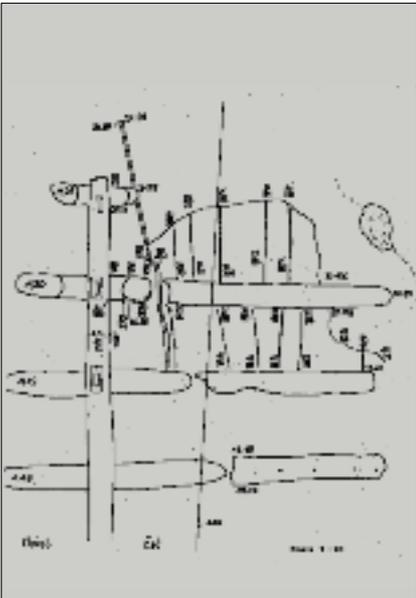


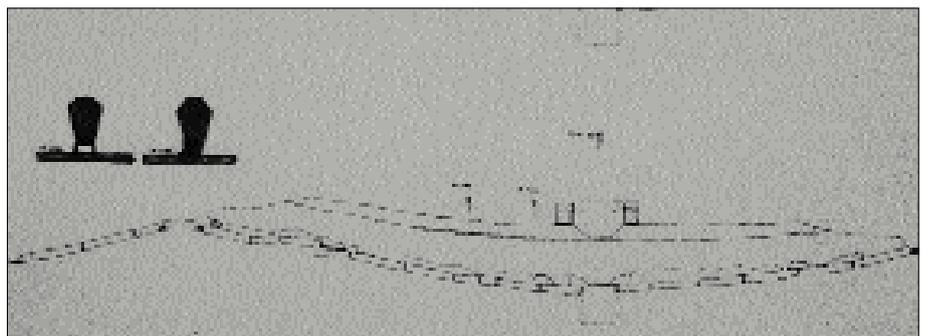
Fig. 9. Plan of the floor timbers and the strakes between floor timbers 19 and 21 East.

boards of various widths connected with plant-fibre cords. This was the way in which they made the hull, in a technique long-tested and common in the Aegean at least through the fourth century B.C. in both merchant ships and war-vessels. Examples date as early as the third millennium B.C., as one may see in the ship of Cheops, which in effect was simply a large river boat designed for sailing on the Nile. It was buried about 2528 B.C. together with the funerary assemblage of this Egyptian pharaoh in front of his pyramid³.

This construction technique is attested, furthermore, in the few remains of the exterior hull of a merchant ship which sank about 1110 B.C. near Cape Gelidonya along the southwestern coast of Turkey⁴.

Inside the ship at Gela were the floor timbers, 17 in all, laid out across the vessel without the alternation of continuous and futtock types. Sixteen of them passed under the keelson (fig. 8). Fixed to the structure of the vessel itself, they simply constitute a thickening of the hull, and they have no bearing function (figs 9, 10, 11). They average 10 to 14 centimeters in height and, along the straight portion which was formed from a single trunk they measure four meters. The curving portion of the floor timbers was connected to the straight portion with a joint cut at an angle like the mouth-piece of a flute and with a lower scarf in order to block slippage of the futtock, and it was held by three pegs hammered directly into the joint. The tips of nails in copper or iron hammered in along the exterior of the hull protrude from the curving surface of the floor timbers (fig. 12).

Fig. 10. Section of a floor timber.



³ Landstrom 1970.

⁴ Höckmann 1988, p. 41.



Fig. 11. Detail of the strakes inserted beneath the floor timber.

In the central portion of the ship, between the interior base of the keel and the lower part of the mast-step, additional pieces of wood were discovered beneath the floor timbers. These served to keep the floor timbers at a constant height of 30 centimeters.

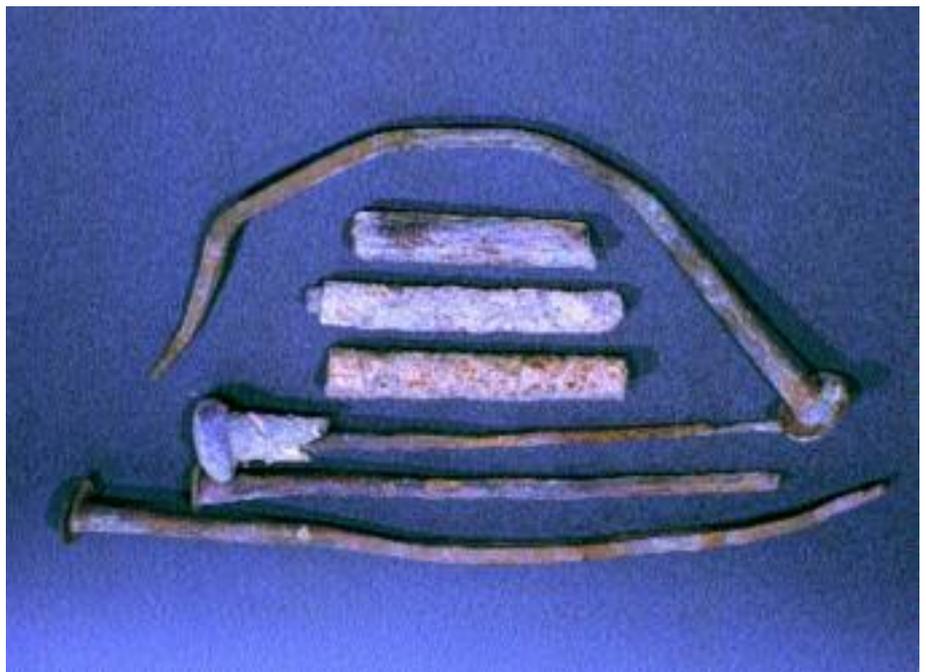
Four strakes made from boards of various size, in light pine (*Pinus pinea*), were perfectly preserved and fixed to the bearing structure of the vessel, while a fifth one was split just before the end that was fixed in the sternpost. The planking above this line in the hull had been knocked down and separated, while the same strakes at the center of the vessel, because of the change in profile of the floor timbers from oblique to horizontal, were preserved *in situ* and still bound to each other with plant-fibre cords.

The system by which the planks of the hull were sewn together, bound with plant-fibre cords which passed through holes drilled obliquely along the interior edge of the planks (fig. 13), required the prior insertion of cylindrical wooden dowels. The dowels were faceted and chamfered at each end and set horizontally at intervals of 18 centimeters in the seams between the planks, thereby increasing the connection between them. Alternating with the wooden pegs one may see triangular notches created using a gimlet (or gouge) 15 millimeters on each side (fig. 14). The plant-fibre cord was introduced into each notch, and passed obliquely through the edge of the board by way of a hole which exited at the seam. In such a way the builders were able to obtain a solid hull, for which they tried further to achieve the best possible hold through the alternation of cylindrical treenails and mortise-and-tenon joints, as one may see in the area of the stern (fig. 15).

The combination of the technique of sewing planks together and the mortise-and-tenon technique is documented already in the wrecks at Mazzaron in Spain⁵, in the Archaic ship at Marseilles (J. Verne 7)⁶ and in the wreck of Ma'agan Mikhael in Israel. It is also evidence for the rapid adoption in our wreck of a new construction method for repairs.

The method of construction with sewn planks is very ancient, and it is attested already in the ship of Cheops. But Homer, too, in the *Iliad* (II, 135) refers to the keel, to the frame and to the planks joined together by the tech-

Fig. 12. Several nails recovered during the course of excavation.



⁵ Cf. Neguerela - Pinedo - Gómez - Minano - Arellano - Barba 1995, pp. 189-197.

⁶ Pomey 1995, pp. 459-484.



Fig. 13. Detail of the planking with holes and the remains of rope and of the seams.



Fig. 14. Detail of the triangular notches along the edges of the planks.



Fig. 15. Detail of one plank – one may see the wooden treenails and the mortise-and-tenon joints.

Fig. 16. Detail of the planks coated with pitch.



nique of sewing. The poet recalls that the cables of the Greeks' ships, which lay dry for years on the shores of Troy, were slackened by exposure to the blazing heat of the sun.

In the Mediterranean the number of known ships with a sewn hull are not numerous, but they do cover a wide range of time with examples even from the Middle Ages. They display a lasting, archaizing quality, with the continuation in some shipyards of very ancient traditions which continued to be in vogue at the same time that more modern techniques were being employed. The system of sewing in order to connect the frame to the hull, and for repairs, has been identified even in the Punic wrecks at Mazzaron of the seventh century B.C. mentioned above⁷.

Belonging to the same age as the ship at Gela, or at least in the same historical period, are the remains of a wreck, perhaps Etruscan, which have been identified near Isola del Giglio (Baia Campese) in Tuscany, datable to the end of the sixth century B.C.⁸, or those of the Greek ship at Bon Porté along the southern coast of France, which are datable to the second half of the sixth century B.C.⁹.

To the latter period one may also attribute the wrecks which have been found in Piazza J. Verne at Marseilles¹⁰. The wreck in Israel discovered near the coast of Caesarea dates to just a few years later¹¹, while the Kyrenia wreck on which one also finds the mortise-and-tenon technique dates to the fourth century B.C.¹².

Among the more recent examples of sewn ships one may enumerate, in chronological order, the wreck at Ljubljana¹³, that at Valle Ponti near Comacchio, at Ferrara, of the Augustan era, with the lower part sewn together and the upper part assembled with fixed joints¹⁴. Further still there are the vessels of Nin (Croatia)¹⁵ and of Cervia (Ravenna)¹⁶, datable, respectively, to the first century A.D. and between the fourth-sixth Centuries A.D. Lastly, but only in the order of its discovery, we cite the wreck found at Lido di Venezia which is datable between the First and the second centuries A.D.¹⁷.

It has been ascertained that on the interior of the hull of the vessel at Gela fabric had been inserted along the seams between the joints and the wood in order to prevent the seepage of water, while the inner surface was sealed with pitch in order to improve the hull's impermeability (fig. 16). This system, too, is documented in Homeric poetry, and in several of the

⁷ Cf. Neguerela - Pinedo - Gómez - Minano - Arellano - Barba 1995, pp. 189-197; Neguerela 1995.

⁸ Bound 1985, pp. 49-65; Bound 1991a, pp. 181-198; Bound 1991b, pp. 199-244.

⁹ Cf. Pomey 1981, 67.3, pp. 225-251; Joncheray 1986, pp. 5-36.

¹⁰ Cf. Pomey 1995, pp. 459-484; Pomey 1998, pp. 147-160.

¹¹ Cf. Kahanov 1998, pp. 155-160.

¹² Cf. Steffy 1985, pp. 71-101.

¹³ Cf. Salemke 1973, pp. 21-24.

¹⁴ Cf. Berti 1990, pp. 29-42.

¹⁵ Cf. Brusic - Domjan 1985, pp. 67-85.

¹⁶ Cf. Bonino 1967, pp. 209-217; Bonino 1971, pp. 316-325.

¹⁷ Cf. Beltrame 1996, pp. 31-53.

Fig. 17. Fragment of lead plate recovered during the course of excavation.



wrecks cited above the presence of a protective internal stratum based on of some kind of resinous substance has been encountered.

It is possible that the fragments of lead plates, which were found during the course of the excavation, may have protected exterior portions of the hull, preventing also the attachment of mollusks (*Teredo navalis*) (fig. 17).

The flow of bilge water and rainwater from the covering of the ship was ensured by the presence at the center and on the base of each floor timber and just above the keel, of two notches called 'limbers', which are triangular in shape and match those on the keel.

Even the external keel, which measures 0.25 x 0.37 meters, was connected to the vessel by the system of sewing, something also found on other ancient wrecks. It shows a rabbet for the placement of the first board of the planking (the garboard strake). Its thickness, however, was reinforced by the keelson, which is totally preserved and which runs lengthwise along the entire vessel, stretching from the first floor timber to the stern (fig.s 2 and 18). At the bow the keelson ends against the first floor timber, and it shows at the center a rectangular recess in which there is a strip of wood that goes down to the keel, crossing the floor timber obliquely. The keelson, which was made from pinewood, was laid furthermore with a system of fixed joints together with the mast-step, above the floor timbers which had been flattened deliberately on their upper side. Along the central portion of the keelson there were numerous, rectangular or circular, recesses and protruding elements which were meant for the attachment of elements which supported the overlying structure (fig. 19).



Fig. 18. View of the keelson with the mast-step.

The most notable element of the vessel at Gela is the mast-step, placed in the central and forward portions and consisting in an element 0,58 m wide, 6 meters long, and 0.20 meters thick, that is made from two pieces of wood set side-by-side, each with a roughly square section (the one on the west measures 225 cm x 20 cm x 22 cm high, the one on the east measures 185 cm x 15 cm x 22 cm high). Each piece is rounded and shaped at the ends. The mast-step shows several rectangular and circular recesses which served for the placement not only of the main mast but also the planks and the props that guided the raising and lowering of the mast and provided the necessary counter thrust during navigation. The wooden assemblage pertaining to the mast-step terminates abruptly toward the stern with a single narrow joint that connects it to the keelson, which was joined through a notch in the same floor timber where the mast-step terminated.

Fig. 19. One of the rectangular elements emerging from the keelson.



Towards the bow the mast-step narrows with deliberate profiling, and it continues straight to the point at which it connects in a joint with the keelson which, in turn, extends to the first floor timber.

Also on the keelson in the area of the bow there are various recesses which are aligned with those of the mast-step and those of the portion of the keelson in the area of the stern. These recesses had the same function as the ones previously mentioned.

During the last excavation campaign it was possible also to identify the sternpost, which had been split in the course of the shipwreck (fig.s 20, 21, 22, 23). It was held with a fixed joint at the curving part, creating a kind of sternpost and constituting the end of the keel to which it was

Fig. 20. View of the stern of the ship with the planking converging toward the sternpost.



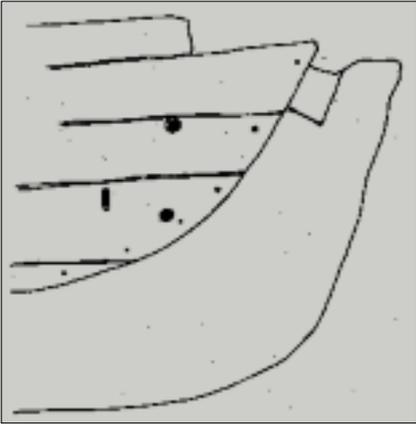


Fig. 21. Illustration of the sternpost (east side).

connected, in turn, with a joint. On the sternpost one may notice the various rabbets corresponding to the ends of the planks of the hull.

In the central portion of the vessel there was a mat in simple woven plant-fibre. Similar matting was noted in other areas of the vessel, always above the floor timbers and the keelson and towards the stern. It must have extended along the bottom of the ship and permitted the placement of cargo on the wooden base made of planks set side-by-side (fig. 24). Unfortunately, the matting was difficult to remove because it was mixed in with sand and mud and folded in several places. This condition condemned it to destruction when one attempted to remove even a small part.

An important discovery was that of a fragment of rope which lay between the eighth and the seventh floor timbers to the east and was pre-



Fig. 22. The stern of the ship with the keelson above floor timbers 20-21. The planking bonded to the floor timbers converges toward the stern.

served for a length of 25 cm circa. It was recovered and treated for conservation (fig. 25).

At the end of the excavation, the Greek merchant ship, which remains to be excavated at the central portion of the bow, appeared to have been very wide at the center and rather squat with a short bow almost like a basket. But it also had a notable storage capacity and a certain degree of stability due to the accuracy with which its structural components had been created. It may be reconstructed as a sailing ship, operated by just a few men, possibly used to sail short distances with frequent ports-of-call determined above all by the needs of loading and unloading cargo and food supplies.

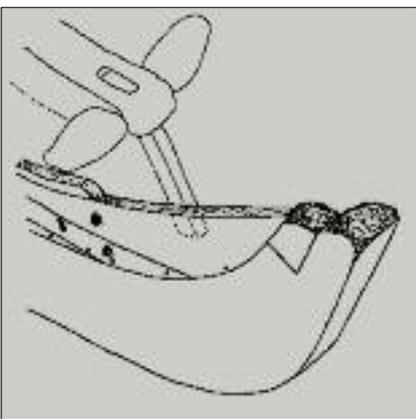


Fig. 23. Axonometric view of the sternpost (east side).

THE CARGO ON BOARD AND COMMERCIAL GOODS

At the moment of the ship's discovery the sunken cargo was no longer whole. We may suggest three reasons for its incomplete state:

- a) partial recovery in antiquity following the shipwreck;
 - b) destruction by the waves, given the shallow depth of the deposit, of whatever came to rest above the pile of stones;
 - c) partial off-loading of the cargo in ports-of-call prior to the shipwreck.
- This last hypothesis is supported by the presence of an exceptional



Fig. 24. A portion of the straw matting.

quantity of stones (6-7 tons), identifiable as ballast loaded in place of cargo which had been off-loaded for sale. The ballast was distributed in several bays separated by wooden partitions, which presumably would have been emptied at the port of final destination, perhaps Gela itself, and replaced with commercial goods and/or foodstuffs destined for export.

All of the recovered material, and not just Attic or Ionic pottery (the latter probably was produced in colonial kilns), is of significant value. From an examination of these materials it is possible to reconstruct an almost complete picture of life on-board, as well as the type of commercial traffic and the routes followed by the ship found at Gela.

Among the ceramics of Attic production, we should mention above all the trefoil black-figure *oinochoe* with a painted *gigantomachy* (the goddess Athena is shown vanquishing the giant Enchelados), which is attrib-

Fig. 25. A fragment of rope.





Fig. 26. Attic black-figure oinochoe.

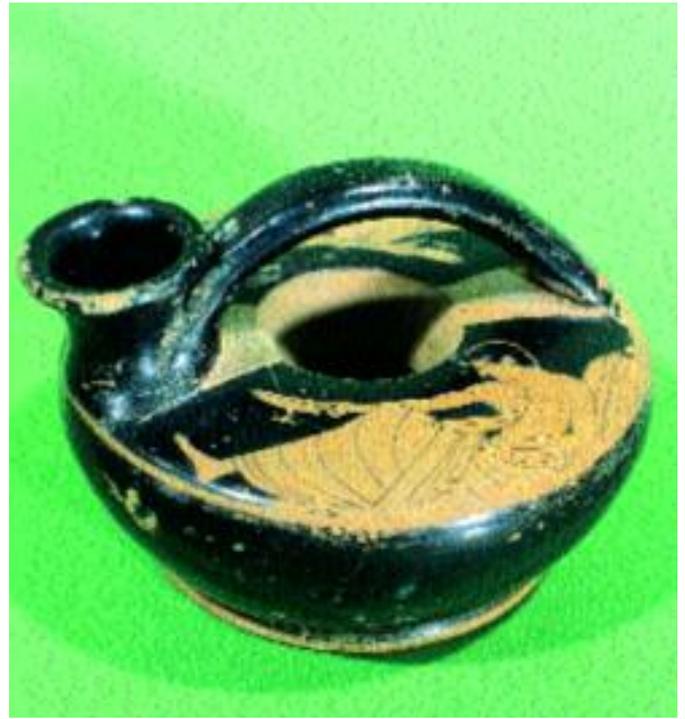


Fig. 27. Attic red-figure askos with scene of banqueting youths.



Fig. 28. Attic red-figure askos with two silens making libations.



Fig. 29. Attic red-figure askos with a silen and a maenad.

able to the Athena Painter (fig. 26), and the large and very original black-figure cup with a horse and a male figure looking back (Cat. No. 36250). Furthermore, there are three Attic red-figure *askoi*, the work of a great vase-painter, *Epiktetos*, who was active around 490-480 B.C.: the first shows a scene of youthful banqueters with a cup in the left hand (fig. 27), the second two Silens making a libation (fig. 28) and a third a Silen and a Maenad (fig. 29). These vessels, on the one hand, confirm the preference of the Geloan market for the products of Attic workshops which appeared in the third quarter of the sixth century B.C. and continued for about one hundred years, as well as products from the workshops of specific vase-painters who were prized already at Gela, such as those of the Athena Painter (see at least as examples the two *lekythoi* in the Gela museum, one with white ground in the Navarra collection [CN 207], the other from the via Salerno Necropolis [Cat. No. 14]). There seems to be, however, a new



Fig. 30. Attic black-glaze ring-bodied askoi.

preference for red-figure painters, such as Epiktetos, whose products, the three red-figure *askoi*¹⁸, seem to reach the colony for the first time by way of maritime commerce.

To the same workshops one may attribute other ceramics in black glaze, including two ring-bodied *askoi* (fig. 30). At the moment of its discovery, one of these was found to preserve a portion of the cork stopper which kept its liquid contents from spilling out (fig. 31). Other black glaze ceramics include small salt-cellar-type dishes (Cat. No. 36264-38008), small footed cups (Cat. No. 36210), *skyphoi* (Cat. No. 38078-38222-38049-38050), and skyphoid cups (Cat. No. 36347), which repeat typologies exported mostly to the Greek colonies of the West.

Evidently such material was destined for markets at Gela and the hinterland which by now had become subject both culturally and politically to the Siciliote city for some time.

There are attested, furthermore, Laconian ceramics, here represented by a small plate with a staff-handle, by the fragment of the neck of another crater and by a *stamnos* in black glaze of which there remains only the handle with a point on its back (Cat. No. 38083-38208-38197).

Fig. 31. Askos with a cork stopper before recovery.



¹⁸ See Giudice 2000.



Fig. 32. Black-glaze basin.

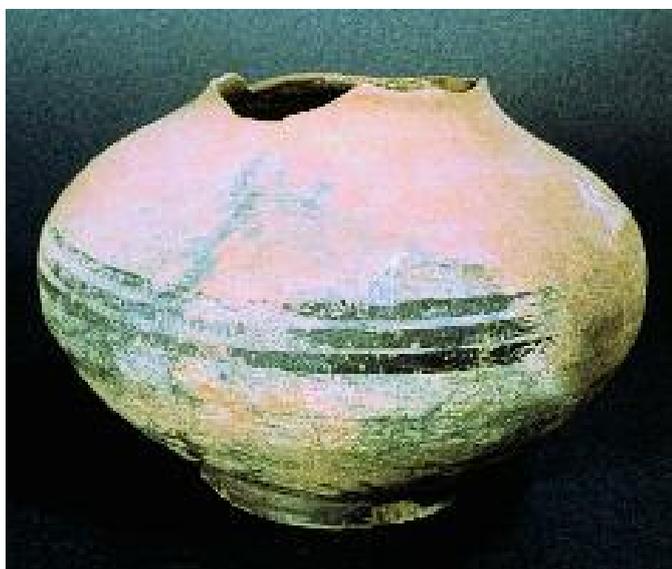


Fig. 33. Banded myke.



Fig. 34. Banded skyphos.

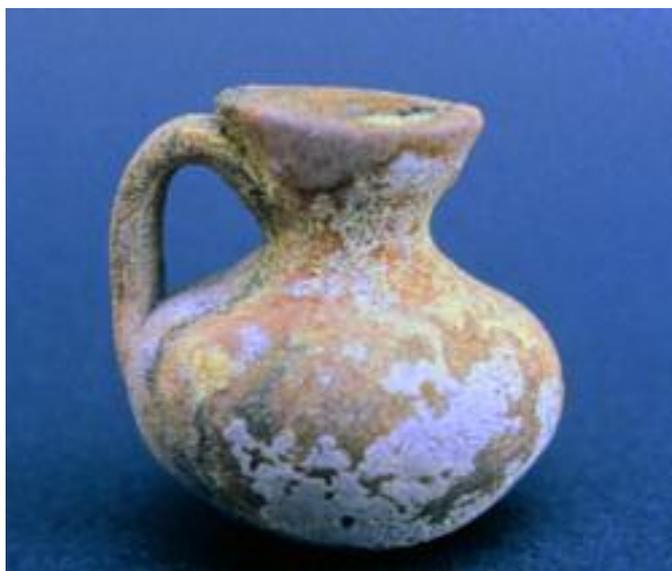


Fig. 35. Undecorated miniature aryballic lekythos.



Fig. 36. Chian amphora before recovery.

Laconian products were important for Gela, and for related markets in the hinterland, already at the end of the sixth century B.C. and still in the following fifth century. One finds at these locations *aryballoi*, craters with staff handles, *stamnoi*, amphorae and *choai*, such as those found in the excavations of the Thesmophorion on the Bitalemi hill near the mouth of the Gela river, those found on the acropolis, those from the cemeteries of Gela, and those found at the indigenous centers at Monte Bubbonia and Marianopoli (these last two locations are in the south-central region of Sicily)¹⁹.

The small number of objects which have been discovered to date and which may be attributed securely to the above-mentioned ceramic types demonstrate a limited opening of the markets of Gela and of those of the territory which depended on it towards the products of Laconian workshops. This choice was conditioned certainly by political relations which looked first and foremost to connections with Attica. One should not exclude the hypothesis that the two black glaze basins (Cat. No. 36274-36275, fig. 32) may be attributed to this production, based on the examination of the ceramic corpus, the glaze and the tronco-conic profile of the foot.

To colonial workshops which imitated models widely produced by the workshops of the eastern area of the Mediterranean one may attribute: the Type B1 cup (Cat. No. 38300; the production of this ceramic, which up to now has been attested through the end of the sixth century B.C., seems have continued into the period between 490-480 B.C.), the Type B2 cup (Cat. No. 36277-38003-36279-36278-38051-38010-381655-38147), the *askos* (Cat. No. 36266), the *myke* (Cat. No. 36282, fig. 33), and the *skyphoi* with bands on the body (Cat. No. 38004, 38162, 36163, 38168, 38102, fig. 34). To the same colonial *ateliers* one may attribute the undecorated and partially painted wares (lamps, *kotyliskoi*, double-handled bowls, small cups, small amphorae, small pitchers, small footed dishes, *lekanai*, jars, pans, lids, basins, mortars, and the black glaze *oinochoai*), destined, like those described above, for markets at the city and in the hinterland. Certainly the jars with clear traces of burning, the lids and some of the objects which have been cited, such as the *lekanai*, were used for cooking on-board and therefore for the use of the crew.

One special object is an aryballic *lekythos* (Cat. No. 36248, fig. 35), which is attested in contexts of the fifth century B.C. in the Buffa necropolis at Selinus, but the presence of which on board our ship permits us to date around 490-480 B.C.. To this same period belongs a small amphora (cat. N. 36281) known up to now only in contexts of the mid-fifth century B.C. (again in the Buffa necropolis at Selinus).

The bronze strainer (Cat. No. 38303), of which there remains only the handle with the terminal portion decorated in the form of a duck's head, finds comparisons in identical types in the Tyrrhenian region.

The abundance of finds attributable to colonial *ateliers* permits us to suggest that our merchant ship followed a route consisting in brief voyages along the coasts of Sicily and Magna Grecia with stops at various *emporia*. The ship seems to have served to gather and distribute the products of various workshops, which were loaded on board and then sold at the following ports-of-call.

The hypothesis of a route connecting nearby ports is supported further by the recovery during the course of excavation of an indeterminate quantity of amphorae of various types. Almost all of them were found in a fragmentary state, with the exception of a Chiote type (fig. 36). In the catalogue one may find descriptions of the best preserved examples, and it is difficult

¹⁹ Regarding maritime commerce and emporia see: Mele 1979; Di Stefano 1985, pp. 129-140; Martelli 1985, pp. 175-181; Bresson - Rouillard 1993; Di Stefano 1993-94, pp. 111-134; Ampolo 1994, pp. 29-36; Cristofani 1995, pp. 27-38; Gras 1995; Rouillard 1995, pp. 95-108; Gras 1996, pp. 121-144; Hansen 1997, pp. 83-105; Wilson 1997, pp. 199-207; Gras 1998, pp. 477-484.

Fig. 37. One of the baskets at the moment of discovery.



to describe analytically the hundreds of fragments that were recovered; yet from the calculation of their presence it is possible to determine approximately the percentage of the examples that were stowed on board.

The Chiote amphorae pre-dominate (60%). There is both a type with an unslipped surface and without an interior lining in pitch in imitation of the original models as well as a type with linear decoration at the base of the neck and on the back of the handles, which we consider to have been produced actually on the island of Chios. The latter preserve an interior lining of pitch and therefore were made certainly for the transport of Chiote wine, which was very famous in Antiquity, while the other type could have contained various foodstuffs. Twenty percent of the amphora fragments were from the western Greek or so-called Greco-Massaliote type, and they were used to hold wine and oil, or salted fish in pickle.

In a more limited percentage (10%) there were the following amphora types: Corinthian Type A, these were used for the transport of oil, just as the Samian and Lesbian types, the latter present in a fragmentary example (and, therefore, in a very low percentage — 3%), Milesian types, Corinthian Type B, Attic “a la brosse” amphorae, Punic amphorae, these last two varieties being typical containers for oil. The presence of Milesian examples is particularly noteworthy — although they are known principally in contexts of the sixth century B.C., the discovery on the Gela wreck permits us to see their circulation still in the following century. The same may be said for the single example of a Klazomenian amphora which was recovered.

In our opinion these diverse types of amphora also were loaded not in the ports of their original production but rather in other commercial ports, as we have suggested, along the coasts of Sicily and Italy where they would have been loaded with foodstuffs, especially wine, oil, pickle, and fish sauce for the satisfaction of clients, including those at Gela.

A similar function may be attributed to eight baskets which were located in the central area of the prow of our ship. They were containers woven from plant-fibres and completely covered in pitch (fig. 37). Two of them were recovered partially and restored²⁰ (fig. 38). Probably they contained foodstuffs, perhaps hens or pickled food, destined for sale in the markets or perhaps reserved for the crew. The sustenance of the crew must have

²⁰ Cf. Hug 1990, pp. 37-39.



Fig. 38. Portion of a basket after restoration.

been served also by the oxen carried on board. They had been butchered in quarters, and the remains of their carcasses were found.

Nourishment on board must have come also from fishing, as a hook and a terracotta whorl from a fish-net which were recovered during the excavation suggest.

It is not possible, however, to exclude completely the possibility that our ship had not completed a part of its voyage in the direction of the commercial ports of the Greek Motherland or even that it had come precisely from that area in the Aegean. At the present state of our research and on the basis of the ceramic finds, we might try to reconstruct several portions of the ship's voyage. Propelled only by the sails and in a favorable sailing season, our ship must have paid calls at the port of Athens, Phaleron, and then at a port in the Peloponnesus, where the terracotta altars may have been obtained. From there, following the western Greek coast, it may have crossed the Channel of Otranto and, following a route along the coasts of the Italian peninsula, it would have set sail for Sicily to reach, among other ports, Gela ... that is, if the storm had not prevented the completion of its voyage.

But what were the goods to be loaded at Gela, in exchange for the products on board? It is possible to think of grain and cereals, which were cultivated abundantly in the fields of that Siciliote colony from an early date. They must have been exported to flow into the markets of Attica, which had need for great quantities of grain.

LIFE ON BOARD

It is possible to attempt a reconstruction of life on-board on the basis of the objects which have been recovered. First of all, we can say that on the ship there was a merchant, from the bone stylus (Cat. No. 36283) which was used to make marks in a layer of wax on the surface of a wooden tablet. The life of the sailors on-board may have been merried by musical instruments: one may think that on the basis of a terracotta pipe (Cat. No. 38006), the sound of which was used also to communicate commands during the course of the voyage in the manner still used on merchant ships up to a few decades ago. Perhaps the pipes found on the wreck of Giglio served this purpose, too²¹.

The furnishings on-board included *klinai* (couches) and wooden benches fitted with metal bolts, as suggested by the discovery of similar objects in bronze with a circular base (Cat. No.s 38313-38314-38315-38316-38317-38319). The existence of furnishings on board ancient ships has been suggested, furthermore, by the discovery of elements of furniture on the wreck at Ventotene²², which is datable, however, to the Roman period.

Finally we consider it possible that some of the finds may have served a special function on board, that is, before they were sold once and for all in the port where the ship was directed. In other words, they could have been used for religious observances which took place during the voyage. Possible cult objects include the terracotta altars (Cat. No.s 36244-36245-36246-36247, fig. 39), the terracotta boar (Cat. No. 36261, fig. 40), the two tronco-conical loom-weights (Cat. No.s 36253-36252), the pipe (Cat. No. 38006), and the wooden statue of which only an arm was recovered

²¹ Cf. Bound 1991b, p. 232ff., figs. 78-79.

²² Cf. Gianfrotta 1986, pp. 213-222; Gianfrotta 1997, pp. 102-113; Beltrame 1998, pp. 38-43 (with earlier bibliography).

Fig. 39. Painted terracotta altars.

(Cat. No. 36265, fig. 41), as well as the bronze tripod which probably served to support a *deinos* (Cat. No. 36243, fig. 42). Furthermore such an hypothesis would not be surprising because the tradition that one finds in ancient writers such as Pliny, Arrian, and even earlier in Homer (*Odyssey*, V, 323) and Thucydides, mentions cases in which specific ceremonies were practiced by sailors before their departure and after their return home, or during the voyage in order to appease the divinities. In this sense, an example could be found in the anchors of Sostratos of Aegina and Phaillos of Croton²³ or of the *louteria* recovered in the sea²⁴. It is logical to think that sailors, who were forced to face long voyages, placed themselves under the protection of gods. They may have performed ceremonies on the ship before they touched the dry land where there were also sanctuaries along the inlets to such ports as that of Hera Limenia at Perachora or on such rocky promontories beaten by the wind as Artemision in Euboea, Cape Sounion in Attica, or even near such commercial ports as Gravisca²⁵. Literary sources also mention parade floats in the form of ships constructed in honor of the gods. One example of these consists of a *carrus navalis* created for the festivals of Dionysos at Smyrna and Athens, which had its forward portion in the form of a ship's prow and was modeled in the head of a boar (a small boar, in fact, was found on our ship, too).

Evidence for religious ceremonies which took place on board is offered by the Torlonia relief of the third century A.C.²⁶, in which there is an *apobaterion*, or departure scene, with several figures who are making a sacrifice at the stern (fig. 43). Further evidence for cult practices on board ships may be found in the altars found in the sea at Spargi²⁷ in the La Maddalena archipelago north of Sardinia and at Terrasini²⁸ along the northwestern coast of Sicily. A cultic function may be attributed, in our opinion, also to the Syro-palestinian statuette of Reshef dating to the fourteenth-thirteenth centuries B.C. which was found in the waters off of southwestern Sicily²⁹.

As we conclude our examination of life on board it would be quite

²³ Cf. Gianfrotta 1975, p. 311ff.

²⁴ Cf. Kapitan 1979, pp. 197-201.

²⁵ Torelli 1971, pp. 44-77.

²⁶ Cf. Wachmuth 1967, p. 150, (note 13).

²⁷ Cf. Lamboglia 1971, pp. 205-214; Pallarés

1986, p. 98, pl. VIII, fig. g.

²⁸ Cf. Purpura 1994, pp. 67-81.

²⁹ Cf. Purpura 1994, p. 71.

Fig. 40. Terracotta boar at the moment of discovery.

Fig. 41. Arm from a wooden statue.

something to identify the captain of our ship, who was traveling along the coast of Sicily at the beginning of the fifth century B.C., and we would not be in error probably to think that he belonged to a higher social class.

Referring to ship captains, the historian Dionysus of Halicarnassus recalls a rich Demaratus of Corinth who marketed precious goods, and the poet Sappho, who in one of her sonnets, laments the departure of her brother Caraxos, who was headed to Egypt with his ship³⁰.

It seems probable, therefore, that commerce and maritime traffic were controlled by individuals of elevated social rank and that the wine, oil and other merchandise transported by the ship that sank at Gela must have been destined for rich citizens who had requested them during those years in which the colony, under the leadership of the tyrants Hippocrates and then Gelon, asserted itself politically and economically becoming one of the most important Greek cities in Sicily with the extension of its power as far as the Straits of Messina.

³⁰ Cf. Cristofani 1998, pp. 205-232.

Fig. 42. Bronze tripod.



Fig. 43. Torlonia relief with a scene of apobaterion (departure).

*Catalogue **

*Attic black-figure oinochoe
with a gigantomachy:
Athena vanquishes Enchelados
(first decades of the fifth century B.C.).*

** Transport containers catalogued by Lavinia Sole*

ATTIC POTTERY

Cat. No. 36348 (Pl. I, 1)

Black-figure Oinochoe

Trefoil rim; neck with concave profile clearly distinguished from the shoulder; handle with circular section raised slightly above the rim; oval body.

Secondary decoration: at the base of the neck, small tongues; to the sides of the scene, a double row of dots.

At the center, within a metopal space, there is a gigantomachy: Athena vanquishes Enchelados. The goddess, shown in profile to the right wearing a chiton and an himation, is in the act of piercing the giant with a spear held in her right hand, while she defends herself with a large shield held in the other hand. Enchelados, looking back in profile to the left, wears a helmet and a chitoniskos. He holds a shield with his right arm, while his left arm is bent forward, and he holds a sword in his hand. On the bottom, grape-vines.

Details of anatomy, clothing, and the shields are



rendered through incision.

Attributed to the Athena Painter.

First decades of the fifth century B.C.

H 13,7; max. diam. 9,5. BF. orange. I. beige. P. dense and shiny black. Damaged along the edge of the foot.

Bibliography: Panvini 1989, p. 198; Fiorentini 1990, p. 32, pl. XXI, 2; Panvini 1996, p. 79, pl. 35; *Eadem* 1997b, p. 139, fig. 12; *Eadem* 1998, p. 102.

Cat. No. 36250 (Pl. I, 2)

Black-figure cup

Fragment of the thickened and slightly everted rim; wide and deep body on a low, wide ring base.

On the painted rim fragment, a male figure looking back in profile and wearing a hat with a wide, raised brim, is preserved as far as the torso. Whatever the actual fragment that matches the rest of the cup may be, the head is that of a male with a robust torso seen from the side and muscular legs rendered in running position. He wears a mantle draped on the left arm. Beneath the handle, a palmette with several petals and a volute at the base. On the opposite side, the two forelegs and one of the rear legs of a horse are clearly visible.

The anatomical details of the male figure are rendered with incision, as are the petals of the palmette. The interior of the foot is reserved except



for a wide band on the interior margin and a central circle.

Beginning of the fifth century B.C.

H ca. 9,5; max. width ca. 21,8; diam. foot 10,5. cc. orange, beige fabric. Shiny, dense, black paint. Fragmentary.

Bibliography: Panvini 1989, p. 197; Fiorentini 1990, p. 32; pl. XXI, 1; Panvini 1997b, p. 138, fig. 11; *Eadem* 1998, p. 102.

Cat. No. 38048 (Pl. I, 3)

Small black-figure cup

Fragment of the shoulder with the handle turned upward (Shape B Bloesch 1940).

On the cup there are the petals of a palmette. The handle and the interior of the cup are completely covered with black paint.

H 4. cc. orange, fine. Shiny black paint.

Cat. No. 36349 (Pl. I, 4)

Red-figure askòs

Rounded and thickened rim; short spout with concave profile; shoulder flat and rounded next to the ring-shaped, tronco-conical body; handle with an oval section set horizontally between the attachment of the neck and the shoulder; low ring base.

On the shoulder in two zones separated by a reserved band, there are two youthful banqueters arranged symmetrically on either side of the handle. Both figures recline with the left arm on a cushion. The face is shown in profile with a pronounced nose, a thickened chin, well drawn ears, and hair shown as a mass of painted curls. The breast is rendered with a thin line of



black paint, and the nipples are indicated with two small circles.

The two youths are bare breasted, while the lower part of the body, down to the shins, is wrapped in an himation with large folds. One of the two holds in his left hand a kylix with a long stem and in the right he holds a second kylix by the handle.

The other banqueter extends his right arm holding the handle of a long-stemmed kylix.

It is probable that the two youths are engaged in the game of *kottabos*, which involves hurling drops of wine from the bottom of a kylix at another vessel called the *kottabeion*.

Above the first youth there is the painted inscription EPOIESEN, above the second, KALO, the latter term possibly in the Greek dual, referring to the two youths.

Attributed to Epiktetos.

500-490 B. C.

H 4; max. diam. 11. BF. orange, dense, well refined. P. shiny black and uniform. Restored at the spout.

For the shape see Athenian Agorà XII, p. 318, n. 1166, pl. 39, dated to 475 - 450 B.C.

Bibliography: Fiorentini 1990, p. 33, pl. 22, 1-3; Panvini 1996, pp. 79-80, pl. 37; *Eadem* 1997a, p. 139; Giudice 1998, p. 104, fig. a.

Cat. No. 36350 (Pl. I, 5)

Red-figure askòs

Rounded and thickened rim; short spout with concave profile; shoulder flat and rounded next to the ring-shaped tronco-conical body; handle with an oval section set between the attachment of the neck and the shoulder; low ring base.



On the shoulder in two zones separated by a reserved band, two naked and drunken satyrs, are shown in profile arranged symmetrically on either side of the handle. They have long, thick beards, and their hair is in loose locks. The breast is rendered with a thin line of paint. One is partially reclining, resting on his bent left arm, as he seems to caress his hair with his hand. He extends his right arm between his legs and in his hand he holds a drinking horn; the long pony-tail is folded up behind his back.

The other satyr reclines with his left arm on a small cushion, and bends his head back. He extends his right arm and holds a phiale in his hand; he holds a drinking horn in his left hand.

Above there is the painted inscription EPOIEIN.

Attributed to Epiktetos.

500-490 B. C.

H 4,5; max. diam. 8,3. BF. orange, dense and well refined. P. shiny black and uniform.

For the shape see Athenian Agorà XII, p. 318, n. 1167, pl. 39, dated to 475 - 450 B. C.

Bibliography: Fiorentini 1990, pp. 33-34, pl. 22, 4-6; Panvini 1996, pp. 79-80, pl. 37; *Eadem* 1997a, p. 139; Giudice 1998, p. 105, fig. b.

Cat. No. 38007 (Pl. I, 6)

Red-figure askòs

Shoulder flat and rounded on a ring-shaped tronco-conical body; low ring base.

On the shoulder in two zones separated by a reserved band, a satyr and a maenad are shown in profile banqueting. The first, nude with an erect phallus, is represented partially reclining, and he rests on his left arm with a drinking horn in his

hand. His right arm is extended along his back, and his pony-tail is folded beneath his back. A small crown is painted in gray around his head.

The maenad is naked. Her hair is gathered in a *sakkòs*, and above that a small grayish crown is painted. She reclines with her left arm on a cushion, and with the arm bent beneath her breast she holds a long-stemmed kylix by the handle in her right hand. The abdominal muscles, the leg-muscles, the tendons and the knees are rendered with diluted paint. Above there is the painted inscription EPOIESEN.

Attributed to Epiktetos.

500-490 B. C.

H 4,4; max. diam. 10. BF. orange, fine, dense and well refined. P. shiny black, uniformly distributed. The handle and the spout are missing.

For the shape see Athenian Agorà XII, p. 318, n. 1167, pl. 39, dated to 475 - 450 B. C.

Bibliography: Panvini 1996, pp. 79-80, pl. 37; *Eadem* 1997a, p. 139, fig. 15a; Giudice 1998, p. 105, fig. c.

Cat. No. 36259 (Pl. II, 7)

Black-glaze askòs

Rounded, thickened rim and a short spout with a concave profile; shoulder flat rounded next to the ring-shaped tronco-conical body; handle with a lenticular section set horizontally between the attachment of the neck and the shoulder.

H 5,2; diam. 7. BF. orange. P. shiny black, dense and uniform. The paint is slightly chipped.

For the shape see Athenian Agorà XII, p. 318, n. 1166, pl. 39, dated to the second quarter of the fifth century B.C.



Bibliography: Panvini 1989, p.198; Fiorentini 1990, p. 32, pl. XX, 10-11; Panvini 1996, p. 79, pl. 36; *Eadem* 1997a, p. 139, fig. 15; *Eadem* 1998, p. 103.

Cat. No. 36260 (Pl. II, 8)

Black-glaze askòs

Rounded rim not distinct from the concave profile spout; shoulder flat and rounded next to the ring-shaped tronco-conical body; handle with a lenticular section set between the spout and the shoulder; ring base.



At the moment that this askòs was discovered there were still traces of its cork stopper. H 6; max. diam. 7. BF. orange, dense and well refined. P. shiny black and uniform. For the shape and the bibliography see the preceding example.

Cat. No. 36270 (Pl. II, 9)

Small cup on a black-glaze base

Rim thickened, with a groove incised along the exterior margin; cup convex on a low stemmed



foot distinguished at the upper end by a ring. H 5,5; rim diam. 8,8. BF. orange, dense and well refined. P. shiny black but not uniformly distributed.

For this type see Athenian Agorà XII, p. 304, n. 973, pl. 35, dated to 500 - 480 B. C.

Bibliography: Fiorentini 1990, p. 32, pl. XX, 7.

Cat. No. 38008 (Pl. II, 10)

Small black-glaze 'saltcellar' bowl

Rim inverted; cup with a convex profile; flat base, hollow on the interior.

H 3,2; rim diam. 4,8; diam. base 6,2. BF. orange,



dense and refined. P. black, heavily corroded from long exposure to the sea.

For this type see Athenian Agorà XII, p. 300, n. 891, dated to the beginning of the fifth century B.C.

Bibliography: Fiorentini 1990, p. 32, pl. XX, 9; Panvini 1998, p. 105.

Cat. No. 36264 (Pl. II, 11)

Small black-glaze 'saltcellar' bowl

Rim inverted and not distinct; cup with a concave profile; flat base.



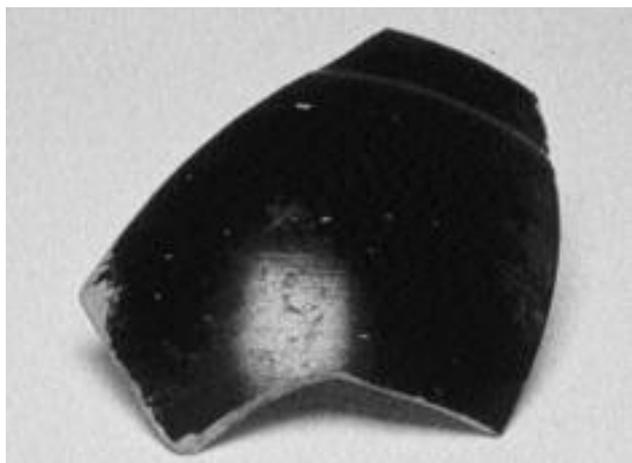
H 3,4; rim diam. 4,3; diam. base 6. BF. orange, fine, dense and refined. P. black, with white deposits on the surface. P. worn; surface chipped. For this type and the bibliography see the preceding example.

Cat. No. 36347 (Pl. II, 12)

Black-glaze skyphoid cup

Rim slightly everted and thickened in its upper portion, distinguished from the wide and deep cup, tapered at the foot.

H est. 13; rim diam. not measureable. BF. orange.



P. shiny black, uniform and covering. Only a fragment is preserved.

For this type see Athenian Agora XII, p. 276, n. 575, pl. 25, dated to 490-480 B. C.

Cat. No. 38078 (Pl. III, 13)

Black-glaze skyphos

Small everted rim, not distinguished from the deep cup which tapers to the base. Handle set almost obliquely just below the rim.

Completely covered with black paint. On the upper part of the cup's exterior, a thin line is painted in white.

H 8; diam. 12. BF. orange. P. black covering uni-



formly.

For this type see De Miro 1989, p. 81, pl. XXIV, T. 1305, dated to the fifth century B. C.

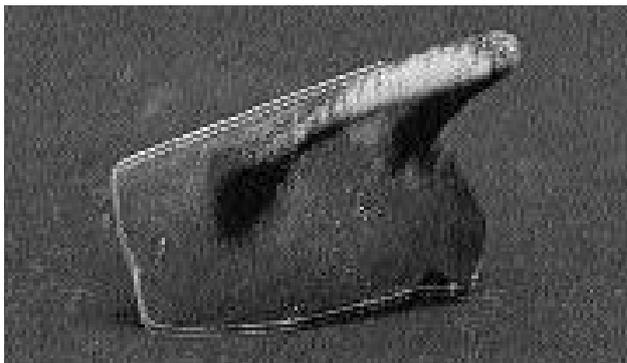
Cat. No. 38222 (Pl. III, 14)

Black-glaze skyphos

There is preserved only a handle with a circular section curving upwards slightly and set obliquely on the wall.

BF. rosy beige. P. opaque black.

For this type see Athenian Agora XII, p. 257, n. 319, pl. 15, dated to 450-430 B. C.



Cat. No. 38049 (Pl. III, 15)

Black-glaze skyphos

Only a handle with a circular section set obliquely just below the rim is preserved.

The handle and the interior are painted in black; reserved areas in the portion between the attachments of the handle.

Length 6,7; width 7,4. BF. light orange, fine and dense. P. opaque black.

For this type see Athenian Agora XII, p. 259, n. 343, pl. 16, dated to 460-440 B. C.

Cat. No. 38050 (Pl. III, 16)

Black-glaze skyphos

Only a handle with a cylindrical section set horizontally just below the pronounced rim is preserved.

H 4; width 4,4. BF. brown, fine. P. shiny black.

For this type see Athenian Agora XII, p. 259, n. 341, pl. 16, dated to 480-450 B. C.

Cat. No. 38066 (Pl. III, 17)

Black-glaze kylix

Only a portion of the slightly everted and thickened rim, which is distinguished from the convex

profile of the cup is preserved.

H 4,2. BF. pale red, dense and refined. P. shiny black.

For this type see Athenian Agorà XII, p. 264, 411, pl. 19, dated to 480 B. C.

Cat. No. 38018 (Pl. III, 18)

Black-glaze kylix

The disc-shaped foot, which is hollow inside, and the lower part of the cylindrical stem is preserved. Completely painted in black except for the exterior edge and the hollow base.

H 5; diam. 11,5. BF. orange, fine and refined. I. hazel. P. shiny black.



For this type see Athenian Agorà XII, p. 264, n. 410, pl. 19, dated to 480 B. C. circa.

S. Cat. No. (Pl. IV, 19)

Black-glaze kylix

Only a portion of the curved and everted rim which is distinguished from the cup by a groove is preserved.

H 4. BF. light yellow. P. opaque black.

For this type see Athenian Agorà XII, p. 264, n. 408, pl. 19, dated to 500-480 B. C.

LACONIAN POTTERY

Cat. No. 38083 (Pl. IV, 20)

Black-glaze crater

Only a portion with the attachment of the staff-handle and the rim which is completely painted in black is preserved.

H 5. BF. grayish. P. shiny black, uniform and dense. For this type see Pelagatti 1989, p. 80, fig.s 70-75,

dated to the fifth century B. C.

Cat. No. 38208 (Pl. IV, 21)

Black-glaze crater

Only a portion with the handle with the attachment of the staff is preserved.

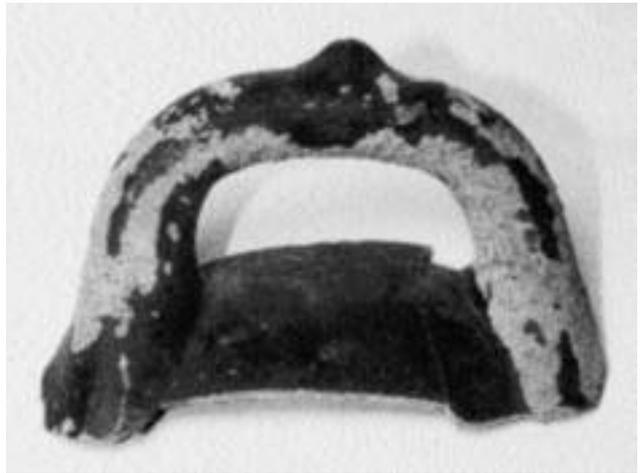
Width 7; length 6,1. BF. grayish pink, with vacuoles, white and black inclusions. P. black, opaque, chipped.

For this type see Pelagatti 1989, p. 61, n. cat. 303, fig.s 146-147, dated to the fifth century B. C.

Cat. No. 38197 (Pl. IV, 22)

Black-glaze stamnos

There is preserved a fragment of the shoulder with the handle set obliquely and with its point at the center of the back. Length 17,6; diam. handle



3. BF. grayish. Completely covered with opaque black paint.

For this type see Pelagatti 1989, p. 44, nn. 94, 95, 96 (examples from Gela), dated to the fifth century B. C.

Cat. No. 36274 (Pl. IV, 23)

Black-glaze basin

Rim thickened and rounded, distinguished from the very deep and wide cup with tronco-conical



walls; wide tronco-conical foot.

Covered with black paint except for the interior of the cup and for a band on its exterior.

H 9,4; rim diam. 36; diam. foot 26,5. BF. pinkish hazel with gray, black, micaceous inclusions. P. opaque black. Chipped on the foot.

Bibliography: Panvini 1989, p. 198; Fiorentini 1990, p. 31, pl. XIX, 1; Panvini 1998, p. 101.

In the absence of comparisons, only the ceramic body, the paint and the profile of the foot suggest Laconian production.



For this type see Rouillard 1978, p. 283, pl. CXXIX, fig. 10, 1, dated after 550 B. C.

Cat. No. 36275 (Pl. IV, 24)

Black-glaze basin

Rim thickened, emphasized on the exterior by an incised groove; cup wide and shallow with tronco-conical walls; wide tronco-conical foot, flared



on the exterior.

Covered with black paint, except for a band on the exterior and on the interior of the cup. At the base of the foot, there are three decorative elements, consisting in two concentric grooves, placed at equal distance and an incised grid.

H 8,8; rim diam. 36,6; diam. foot 28. BF. light gray, dense, with very few black inclusions. P. opaque covering black, worn in places. Restored from four fragments. Surface chipped.

For bibliography and analysis see the preceding example.

**IONIC POTTERY
OF COLONIAL PRODUCTION**

Cat. No. 38077 (Pl. V, 25)

Basin with banded decoration

Only a portion is preserved of the wide and low cup, distinct from its wide and thickened rim.

Painted band along the rim.

H 11,5. BF. orange with vacuoles and whitish inclusions. P. diluted brown.

S. Cat. No. (Pl. V, 26)

Banded lekane

Rim flat and horizontal with interior projection; hemispherical cup.

Completely painted, except for the upper part of the rim, the exterior of the projection, and the lower part of the cup next to the foot.

H 3. BF. pinkish hazel, hard, with minute vacuoles and a high content of mica. I. hazel. P. black, diluted in places.

For the shape see Meligunìs Lipàra IX, p. 233, pl. CXI, 145 (ionic type), dated between the sixth and the first half of the fifth century B.C.

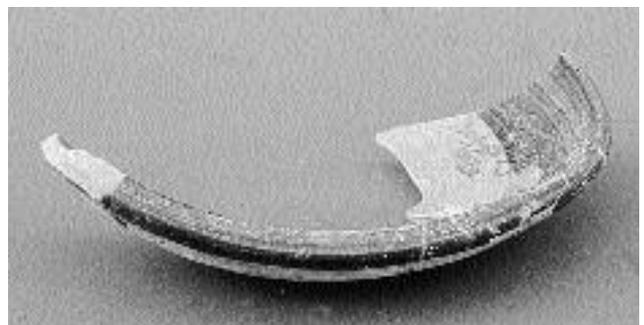
Cat. No. 38220 (Pl. V, 27)

Banded bowl

Rim inverted, cup wide and flat.

On the rim and on the upper half of the cup, there is a band in black paint.

H 2; diam. 17,5. BF. hazel, granular with micaceous and blackish inclusions. I. pinkish beige. P. opaque black, uniform. Restored, a significant



portion of the base is missing.

For this type see Meola 1997, p. 115, t. 153, pl. 184, dated to around the fifth century B.C.

Cat. No. 38004 (Pl. V, 28)

Banded skyphos

Rim everted with rounded lip; deep cup with tronco-conical walls; handles set obliquely at the level of the shoulder; flared ring foot.

On the rim and on the body there are bands in



black paint; the interior of the handles and the foot are completely painted.

H 12,3; rim diam. 17,8. BF. pinkish orange with micaceous inclusions. I. beige. P. shiny black and uniform. Restored from several fragments and integrated.

For this type see Sarà 1993, p. 300, n. 376, dated to the sixth-fifth century B. C.

Bibliography: Panvini 1997a p. 140, fig.13.

This is a type produced in oriental and Attic workshops which was widely distributed among the colonies during the first half of the fifth century B.C. See Tardo 1999, pp. 162 ff.

Cat. No. 38162 (Pl. V, 29)

Banded skyphos

There is preserved a fragment of the rim with a concave profile, indistinct from the cup which is



deep and pointed at the bottom.

Interior covered with black paint. On the rim and on the central portion of the cup there is a band in diluted black paint.

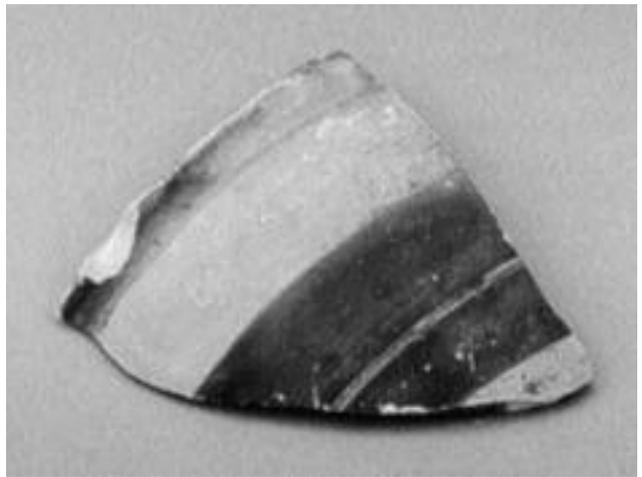
H 9,5; diam. 14. BF. red, fine, with vacules. I. pinkish orange. P. shiny black, diluted on the exterior.

For the shape see Meola 1997, p. 493, pl. 163, t. 727, 2.

Cat. No. 38163 (Pl. V, 30)

Banded skyphos

Only a portion is preserved of the rim with a concave profile, indistinct from the deep cup.



The interior of the cup is completely painted. Along the rim and at the center of the cup, there are bands in black paint.

H 9; diam. not measurable. BF. hazel, fine. I. pinkish orange. P. shiny black and dense.

For this type see the preceding example.

Cat. No. 38168 (Pl. VI, 31)

Banded skyphos

Only a portion is preserved of the everted rim with a rounded lip and a deep tronco-conical cup. The interior of the cup is completely painted. On the rim and on the lower part of the cup there are bands of paint.

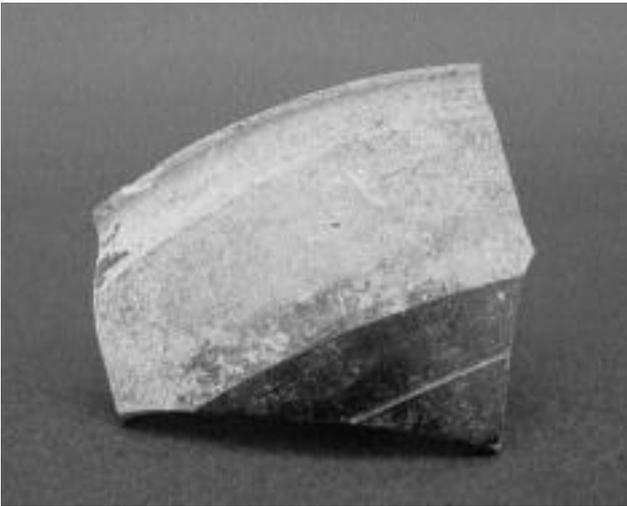
H 7. BF. pink. I. pinkish hazel. P. opaque black, diluted on the rim.

For this type see the preceding example.

Cat. No. 38102 (Pl. VI, 32)

Banded skyphos

A fragment of the upper portion with a slightly curving rim and a deep tronco-conical cup is preserved.

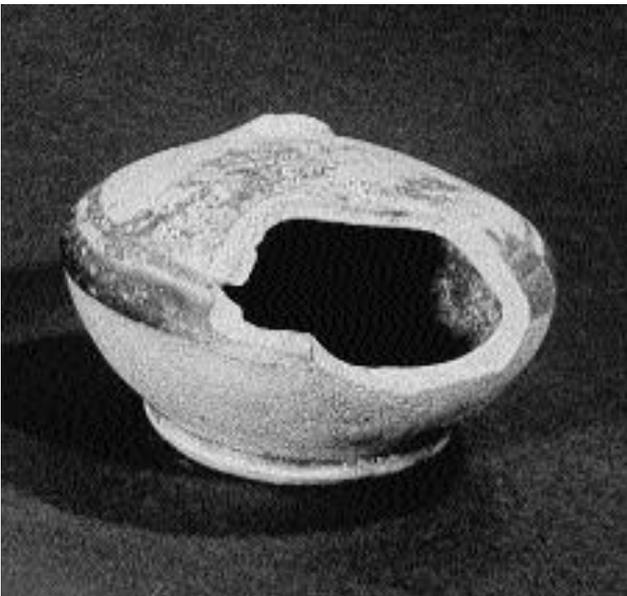


Interior covered with black paint. On the rim and on the cup there are bands in black paint.
H 7,7. BF. hazel, fine and hard. I. pinkish. P. opaque black.
For this type see the example Cat. No. 38004.

Cat. No. 36266 (Pl. VI, 33)

Banded askòs

Rounded shoulder, body with convex profile,



ringed foot.
There are bands in black paint next to of the body, on the shoulder and by the foot.
H max 4,4; max. diam. 7,6; diam. foot 4,7. BF. beige, granular, dense, well refined. P. shiny black, diluted in places. The spout and the handle are missing.
For this type see Meola 1997, p. 153, pl. 84, 1, Dep. 148; p. 64, pl. 194, t. 92, dated to the first quarter of the fifth century B.C.
Bibliography: Fiorentini 1990, p. 31, pl. XIX, 3.

Cat. No. 36282 (Pl. VI, 34)

Banded myke

Squat globular body; wide ringed foot. The attachments of the two handles set vertically on the shoulder are preserved.
On the body, there are three concentric bands with



black paint and a band next to the foot.
H est. 14,7; diam. foot 8,9. BF. hazel, porous, with many small black and micaceous inclusions. I. whitish. P. black, opaque, inconsistent. The neck and the handles are missing.
For this type see Camerata Scovazzo-Castellana 1998, p. 196, p. 232, 320, VG 169, dated to the fifth century B. C.
Bibliography: Fiorentini 1990, p. 31, pl. XIX, 4.

Cat. No. 38300 (Pl. VI, 35)

Type B1 Cup

Short sloping rim; deep cup on a low ring base; handles with a cylindrical section set obliquely at



the level of the shoulder.
The interior of the cup and the rim are completely painted; there is a thin band on the body.
H 4,7; largh 12,7. BF. hazel, fine. I. beige. P. diluted black and inconsistent on the exterior.
Similar to type III at Gravisca (Hayes type V), dated to the second half of the sixth century B. C.
For this type see Boldrini 1994, p. 158 ff.

Cat. No. 36277 (Pl. VI, 36)

Type B2 cup

Sloping rim distinguished from the rather deep hemispherical cup on a high flaring foot; handles with a circular section set obliquely at the level of the shoulder. The interior of the cup, the rim, the lower part, and a portion of the handles are completely painted; there



are thin lines in reddish brown on the shoulder. H 7,5; rim diam. 13. BF. beige fine, dense. I. beige. P. reddish brown, diluted, not dense, chipped in places. Slight chipping on the rim and on the foot. For this type see Pierro 1984, p. 56, n. 35, pl. XXXIV, dated to the second half of the sixth century B. C.

Cat. No. 38003 (Pl. VII, 37)

Type B2 cup

Sloping rim, distinguished from the shallow cup with a convex profile on a flaring foot. The interior of the cup, the rim, the lower part and



a portion of the handles are completely painted. On the shoulder there is a reserved band. H 8; rim diam. 13,4. BF. pinkish beige. I. hazel. P. diluted black tending towards brown. Restored. For this type see Pierro 1984, p. 56, n. 35, pl. XX-XIV, dated to the second half of the sixth century B. C.

Cat. No. 36279 (Pl. VII, 38)

Type B2 cup

Rim slightly sloping, clearly distinguished from

the shallow cup with a convex profile on a flaring foot. Handles set obliquely at the level of the shoulder.

Completely painted on the interior, the lower part of the cup, and the handle; on the rim and on the shoulder there are thin lines of paint.

H 8; rim diam. 13,5. BF. beige, fine, well refined with vacules. I. pinkish orange. P. black not uniform and diluted, in places chipped. A large portion and a handle are missing; chipped along the rim and on the foot. For this type see Boldrini 1994, p. 166, pl. 10, n. 334, type IV/1, dated to around the sixth century B. C.

Cat. No. 36278 (Pl. VII, 39)

Type B2 cup

Everted rim indistinct from the deep cup with a convex profile on a flaring foot; handles set obliquely at the level of the shoulder.

Completely painted on the interior, the lower part of the cup, and the handle; there are thin lines of paint on the rim and on the shoulder.

H 8,4; rim diam. 13,5. BF. pinkish beige. I. pinkish orange. A large portion is missing. For this type see the preceding example.

Cat. No. 38051 (Pl. VII, 40)

Type B2 cup

There is preserved only a fragment of the lower part of the cup on a flaring foot. The interior is painted black.

H est. 4,5. BF. hazel, fine with black inclusions. P. diluted black. For this type see Boldrini, 1994, p. 165, n. 325, pl. 9, type IV/1, dated to around the sixth century B. C.

Cat. No. 38010 (Pl. VII, 41)

Type B2 cup

Everted rim indistinct from the deep cup with a



convex profile on a flaring foot; handles set obliquely at the level of the shoulder.

Completely painted on the interior, the lower part of the cup, and the handle; on the shoulder, a line in black paint.

H 7. BF. orange, with vacules. I. pinkish. P. opaque black. A large portion is missing.

For this type see Boldrini 1994, p. 165, n. 325, type IV/1, dated to around the sixth century B. C.

Cat. No. 38165 (Pl. VII, 42)

Type B2 cup

Similar in shape and type to the preceding example.



H 8; diam. 11. BF. hazel, fine with vacules. I. beige. P. uniform shiny black. A large portion is missing.

Cat. No. 38147 (Pl. VIII, 43)

Type B2 cup

Only a portion is preserved of the slightly everted rim and part of the cup with a convex profile. A handle with a circular section set obliquely below the rim. Paint is chipped.

H 5,7. BF. pinkish, hard, with rare vacules. I. beige. P. brown, diluted in places and with traces of pink, chipped.

For the shape see Tardo 1999, p. 164, fig. 164, n. 195, dated to the second half of the sixth century B. C.

PAINTED, PARTIALLY PAINTED
AND UNDECORATED POTTERY
OF COLONIAL PRODUCTION

Cat. No. 38005 (Pl. VIII, 44)

Black-glaze oinochoe

Everted lip indistinct from the cylindrical neck that flares at the base, clearly separated from the shoulder; ribbon handle that departs from the center of the neck.



H est. 9,2; rim diam. 7. BF. hazel, fine and dense. V. opaque black, with reddish deposits on in surface. Only the upper part is preserved with many portions of the rim missing.

Cat. No. 36263 (Pl. VIII, 45)

Small cup with a black-glaze foot

Rounded rim and sloping; hemispherical shallow cup on a stemmed foot, hollow inside.

H 5,2; rim diam. 5,2; diam. foot 4,68. BF. beige, well refined and dense. P. black with metallic tints that are not very uniform.

For this type see Athenian Agorà XII, p. 304, n. 978, pl. 35, dated between 500-480 B. C.

Bibliography: Fiorentini 1990, p. 32, pl. XX, 8.



Cat. No. 36273 (Pl. VIII, 46)

Kotyliskos in brown glaze

Rim indistinct and rounded with vertical lip; tronco-conical cup; handle with circular section set obliquely at the level of the rim; foot with a tronco-conical profile.

Painted in brown, except for the foot.

H 3,7; rim diam. 6; diam. foot 3,4. BF. brownish, dense and well refined. P. brown, opaque with reddish derivations, in places chipped. One handle is missing.



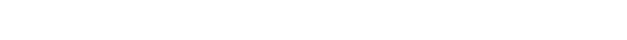
Bibliography: Fiorentini 1990, p. 31, pl. XX, 1.

Cat. No. 38009 (Pl. VIII, 47)

Single spouted lamp in brown glaze

Rim flat and slightly inverted; short spout with wide central hole; cup with concave walls and central barrel; flat base.

On the rim, three thin concentric lines of paint; another thin line runs below the shoulder. The interior of the reservoir and the area below the rim are completely painted in black. The exterior of the cup and the base are reserved.

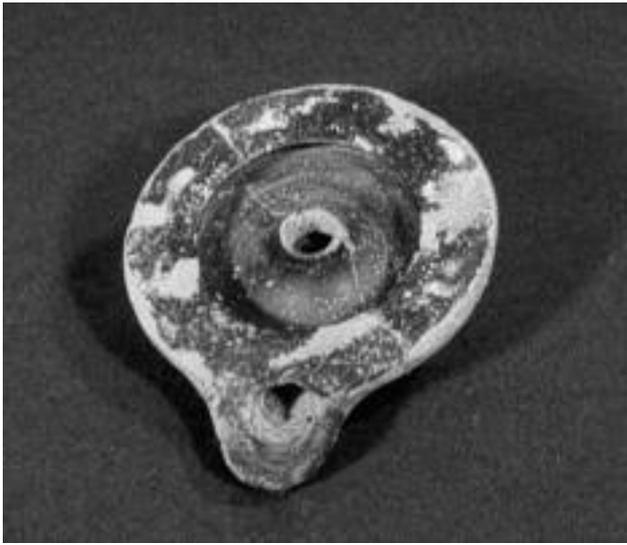


H 3,2; rim diam. 9,6. BF. hazel, dense with small micaceous inclusions. P. brown opaque.
For this type see Bronner 1930, pp. 38-39, fig. 14, n. 16, type III, dated between the end of the sixth and the beginning of the fifth century B. C.

Cat. No. 36251 (Pl. VIII, 48)

Single spouted lamp in black-glaze

Horizontal rim sloping slightly towards the interior; low reservoir with convex walls and central



barrel; short spout; flat base.

Completely painted on the interior of the reservoir, the rim and the spout.

H 1,7; rim diam. 9,4. BF. beige, dense, well refined. P. opaque black, in places chipped.

For this type see Athenian Agora IV, p. 41, n. 139, type 191, dated to about 480 B. C.

Bibliography: Fiorentini 1990, p. 32, pl. XX, 12.

Cat. No. 36257 (Pl. IX, 49)

Single-handled cup in black-glaze



Rim turned slightly inward and rounded, distinguished by a recess from the shallow cup, narrowing next to the ringed foot.

H 3,8; rim diam. 7,6. BF. beige, dense, well refined. P. black, opaque, not uniform. The handle, of which there remains only the trace of an attachment, is missing.

Bibliography: Fiorentini 1990, p. 31, pl. XX, 5.

Cat. No. 36255 (Pl. IX, 50)

Olpe partially painted

Rounded rim; neck with concave profile indistinct from the pear-shaped body; raised handle with circular section; flat base.



The handle and the upper part up to the neck were painted for immersion.

H 14,5; rim diam. 4,5. BF. hazel, fine, with numerous blackish inclusions. I. pinkish beige. P. brown opaque, diluted. Slight chipping on the surface.

For this type see Meola 1997, p. 491, pl. 82, 3, t. 693, dated to the sixth-fifth century B. C.

Bibliography: Fiorentini 1990, p. 30, pl. XVIII, 7.

Cat. No. 38304 (Pl. IX, 51)

Kotyliskos partially painted

Short vertical rim, indistinct from the tronco-conical cup; flaring foot; handles set horizontally slightly below the rim.

The upper part was painted for immersion.

H 4; diam. 5,5. BF. red with blackish micaceous inclusions. I. pinkish beige. P. opaque black, diluted.



For the shape see Meola 1997, p. 265, pl. 78, 5, D 237, dated to the fifth century B. C.

Cat. No. 38276 (Pl. IX, 54)

Cup partially painted



Rim indistinct from the hemispherical cup; ribbon handles set horizontally below the rim. Only a portion with a handle is preserved.

Band of paint brown on the upper part.

H 6; max. width 14,5. BF. orange with black inclusions.

Cat. No. 36254 (Pl. IX, 53)

Two-handled cup



Rim indistinct from the wide and shallow cup; low tronco-conical foot; short ribbon handles set horizontally at the level of the rim.

H 8,7; width 19,8. BF. pinkish, granular, with blackish inclusions. I. beige. Restored at the handle.

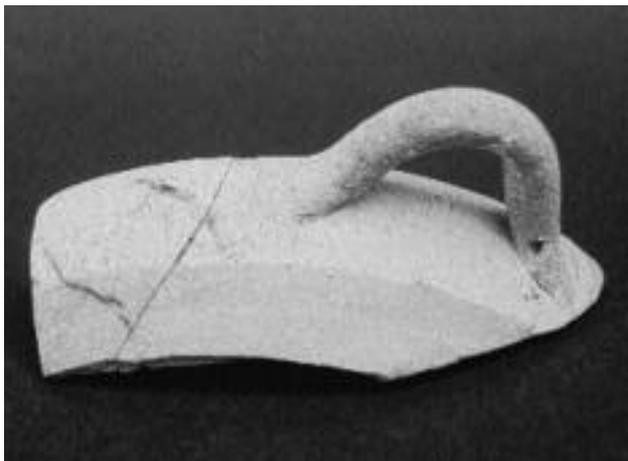
For this type see the example Cat. No. 36247

Bibliography: Fiorentini 1990, p. 31, pl. XVIII, 7.

Cat. No. 38276 (Pl. IX, 54)

Two-handled cup

Short inverted rim indistinct from the cup; handle with a cylindrical section set obliquely at the level



of the rim. Only a portion is preserved.

H 4; rim diam. 14. BF. orange, granular with gray nucleus and vacules. I. whitish.

Cat. No. 36341 (Pl. X, 55)

Two-handled cup

Rim indistinct from the cup with a convex profile; ribbon handles set just below the rim. Only a portion with one handle is preserved.

H 9; diam. 16. BF. beige refined and soft. I. pinkish hazel.



Cat. No. 38166 (Pl. X, 56)

Two-handled cup

Portion of the hemispherical cup and indistinct rim; ribbon handle set at the level of the rim.

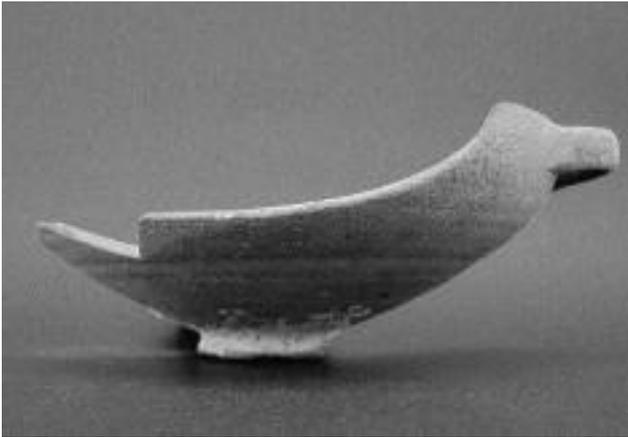
Cream-colored band in the upper part.

H 5,5; diam. 13 BF. pinkish beige with minute black inclusions. I. white.

Cat. No. 38207 (Pl. X, 57)

Two-handled cup undecorated

Rim indistinct; hemispherical cup with slight



carenation, tapers towards the ring base; ribbon handles set horizontally below the rim.

H 7,9; max. width 18. BF. dark pink, micaceous, with black and white vacules of small and medium dimension. Missing many pieces.

Cat. No. 36342 (Pl. X, 58)

Small two-handled cup undecorated

Short rim slightly inverted, indistinct from the wide and shallow cup, narrows next to of the disk-shaped foot; handles with a cylindrical section set horizontally at the level of the rim.

H 5,3; rim diam. 8,7. BF. hazel, fine with vacules. I. beige. Slight chipping on the rim and on the foot.

For this type see Siracusano 1996, pl. XLIII, 10,



dated to the second half of the fifth century B.C.

Cat. No. 36267 (Pl. X, 59)

Small two-handled cup undecorated

Rim indistinct from the tronco-conical cup; ribbon-like handles set horizontally at the level of the rim; small flaring ringed foot.

H 5,5; width 9,5. BF. beige, granular, with vacules. I. hazel.



For this type see the preceding example.

Cat. No. 38305 (Pl. X, 60)

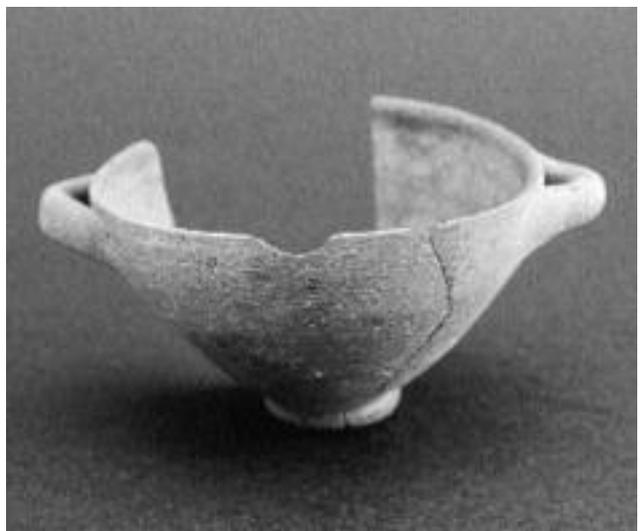
Kotyliskos undecorated

Rim indistinct from the tronco-conical cup which tapers toward the ring base. Small handles set at the level of the rim.

H 4,3; rim diam. 7, 5. BF. gray with micaceous inclusions. Without slip. Restored and missing a portion.

For the shape see Tardo 1999, p. 184, n 286.

This is a product which imitates Corinthian models, and it enjoyed wide distribution during the sixth century B. C.



Cat. No. 36272 (Pl. XI, 61)

Small dish undecorated

Everted, sloping rim, distinguished from the shallow cup with a carenated profile; ringed foot.

H 5; rim diam. 6,5. BF. orange, dense with blackish inclusions. I. whitish.

For this type see Calderone 1996, p. 76, pl. XCV,



1, dated to 550-480 B. C.

Bibliography: Fiorentini 1990, p. 30, pl. XVIII, 3.

Cat. No. 38164 (Pl. XI, 62)

Small dish undecorated

Everted rim, flat on the upper part; deep cup with a vertical wall carenated at the bottom; ringed foot.

H 4,1; rim diam. 8,3. BF. dark pink with vacules. I. whitish. Missing a portion.



For this type see Calderone 1996, p. 69, pl. LX-XXIV, 2, dated to 530-480 B. C.

Cat. No. 36256 (Pl. XI, 63)

Small footed dish undecorated

Rim thickened and everted, distinguished from the convex and shallow cup on a high foot with a ring base.

H 4,5; rim diam. 8,5. BF. hazel with blackish



inclusions. I. beige. Restored from several fragments; chipped along the rim and on the exterior surface.

For the shape see Denti 1996, p. 92, pl. CXXI, fig. 3, dated to the sixth - fifth century B. C.

Bibliography: Fiorentini 1990, p. 30, pl. XVIII, 3.

Cat. No. 38200 (Pl. XI, 64)

Basin undecorated

Everted, pendant rim; wide cup that tapers towards the ring base.



On the rim, remains of cordoning.

H 5; diam. 20. BF. hazel, granular with whitish inclusions. Missing a portion.

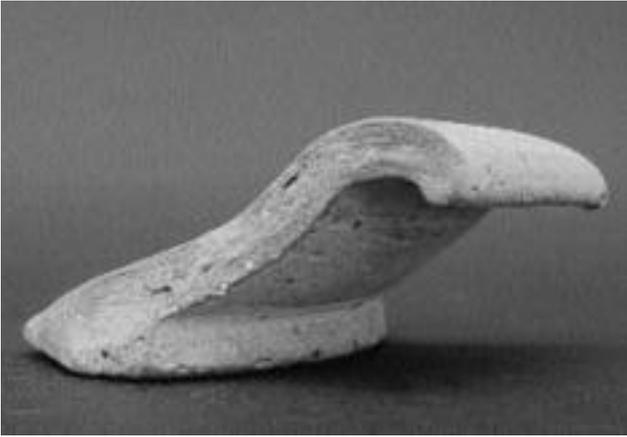
For this type see Tardo 1999, p. 234, n. 431, dated to the sixth - fifth century B. C.

Cat. No. 38185 (Pl. XI, 65)

Basin undecorated

Everted, curving rim indistinct from the wide and low cup on a flaring foot.

H 3,5. BF. dark orange with red nucleus and large whitish inclusions. I. whitish. Only a portion is preserved.



shaped body; handle with a slightly raised circular section; flat base.

H 12,5; rim diam. 4,5. BF. grayish with vacules. I. whitish. Missing portions of the rim and of the neck.

For the shape see Calderone 1996, p. 67, pl. LXXXIII, 3, dated to the the end of the sixth century B. C.

Bibliography: Fiorentini 1990, p. 30, pl. XVIII, 1.

Cat. No. 38301 (Pl. XII, 68)

Olpe undecorated

Lower part of the pear-shaped body on a flat base.

Cat. No. 36345 (Pl. XI, 66)

Basin undecorated

Thickened rim distinguished from the tronco-conical cup on a ringed foot.

H 8; diam. 30. BF. orange, granular with vacules,



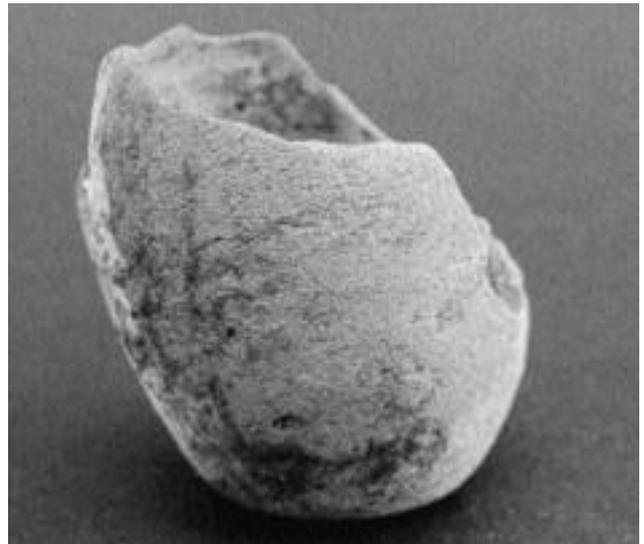
I. whitish quartzite. Without slip. Slightly less than half is preserved.

Bibliography: Fiorentini 1990, p. 31, pl. XVIII, 9.

N. Inv 36276 (Pl. XII, 67)

Olpe undecorated

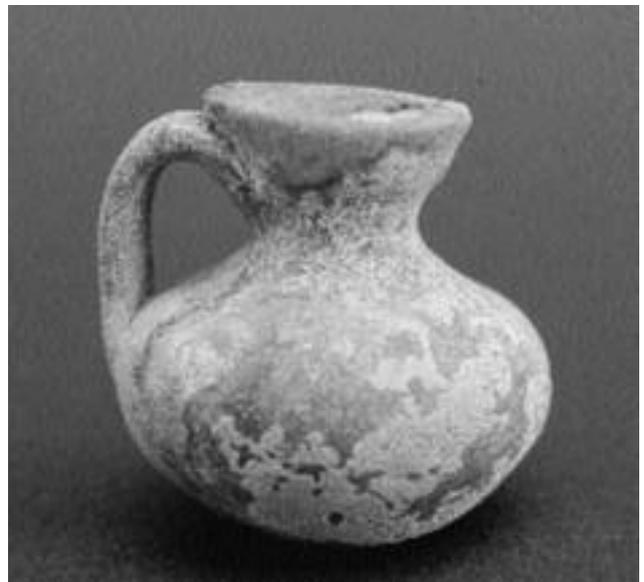
Rim slightly everted, indistinct from the neck which has a continuous profile and the pear-



The lower attachment of the handle is preserved. H 6; max. diam. 6. BF. red, granular and with vacules. Without slip. Completely coated with pitch.

Cat. No. 36248 (Pl. XII, 69)

Miniature aryballic lekythos undecorated



Sloping rim; lenticular body; ribbon handle set between the neck and the shoulder; flat base.

H 5. BF. hazel, fine. I. beige.

For this type see Meola 1997, p. 91, pl. 173, 2, t. 126, dated to the middle of the fifth century B.C. (var.).

Cat. No. 36271 (Pl. XII, 70)

Miniature lekythos undecorated

The neck and a portion of the shoulder are pre-



served; rim with concave profile.

H est. 5,5; rim diam. 4. BF. reddish, fine.

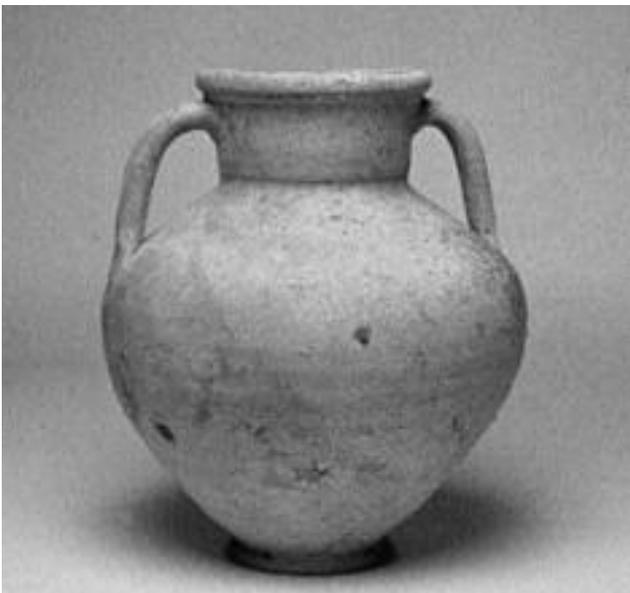
For this type see Tardo 1999, p. 173, n. 152, dated to the second half of the sixth century B. C.

Bibliography: Fiorentini 1990, p. 30.

Cat. No. 36280 (Pl. XII, 71)

Small amphora undecorated

Rim thickened, modeled at the base on a short, cylindrical neck; globular body; flaring foot; small ribbon handles set between neck and shoul-



der.

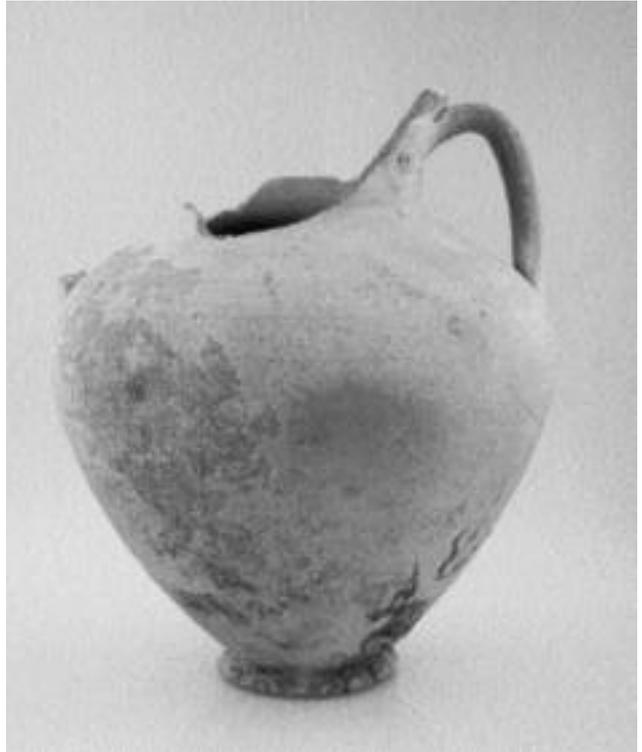
H 22,2; rim diam. 9,5. BF. orange, fine, with numerous blackish inclusions. I. beige. Slight chipping on the surface.

Bibliography: Fiorentini 1990, p. 29, pl. XVII, 1.

Cat. No. 36281 (Pl. XII, 72)

Small amphora undecorated

Flaring rim on a stocky cylindrical neck; oval body; ribbon handles set between neck and shoul-



der; flaring foot.

H 20,5; rim diam. not measurable. BF. orange, granular. I. beige. Missing a handle and a portion of the neck.

For this type see Meola 1997, p. 324, pl. 111, t. 459, dated about the middle of the fifth century B.C.

Bibliography: Fiorentini 1990, p. 29, pl. XVIII, 2.

Cat. No. 36338 (Pl. XIII, 73)

Small amphora undecorated

Rim thickened and everted on a cylindrical neck



and with recess in the upper part; handles with a cylindrical section set between the upper part of the neck and the shoulder.

H est. 11; rim diam. 10. BF. grayish, granular, with blackish inclusions. I. whitish. Only the upper part up to the shoulder is preserved, and a portion of the neck is missing.

Bibliography: Fiorentini 1990, p. 30, pl. XVII, 3.

Cat. No. 36343 (Pl. XIII, 74)

Small amphora (?) undecorated

Lower part of the pear-shaped body; flaring foot.

H 7; max. diam. 0,7. BF. gray, fine. I. beige.

Cat. No. 36249 (Pl. XIII, 75)

Small lid undecorated

Hemispherical in shape with a small sloping edge on the interior and tronco-conical handle.

H 4,5; diam. 9. BF. yellowish, granular with vacuoles.



Bibliography: Fiorentini 1990, p. 27.

Cat. No. 36268 (Pl. XIII, 76)

Small lid undecorated

In the form of an hemispherical cap, with a short edge sloping towards the interior and a tronco-conical handle.

H 4,5; diam. 8,8. BF. brown, with micaceous



inclusions.

For the bibliography see the preceding example.

Cat. No. 38195 (Pl. XIII, 77)

Dolium undecorated

Fragment of the pendant rim, flat on the upper part of the vertical neck.

H 14. BF. orange, soft and with black inclusions. I. whitish.

Cat. No. 38092 (Pl. XIII, 78)

Lekane undecorated

Rim slightly inverted with interior projection, distinguished from the wide cup with a convex profile ending at the flaring ringed foot.

H 7,5; diam. 24. BF. orange, with gray nucleus and blackish inclusions. I. beige. Restored. Only a portion of the cup and the rim are preserved.



Cat. No. 38379 (Pl. XIV, 79)

Lekane undecorated

Rounded rim with interior projection and a wide and flat cup with a convex profile.

H 9; diam. 20. BF. red with micaceous inclusions. I. hazel. Traces of burning on the rim. Only a portion is preserved.

Cat. No. 38080 (Pl. XIV, 80)

Lekane undecorated

Rim inverted with interior projection, distinguished from the wide cup with a convex profile.

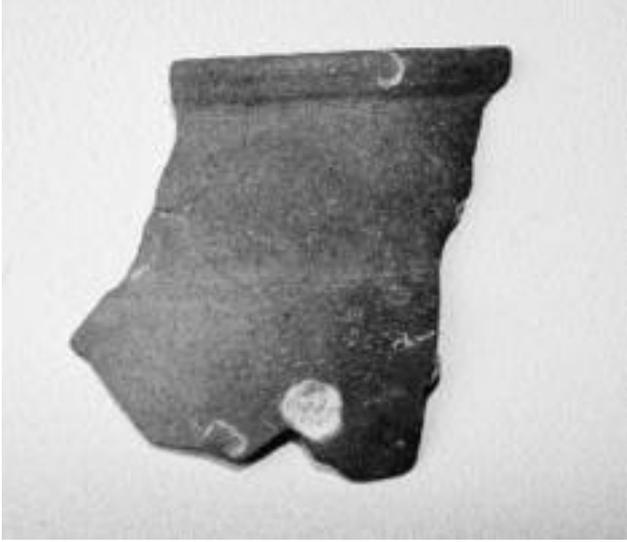
H 5; rim diam. 22. BF. red with blackish micaceous inclusions. I. beige. Only a portion is preserved.

Cat. No. 36334 (Pl. XIV, 81)

Jar

Rim thickened and everted; part of the flaring

neck is distinguished from the short rounded shoulder in a continuous profile with the globular body.



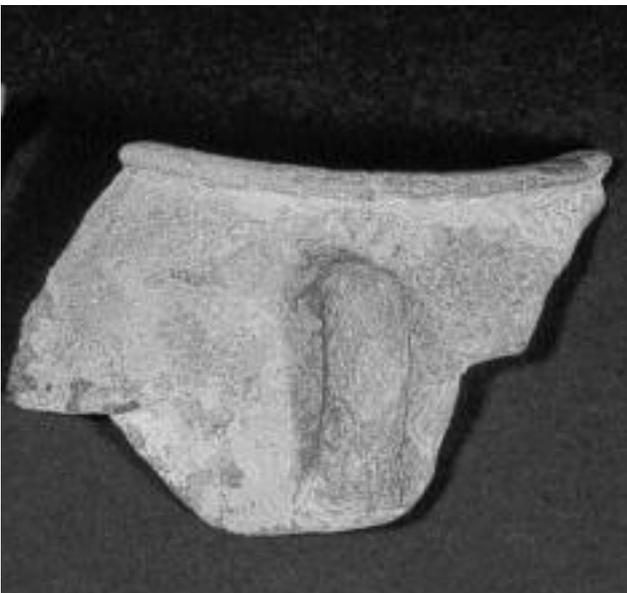
H est. 13,4. BF. pinkish, granular, with some white quartzite inclusions and vacuoles. Traces of burning on the surface and marine encrustations on the interior. Only a portion is preserved.
Bibliography: Fiorentini 1990, p. 27.

Cat. No. 36346 (Pl. XIV, 82)

Jar

Rim flat and everted, distinguished from the globular body; ear-shaped handle with a circular section.

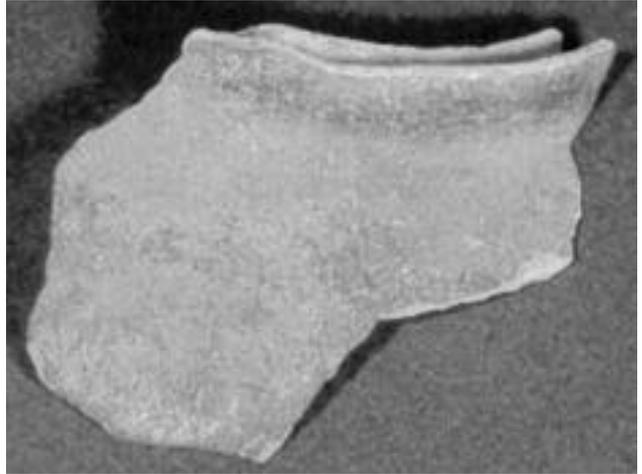
H est. 9,8. BF. orange, granular, with minute black inclusions. Only a portion is preserved.
Bibliography: Fiorentini 1990, p. 27.



Cat. No. 36328 (Pl. XIV, 83)

Jar

Vertical rim with interior projection indistinct from the body which is shaped like an hemispherical cap.



H 5,5. BF. blackish with whitish inclusions. Burnt on the interior. Only a portion is preserved.
For this type see the preceding example.

Cat. No. 38015 (Pl. XIV, 84)

Jar

Rim thickened, distinguished from the cylindrical neck in a continuous profile with the body. Ribbon handle set between rim and shoulder.

H 13,5; rim diam. 12,5. BF. red with gray nucleus and numerous inclusions of quartzite and blackish mica. Without slip. Only a fragment of the upper part is preserved.

For this type see Meligunìs Lipàra IX, p. 93, pl. XXXIV, 2a, dated to around the sixth century B.C.

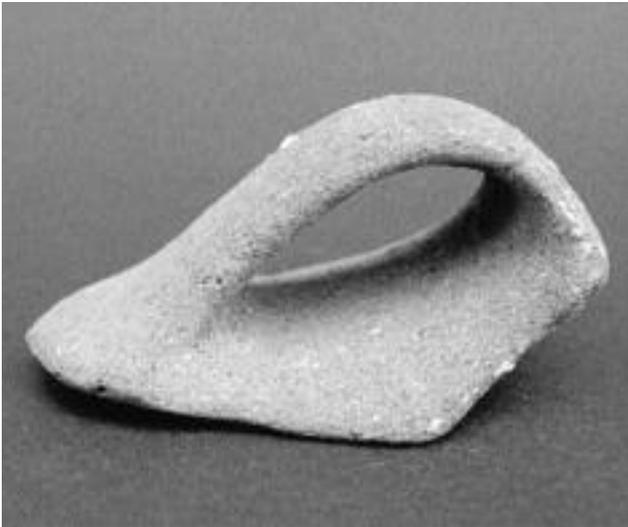


Cat. No. 38187 (Pl. XV, 85)

Jar

Flaring rim indistinct from the globular belly; ribbon handle set between rim and shoulder.

H 12. BF. red, granular, rich in black micaceous



inclusions. Without slip. Only a fragment of the upper part is preserved.

For this type see the preceding example.

Cat. No. 38186 (Pl. XV, 86)

Jar

Flaring rim indistinct from the vertical wall; ribbon handle set vertically between rim and shoulder.

H 23. BF. brown, granular mixed with mica and black inclusions. Without slip. Only a fragment of



the upper part is preserved.

For this type see the preceding example.

Cat. No. 36331 (Pl. XV, 87)

Jar

There is preserved a fragment of the everted rim, indistinct from the globular body.

H 6,2. BF. pinkish orange with blackish and whitish inclusions. I. reddish. Traces of burning on the exterior.

Cat. No. 36237 (Pl. XV, 88)

Pan

Only a portion of the vertical rim is preserved; interior projection distinguished from the globular body.

H est. 8,8. BF. blackish, micaceous, with whitish inclusions of quartzite and vacules. Surface burnt.



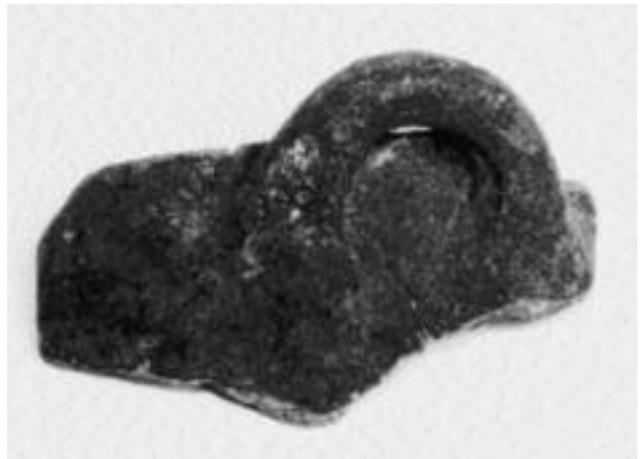
Bibliography: Fiorentini 1990, p. 26, pl. X, 3.

Cat. No. 36258 (Pl. XV, 89)

Pan

Vertical rim with interior projection indistinct from the hemispherical body; handle with circular section adhering to the rim.

H 5,3. BF. blackish, micaceous, with whitish inclusions of quartzite and vacules. Surface burnt.



Only a portion is preserved.

For this type see Camerata Scovazzo-Castellana 1998, pp. 144, 181, 310, n. cat. 121, dated to the end of the sixth century B. C.

Bibliography: Fiorentini 1990, p. 26, pl. X, 2.

Cat. No. 38084 (Pl. XV, 90)

Handle of an undecorated pan.

Pertaining to a pan with the terminal portion bent back onto the interior.

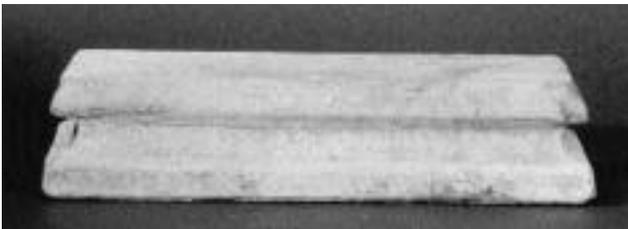
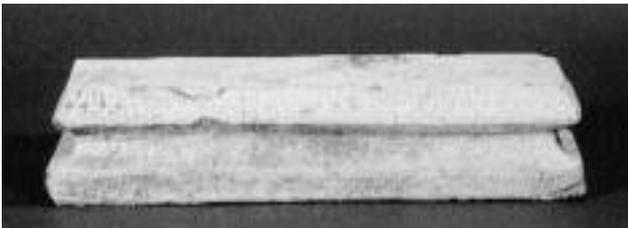
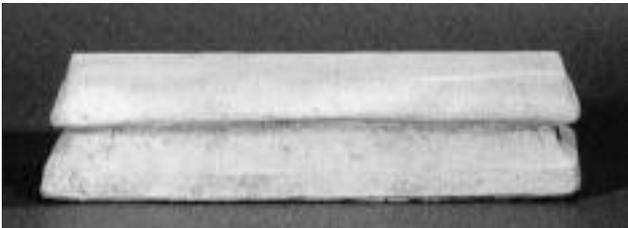
Length 13. BF. red with blackish inclusions. Without slip.

MATERIALS OF VARIOUS TYPOLOGIES

Cat. No. 36244-36245-36246-36247 (Pl. XVI, 91-92-93-94)

Painted terracotta altars

These are four examples, all of the same type and decoration. Rectangular in shape, flat on the upper part and on the rear side, hollow on the interior. The upper part, crowned by a projecting cornice, is separated from the base by a deep central recess.



On the cornice, there is a double row of ovulae set opposite each other with alternating fields of red and black bordered by white in between. On the central portion there is a series of palmettes each with seven petals, alternating with lotus flowers between black volutes. On the base, there is a continuous wave motif in brown.

There are no direct typological parallels with other objects of the same purpose which have been found Greece, Magna Graecia or in Sicily. However, the distinct color and the fine quality of the clay, extremely pure and well smoothed on the exterior, uniformly covering a sandy, coarse stratum on the interior, would suggest a workshop in the Peloponnesus. In particular, one may note certain affinities with a fragment of a small votive altar found in the Stoa of Corinth in 1946, especially in terms of the technique of production. To the same Corinthian setting one may ascribe the decorative 'doric leaf motif' along the upper cornice, which is comparable to examples from Perachora (fragment of an Archaic altar: Payne 1940, PL A, 2, pp. 91-91) or to an altar from Skione in Macedonia, now in a museum at Baltimore (of the beginning of the fifth century B.C.) or further still to an example from Corinth (Bronner 1947, pp. 214-223).

Even the palmette motif alternating with the lotus flowers can be found in the Peloponnesus.

H: 8; 8; 7,8; 7,8; length 35,8; 35,7; 34; 34. BF. orange, granular, with black inclusions. I. cream.

The decoration of examples Cat. No. 36244, 36246 and 36247 is somewhat inconsistent.

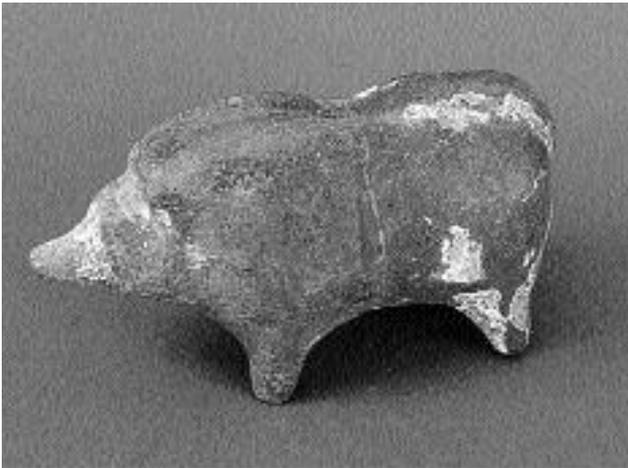
Regarding such altars see, for example, Swindler 1932, pp. 512-520, fig.s 1-2; Olynthus VIII, pp. 322-325 and XII, p. 45; Davidson 1942, p. 124, fig. 13; Bronner 1947, pp. 214-223, pls. L-LIII, pp. 216-220; Yavis 1949, pp. 137-139 and 171-175; Rupp 1974-75.

Bibliography: Panvini 1989, p. 197; Fiorentini 1990, p. 35, pl. XXXIV; *Eadem* 1993, pp. 61-63; Panvini 1996, p. 80, fig. 38a; *Eadem* 1997a, p. 138, fig. 9; *Eadem* 1998, p. 98.

Cat. No. 36261

Terracotta boar

The animal with its razor-like head ending in a rather sharp snout, has its eyes emphasized through a slight swelling; semi-circular ears in high relief; a stocky massive body with a tall crest on the back, interrupted at mid-body; short stocky legs. At the rear, in correspondence to the



1990, p. 35, pl. XXXIII, 1; Panvini 1998, p. 100.

Cat. No. 38006

Terracotta pipe

Part of a musical instrument; two holes preserved. Length 6,4; diam. 19,5. BF. orange, dense, mixed with numerous micaceous inclusions.

Such an instrument was used not only for sympotic activities but also for communicating orders to sailors, as it was used until just a few decades

ago. end of the crest there is an extremely small hole. This type seems to have its origins at Rhodes, even though later on it is found widely distributed both in tombs and in sanctuaries of Magna Graecia and Sicily.

Regarding this type see Lindos I, col. 583 pl. CXIII, 2410; Higgins 1954, p. 78, n. 182, pl. 33; Caporusso 1975, pp. 83-84.

H 5,4; length 10. BF. light yellow, fine, dense. Surface abraded due to long exposure under the sea.

Bibliography: Panvini 1989, p.198; Fiorentini 1990, p. 35, pl. XXIII, 3; Panvini 1996, p. 80, fig. 38b; *Eadem* 1997a, p. 140, fig. 16; *Eadem* 1998, p. 99.

Cat. No. 36243

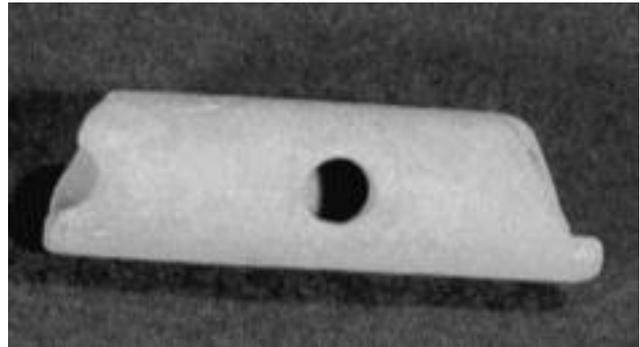
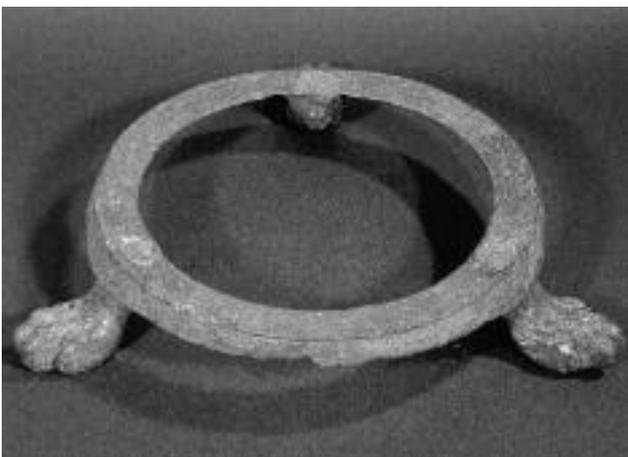
Bronze tripod

Ring-shaped support with three lion's feet welded to the base in lead.

H 5,5; diam. 27,2.

For this type see, for example, Payne 1940, pp. 165-167, pl.s 70-71.

Bibliography: Panvini 1989, p. 197; Fiorentini



ago.

Bone pipes have been found also on the wreck at Isola del Giglio.

Bibliography: Panvini 1997a, p. 140, fig. 18.

Cat. No. 36265

Forearm of a wooden statue

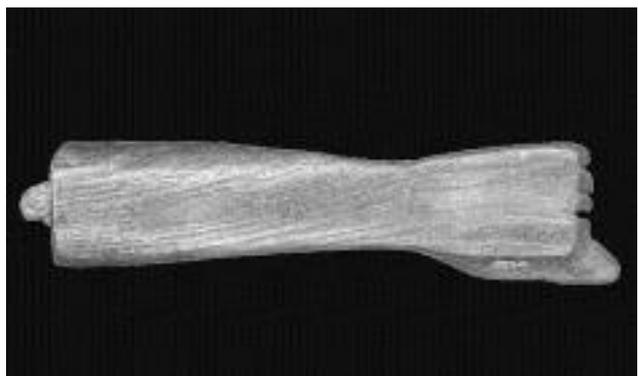
Left forearm pertaining probably to the image of a divinity. It is preserved to the elbow where there is the trace of the dowel which joined it to the limb.

Traces of metal in the closed fist lead one to suggest the presence of a spear or some other object.

Length 3,5; diam. 0,1. Carved olive wood.

This object was subjected, following its recovery, to freeze-drying and then subsequent consolidation through immersion in a solution of polyethylene glycol.

Bibliography: Panvini 1989, p. 198; Fiorentini



1990, p. 35, pl. XXIII, 2; Panvini 1998, p. 99.

Cat. No. 36253

Loom-weight

Tronco-pyramidal form with square base and equal oblique faces; at the top there is a hole for suspension.

H est. 5; width base 3,8. BF. reddish with numer-



ous black inclusions. I. beige. Missing a portion of the top.

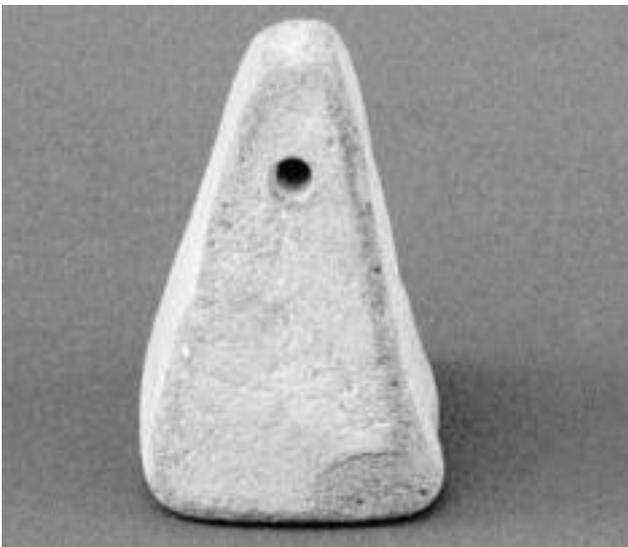
For this type see Valentino 1997, p. 198, 25, dated between the sixth and the fifth century B. C.

Cat. No. 36252

Loom-weight

Tronco-pyramidal form with flat bases and equal sides, oblique and tapered towards the top where there is a hole for suspension.

H 6; width base 3,5. BF. brown, with blackish inclusions. I. beige.



For this type see the preceding example.

Cat. No. 36283

Bone stylus

The terminal portion is tronco-pyramidal in shape.

Length 15. Restored at the tip.

Bibliography: Fiorentini 1990, p. 31; Panvini



1997b, p. 140; Eadem 1998, p. 100.

Cat. No. 38303

Handle for a bronze strainer

Attachment with lateral apices and a terminal portion ending in the head of a duck. Probably pertaining to a strainer.

Length 25.



For this type see Terrosi Zanco 1974, p. 162, pl. XL. Bibliography: Panvini 1997 b, p. 141, fig. 23.

NN. Invv. 38313, 38314, 38315, 38316, 38317, 38318, 38319, 38320

Bronze bosses and a ring

Bosses of long conical shape and concave profile with ring bases in relief and small spheroid enlargements at the extremities; cylindrical interi-



or stem. Ring with a circular section with two suspension hooks.

Elements certainly pertaining to the furnishings on board (couches or benches), comparable, for example, with similar finds from the Bothros of Eolos on the Acropolis of Lipari.

HH: from 9 to 3,5; max. width from 5,3 to 3,9; ring diam. 4,6:

For this type see Meligunì Lipara IX, p. 48, pl. XII, e-f and fig. 12, e-f.

Cat. No. 36262 (Pl. XVI, 95)

Spindle-whorl

Tapering shape with a groove in the direction of the length; the bore passes through its extremities. Length 8; width 3,4. BF. grayish hazel, not very



dense, with whitish inclusions and vacuoles. Chipped at the extremities.

Cat. No. 36284 (Pl. XVI, 96)

Sounding lead

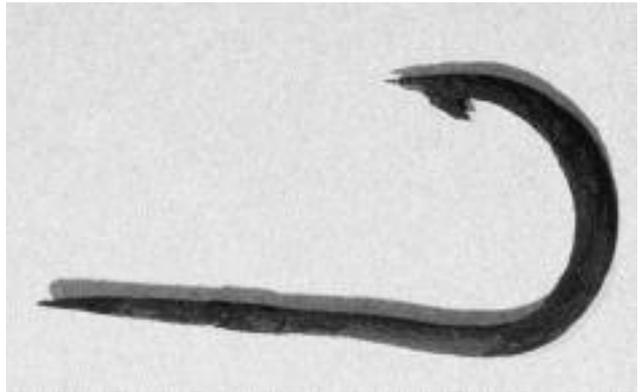
Shaped like an hemispherical cap with a suspension hook.

H 7,5; diam. 14,5. Heavily oxidized.



Cat. No. 36287

Bronze fish-hook



Length 5,5; width 2,6.

For this type see Barra Bagnasco 1989, p. 18, pl. IV, 2.

Cat. No. 36285

Small basket

Woven in graminaceous fibers; interior coated with pitch; held at the mouth by a strip of fig-wood.

This find, placed under restorative treatment



through immersion in a solution of polyethylene glycol and subsequently freeze-dried, served as a container for foodstuffs.

Bibliography: Panvini 1989, p. 198; Fiorentini 1990, p. 38, pl. XXV, fig. 12; Hug 1990, p. 37; Panvini 1997a, p. 141, fig. 23; *Eadem* 1998, p. 106.

TRANSPORT CONTAINERS
by Lavinia Sole

CHIAN AMPHORAE

Cat. No. 36298 (Pl. XVII, 97)

Rounded rim and thickened neck; oval body that tapers down to the tronco-conical base; thick handles set between neck and shoulder.

At the base of the neck and on the back of the handles there is a reddish line.



H 67,5; max. diam. 37. BF. orange with numerous blackish inclusions. Restored in the lower part. Interior coated with pitch.

For this type see Whitbread 1995, pp. 135-144, pl. 4, 35 (for the class "with slip"); Albanese Procelli 1996, p. 104 (for the class "with white slip") and, in particular, Cook-Dupond 1998, p. 149, fig. 23.2, type d, dated to 500-475 B. C.

Bibliography: Fiorentini 1990, pp. 27-28, pl.s XII,1-4, XIV,1-6; Panvini 1997b, p. 137, fig. 8; Panvini 1998, p. 106.

Cat. No. 38115 (Pl. XVII, 98)

Lower part of the base to the knob.

H 11,5. BF. pink, with minute vacuoles and white and micaceous inclusions.

For this type and the bibliography see the preceding example.

Cat. No. 36299 (Pl. XVII, 99)

Portion of the upper part of the rounded rim down to the shoulder with one handle and the attachment of the other.

At the base of the neck and on the back of the



handles a reddish line; at the base of the neck a small incised circle.

H 13; rim diam. 12. BF. reddish, fine with blackish inclusions. Interior coated with pitch. Restored, missing a portion of the neck.

For this type and the bibliography see the preceding example.

Cat. No. 38323 (Pl. XVII, 100)

Portion of the thickened neck and rounded rim. Part of the handle is preserved.

At the base of the rim and on the back of the handle there is a reddish line.

H 9; rim diam. 10. BF. pinkish with numerous large inclusions. I. pinkish gray. Interior coated with pitch. For this type and the bibliography see the preceding example.

Cat. No. 38266 (Pl. XVII, 101)

Portion of the neck and rounded rim.

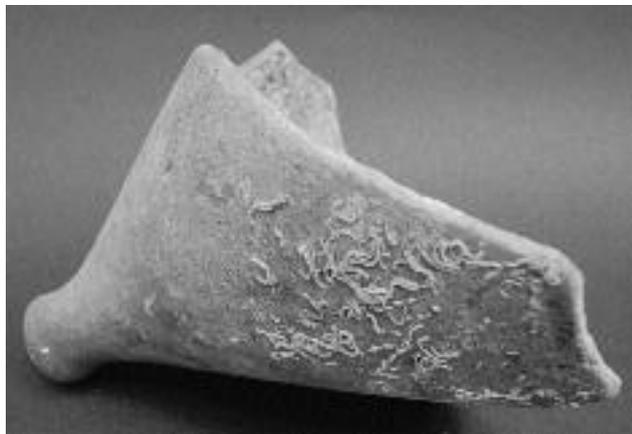
At the base of the rim there is a brown line.

H 12. BF. hazel, granular. I. pinkish beige. Interior coated with pitch.

For this type and the bibliography see the preceding example.

Cat. No. 38143 (Pl. XVII, 102)

Lower part from the point where the wall begins



to taper down to the knob.
H. 29; diam. not measurable. BF. dark gray, with blackish inclusions. Without slip.
Interior coated with pitch.
For this type and the bibliography see the preceding example.

Cat. No. 38144 (Pl. XVIII, 103)



Portion of the lower part from the belly to the foot.
H 34; diam. not measurable. BF. reddish, fine.
Interior coated with pitch.

For this type and the bibliography see the preceding example.

Cat. No. 38161 (Pl. XVIII, 104)

Portion of the neck with the rim thickened and the attachment of a handle.



H 10,5; rim diam. 12. BF. hazel, fine, with blackish, whitish, and micaceous inclusions. Interior coated with pitch.

For this type and the bibliography see the preceding example.

Cat. No. 38271 (Pl. XVIII, 105)

Upper part of the rounded rim to the shoulder; a handle is preserved.

H 16; rim diam. 11. BF. red, fine with vacules. I. beige. Interior coated with pitch.

For this type and the bibliography see the preceding example.





Cat. No. 38201 (Pl. XVIII, 108)

Portion of the upper part from the rounded rim, flat on the surface to the shoulder. A handle is preserved. At the base of the handle there is a finger impression.

H 15; rim diam. 12. BF. hazel, fine with vacules. For this type and the bibliography see the preceding example.

Cat. No. 36309 (Pl. XIX, 109)

Portion of the upper part down from rounded rim. At the base of the rim, on the back of the handle



Cat. No. 38264 (Pl. XVIII, 106)

Lower part from the point where the wall begins to taper down to the knob.

H 14; diam. 18. BF. hazel, fine, with numerous blackish inclusions and vacules. Without slip.

Interior coated with pitch.

For this type and the bibliography see the preceding example.

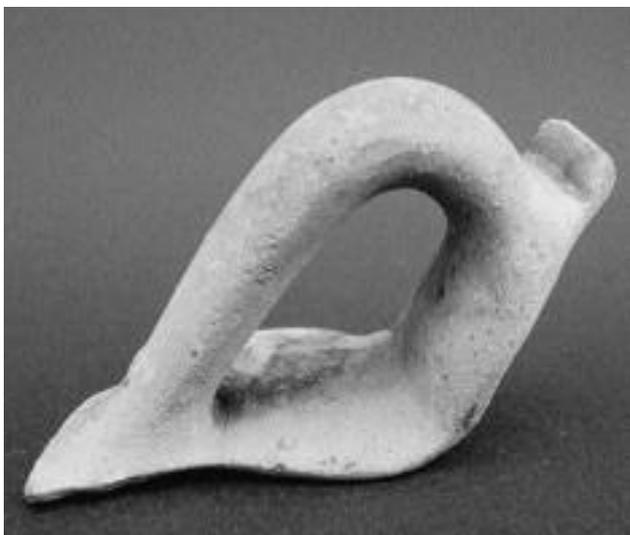
S. Cat. No. (Pl. XVIII, 107)

Upper part from the rounded rim to the shoulder. A handle is preserved.

At the base of the rim and on the back of the handle there is a red line.

H 17,5. BF. red with whitish inclusions and vacules. I. pinkish beige. Interior coated with pitch.

For this type and the bibliography see the preceding example.



and on the shoulder there is a reddish line.

H. 15; diam. Not measureable. BF. hazel. Interior coated with pitch.

For this type and the bibliography see the preceding example.

Cat. No. 36311 (Pl. XIX, 110)

Upper part from the rounded rim to the shoulder.

On the back of one handle there is a brown line.

H 12,5; rim diam. 11. BF. gray, fine and with blackish



and micaceous inclusions. Interior coated with pitch.
For this type and the bibliography see the preceding example.

Cat. No. 38121 (Pl. XIX, 111)

Lower part to the knob.

H 16. BF. pink to light yellow, in places gray with vacules and white and black inclusions. Fragment restored. Traces of interior coating of pitch.

For this type and the bibliography see the preceding example.

Cat. No. 38109 (Pl. XIX, 112)

Lower part down to the knob.

H 19. BF. pink to light yellow, in places gray, with vacules and white and black micaceous inclusions. Traces of interior coating of pitch.

For this type and the bibliography see the preceding example.

S. Cat. No. (Pl. XIX, 113)

A handle and its attachment to the wall with a portion of the rim are all preserved.



Red profiling line below the rim and along the back of the handle.

H 13. BF. pink, with vacules and white and black micaceous inclusions. P. reddish brown. Traces of interior coating of pitch.

For this type and the bibliography see the preceding example.

S. Cat. No. (Pl. XIX, 114)

A handle fragment with an attachment to the shoulder are preserved.

Red line on the back of the handle.

H 12,5. BF. pink to light yellow, with rare vacules and black and whitish inclusions. P. reddish brown. Traces of interior coating of pitch.

For this type and the bibliography see the preceding example.

S. Cat. No. (Pl. XX, 115)

Only a portion of the neck with the rounded rim is preserved.

Red line at the base of the neck.

H. 8,8. BF. pinkish, granular. P. inconsistent reddish brown. Traces of interior coating of pitch.

For this type and the bibliography see the preceding example.

Cat. No. 36310 (Pl. XX, 116)

Portion of the upper part from the rounded rim to the shoulder; a handle and the attachment of another are preserved.

At the base of the rim and on the back of the han-



dles there is a reddish line.

H 19; rim diam. 12. BF. red, fine. I. beige. Restored and integrated. Interior coated with pitch.

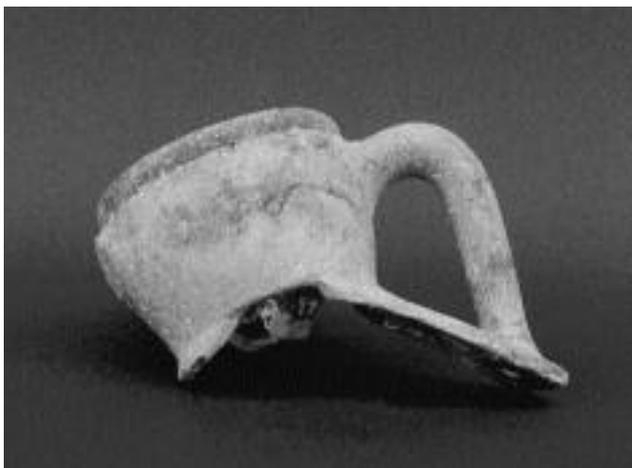
For this type and the bibliography see the preceding example.

Cat. No. 36308 (Pl. XX, 117)

Upper part from the rounded rim to the shoulder. At the base of the rim and on the back of the handle there is a reddish line.

H 16; rim diam. 13. BF. red, fine. I. beige. Restored and integrated; only a handle is preserved. Interior coated with pitch.

For this type and the bibliography see the preceding example.



Cat. No. 38013 (Pl. XX, 118)

Upper part from the rounded rim to the shoulder. At the base of the rim and on the back of the handles there is a red line; at the base of the neck a small incised circle. H 16; rim diam. 11,5. BF. hazel, fine and with white inclusions. I. pinkish beige.



Interior and the edge of the rim coated with pitch. For this type and the bibliography see the preceding example.

Cat. No. 38203 (Pl. XX, 119)

Portion of the upper part from the rounded rim to the neck; only one handle is preserved. At the base of the neck and on the back of the handle there is a reddish line. H 9; rim diam. 12. BF. gray, fine and with whitish inclusions. Restored. Interior coated with pitch. For this type and the bibliography see the preceding example.



Cat. No. 38204 (Pl. XX, 120)

Small portion of the neck with rounded rim. At the base of the rim there is a red line. H 7,5; rim diam. 12. BF. red, fine with vacules. I. beige. Interior coated with pitch.



For this type and the bibliography see the preceding example.

Cat. No. 38275 (Pl. XXI, 121)

Portion of the upper part from the rounded rim to the belly. At the base of the rim and on the back of the handle there is a reddish line. H 26,5; rim diam. 12. BF. gray, fine, with blackish inclusions and vacules. Interior coated with pitch. For this type and the bibliography see the preceding example.



CHIAN TYPE AMPHORAE

Cat. No. 36312 (Pl. XXI, 122)

Portion of the thickened neck and thickened rim. H 9.5. BF. orange, fine, with numerous blackish inclusions. Without slip.

For this type see Whitbread 1995, pp. 135-144, pl. 4, 36 (for the class "without slip"); Albanese Procelli 1996, p. 104 (for the class "coarse wares"), and in particular, Cook-Dupond 1998, p. 149, fig. 23.2, e, dated to the beginning of the fifth century B. C.



Cat. No. 36337 (Pl. XXI, 123)

Lower part from the center of the belly to the foot. H 37; max. diam. 24. BF. hazel, fine, with occasional blackish inclusions. Without slip.

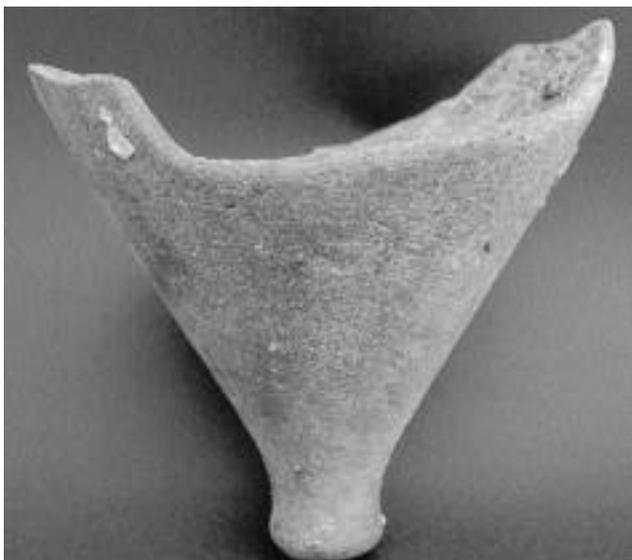
For this type and the bibliography see the preceding example.

Cat. No. 38278 (Pl. XXI, 124)

Lower part from the center of the belly to the foot. H 26; max. diam. 25. BF. gray, fine, with micaeous inclusions. Without slip.

For this type and the bibliography see the preceding example.





Cat. No. 38017 (Pl. XXI, 125)

Lower part from the point where the wall begins to taper down to the knob.

H 24; max. diam. 24. BF. gray, fine. Without slip.

For this type and the bibliography see the preceding example.

S. Cat. No. (Pl. XXI, 126)

Portion of the upper part from the thickened rim to the shoulder and the handle.

H 16; max. diam. 12.5. CC hazel, with white and micaceous inclusions. Without slip.

For this type and the bibliography see the preceding example.

Cat. No. 38245 (Pl. XXII, 127)

Lower part from the point where the wall begins to taper down to the knob.

H 20; diam. not measurable. BF. red, fine. I. beige. Without coating in pitch.

For this type and the bibliography see the preceding example.

OTHER TYPES OF AMPHORA

Cat. No. 36300 (Pl. XXII, 128)

Corinthian Type A amphora

Rim flat on the upper part, slightly sloping towards the exterior and projecting from the cylindrical neck.

H est. 17. BF. pinkish, granular, with numerous inclusions. Only a large portion of the neck is pre-



served.

For this type see Koehler 1979, pp. 101 - 104, nn. 28 - 35, dated to the beginning of the fifth century B.C.

Bibliography: Fiorentini 1990, p. 29, pl. XV, 9.

Cat. No. 38244 (Pl. XXII, 129)

Corinthian Type A amphora

There is preserved only a large portion of the wide flat rim set on the cylindrical neck with the attachment of a handle.

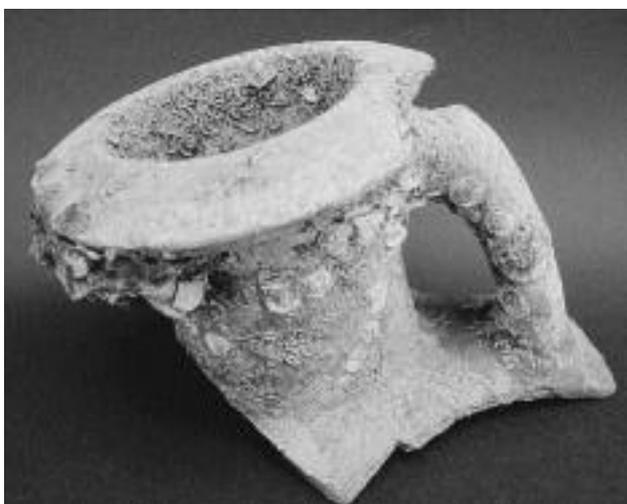
H 9. BF. orange, granular, mixed with many minute blackish inclusions. Traces of interior coating of pitch.

For this type and the bibliography see the preceding example.

Cat. No. 38016 (Pl. XXII, 130)

Corinthian Type A amphora

Portion of the neck and rim; wide rim sloping towards the exterior set between the cylindrical neck and the inclined shoulder; vertical handle with circular section is preserved set between the upper part of the neck and the inclined shoulder.



H 20; rim diam. 11. BF. gray, granular, with numerous blackish inclusions. I. beige.
For this type see Polizzi 1999, p. 221, n. 385, dated to the beginning of the fifth century B.C.

Cat. No. 36324 (Pl. XXII, 131)

Corinthian Type A amphora

Portion of the cylindrical neck with a broad rim.



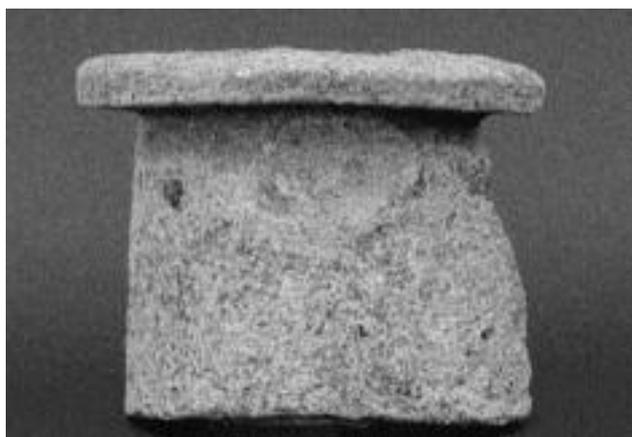
H 13. BF. orange, with numerous large inclusions and vacules. Without slip. Traces of interior coating of pitch.
For this type and the bibliography see the preceding example.

Cat. No. 38014 (Pl. XXII, 132)

Corinthian Type A amphora

Portion of the cylindrical neck with broad horizontal rim.

H 14. BF. yellowish, with numerous inclusions mixed with grog. I. pinkish. Interior coated with pitch.
For this type and the bibliography see the preceding example.



Cat. No. 38169 (Pl. XXIII, 133)

Corinthian Type A amphora

Portion of the lower part to the cylindrical knob.
H 10,6; diam. foot 9,6. BF. beige with large inclusions and grog. I. pinkish beige. Without coating of pitch.



For this type and the bibliography see the preceding example.

Cat. No. 38272 (Pl. XXIII, 134)

Corinthian Type A amphora

Lower part from the belly down to the cylindrical knob.

H 15; diam. knob 6,4. BF. pinkish with grog. Without slip. Traces of interior coating of pitch.
For this type see Cavalier 1985, pp-26-27, fig. 2 b, pl. b, dated to the beginning of the fifth century B.C.



S. Cat. No. (Pl. XXIII, 135)

Corinthian Type A amphora

H. 6,1. BF. pink to light yellow, hard with grog.

Fragment of the broad rim and the neck; chipped in places.

For this type see the preceding example.

S. Cat. No. (Pl. XXIII, 136)

Corinthian Type A1 amphora

Fragment of the flaring base with part of the full button knob.

H 6,4. BF. pink to light yellow, hard with grog.

For this type see Koehler 1981, 455, fig. 1b, pl. 99, h, dated to the first quarter of the fifth century B.C.

Cat. No. 36336 (Pl. XXIII, 137)

Samian amphora

Portion of the upper part from the rounded rim to the cylindrical neck marked by a recess at the



base; the attachment of a handle is preserved.

H 12,5; diam. 13. BF. pinkish orange, fine and with a few black inclusions. I. pinkish. Interior coated with pitch.

For this type see Cook-Dupond 1998, p. 179, fig. 23.10 (b), dated to the second half of the sixth century B. C.

Cat. No. 36305 (Pl. XXIII, 138)

West Greek amphora

(so-called “Greco-Massaliote”)

Thickened lip, distinguished by a recess in the neck; handles with an oval section set between the neck and the shoulder.

H est. 16; rim diam. 16. BF. yellowish, with white and red inclusions.



For this type see Bats 1990, p. 39, fig. 15 (type 1), dated to the beginning of the fifth century B.C.; Albanese Procelli 1996, p. 116, dated between the second half of the sixth - first quarter of the fifth century B.C.

Bibliography: Fiorentini 1990, p. 29, pl.s XVI, 5-6.

Cat. No. 38011 (Pl. XXIV, 139)

West Greek amphora

(so-called “Greco-Massaliote”)

Portion of the upper part from the ring rim, distinguished by means of a recess in the cylindrical neck, to the shoulder; a handle set vertically between the



upper part of the neck and the shoulder is preserved.

H 16,5; rim diam. 15,5. BF. pinkish, hard, with blackish and micaceous inclusions. I. whitish.

For this type see Calderone 1996, p. 67, pl. LXXXII, 5, pl. i, 4, dated to the beginning of the fifth century B.C.

Cat. No. 36307 (Pl. XXIV, 140)

West Greek amphora

(so-called “Greco-Massaliote”)

Upper part from the rounded rim, distinguished from the cylindrical neck, to the shoulder; handles



with a cylindrical section set between the neck and the shoulder.

H 14; rim diam. 7. BF. light yellow, with gray, black, and white inclusions.

Interior coated with pitch.

For this type see Bats 1990, p. 273 ff., dated to the beginning of the fifth century B.C.

Bibliography: Fiorentini 1990, p. 29, pl. XVI, 5.

Cat. No. (Pl. XXIV, 141)

Amphora of West Greek type

Portion of the rounded rim, flat on the upper part.

H 6. BF. yellowish gray, granular, with numerous blackish inclusions.

Cat. No. 36301 (Pl. XXIV, 142)

Lesbian amphora

Rounded rim, clearly distinguished from the high cylindrical neck. A handle with a cylindrical sec-



tion set between the upper part of the neck and the shoulder is preserved.

H est. 18,5; rim diam. 10,8. BF. red, fine and with blackish micaceous inclusions. Interior coated with pitch.

For this type see Clinkenbeard 1986, p. 355 fig. 3, n. 2, class of the "fractional red" dated between the end of the sixth and the beginning of the fifth century B.C.

Bibliography: Fiorentini 1990, p. 28, tavv XII, 5; XV, 3-4; Panvini 1997a, p. 138.

Cat. No. 36335 (Pl. XXIV, 143)

Lesbian amphora

Portion of the upper part from the rim to the shoulder. Rounded and everted rim; cylindrical neck that flares in its lower part and is distinguished by



means of a groove from the rounded shoulder; only a ribbon handle set obliquely between the upper part of the neck and the shoulder is preserved.

H 21. BF. grayish hazel, hard, with vacules and a few inclusions. Interior coated with pitch.

For this type see Cook-Dupond 1998, p. 157, fig. 23.4 (g): "table-amphora" type, dated to the first half of the sixth century B. C.

Cat. No. 36316

Attic "à la brosse" amphora

Only a portion of the belly is preserved.

H est. 16. BF. orange. P. diluted black.

For this type see Johnston-Jones 1978, pp. 103-141; Albanese Procelli 1996, pp. 99ff. dated to the end of the sixth century B. C.



Bibliography: Fiorentini 1990, p. 29; Panvini 1997a, p. 138.

Cat. No. 36314

Attic “à la brosse” amphora

Body fragment.



H 22,6; width 10. BF. orange, with vacules and whitish inclusions. P. diluted red.

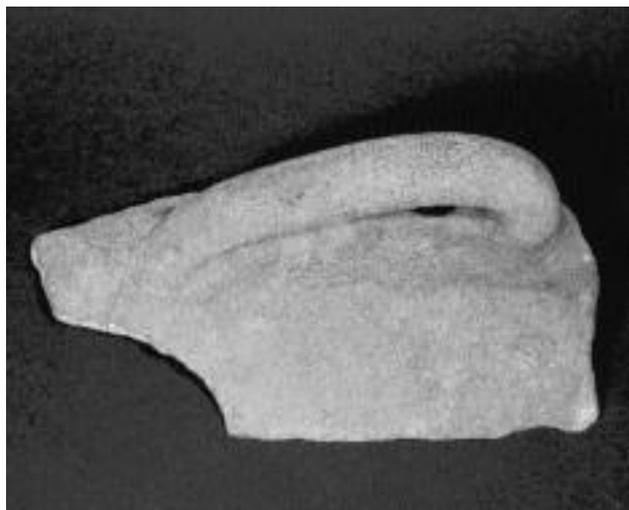
For this type see the preceding example.

Cat. No. 36302 (Pl. XXIV, 144)

Punic amphora

Portion pertaining to the body, with large vertical handle.

Length max 27; max. width 15,1; diam. handle



3,6. BF. grayish hazel, porous and granular. Restored.

Cat. No. 38117 (Pl. XXV, 145)

Punic amphora

Upper part from the rim thickened at the middle of the torpedo-shaped body; a ring-handle with a circular section set in the upper part of the body is preserved.

H 29; rim diam. 12. BF. hazel with grog.

Traces of encrustations.

Cat. No. 36304 (Pl. XXV, 146)

Kladzomenian amphora

Upper part from the rounded rim, distinguished from the cylindrical neck, to the inclined shoulder; ribbon handles set between the upper part of the neck and the shoulder.

H 17,5; rim diam. 11. BF. hazel, granular, with whitish inclusions and vacules. Interior coated with pitch.

For this type see Cook-Dupond 1998, p. 152, fig. 23.3 (c): type A, dated to the third quarter of the sixth century B. C.





Cat. No. 36306 (Pl. XXV, 147)

Fragmentary Samian amphora

Upper part from the rim to the shoulder. Rounded lip distinguished by means of a recess from the flaring rim; cylindrical neck marked by a triple groove in the upper part, flaring next to the attachment with the inclined shoulder, crenated; ribbon handles set between the upper part of the neck and the shoulder.

H 14,2; rim diam. 9,1. BF. orange, hard, with whitish inclusions. I. whitish. Interior coated with pitch.

For this type see Cook-Dupond 1998, p. 181, fig. 23.12 (o): type A, dated to the end of the sixth century B. C.

Bibliography: Fiorentini 1990, p. 28, pl.s XII, 3 and XIII, 1.

Cat. No. 38012 (Pl. XXV, 148)

Corinthian Type B amphora

Upper part of the flaring rim, distinguished from the cylindrical neck which is marked on the upper part



by a groove, to the shoulder; ribbon handles set between the upper part of the neck and the shoulder. H 12,5; rim diam. 15. BF. orange, granular, with vacules and micaceous and whitish inclusions. I. pinkish beige.

Interior coated with pitch.

For this type see Cavalier 1985, pp. 84-85, n. cat. 125, fig. 23, dated to the first half of the fifth century B.C.

Cat. No. 38184 (Pl. XXV, 149)

Milesian amphora

Upper portion with a rim with a convex profile, distinguished from the cylindrical neck marked at the base by a recess, to the inclined shoulder; a



handle is preserved with a circular section and a central rib set between the upper part of the neck and the shoulder.

H 14; rim diam. 14,5. BF. pink, with numerous micaceous inclusions and vacules. Without slip. Interior coated with pitch.

For this type see Cook-Dupond 1998, p. 74, fig. 23. 8 (d) dated to the last quarter of the sixth century B. C.

Part Two



The Second Greek Wreck at Gela:
Preliminary observations

by Rosalba Panvini

The discovery of a second wreck in the waters off the coast of Gela dates to 1990, when a local diver, Gianni Occhipinti, delivered several ceramic fragments to the Soprintendenza. They had been recovered from a pile of stones which lay on the bottom of the sea about 800 meters from the shore and about one kilometer to the east of the first wreck.

A first systematic exploration of the site was begun at the end of 1995 with the valuable collaboration of Fabio Faccenna. It was directed toward the identification of wooden remains beneath the stones. The results of excavation, which were presented for the first time at the Anzio Convention by Faccenna himself¹, led to the identification of a portion of the planking and the recovery of a small globular jar and two undecorated ceramic fragments.

It must be said at the outset that careful examination of the ceramic materials recovered has permitted us to specify the date of the wreck. As we shall see, although it does contain finds dating from the beginning of the fifth century B.C., the wreck itself is datable to the third quarter of that century.

This second ship, as we have stated earlier, lies along a tract of Gela's shoreline at Bosco Littorio where there are buildings in mud-brick construction. This settlement may be identified as the *emporion* of the ancient colony. It was located near the mouth of the river Gela, but also at a natural inlet where there was an easy place for a ship to approach the shore.

The wreck lay under a thick stratum of stones, 1.50 meters high, which constituted the ballast transported on board but which was scattered on the sea-floor after the ship had sunk. From a preliminary lithological examination the ballast seems to have been made up of hard rocks (17 in all among those sampled during the course of the excavation), of limestone rocks and a single rock of igneous origin. All of these stones are typical of geological formations in eastern Sicily, and this would make one think that the ship had stopped at one of the ports along that portion of the island before setting sail for Gela.

In and among these stones as well as below them, and in the latter case in contact with the wood of the vessel, it was possible to recover the cargo on board. Albeit largely in a fragmentary state, the materials included the ship's stores, precious materials, transport containers, and at least one basket woven from plant-fibre which was similar to one of the containers of this type found on the first wreck. This basket, from which there has been removed for the moment only one sample for laboratory analysis, probably contained foodstuffs just like the baskets found on the first wreck.

Before examining the various finds it should be said that the excavation also recovered the bones of cattle and chickens, animals which had been butchered and brought on board in quarters as food for the crew.

A curious find was that of a human bone, perhaps the ball of the radius of a young individual.

The excavation recovered not only the pits of of peaches and plums, but also grains of wheat, which were scattered on the bottom of the vessel in contact with the planking. Several grains of wheat were contained in a small, undecorated *olpe* together with two pinenuts, two beans and a few grape pits. One may suspect, however, that the grains of wheat scattered along the bottom of the vessel may have come from the supplies

¹ Cf. Faccenna 1997, pp. 143-146.

Fig. 44. Wooden stylus.

on board. If so and if this discovery were matched by later ones, it would confirm further that grain was carried on board and baked into bread (*focacce*) for the crew.

The discovery of a wooden stylus (Cat. No. 38751, fig. 44) confirms the presence on-board of a merchant, just as we found on the Archaic ship.

As we pass now to an examination of the finds we note among the ship's supplies two globular jars, several pitchers, undecorated *olpai*, undecorated *lekanai*, as well as various two-handled cups, some of which had slipped surfaces. Among the furnishings on board one there were three lamps. From one of these there was recovered the support with a ring foot, which is comparable with types dating to the fourth century B.C.

There was a sole fragment of a Corinthian Type-A amphora handle, while fragments of Corinthian Type-B amphora handles, typical of the fifth century B.C. are more numerous.

Fig. 45. Small black-glaze olpe.

Fig. 46. Fragment of an attic red-figure krater.

Fig. 47. Fragment of an attic red-figure column krater.

Among the imported materials one notes the base of an Attic black figure *skyphos*. One may make out the feet and the legs of two male figures who were part of a *komos* scene. This vessel bears the incised inscription EMI XALY on its foot, and it is attributable to the CHC Group which is dated between 490-480 B.C. (Cat. No. 38700). We further note among the materials imported from Attica a small, black glaze jar (fig. 45), chipped along the rim and on the belly, which falls among types datable generally to the fifth century B.C. (Cat. No. 38684). There are also two rim fragments from two different black glaze Laconian kraters (Cat. No.s 38702, 38712), and the base of an Attic black glaze *skyphos* comparable to Type 257 of the Athenian Agora which is dated to 450 B.C. (Cat. No. 38695). Finally, there is a fragment from the belly of an Attic red figure krater on which one may make out a male figure wearing a mantle. On the basis of stylistic traits, this vessel may be dated to 450 B.C. (Cat. No. 38731, fig. 46).

Without doubt the most notable find discovered on this second vessel is a magnificent Attic red figure column krater. For the moment, we have identified only the upper portion including the neck, part of the shoulder and the belly. One may recognize the scene, bordered along the top by a

row of small tongues and along the sides by a double row of black dots, in which a youth wearing a mantle is shown in profile. His hair is rendered in thick brushstrokes from which a drop of excess paint hangs down onto his neck (Cat. No. 38730, fig. 47).

The stylistic traits and the way in which the pupil is rendered permit us to assign this krater to the decade between 440 and 430 B.C. It seems probable that this is the work of a Mannerist, perhaps the Duomo Painter or an artist in his circle.

We present here as odd finds among those just described a fragment of a black-figure cup (Cat. No. 38700) datable to the first quarter of the fifth century B.C., and the undecorated lamp which is comparable to types commonly found in contexts of the fourth century B.C. To the latter period one may assigned also a fragment of a black glazed *lekythos* with a ribbed body (Cat. No. 38751, fig. 48) and a fragment of an undecorated jar (Cat. No. 38755), types that are directly comparable to finds in contexts of the fourth century B.C. on the island of Lipari and at Monte Saraceno (Ravanusa).

The discovery of these odd finds on the bottom of the vessel leaves us a bit perplexed. Inasmuch as they lay in contact with the planking, and it is impossible given our present understanding of the wreck that they could be attributed to infiltration or deposition caused by the movement of marine currents.

One could think, on the other hand, that the objects dating to the Archaic period, by now out of fashion, could have been part of the personal property of a member of the crew, retained perhaps as keepsakes.

Questions still remain about the shoulder fragment of an aryballic *lekythos* with a ribbed body (Cat. No. 38751), the spout of a black glazed lamp (Cat. No. 38771) and a jar (Cat. No. 38755) which, as we have stated already, are all datable to the fourth century B.C. One should take into consideration the hypothesis that such objects, instead, may have been in circulation already in the third quarter of the fifth century B.C. For this reason the examination of the cargo on-board this second wreck could be important to the study of the circulation of ceramics and the persistence of types that continued to be in use, even if only as heirlooms, long after the moment in which they were produced.

We hope, therefore, that continued excavation may furnish greater clarification, ultimately confirming the hypotheses which have been presented here or revising what we know about the importation and the continuity of ceramic types of the Greek era.

Fig. 48. Fragment of an aryballic ribbed *lekythos*.

*Catalogue**

**Transport containers catalogued by Lavinia Sole*

ATTIC POTTERY

Cat. No. 38700 (Pl. XXV, 150)

Black-figure cup

The lower portion of the body which tapers towards a disc foot is preserved.



On the body, a *komòs* scene, delimited on the lower side by a band of vertical marks below a double row of dots. Two figures stand back to back, both wearing shoes: one advances towards the right with great strides and is probably wrapped in an *himation* of which one sees the pendant edges; the other, perhaps winged, holds the feet together.

The interior is completely painted, except for the reserved central space which has three concentric circles, and the upper part of the foot, except for the exterior edge and the bottom in which one reads the incised inscription EMI KALY.

H 7,8; diam. foot 12,3. BF. orange, fine and refined. I. pinkish. P. shiny black.

CHC Group.

First quarter of the fifth century B.C.

Cat. No. 38730

Red figure column crater

Only a portion is preserved – it is missing many



pieces of the upper part from the rim to the shoulder; there are three fragments which do not join. Rim bent back on the exterior with a slightly concave profile; flat on the upper part; cylindrical neck; column-handles set by means of rectangular plates between the rim and the rounded shoulder.

Secondary decoration: on the upper margin of the rim and on the neck, a chain of stylized lotus buds joined by arching stalks; on the exterior of the rim a double horizontal row of dots between thin lines; on each plate of the handle there is a palmette between volutes.

On the body, a figural scene delimited on the upper part by a frieze of small tongues and, to the sides by a double vertical row of dots between thin lines; to the left, a male figure wearing a mantle faces right.

H 14; rim diam. 30. BF. orange, hard, dense, with occasional vacuoles and black inclusions. I. Pale pink. P. shiny black, in places degenerating into red. Restored and integrated.

Attributable to the Duomo Painter or to an artist of his circle.

440-430 B. C.

Cat. No. 38684 (Pl. XXVI, 151)

Small black-glaze jar

Everted rim; neck with concave profile marked by a slight recess at the point of attachment with the globular body flattened at the base; raised handle with circular section and a sinuous profile set between the rim and the point of maximum diameter of the body; very low ringed foot.



H 9,5; rim diam. 4; diam. foot 4,6. BF. orange granular, with white inclusions. I. hazel. P. dark gray, shiny. Restored from several fragments; chipped on the surface and on the rim.

For this type see Meligunìs Lipàra II, pl. LXI, 6 (var.), dated to the third quarter of the fifth century B.C.

Cat. No. 38710 (Pl. XXVI, 152)

Black-glaze skyphos

There is preserved the lower portion of the tronco-conical body, slightly tapering towards the ring



base. Completely painted except for the lower part of the foot and the bottom with a dot within a central circle.

H 6,8; diam. foot 7. BF. orange, fine and refined. I. pinkish. Shiny black paint, chipped and degenerating to red in places.

For this type see Athenian Agorà XII, p. 259, n. 341, pl. 16, dated to 480-450 B. C.

Cat. No. 38695 (Pl. XXVI, 153)

Black-glaze skyphos

The lower part of the tronco-conical body is preserved, slightly tapered towards the ring base.

Completely painted, except for the of the lower part of the foot and the base.

H 4,3; diam. foot 7,5. BF. pinkish orange, fine and refined. I. pinkish. P. opaque black, chipped.

For this type see Athenian Agorà XII, p. 259, n. 341, pl. 16, dated to 480-450 B. C.

Cat. No. 38741 (Pl. XXVI, 154)

Black-glaze kylix

There is preserved the square handle with a circular section, curving at the extremities and set on the lower part of the flaring rim which is distin-



guished on the interior by means of a recess, from the small portion of the cup.

Completely painted.

H 5,1; length 4,5; diam. handle 1,3. BF. orange, hard and refined, light gray in places. P. shiny black. For this type see Athenian Agorà XII, p. 268, n. 465, pl. 21, dated to 440-430 B. C.

Cat. No. 38771 (Pl. XXVI, 155)

Single spotted lamp in black-glaze



Long spout rounded with a circular hole; globular reservoir with cylindrical barrel at the center; atrophied foot distinguished from the body by means of a groove.

Completely painted.

H 3,2; diam. reservoir 5,2. BF. pinkish orange. P. opaque black, inconsistent on the exterior surface. For this type see Athenian Agorà IV, pp. 67-71, pl. 9, n. 272, type 25A, dated to the second quarter of the fifth century B. C.

LAKONIAN POTTERY

Cat. No. 38712 (Pl. XXVI, 156)

Black-glaze krater

Only a portion of the rim, with a slightly concave profile, flat on the upper part, and part of the cylindrical neck are preserved.

H 9,3. BF. pink grayish, hard, with vacules, occasional whitish and micaceous inclusions. P. opaque black, chipped.

For this type see Pelagatti 1989, p. 61, n. 303, fig.s 146-147, dated to the beginning of the fifth century B.C.

Cat. No. 38702 (Pl. XXVII, 157)

Black-glaze krater

Only a portion of the rim is preserved, flat on the upper part, distinguished by means of a groove from the cylindrical neck which has a triple groove in its lower part.

Completely painted; line of red paint on the neck



between the two series of grooves.

H 10,6. BF. gray, soft, with vacules. P. black, opaque, and reddish, chipped in places.

For this type see Stibbe 1989, fig. 16, C 6 (Gela 8692) (var.).

IONIC TYPE POTTERY OF COLONIAL PRODUCTION

Cat. No. 38770 (Pl. XXVII, 158)

Type B2 cup

A handle is preserved with its circular section set obliquely on a portion of the cup.

Completely painted on the interior and the handle. H 5,1. BF. Light hazel, soft, with occasional black inclusions. I. pinkish. P. black, opaque and diluted.

For this type see Boldrini 1994, p. 166, pl. 10, n. 334, type IV/1, dated roughly to the sixth century B. C.

Cat. No. 38747 (Pl. XXVII, 159)

Small pitcher in black-glaze

Everted rim; short neck with concave profile; inclined shoulder; lenticular body; footless.

H 5,7; max. diam. 6,7. BF. pinkish orange, soft, granular. I. pinkish. P. black, opaque inconsistent. Restored, integrated, missing many pieces along the rim.

For this type see Semeraro 1997, pp. 232-233, n. 814, fig. 199, dated to the first quarter of the fifth century B.C.

Cat. No. 38697 (Pl. XXVII, 160)

Small jar partially painted

Only a portion of the globular body is preserved, tapered towards the very low ringed foot, and the attachment of the ribbon handle.

The upper part is painted for immersion.

H 5,5; diam. foot 3,5. BF. orange, soft, refined and micaceous. I. pinkish. P. brown, diluted, chipped in places. Restored and missing many pieces.

POTTERY OF COLONIAL PRODUCTION

Cat. No. 38727 (Pl. XXVII, 161)

Small two-handled cup undecorated

Rim indistinct from the flaring cup, crenated in the upper part and tapers to the low cylindrical foot; a handle with circular section set slightly below the rim is preserved.

H 4,2; rim diam. 12. BF. orange, brown on the exterior surface, granular, with many vacules and

black inclusions of mica and quartzite. Missing many pieces and restored.

Cat. No. 38767 (Pl. XXVII, 162)

Two-handled cup undecorated



Only a portion is preserved of the deep cup with a convex profile indistinct from the rim and the thickened ribbon handle which is set at the level of the rim.

H 9,8. BF. pinkish, soft and porous.

For this type see Denti 1996, p. 150, 89-3, pl. CXXXIV, 3 (sep. 89), dated to the second half of the fifth century B.C.

Cat. No. 38762 (Pl. XXVIII, 163)

Two-handled cup undecorated

Only a portion is preserved of the deep cup with a convex profile, indistinct from the rim, and the thickened ribbon handle which is set at the level of the rim.

H 9,2. BF. pinkish, soft, granular, with vacuoles and black inclusions.

For this type see the preceding example.

Cat. No. 38735 (Pl. XXVIII, 164)

Two-handled cup undecorated

Only a portion is preserved of the cup with a convex profile indistinct from the rim and a ribbon handle set at the level of the rim.

H 6,7. BF. pinkish, hard, with occasional vacuoles and black inclusions.

Cat. No. 38754 (Pl. XXVIII, 165)

Two-handled cup undecorated

A handle is preserved with a circular section set below the rim which is indistinct from the con-

vex profile of the cup.

H 4,2. BF. pinkish orange, soft, with minute black inclusions.

Cat. No. 38765 (Pl. XXVIII, 166)

Two-handled cup

A handle is preserved with a circular section set at the level of the rim indistinct from the convex profile of the cup.

Cream-colored band in the upper part.

H 6,2. BF. pinkish orange, soft, with minute black inclusions. I. cream.

Cat. No. 38736 (Pl. XXVIII, 167)

Two-handled cup

Only a portion is preserved of the cup with a convex profile indistinct from the rim and a ribbon handle set at the level of the rim.

H 6,3. BF. pinkish, hard, granular, with black inclusions. I. cream.

S. Cat. No. (Pl. XXVIII, 168)

Two-handled cup

Only a portion is preserved of the cup with a convex profile indistinct from the rim and a ribbon handle set at the level of the rim.

H 3,5. BF. pinkish, soft, with inclusions, vacuoles and mica. I. cream.

Cat. No. 38701 (Pl. XXIX, 169)

Two-handled cup

Only a portion is preserved of the cup with a convex profile indistinct from the rim and a ribbon handle set at the level of the rim.

H 6. BF. pink, soft, with inclusions and vacuoles. I. cream.

Cat. No. 38707 (Pl. XXIX, 170)

Two-handled cup

Only a portion is preserved of the cup with a convex profile indistinct from the rim and a ribbon handle set at the level of the rim.

H 4,1. BF. Light orange, soft, granular. I. cream.

N Inv. 38759 (Pl. XXIX, 171)

Kotyliskos

Rim indistinct from the convex profile of the cup; thickened ribbon handle set at the level of the rim; ringed foot.

Cream color on the interior and in the upper part.

H 4,7; rim diam. 7,5; diam. foot 3,1. BF. orange, hard, granular. I. cream. Cup missing pieces.



Cat. No. 38752 (Pl. XXIX, 172)

Small dish undecorated

Everted and slightly pendant rim; low carenated cup that tapers toward the flaring foot.

H 4,5; rim diam. 10,6; diam. foot 4,1. BF. orange, with large calcite inclusions. I. cream. Missing many pieces along the rim.

For this type see Meola 1997, p. 388, 4 (D. 432),



pl. 4, dated roughly to the fifth century B.C.

Cat. No. 38670 (Pl. XXIX, 173)

Small pitcher undecorated

Everted rim with upper attachment of the ribbon handle; short neck with concave profile; inclined



shoulder; globular body with lower attachment of the handle; footless.

H 6,1; rim diam. 4,1; max. diam. 6,2. BF. pinkish, with vacules and micaceous inclusions. I. white grayish. Missing many pieces of the handle and the rim. Traces of encrustation.

Cat. No. 38757 (Pl. XXIX, 174)

Small pitcher undecorated

Everted rim with upper attachment of the ribbon handle; short neck with concave profile; shoulder



horizontal; lenticular body with a trace of the lower attachment of the handle; footless.

H 5,7; rim diam. 4,1; max. diam. 6,7. BF. pinkish orange, with vacules and micaceous inclusions. Missing of the handle.

Cat. No. 38758 (Pl. XXX, 175)

Small pitcher undecorated

Everted rim; short neck with concave profile; inclined shoulder; globular body; flat base.

H 6,2; max. diam. 6,3. BF. hazel to light yellow, granular, with black inclusions. Missing many pieces along the rim and missing the handle.

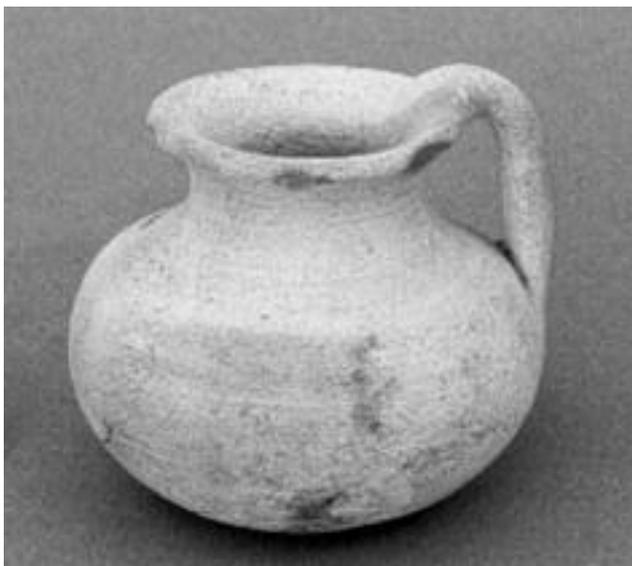
For the shape see Semeraro 1997, p. 257, n. 957, fig. 213, dated to the fifth century B. C.

Cat. No. 38731 (Pl. XXX, 176)

Small pitcher

Everted rim; short neck with concave profile; inclined shoulder; ribbon handle, slightly raised, set between the rim and the maximum diameter; lenticular body; footless.

H 5,7; rim diam. 4,2; max. diam. 6,4. BF. pinkish orange, soft, with vacules and black inclusions. I. whitish. Slightly chipped on the rim.



Cat. No. 38734 (Pl. XXX, 177)

Small amphora undecorated

There are preserved a fragment of the upper part with the rim thickened and marked by a central groove, the cylindrical neck and a handle with a circular section set between the upper part of the neck and the inclined shoulder.

H 7. BF. pinkish orange, hard, with black inclusions. I. cream.

Cat. No. 38711 (Pl. XXX, 178)

Jar

Everted rim with pendant lip; short cylindrical neck slightly flaring towards the inclined shoulder in a continuous profile with the globular body. Vertical stripes along the body.

H 14; rim diam. 11. BF. orange, granular, with black, white, and micaceous inclusions. I. hazel. Missing many pieces and restored.

For this type see Calderone 1996, p. 66, pl.



LXXXI, 4, dated between the end of the sixth and the first quarter of the fifth century B.C.

Cat. No. 38763 (Pl. XXX, 179)

Jar

Rim horizontal, flat and everted with thickened lip; handle with circular section adhering to the lip; body with a convex profile.

H 16. BF. orange reddish, hard, with black and white inclusions. I. ivory. Missing many pieces.

Cat. No. 38703 (Pl. XXX, 180)

Jar

There is preserved a fragment of the thickened, slightly flaring rim with the attachment of the ribbon handle and part of the wall.

H 6,5. BF. reddish, hard, with numerous and large black inclusions of mica and quartzite.

For this type see Meligunìs Lipàra IX, p. 93, pl. XXXIV, 2a, dated roughly to the sixth century B.C.

Cat. No. 38755 (Pl. XXXI, 181)

Jar

Flaring rim with short interior projection; saddled ribbon handle set vertically on the inclined shoulder in a continuous profile with the globular body.

H 6,8. BF. orange reddish, hard, granular. Surface burnt. Missing many pieces.



For this type see Meligunìs Lipàra II, pl. XCIV, 1a (t. 69), dated to the fifth century B. C.

Cat. No. 38768 (Pl. XXXI, 182)

Olpe undecorated

Everted rim with flattened vertical lip; short neck with concave profile; inclined shoulder; ribbon handle set between the rim and the globular body.

H 8,6; rim diam. 9,5. BF. orange, hard, with vacuoles. I. cream. Missing many pieces.

For this type see De Miro 1989, p. 75, pl. LVII, t.

592, dated within the middle of the fifth century B.C.

Cat. No. 38753 (Pl. XXXI, 183)

Olpe undecorated

Everted rim; short neck with concave profile; ribbon handle set between the rim and the point of attachment of the shoulder in a continuous profile with the globular body; footless.

H 10,8; rim diam. 7,5; max. diam. 11,8. BF. orange, hard, granular, with numerous and minute vacules. I. whitish. Missing many pieces along the rim.



Cat. No. 38740 (Pl. XXXI, 184)

Stemmed lamp

There are preserved the stem, grooved in the upper part and along the exterior edge, hollow on the bottom and flaring towards the disc foot.

H 8; diam. foot 6,5. BF. pinkish, soft and refined.



I. beige.

For this type see Calderone 1996, p. 28, pl. XXXV, 6, dated to the fifth century B. C.

TRANSPORT CONTAINERS

by *Lavinia Sole*

CORINTHIAN TYPE B AMPHORAE

Cat. No. 38776 (Pl. XXXI, 185)

Portion of the upper part, from the flaring rim, slightly thickened with a short flat lip, to the cylindrical neck, marked by a groove; the attach-

ments of the two ribbon handles set in the upper part of the neck are also preserved.

H 11,8; rim diam. 17. BF. pinkish hazel, gray fabric, soft, with brown inclusions. I. cream.

Heavily encrusted.

For this type see Cavalier 1985, pp. 84-85, n. cat. 125, fig. 23, dated to the first half of the fifth century B.C.

Cat. No. 38774 (Pl. XXXI, 186)

Portion of the upper part from the flaring rim with a convex profile and a lip flat to the cylindrical neck marked by a groove.



Traces of interior coating of pitch.

H 12,9; rim diam. 16,6. BF. pinkish hazel, gray fabric, soft, with brown inclusions. I. cream. Traces of encrustation, handles recomposed.

For this type see the preceding example.

Cat. No. 38777 (Pl. XXXII, 187)

Portion of the upper part from the rim to the shoulder. Flaring rim with a convex profile and a lip flat, sloping towards the interior; ribbon handles, which are preserved only at the point of attachment, set between the upper part of the cylindrical neck, marked by a double groove and

the slightly inclined shoulder.

H 12,8; rim diam. 17,2. BF. pinkish hazel, soft, with brown inclusions; I. Light gray. Traces of interior coating of pitch. Traces of encrustation.

For this type see Cavalier 1985, p. 63, cat. 55, fig. 16, dated to the first half of the fifth century B.C.

Cat. No. 38775 (Pl. XXXII, 188)

Upper part from the rim to the shoulder. Flaring rim slightly thickened with a short flat lip, clearly distinguished by means of a recess, from the cylindrical neck; there is preserved a ribbon handle set between the upper part of the neck and the slightly inclined shoulder.

h 12,5. BF. hazel, soft, porous, with occasional black and micaceous inclusions. I. pinkish.



For this type see Cavalier 1985, pp. 84-85, n. cat. 125, fig. 23, dated to the first half of the fifth century B.C.

Cat. No. 38726 (Pl. XXXII, 189)

Portion missing many pieces of the flaring rim, slightly thickened, with a groove in the upper part.

H 4,2; rim diam. 16. BF. pinkish orange, soft, with small black inclusions. I. hazel. Traces of encrustation.

For this type see the preceding example.

Cat. No. 38728 (Pl. XXXII, 190)

There is preserved the small button-like tronco-conical knob, convex at the base, and a portion of the lower part of the globular body.

H 5,1. BF. pinkish, soft, with vacuoles, black inclusions and mica. I. hazel. Traces of interior coating of pitch.

For this type see Koehler 1979, nn. 230-231, dated to the first half of the fifth century B.C.

Cat. No. 38729 (Pl. XXXII, 191)

There is preserved the small, button-like, tronco-conical knob, convex at the base, and a portion of the lower part of the globular body.

H 7,5. BF. pinkish, soft, with vacuoles and occasional black and micaceous inclusions. I. hazel. Traces of interior coating of pitch. Restored from several fragments.

For this type see the preceding example.

Cat. No. 38696 (Pl. XXXII, 192)

Portion of the upper part from the rim to the neck. Flaring rim with flattened horizontal lip, distinguished by means of a groove from the cylindrical neck; the attachment of a ribbon handle on the upper part of the neck is preserved.

H 7,7. BF. orange, soft, granular, with numerous white and gray inclusions.

For this type see Koehler 1979, n. 231, dated to the first half of the fifth century B.C.

Cat. No. 38705 (Pl. XXXII, 193)

Upper part from the flaring rim, slightly thickened, with horizontal flat lip, to the cylindrical neck marked in the upper part by a groove; there is preserved a ribbon handle set between the upper part of the neck and the inclined shoulder.

H 12. BF. pinkish, soft, with vacuoles and white and black inclusions. I. pinkish hazel. traces of interior coating of pitch.

For this type see Cavalier 1985, pp. 84-85, n. cat. 125, fig. 23, dated to the first half of the fifth century B.C.



MATERIALS OF VARIOUS TYPOLOGY

Cat. No. 38751

Wooden stylus (olive-wood?)

Length 11. Chipped at the tip.



Cat. No. 38743

Lead ring

Ribbon-like rod with oblique profile.

H 1; diam. 2,5. cast. Traces of encrustation.

Cat. No. 38713

Loom-weight

Tronco-pyramidal shape.

H 6,1; base 3,5 x 3,5. BF. Light orange, not very dense, with minute black inclusions. Chipped at the upper extremities; depression in the base.

For this type see Valentino 1997, pp. 200, 205, fig.s 1-2, n. 25, dated between the sixth and the fifth century B. C.



The Second Wreck at Gela: notes on naval architecture

*by Alessandra Benini**

** I would like to thank Dott.ssa Rosalba Panvini of the Soprintendenza per i Beni Culturali ed Ambientali di Caltanissetta very much for having offered me the opportunity to participate in the excavation and for inviting me to present the preliminary results of investigations carried out on the second Archaic wreck at Gela. My sincere thanks are owed also to Delia Lo Iacono who took care of all the graphic documentation of the excavation.*

The wreck lies about one kilometer from the shore of contrada Bulala at a depth of 6 meters and it appears to be a large pile of stones (dolomitic limestone) well cemented by tremolina which rises up from the otherwise sandy sea-floor (fig. 49).

Our awareness that the pile was a shipwreck, beyond the fact that it was similar to the situation encountered in the excavation of the first ship at Gela, came from the preliminary investigations conducted by F. Faccenna in 1995¹. On the basis of such preliminary data the first extensive excavation was arranged in 1997, and it was possible to explore one third of the area covered by the stones (plate XXXIV).

The accumulation of stones extends over an irregular area, and their arrangement appears to be haphazard for their dimensions and their form. Actually, stones of relatively small dimension alternate with large

Fig. 49. View of the edge between the pile of stones and the surrounding sea-floor.

Fig. 50. A wooden element, in part covered by the planking, which lies along the western edge of the wreck.

¹ Faccenna 1997, pp. 143-146.

² The pile extends over an area of roughly 7,5 x 9,5 meters to a maximum height with respect to the surrounding sea-floor of 1,5 meters. The stones are roughly uniform in size varying by a few centimeters to a maximum breadth between 60-70 centimeters, and they do not show any traces of modification.

³ Freschi 1991, pp. 201-210; Panvini 1997a, pp. 135-142; Kahanov 1998, pp. 155-160.

blocks both in the upper strata and in those strata in direct contact with the wood of the ship² (plate XXXV).

The presence of such a huge quantity of stones has already been seen in the wrecks of Gela I and of Ma'agan Mikhael, and by now the most accredited hypothesis is that they belong to the ballast of the ship³.

Fig. 51. Detail of the two mortise - and - tenon joints which bind the two planks.

From the excavation and cleaning of the planking it was learned that the ship had come to rest flat on the bottom. The keel, no longer *in situ*, probably was torn off at the moment of impact with the sea-floor, while the rest of the vessel came to rest a few meters beyond it (plate XXXVI). This scenario is confirmed by a wooden element which was found along the western edge of the wreck partly under the planking. It looks like the keel, although this identification remains uncertain because it presents anomalies compared to other examples that are already known⁴ (fig. 50). It consists of two pieces of wood, each with a rectangular cross-section, which were united by a series of mortise-and-tenon joints, and it does not display traces of rabbets nor other traces for the assembly of the garboard⁵. One of two ele-

Fig. 52. Detail of the rectangular profiled tongue.

⁴ This element has been revealed for a tract of about 3 meters, but one cannot inspect it fully because it is covered partially by the planking of the vessel and, where it is not covered, it has suffered greater deterioration. In order to clarify the function it is necessary to await further excavation.

⁵ The absence of the rabbet is seen also in the two Archaic Greek ships Jules Verne 9 and 7 discovered at Marseilles, see Pomey 1997, pp. 195-203.

Fig. 59. Detail of the tract with traces of the sewing. To the right and the left one sees the wooden treenails and the mortise-and-tenon joints.

ments was composed of two pieces which were joined at the head by means of a rectangular scarf⁶ (fig.s 51-52). This elements may have functioned as a false keel, but it is excessively thick in comparison to such elements identified in other wrecks⁷.

The only other element of the vessel which could have had a similar form is the keelson which up to now has not been recovered, but the position in itself beneath the planking renders this interpretation problematic. Furthermore, in the tract brought to light there are no recesses for the stanchions which often characterize this element and there is no shaping for construction above the floor timbers⁸. On the other hand even the floor timbers do not seem to show particular traces of wear along their longitudinal principal section: it could be the case, therefore, that there was no single element which functioned as a keelson, as one may see already in the example of the wreck at Kyrenia and in that at Bon Porte⁹.

In proximity to the fourth floor timber, furthermore, there was a wooden block. Although it was no longer *in situ* but resting on a stone, it had on its upper side a small recess (13 x 5 cm) for the placement of struts for the superstructure. On the opposite side there was a profile which could match the form of a floor timber¹⁰. The form of this element, anyway, leads us to suggest that this solution may have been adopted as well for the keelson, as one finds in the first wreck at Gela.

From the portion of the vessel brought to light during the first excavation campaign one may see that the skeleton of the ship had a wide frame space (60-70 cm) and that all of the floor timbers were complete with futtocks (fig.s 53-54)¹¹. The floor timbers had a trapezoidal section with a larger base – or rather the upper side was rounded and crossed by eight rectangular or slightly trapezoidal limbers (fig.s 55, 56, 57). The floor timbers and the futtocks were joined with hook timber scarf¹² (fig. 58). Numerous bronze nails with a square section held together the assemblage of the floor timbers, the futtocks and planking.

Along the longitudinal axis where the bottom of the hull is deepest the floor timbers reach a height of about one-half meter, obtained through the insertion of two wooden planks fixed below the floor timber with horizontal pegs. The lower plank was not always preserved— evident-

⁶ This method of joining is found, among wrecks which are contemporary or slightly later in date, in the keelsons of Gela I and di Ma'agan Michael (Israel) and in a repair to the keel of the Kyrenia wreck (Cyprus); see Steffy 1985, pp. 71-101.

⁷ The wrecks at Ma'agan Mikhael and Kyrenia have a false keel which is about 5 cm thick in comparison to the 18 cm of ours.

⁸ The keelson of Gela I shows a series of profiles which correspond to the floor timbers and 12 recesses for pegs along the upper face; in that at Ma'agan Mikhael at least 11 have been identified.

⁹ Joncheray 1986, pp. 5-36; Pomey 1981, pp. 225-244; Steffy 1985, note 6.

¹⁰ A similar block, still resting on the floor timber, has been found also in the wreck of Gela I; see Freschi 1991, note 3.

¹¹ Rib-spacing this wide is found also in the wrecks of Gela I (93 cm), Jules Verne 7 (90 cm) and di Ma'agan Mikhael (75 cm).

¹² Floor timbers with a trapezoidal section are found also in the wrecks of Ma'agan Mikhael, Bon Porté, and Gela I.

Fig. 53. View from above of the long axis of the vessel.

Fig. 54. View of the vessel from the west.

Fig. 55. The first floor timber (M1). One may notice breaks in the planking and the absence of the keel.

Fig. 56. The second floor timber (M2).

Fig. 57. The third floor timber (M3). Detail of the planks inserted beneath the floor timber and of the garboard which has been detached from the rest of the planking.

Fig. 58. Detail of the joint between the floor timber and the futtock.

Fig. 60. The metal reinforcement applied to the interior of the planking.

ly when the keel was ripped off several of these elements were lost¹³ (plate XXXVII, fig. 56).

The longitudinal axis of the wreck was brought to light during the first excavation campaign for a length of about four meters. It was oriented at 320 degrees, and it consisted of 14 planks of the hull still *in situ*, as well as a portion of the bottom with another four planks.

From the point of view of naval architecture the wreck displays classic construction methods: the planks were connected by mortise-and-tenon joints, fixed with vertical wooden pegs which were set at regular intervals of about 20 cm¹⁴. The strakes are between 25 and 30 cm wide and, where they can be measured, 4.5 cm thick.

In the first wreck at Gela the central floor timber measures 4.00 meters in length, while the third floor timber of this wreck, which was slightly mutilated at its eastern end, is preserved for 3.80 meters. It seems probable, therefore, that the two wrecks at Gela were not much different in their dimensions and that the area of the second wreck which has been investigated up to now corresponds to the main section of the ship¹⁵.

One of the two extremities seems to have been lost, perhaps because it had not been protected by the ballast stones. We cannot exclude, however, that other sections of the vessel were not preserved in the area around the pile, from which, already in this campaign, other remains of the hull have emerged, even though they were not *in situ*.

During the cleaning of the planking between the second and the third floor timbers (M2-M3), it was discovered that a small tract which remained whole between the garboard and the counter-garboard was held together not only with mortise joints but with sewing, the other well known, naval construction technique. There are only five points with the typical triangular recess facing each other and with the remains of the rope, which was still preserved in the holes of the plank¹⁶ (fig. 59).

Slightly beyond the third and the fourth floor timbers (M3-M4), on both sides of the hull across the same seam two metal sheets were preserved. They were both in a rather precarious state, almost reduced to dust (perhaps they were in lead), and they were fixed in the planking with small nails. It is thought that they may have served as internal reinforcement perhaps following the repair of the vessel (fig. 60).

¹³ The numbering of the floor timbers begins from the southern end.

¹⁴ This type of spacing is found also in the wreck Jules Verne 9, and it is considered to be a characteristic of the earliest examples of mortise joining; see. Pomey 1998, pp. 47-153.

¹⁵ The total length of the Gela I wreck is estimated to be 17 meters.

¹⁶ It is hoped that with the continuation of the excavation it may be possible to investigate at least one of the ends of the ship. It would be important to verify, in fact, whether or not the sewing technique was adopted also for the assembly of the structural parts.

Fig. 61. Fragments of a plant-fibre rope.

Fig. 62. Device used to keep the limbers clean.

Beyond several fragments of rope (fig. 61) and several fragments of straw there was found also the tool used probably to clean accumulated filth from the limbers. It is a wooden palette with a circular section in the central part (diameter 7 cm) and a rectangular section at the tapered ends (fig.s 62-63). Such shaping permitted the insertion of the entire point of the palette inside the hole in order to remove eventual deposits and to free it for the passage of bilge water. It was discovered still in position between two limbers.

There are also interesting working marks on the planking. In one case there are two crosses incised near a wooden dowel, which one may interpret probably as some kind of identification for the order of construction, while in another there is a simple line visible where the tract of a floor timber is now lost. This second incision seems to mark a reference-line indicating the correct position for the floor timber. If this interpretation is correct, it would be proof that at least the first phases construction employed the

Fig. 63. Detail of the point still inserted in a limbers.

shell technique.

The presence of a repair made by sewing planking already joined by mortise and tenon permits us to attribute the construction of the second wreck at Gela to a combination of the two methods. Perhaps because they were not fully familiar with mortising they preferred to perform repairs by sewing, a method perhaps more tested and therefore seemingly more trustworthy. Unfortunately, we are not yet able to know how the planking was assembled at the bow and the stern, where the means of connecting by sewing seems to have survived even after the adoption of the mortise joint method. Such use of two different techniques has already been noticed in other vessels, in particular the wrecks at Mazzaron in Spain¹⁷, Wreck 7 in Piazza Jules Verne at Marseilles¹⁸, in the wreck at Ma'agan Mikhael in Israel, which are datable between the seventh and the fifth centuries BC. In these wrecks we find, in fact, mortise joints used to connect the planking and sewing used to hold the planks of the bow and the stern, to fix the frames, and to make repairs to the hull.

The wreck at Gela II, therefore, presents characteristics of both methods of construction:

1) The planking in the central portion of the hull is assembled by mortise-and-tenon joints but it shows a repair performed by sewing.

2) The floor timbers have lost the lower profile typical of sewn ships, substituted with limbers for the passage of bilge water, but still they have a rounded section despite the fact that they are fixed to the planking with nails.

3) The double curved bottom belongs, according to the study of Pomey, to an advanced state of evolution in ship construction¹⁹.

It is not possible, however, to understand the use of the two different methods as a simple relation of earlier and later — it is not just a matter of chronological factors, but rather it is necessary to consider other geographical and cultural factors in each wreck²⁰. One bit of evidence comes precisely from the two wrecks at Gela themselves, lying just a few hundred meters apart and datable within fifty years of each other, which were created using the two different techniques of construction.

¹⁷ Neguerela - Pinedo - Gomez - Minano-Arellano - Barba 1995, pp. 189-197.

¹⁸ Pomey 1995, pp. 459-482; Pomey 1998, note 14.

¹⁹ Pomey 1997, note 5, pl. II.

²⁰ The technique of assembly by sewing survived for a long time albeit in specific cultural areas, one notable example of which is the ship at Pomposa which is datable to the Eleventh century; see Bonino 1985, pp. 87-104.

Appendix



Analysis of the wooden remains

*by Francesca Terranova
and Patrizia Lo Campo **

**Laboratorio di Bioarcheologia, Centro Regionale Progettazione e Restauro,
Assessorato BB.CC.AA. Palermo.*

THE ARCHAIC GREEK SHIP

The wreck of the Greek ship lies on a sandy sea-bottom, which has helped its preservation, protecting it from damage by mechanical factors and limiting the changes caused by degradation from biological agents.

The Laboratorio di Bioarcheologia of the Centro Restauro di Palermo¹ has analyzed several samples of wood removed during the excavation campaigns for the purpose of determining the kinds of wood species employed in the construction of the ship.

Characterizing the wood is important not only for the purpose of knowing more about ancient ship-building but also for purposes of conservation because it furnishes elements useful in determining the appropriate treatment for the recovered wood.

The wooden fragments pertaining to the floor timbers, to the keelson, to the keel and to the beam of the wreck have been analyzed by observing under both an optical and a stereoscopic microscope along the three diagnostic sections — transverse, radial and longitudinal. After preliminary observation of the transverse section under the stereoscopic microscope, radial and tangential thin sections were prepared for study under the optical microscope at enlargements between 250x and 400x.

The fragments pertaining to the floor timbers, to the keelson, to the keel as well as fragments of uncertain provenance, display the same characteristics. In transverse section one sees the structure typical of coniferous wood and the presence of resin canals with thin-walled epithelial cells (fig. 64); in radial section (fig. 65) one sees large unpaired pits, small pinoid pits in the cross-fields, and ray tracheids with distinctly dentate walls.

The combination of such characteristics leads us to attribute the sample to *Pinus pinea*.

Pinus pinea is a species limited to the Mediterranean which flourishes in loose, sandy soils. Its range penetrates the hinterland little and only

Fig. 64. Transverse section of *Pinus pinea*.
The resin-bearing channels are visible.

¹ Collaborators in this analysis include Dr. Anna M. Di Sclafani (laboratory technician) and the technicians of the Photographic Laboratory. Reference bibliography: Brorson Christensen 1970; Giordano 1981; Pignatti 1982; ICOM; M. A. "P. Giovio"; Schweingruber 1990; Nardi Berti

Fig. 65. Radial section of *Pinus pinea*. The intersecting fields with pinoidal dotting are visible.

on occasion does it reach between 700-800 meters in elevation.

This conifer produces a clear, resinous wood. Although this wood offers only moderate mechanical resistance, it has significant tolerance in comparison to other woods when it is wet, so much so that it was used frequently in the past for ship-building. Analogies may be made with the second wreck at Gela where the floor timbers and several samples of Stratum III have been identified as *Pinus pinea*.

As far as the fragment belonging to an unknown part of the wreck is concerned, however, one observes under the microscope in transverse section that there is a diffuse-porous structure with distinct growth rings, and many small single perforations. In radial section one may see the presence of simple perforations and heterogeneous rays. This sample is attributed to *Salix sp.*

The use of willow in ancient ship-building is not documented, and therefore it seems probable that this fragment belongs to an object which did not have structural function.

Several fragments which appeared to be in the same state of preservation as the others, were not analyzed because, beneath a superficial stratum which was structurally sound there was an inconsistent and disorderly mass of fiber which had degenerated in large part already.

This poor state of preservation is attributable to an attack by naval shipworms, which are actually bi-valve mollusks. There are several kinds of naval shipworm: in the Mediterranean the most common species are *Teredo navalis L.* and *T. pedicellatus Quatr.*, a cosmopolitan species that has a high tolerance to salinity.

The holes opened by the shipworms are very small, so much so that they can easily escape preliminary observation. The wood that has been attacked is only apparently whole, but its resistance is compromised by the many tunnels that the mollusks have dug on its interior (fig.s 66-67). It has been shown that various species of wood demonstrate different susceptibility to attack by shipworms. In particular, the wood of conifers, such as pine, offers minimal resistance.

The presence of pine and the absence of species such as oak and maple, frequently used in the construction of ships (see the second wreck at Gela), would lead one to think that the Greek carpenter pre-

Fig. 66. Wooden fragments with holes bored by the shipworms.

Fig. 67. Detail of the wooden fragments with holes dug by the shipworms.

ferred to build a light boat rather than a hard and resistant one.

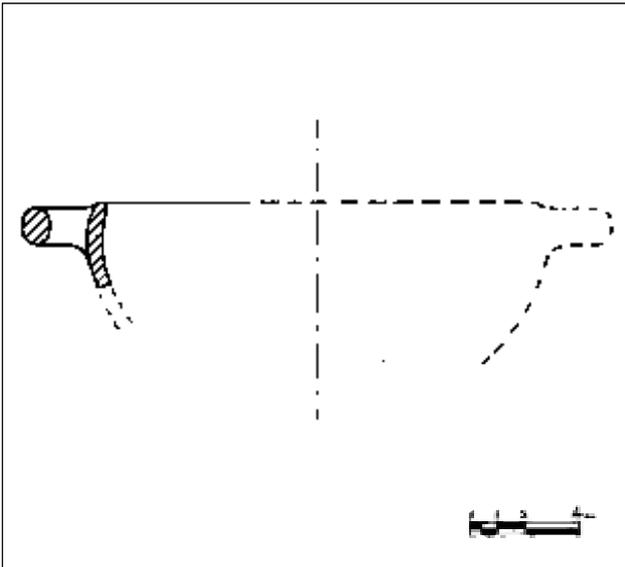
Such an hypothesis might be confirmed, anyway, by the analysis of wooden fragments pertaining to a part of the wreck which has not yet been sampled.

THE SECOND WRECK

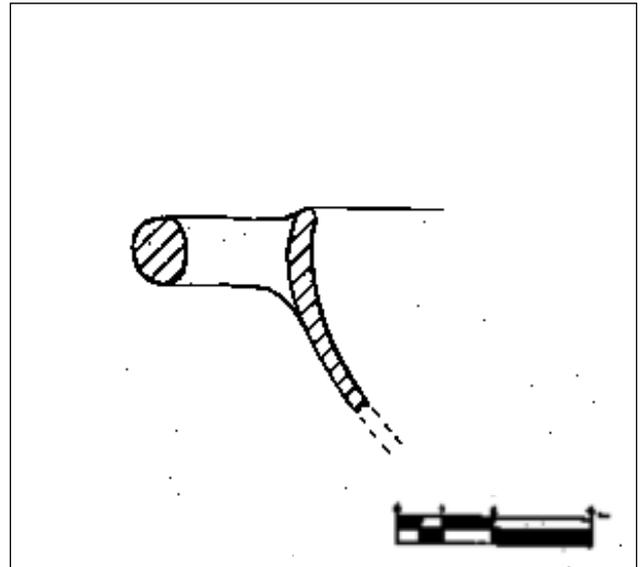
The analysis conducted by the Laboratorio di Bioarcheologia del Centro Restauro on samples of wood from the second wreck have demonstrated that the ship was constructed using different types of wood. The strut is in maple wood, the beam, the tenon and other fragments have been attributed to holm-oak; the planking was in black pine. The ship, which was heading towards the port at Gela, was carrying amphorae of various types separated by branches, which functioned as packing in order to avoid breakage during the trip.

PLATES

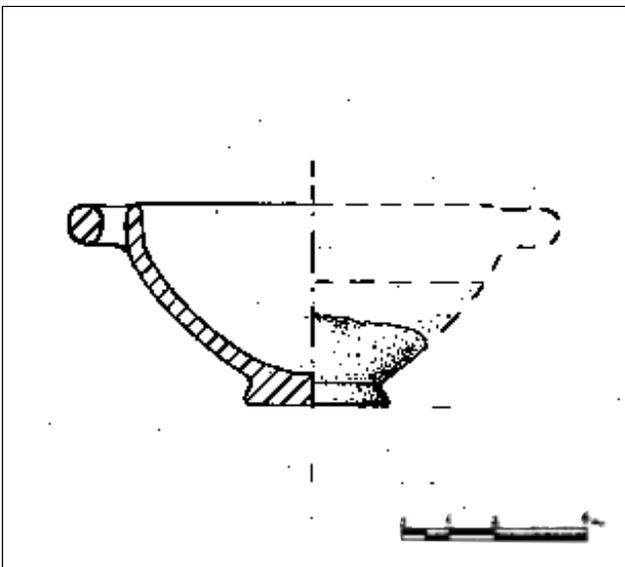




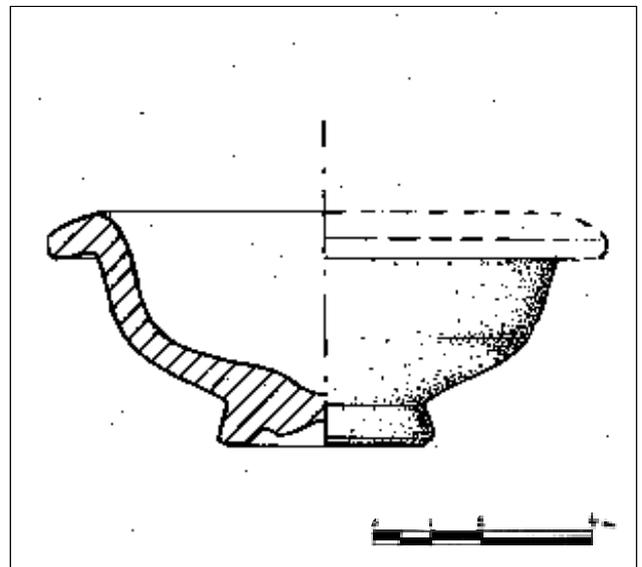
169



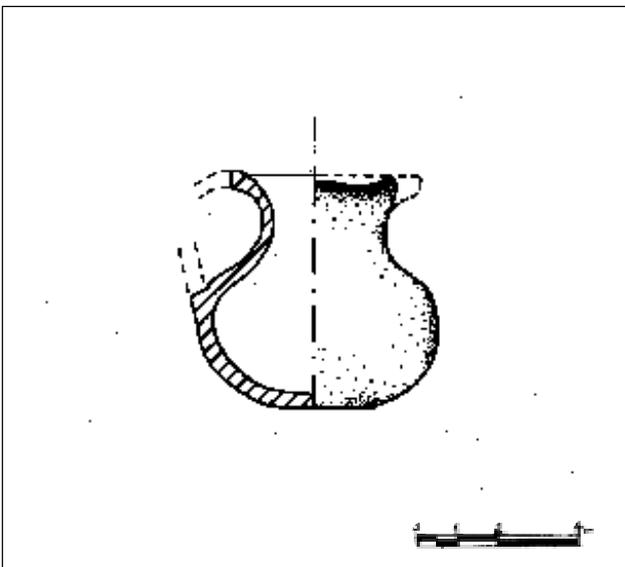
170



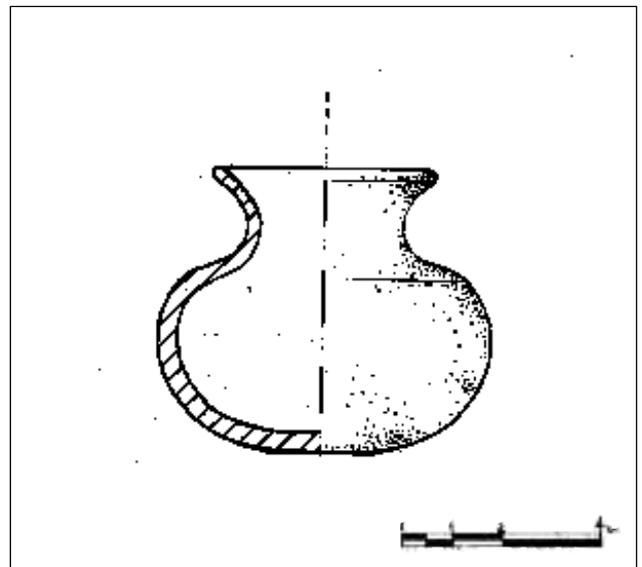
171



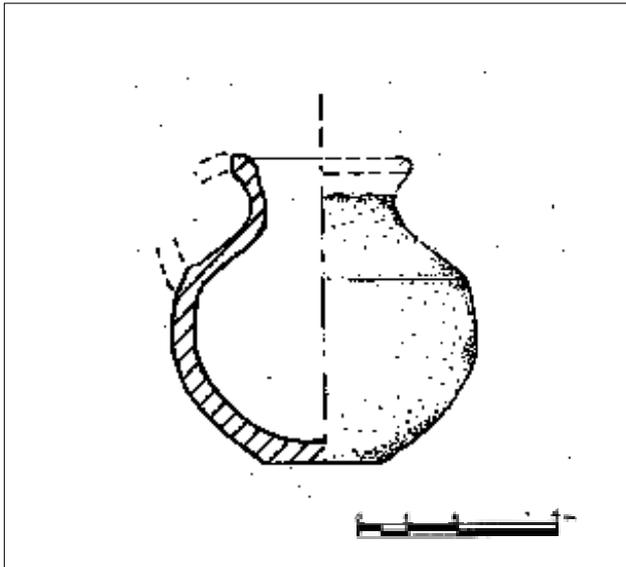
172



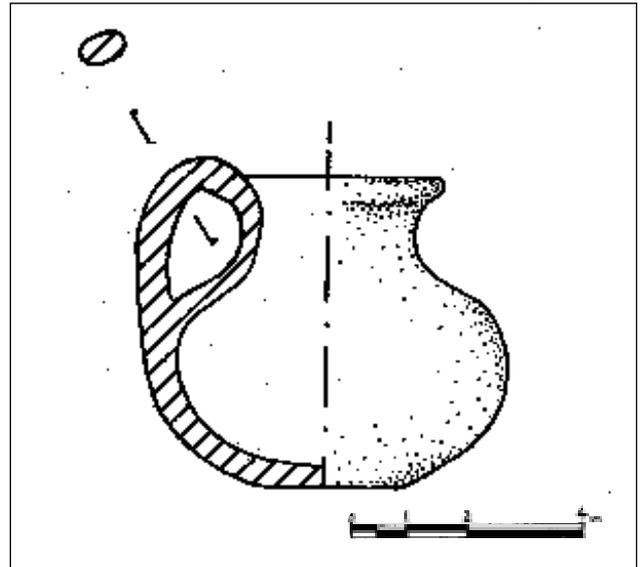
173



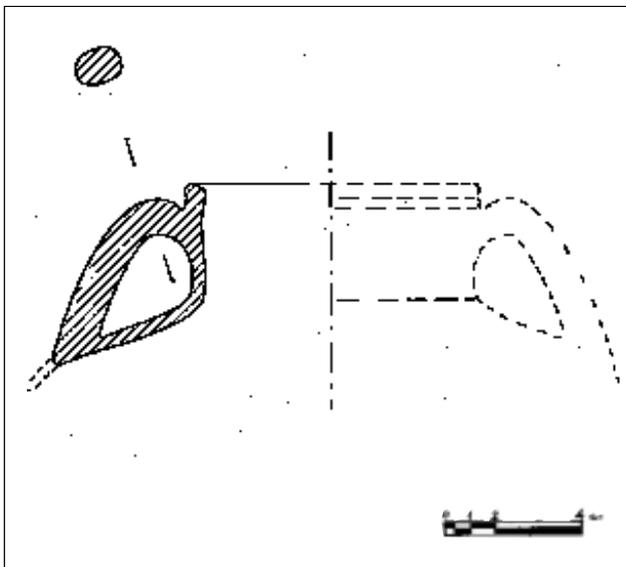
174



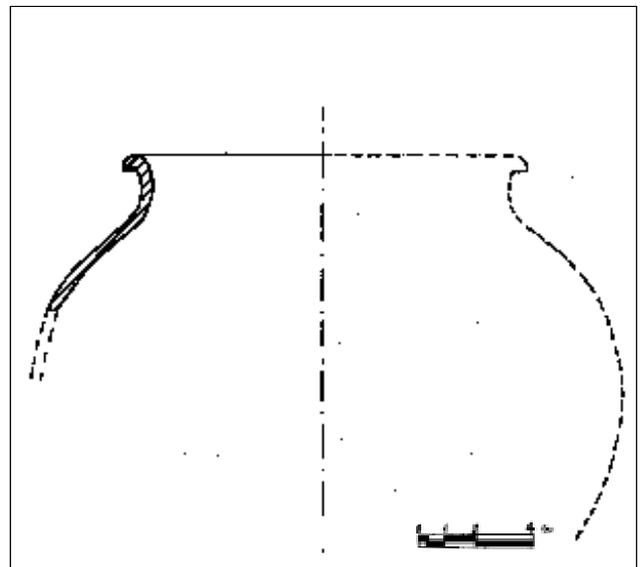
175



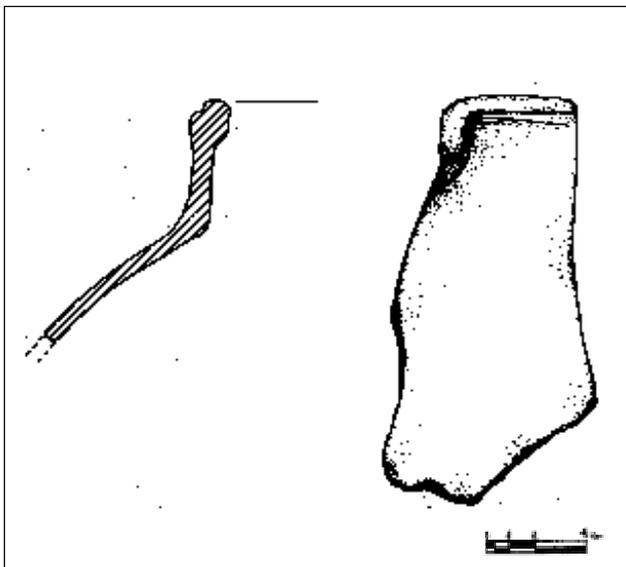
176



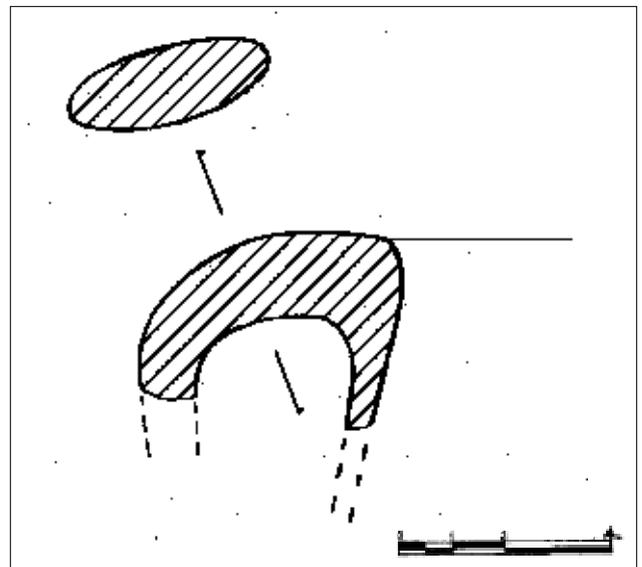
177



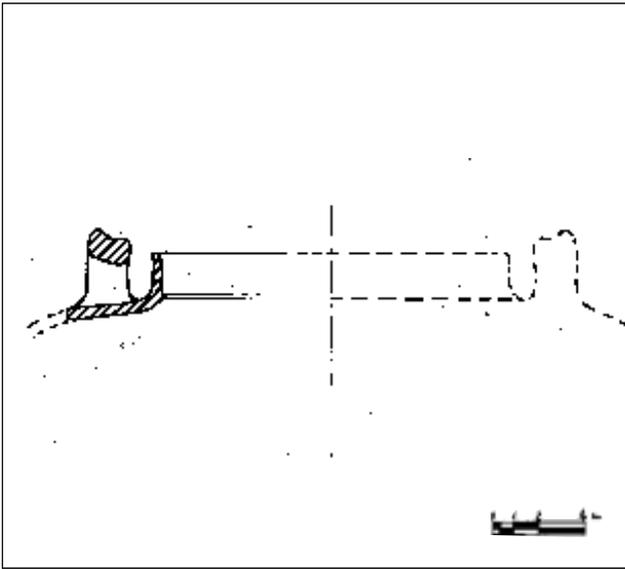
178



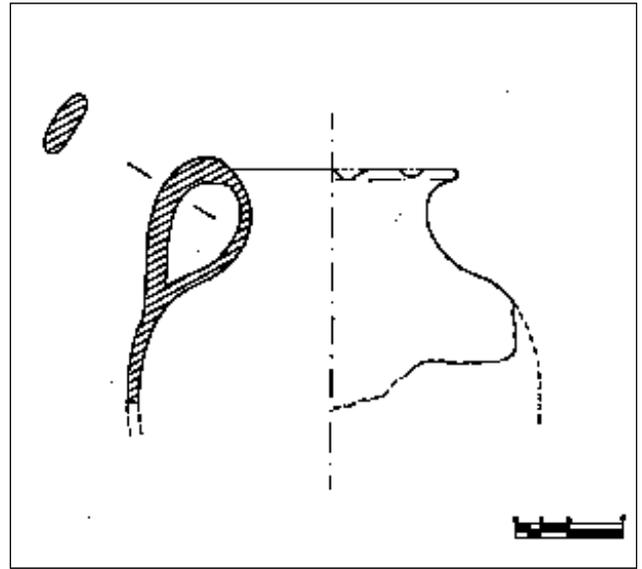
179



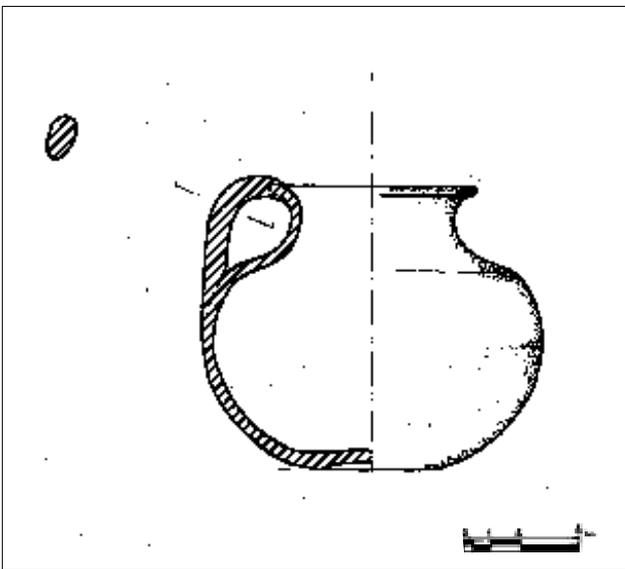
180



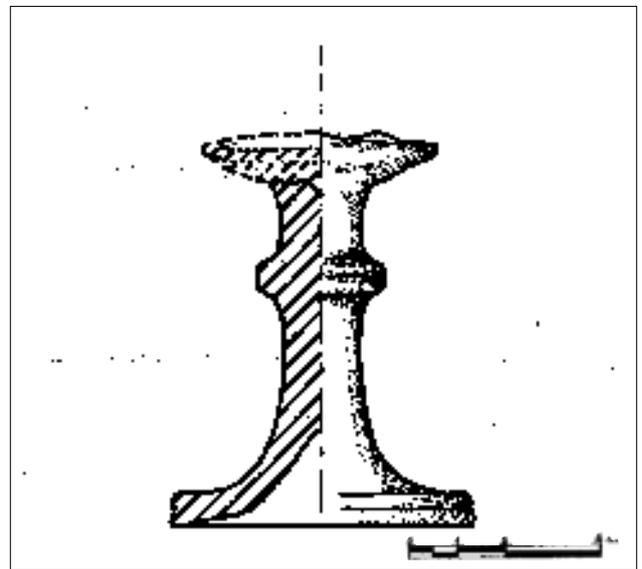
181



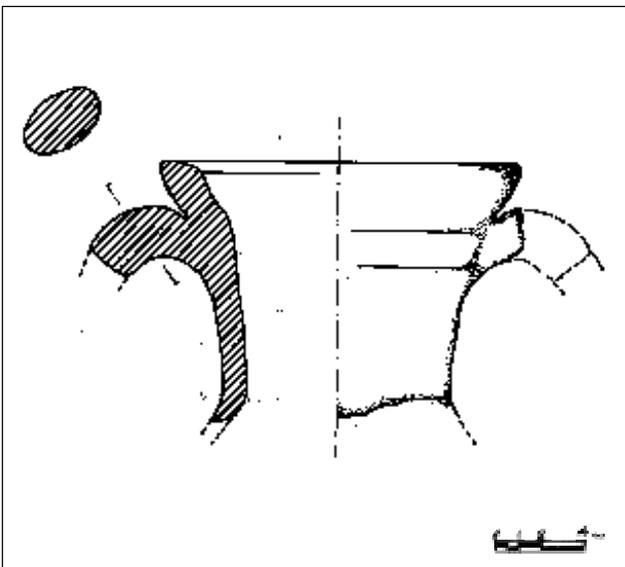
182



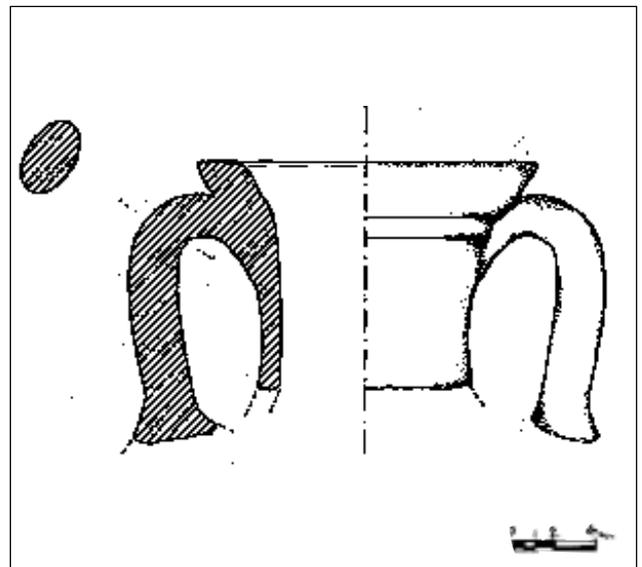
183



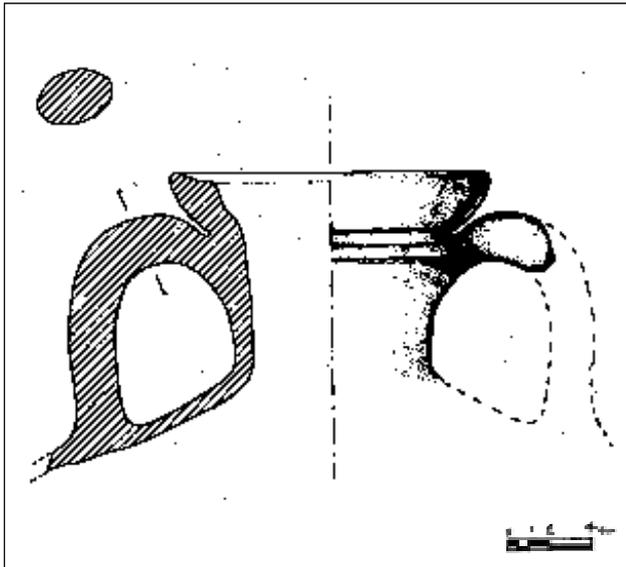
184



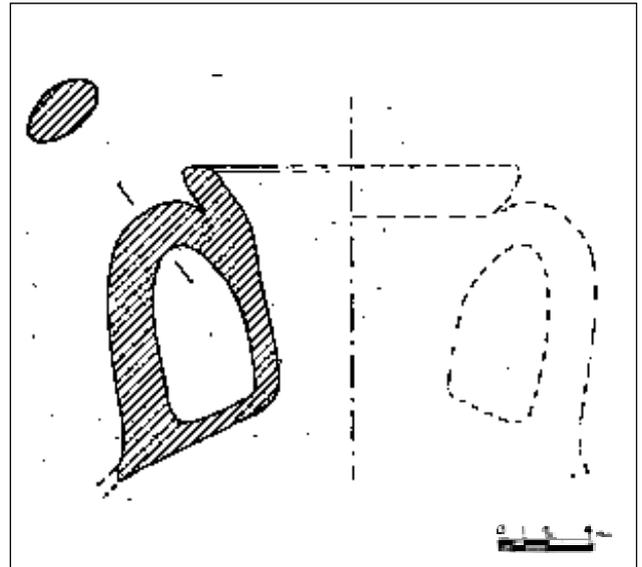
185



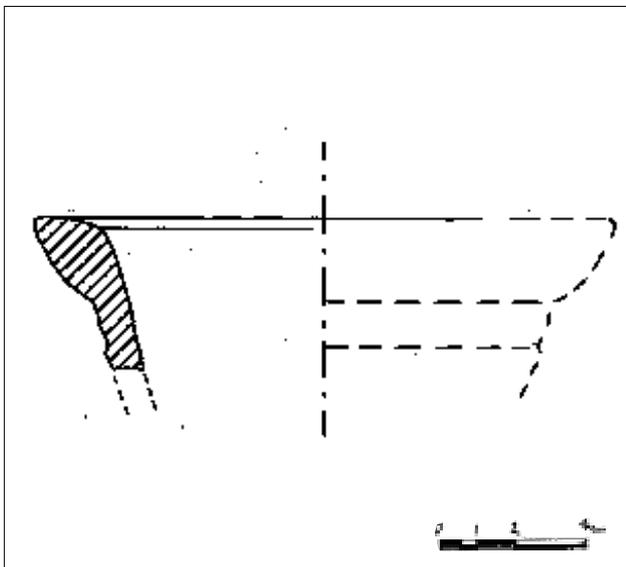
186



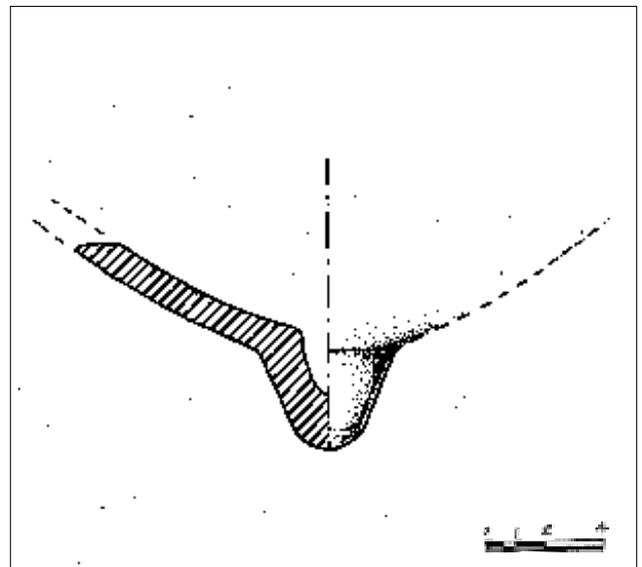
187



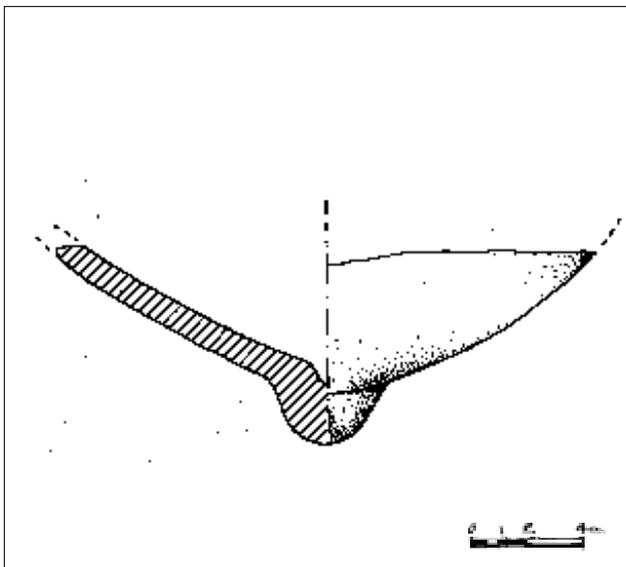
188



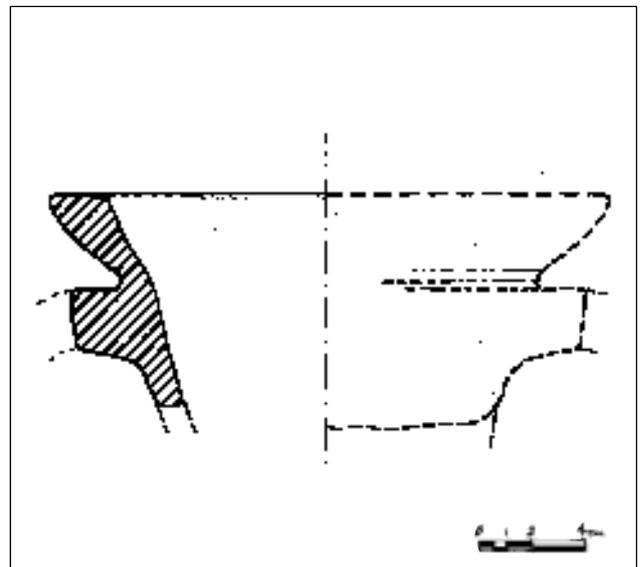
189



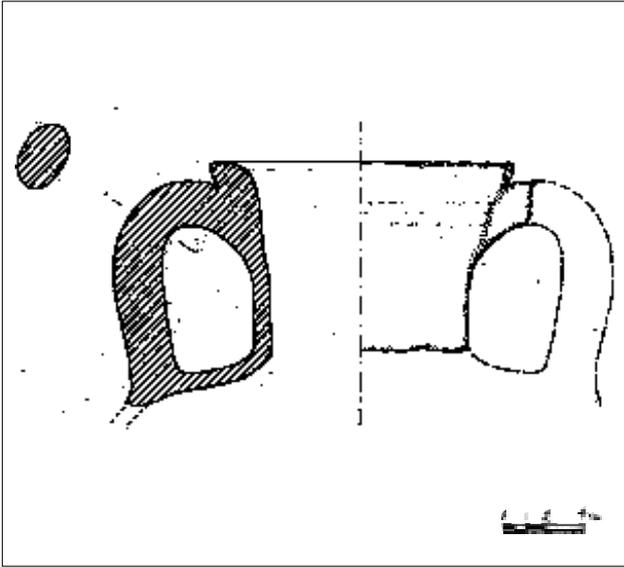
190



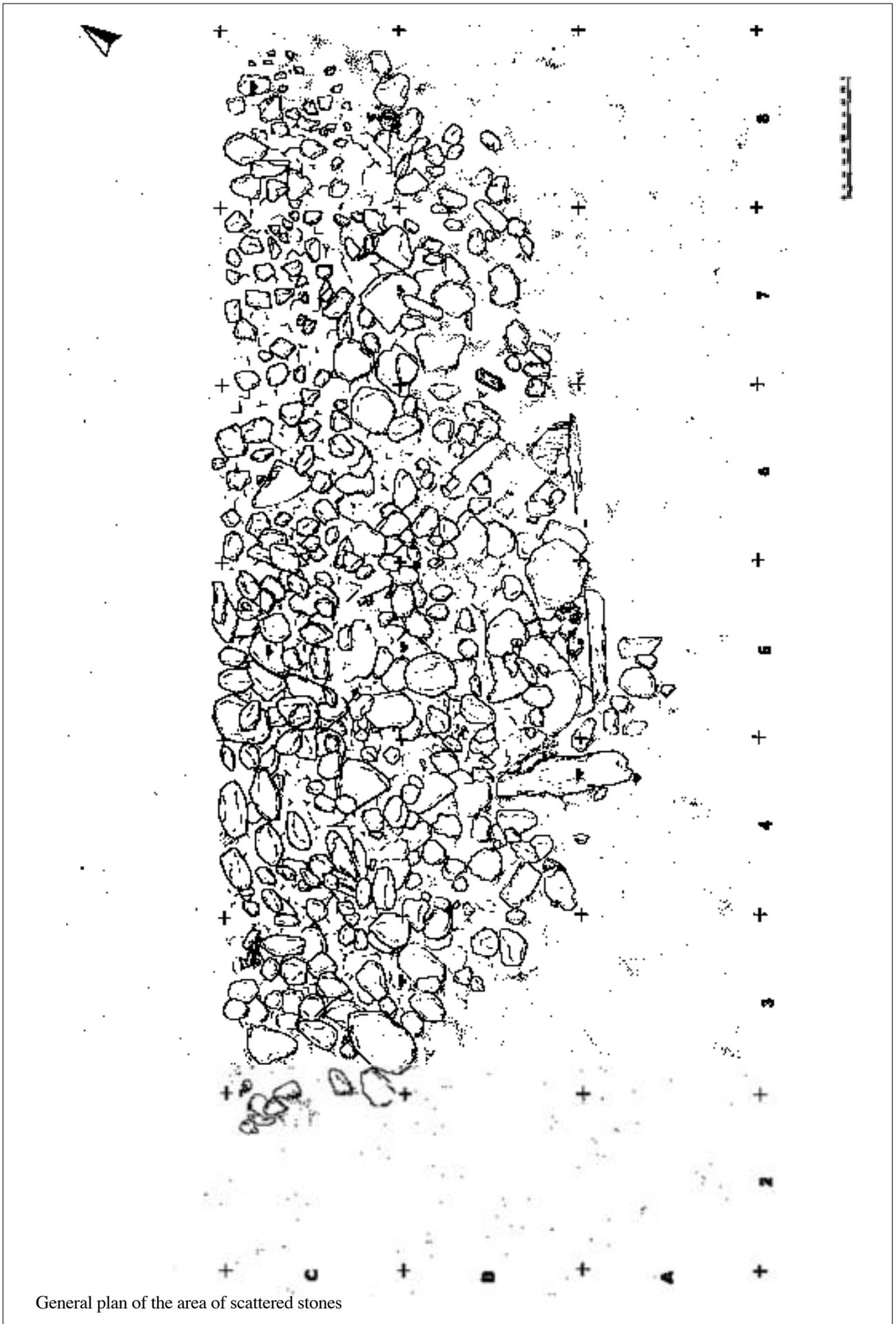
191



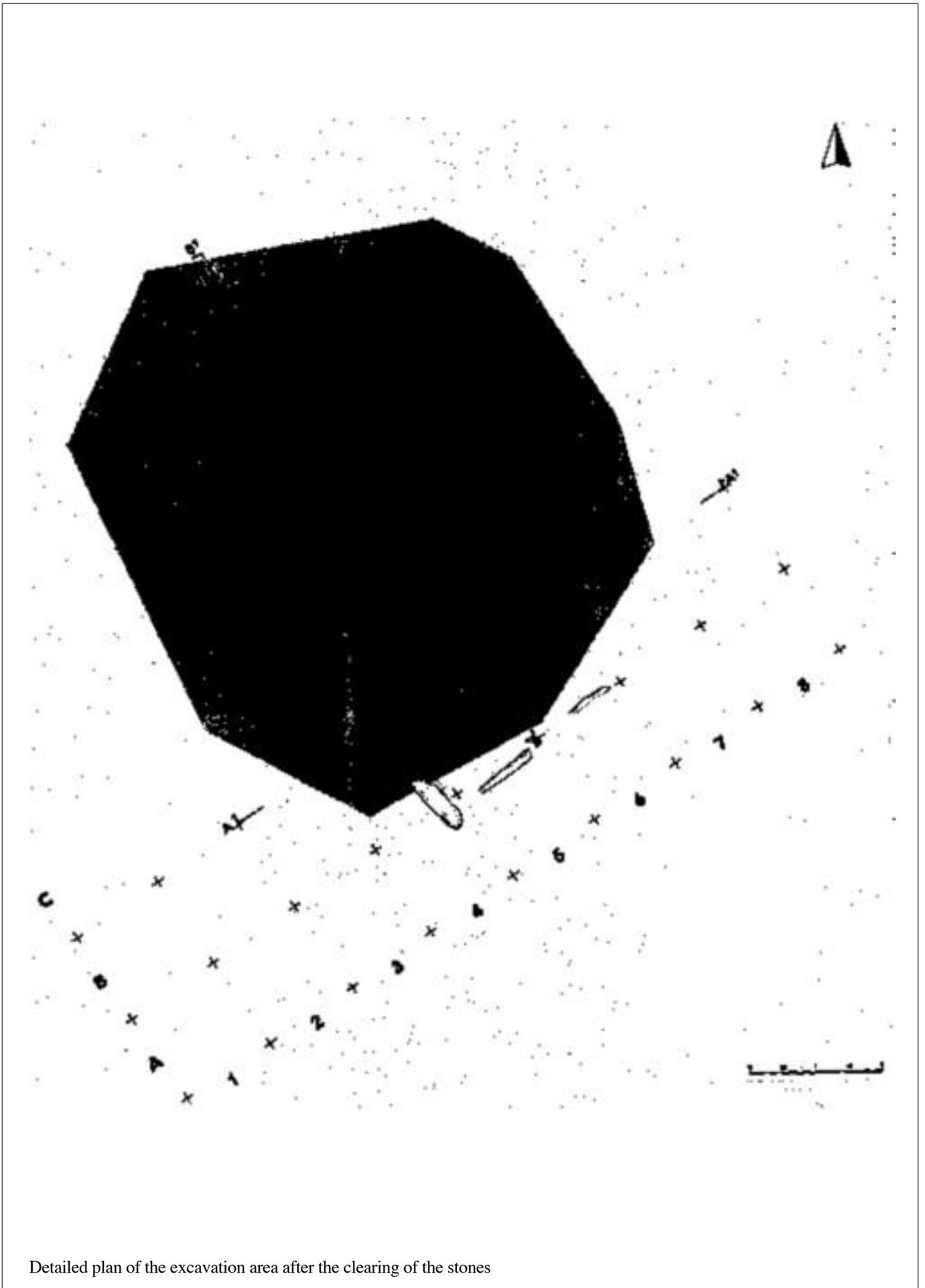
192



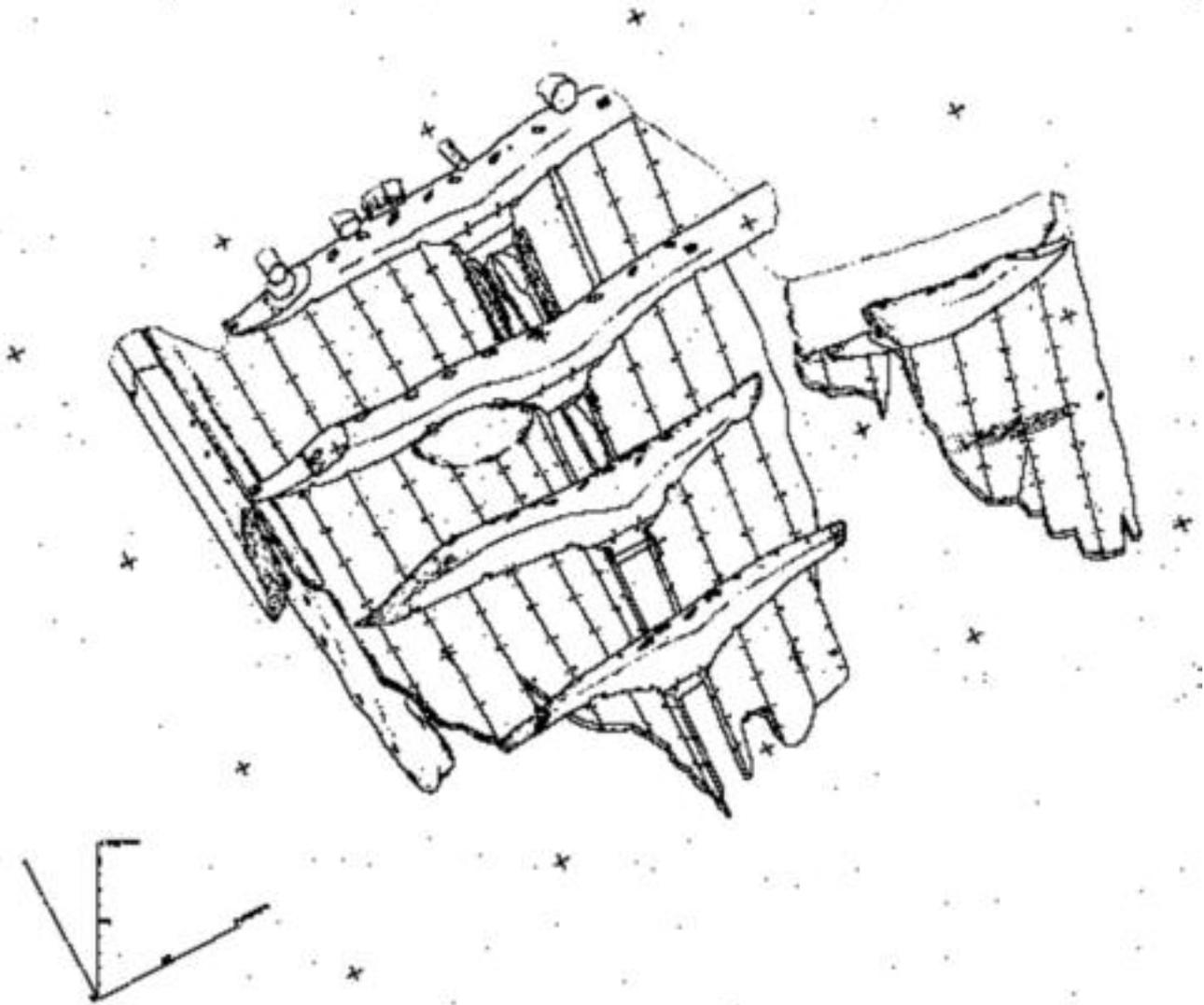
193



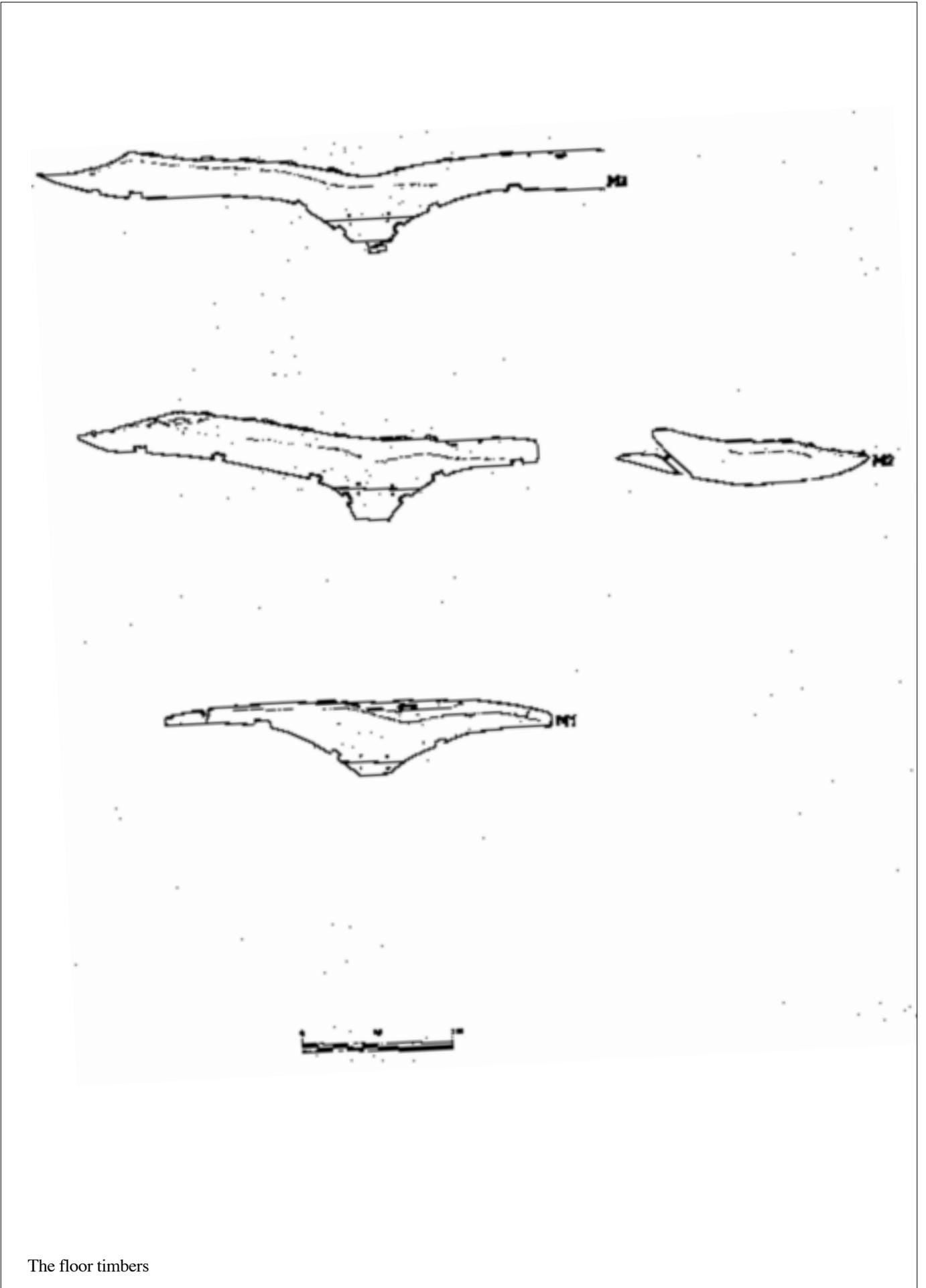
General plan of the area of scattered stones



Detailed plan of the excavation area after the clearing of the stones



Axonometric view of the vessel



The floor timbers

BIBLIOGRAPHY



- ALBANESE PROCELLI 1996 R. M. ALBANESE PROCELLI, *Appunti sulla distribuzione delle anfore commerciali nella Sicilia arcaica*, in «Kokalos» V, v. XLII, 1996, pp. 91-136.
- AMPOLO 1994 C. AMPOLO, *Tra empòria ed emporia: note sul commercio greco in età arcaica e classica*, in «APOIKIA. Scritti in onore di Giorgio Buchner, Annali di Archeologia e Storia Antica, Dipartimento di Studi del Mondo Classico e del Mediterraneo Antico», N. S., n. 1, Napoli 1994, pp. 29-36.
- ATHENIAN AGORA IV R. H. HOWLAND, *Greek Lamps and their survivals, The Athenian Agora. Results of Excavations*, IV, Princeton, New Jersey 1958.
- ATHENIAN AGORA XII B. A. SPARKES - L. TALCOTT, *Black and Plain Pottery of the 6th, 5th and 4th centuries B. C., The Athenian Agora. Results of Excavations*, XII, Princeton, New Jersey 1970.
- BARRA BAGNASCO 1989 M. BARRA BAGNASCO, *Aspetti di vita quotidiana a Locri Epizefiri*, in M. Barra Bagnasco (a cura di), *Locri Epizefiri. III. Cultura materiale e vita quotidiana*, Firenze 1989, pp. 5-36.
- BATS 1990 M. BATS (ed.), *Les Amphores de Marseille grecque*, Et. Mass., 2. Lattes et Aix-en-Provence 1990.
- BELTRAME 1996 C. BELTRAME, *La sutilis navis del Lido di Venezia. Nuova testimonianza dell'antica tecnica cantieristica a cucitura nell'alto adriatico*, in «Navalia. Archeologia e Storia», 1996, pp. 31-53.
- BELTRAME 1998 C. BELTRAME, *Per l'interpretazione del relitto tardo repubblicano di Spargi*, in «Riv. Arch.», XXII, 1998, pp. 38-43.
- BERTI 1990 F. BERTI, *Fortuna maris. La nave romana di Comacchio*, Bologna 1990, pp. 29-42.
- BLOESCH 1940 H. BLOESCH, *Formen Attischer Schalen*, Berne 1940.
- BOLDRINI 1994 S. BOLDRINI, *Gravisca. Scavi nel Santuario greco, 4. Le ceramiche ioniche*, Bari 1994.
- BONINO 1967 M. BONINO, *Tecniche costruttive navali insolite nei reperti di Cervia, Pomposa e Pontelagoscuro*, in «Atti del Convegno Internazionale di Studi sulle Antichità di Classe», Ravenna 1967, pp. 209-217.
- BONINO 1971 M. BONINO, *Ricerche sulla nave romana di Cervia*, in «Atti del III Congresso Internazionale di Archeologia Sottomarina (Barcellona 1961)», Bordighera 1971, pp. 316-325.
- BONINO 1985 M. BONINO, *Sewn boats in Italy: sutiles naves and barche cucite*, in S. Mc Grail -E. Kentley (a cura di), *Sewn Plank Boats. Archaeological and Ethnographic Papers Based on Those Presented to a Conference at Greenwich in November 1984*, «B.A.R International Series» 276, Oxford 1985, pp. 87-104.
- BOUND 1985 M. BOUND, *Early observations on the construction of the pre-classical wreck at Campese bay Island of Giglio: clues to the vessel's nationality*, in S. Mc Grail -E. Kentley (a cura di), *Sewn Plank Boats. Archaeological and Ethnographic Papers Based on Those Presented to a Conference at Greenwich in November 1984*, «B.A.R International Series» 276, Oxford 1985, pp. 49-65.
- BOUND 1991a M. BOUND, *The pre-classical wreck at Campese Bay, Island of Giglio. First Season Report*, in «Studi e Materiali. Scienza dell'antichità in Toscana», VI, 1991, pp. 181-198.
- BOUND 1991b M. BOUND, *The pre-classical wreck at Campese Bay, Island of Giglio. Second interim Report*, in «Studi e Materiali. Scienza dell'antichità in Toscana», VI, 1991, pp. 199-244.

- BRESSON - ROUILLARD 1993 A. BRESSON-P. ROUILLARD (a cura di), *L'Emporion*, Publications du centre Pierre Paris, Paris 1993.
- BRONNER 1930 O. BRONNER, *Corinth. Results of excavations. Terracotta Lamps*, IV, II, Oxford 1930.
- BRONNER 1947 O. BRONNER, *The Corinthian Altar Painter*, in «Hesperia», XVI, 1947, pp. 214-223.
- BRORSON CHRISTENSEN 1970 B. BRORSON CHRISTENSEN, *The conservation of waterlogged wood in the National Museum of Denmark, The National Museum of Denmark*, Copenhagen 1970.
- BRUSIC - DOMJAN 1985 Z. BRUSIC - M. DOMJAN, *Liburnian boats - their construction and form*, in S. Mc Grail - E. Kentley (a cura di), *Sewn Plank Boats. Archaeological and Ethnographic Papers Based on Those Presented to a Conference at Greenwich in November 1984*, «B.A.R. International Series» 276, 1985, pp. 67-85.
- CALDERONE 1996 A. CALDERONE, *L'abitato*, in AA.VV., *Monte Saraceno di Ravanusa. Un ventennio di ricerche e studi*, Messina 1996, pp. 41-88.
- CAMERATA SCOVAZZO - CASTELLANA 1998 R. CAMERATA SCOVAZZO - G. CASTELLANA, *Scavi nell'area dei Vivai Gitto (1980)*, in AA.VV., *Palermo Punica* (Museo Archeologico Regionale Antonino Salinas, 6 dicembre 1995-30 settembre 1996), Palermo 1998, pp. 196-237.
- CAPORUSSO 1975 D. CAPORUSSO, *Coroplastica arcaica e classica delle Civiche Raccolte Archeologiche (Magna Grecia, Sicilia e Sardegna)*, in «RASMI», Suppl. I, 1975.
- CAVALIER 1985 M. CAVALIER, *Les amphores du VIe au IVe siècle dans les fouilles de Lipari*, Cahiers des amphores archaïques et classiques, 1, in «Cahiers du Centre Jean Bèrard», XI, Naples 1985.
- CLINKENBEARD 1986 B. G. CLINKENBEARD, *Lesbian and Thasian Wine Amphoras*, in «BCH» Suppl. XIII, 1986, pp. 353-362.
- COOK - DUPOND 1998 R. M. COOK - P. DUPOND, *East Greek Pottery*, London and New York 1998.
- CRISTOFANI 1995 M. CRISTOFANI, *Prexis aristocratica e commercio organizzato in Occidente*, in B. M. Giannattasio (a cura di), *Viaggi e commerci nell'antichità* (Atti VII Giornata archeologica, Genova, 25 novembre 1994), Genova 1995, pp. 27-38.
- CRISTOFANI 1998 M. CRISTOFANI, *Un naukleros greco-orientale nel Tirreno per un'interpretazione del relitto del Giglio*, in «ASA Atene» LXX-LXXI, n.s., LIV-LV (1992-1993), Roma 1998, pp. 205-232.
- DAVIDSON 1942 G. R. DAVIDSON, *A Hellenistic Deposit at Corinth*, in «Hesperia», XI, 1942, pp. 105-127.
- DE MIRO 1989 E. DE MIRO, *Agrigento. La Necropoli greca di Pezzino*, Messina 1989.
- DENTI 1996 A. DENTI, *Le necropoli*, in AA.VV., *Monte Saraceno di Ravanusa. Un ventennio di ricerche e studi*, Messina 1996, pp. 91-176.
- DI STEFANO 1985 G. DI STEFANO, *Kamarina VIII: l'emporio greco arcaico di contrada Maestro sull'Irminio. Rapporto preliminare della prima campana di scavi*, in «BdA», 44-45, 1985, pp. 128-140.
- DI STEFANO 1993-1994 G. DI STEFANO, *Il relitto di Punta Braccetto (Camarina). Gli emporia e i relitti di età arcaica lungo la costa meridionale della Sicilia*, in «Kokalos», XXXIX-XL, I, 1, 1993-1994, pp. 111-134.
- FACCENNA 1997 F. FACCENNA, *Indagini preliminari sul secondo relitto di Gela (Gela II)*, in «Atti del Convegno nazionale di Archeologia Subacquea (Anzio, 30-31 maggio, 1 giugno 1996)», Bari 1997, pp. 143-146.

- FIorentini 1990 G. FIorentini, *La nave di Gela e osservazioni sul carico residuo*, in «Quaderni dell'Istituto di Archeologia della Facoltà di Lettere dell'Università di Messina», V, 1990, pp. 25-37.
- FIorentini 1993 G. FIorentini, *Alcune arule dipinte dal relitto navale di Gela* (in Atti del Seminario di Studi "Una arula tra Heidelberg e Naxos", Giardini Naxos, 18-19 ottobre 1990), in M. C. Lentini (a cura di), *Arule di Sicilia e della Grecia*, Firenze 1993, pp. 61-63.
- FRESCHI 1991 A. FRESCHI, *Note tecniche sul relitto greco-arcaico di Gela*, in «Atti della IV Rassegna di Archeologia Subacquea (Giardini Naxos, ottobre 1989)», Messina 1991, pp. 201-210.
- GIANFROTTA 1975 P. A. GIANFROTTA, *Le ancore votive di Sostrato di Egina e di Faillo di Crotona*, in «PP», 30, 1975, pp. 311-318.
- GIANFROTTA 1986 P. A. GIANFROTTA, *Rinvenimenti archeologici sottomarini*, in AA.VV., *Le Isole Pontine attraverso i tempi*, Roma 1986, pp. 213-221.
- GIANFROTTA 1997 P. A. GIANFROTTA, *Les marins et les passagers*, in AA.VV., *La navigation dans l'antiquité*, Aix-en-Provence 1997, pp. 102-113.
- GIANFROTTA - POMEY 1981 P. A. GIANFROTTA - P. POMEY, *Archeologia Subacquea. Storia tecniche scoperte e relitti*, Milano 1981.
- GIORDANO 1981 G. GIORDANO, *Tecnologia del legno*, Torino 1981.
- GIUDICE 1998 G. GIUDICE, *Scheda II. 33*, in R. Panvini (a cura di), *Gela. Il Museo Archeologico. Catalogo*, Gela 1998, p. 105.
- GIUDICE 2000 F. GIUDICE, *Contributo all'inquadramento cronologico e stilistico di alcuni vasi attici del primo relitto di Gela ed ipotesi sulla rotta di distribuzione*, in «Miscellanea De Miro» (in corso di stampa).
- GRAS 1995 M. GRAS, *La Méditerranée archaïque*, Paris 1995
- GRAS 1996 M. GRAS, *Les grands courants commerciaux*, in «La Magna Grecia e il mare», Taranto 1996, pp. 121-144.
- GRAS 1998 M. GRAS, *Archeologia subacquea e commerci in età arcaica*, in G. Volpe (a cura di), *Archeologia Subacquea. Come opera l'archeologo, Storie dalle acque*, VIII ciclo di lezioni sulla ricerca applicata in Archeologia, Certosa di Pontignano (Siena, 9-15 dicembre 1996), Firenze 1998, pp. 477-484.
- HANSEN 1997 H. HANSEN, *Emporion. A Study of the use and meaning of the term in the archaic and classical periods*, in T. H. Nielsen (ed.), *Yet more studies in the ancient greek polis*, Stuttgart 1997, pp. 83-105.
- HIGGINS 1954 R. A. HIGGINS, *Catalogue of the Terracottas in the Department of Greek and Roman Antiquities British Museum*, v. I, London 1954.
- HÖCKMANN 1988 O. HÖCKMANN, *La navigazione nel mondo antico*, Milano 1988.
- HUG 1990 B. HUG, *Rapporto sull'intervento conservativo degli oggetti in materiale organico provenienti dal relitto arcaico di Gela*, in «Quaderni dell'Istituto di Archeologia dell'Università di Messina», V, 1990, pp. 37-39.
- ICOM *Proceedings of the 2nd ICOM waterlogged wood working group conference*, Grenoble 1984.
- KAHANOV 1998 Y. KAHANOV, *The Ma'agan Mikhael ship (Israel). A comparative study of its hull construction*, in «Archeonautica», 14, 1998, pp. 155-160.

- KAPITAN 1979 G. KAPITAN, *Loutheria from the sea*, in «IJNA», 8, 2, 1979, pp. 197-121.
- KOEHLER 1979 G. KOEHLER, *Corinthian A and B Transport Amphoras*, Ph. D. Diss. Princeton Univ. 1979.
- KOEHLER 1981 G. KOEHLER *Corinthian Developments in the Study of Trade in the Fifth Century*, in «Hesperia», 50, 4, pp. 449-458.
- JOHNSTON - JONES 1978 A. W. JOHNSTON - R. E. JONES, *The "SOS" amphora*, in «BSA» 73, 1978, pp. 103-141.
- JONCHERAY 1978 J. P. JONCHERAY, *Un épave grecque ou étrusque au large de Saint-Tropez*, in «Dossier de l'Achéologie», 29, 1978, pp. 62-70.
- JONCHERAY 1986 J. P. JONCHERAY, *L'épave grecque ou étrusque de Bon Porté*, in «Les Cahiers d'Archéologie subaquatique», V, 1986, pp. 5-36.
- LAMBOGLIA 1971 N. LAMBOGLIA, *La seconda campagna di scavo sulla nave romana di Spargi (1959)*, in «Atti del III Congresso di Archeologia Sottomarina (Barcellona 1961)», Bordighera 1971, pp. 205-214.
- LANDSTROM 1970 B. LANDSTROM, *Ships of the Pharaons*, London 1970.
- LINDER 1989 E. LINDER, *The Ma'agan Michael shipwreck excavation - First season, 1988*, in «CMS News», University of Haifa, Center for Maritime Studies, Report, 16, 1989.
- LINDOS I C. Blinckenberg, *Lindos. Fouilles et Recherches 1902-1914, I. Les petites objects*, Berlin 1931.
- M.A. "P. GIOVIO" *Museo Archeologico "P. GIOVIO", Laboratorio di Archeobiologia, Archeologia tessile*, Como 1986-1991.
- MARTELLI 1985 M. MARTELLI, *I luoghi e i prodotti dello scambio*, in M. Cristofani (a cura di), *La Civiltà degli Etruschi* (Catalogo della Mostra), Firenze 1985, pp. 175-181.
- MELE 1979 A. MELE, *Il commercio greco arcaico. Prexis ed emporie*, in «Cahiers du Centre Jean Bérard», IV, Naples 1979.
- MEOLA 1997 E. MEOLA, *Necropoli di Selinunte, I- Buffa*, tomo II, Accademia Nazionale di Scienze, Lettere e Arti di Palermo, Palermo 1997-1998.
- MELIGUNÌS LIPÀRA II L. BERNABÒ BREA - M. CAVALIER, *Meligunìs Lipàra. La necropoli greca e romana nella contrada Diana*, v. II, Palermo 1965.
- MELIGUNÌS LIPÀRA IX L. BERNABÒ BREA - M. CAVALIER - F. VILLARD, *Meligunìs Lipàra. Topografia di Lipari in età greca e romana*, v. IX, parti I-II, Palermo 1998.
- NARDI BERTI 1993 R. NARDI BERTI, *La struttura anatomica del legno ed il riconoscimento dei legnami italiani di più corrente impiego*, CNR, Firenze 1993.
- NEGUERELA - PINEDO - GÓMEZ - MINANO - ARELLANO - BARBA 1995 I. NEGUERELA - J. PINEDO - M. GÓMEZ - A. MINANO - I. ARELLANO - J. S. BARBA, *Seventh-century B. C. Phoenician Vessel discovered at Playa the la Isla, Mazzaron, Spain*, in «The International Journal of Nautical Archaeology», 24, 3, 1995, pp. 189-197.
- NEGUERELA 1995 I. NEGUERELA, *Le navi fenicie di Mazzaron*, in «Atti X Rassegna di Archeologia Subacquea (Giardini Naxos, 27-29 ottobre 1995)», (in corso di stampa).
- OLYNTUS VIII D. M. ROBINSON - J. W. GRAHAM, *Excavations at Olynthus. The Hellenic House. A Study of the Houses found at Olynthus with detailed account of those excavated in 1931 and 1934*, VIII, Baltimora 1938.

- PALLARÉS 1986 F. PALLARÉS, *Il relitto della nave romana di Spargi. Campagne di scavo 1958-1980*, in «BdA», suppl. al n. 37-38, 1986, pp. 89-124.
- PANVINI 1989 R. PANVINI, *L'attività della Soprintendenza di Agrigento e Caltanissetta nel campo dell'archeologia subacquea*, in «Atti della IV Rassegna di Archeologia Subacquea (Giardini Naxos, ottobre 1989)», Messina 1991, pp. 193-200.
- PANVINI 1996 R. PANVINI, *Geloiy Storia e archeologia dell'antica Gela*, Torino 1996, pp. 77-79
- PANVINI 1997 a R. PANVINI, *La nave greca arcaica di Gela: nuovi dati dallo scavo e ipotesi sulla rotta seguita*, in «Atti del Convegno Nazionale di Archeologia Subacquea (Anzio, 30-31 maggio, 1 giugno 1996)», Bari 1997, pp. 135-142.
- PANVINI 1997 b R. PANVINI, *La nave greca di Gela*, in AA.VV., *Omaggio a Gela*, Milano 1997, pp. 131-137.
- PANVINI 1998 R. PANVINI, *La nave greca arcaica*, in R. Panvini (a cura di), *Gela. Il Museo Archeologico. Catalogo*, Gela 1998, pp. 96-106.
- PAYNE 1940 H. PAYNE, *Perachora I. The Sanctuaries of Hera Akraia and Limena. Excavations of the British School of Archeology at Athens 1030-1933*, Oxford 1940.
- PELAGATTI 1989 P. PELAGATTI, *Ceramica laconica in Sicilia e a Lipari. Materiali per una carta di distribuzione*, in «BdA», 54, 1989, pp. 1- 62.
- PIERRO 1984 E. PIERRO, *Ceramica "ionica" non figurata e coppe attiche a figure nere, Materiali del Museo Archeologico Nazionale di Tarquinia*, VI, Roma 1984.
- PIGNATTI 1982 S. PIGNATTI, *Flora di Italia*, Edagricole 1992.
- POLIZZI 1999 C. POLIZZI, *Anfore da trasporto*, in S. Vassallo (a cura di), *Colle Madore. Un caso di ellenizzazione in terra sicana*, Palermo 1999, pp. 221-232.
- POMEY 1981 P. POMEY, *L'épave de Bon Porté et les bateaux cousus*, in «Mariner's Mirror», 67.3, 1981, pp. 225-251.
- POMEY 1995 P. POMEY, *Les épaves grecques et romaines de la place Jules-Verne à Marseille*, Académie des Inscriptions & Belles-Lettres, in *Comptes rendus des Scéance de l'annèe 1995*, Paris 1995, pp. 459-484.
- POMEY 1997 P. POMEY, *Un exemple d'évolution des techniques de construction navale antique: de l'assemblage par ligatures à l'assemblage par tenons et mortaises*, in AA.VV., *Techniques et économie antiques et médiévales: le temps de l'innovation* (Atti del convegno internazionale, Aix-en- Provence 1996), Parigi 1997, pp. 195-203.
- POMEY 1998 P. POMEY, *Les épaves grecques du VI siècle av. J. - C. de la place Jules-Verne à Marseille*, in «Archaeonautica» 14, 1998, pp. 147-160.
- PURPURA 1994 G. PURPURA, *Navigazioni e culti nella Sicilia occidentale: alcune testimonianze archeologiche*, in «Atti VI Rassegna di Archeologia Subacquea (Giardini Naxos 1991)», Reggio Calabria 1994, pp. 67-81.
- RIVAL 1991 M. RIVAL, *La Charpenterie navale romaine*, Parigi 1991.
- ROSLOFF 1991 J. P. ROSLOFF, *A one-armed anchor of 400 B.C. from the Ma'agan Michael vessel. A preliminary report*, in «The International Journal of Nautical Archaeology», 20,1991, pp. 223-226.
- ROUILLARD 1978 P. ROUILLARD, *Les céramiques peintes de la Grèce de l'est et leurs imitations dans la péninsule ibérique: recherches préliminaires*, in AA.VV., *Les céramiques de la Grèce de l'est et leur diffusion en Occident*, Colloques internationaux du centre national de la recherche scientifique. Centre Jean Bèrand. Institut Francais de

- Naples (6-9 juillet 1976), Paris - Naples 1978, pp. 274-286.
- ROUILLARD 1995 P. ROUILLARD, *Les emporia dans la Méditerranée Occidentale aux époques archaïques et classique, Les Grecs et l'Occident*, in «Atti del Convegno de la ville "Kyrenios" (1991)», Roma 1995, pp. 95-108.
- RUPP 1974-1975 D. W. RUPP, *Greek Altars of the North-Eastern Peloponnese c. 750-725 B. C. to c. 300/275 B. C.*, I-II, Ann Arbor 1974-1975.
- SALEMKE 1973 G. SALEMKE, *Die Ausgrabung eines Binnensee-Transportschiffes. Schiffarchaeologie von 1890 aus Laibach*, Österreich (jetzt Ljubljana in Yugoslavien), *Das Logbuc*, 9.1, 1973, pp. 21-24.
- SARÀ 1993 G. SARÀ, *Catalogo*, in C. A. Di Stefano, *La necropoli punica della caserma Tuköry*, AA.VV., *Di Terra in Terra. Nuove scoperte archeologiche nella provincia di Palermo* (Museo Archeologico Regionale Antonino Salinas, 18 aprile 1991), Palermo 1993, pp. 297-312.
- SCHWEINGRUBER 1990 F. H. SCHWEINGRUBER, *Anatomy of european woods*, Haupt 1990.
- SEMERARO 1997 G. SEMERARO, *Ep̄nhusiv Ceramica greca e società nel Salento arcaico*, BACT, Quaderno 2, Lecce-Bari 1997.
- SIRACUSANO 1996 A. SIRACUSANO, *L'Acropoli*, in AA.VV., *Monte Saraceno di Ravanusa. Un ventennio di ricerche e studi*, Messina 1996, pp. 7-40.
- STEFFY 1985 J. R. STEFFY, *The Kyrenia ship. An interim report on its hull construction*, in «AJA», 89, 1985, pp. 71-101.
- STEFFY 1994 J. R. STEFFY, *Wooden ship building and the interpretation of shipwrecks*, Texas A&M University Press, College Station, 1994.
- STIBBE 1989 C. M. STIBBE, *Laconian Mixing Bowls. Laconian black-glazed Pottery*, part. 1, Amsterdam 1989.
- SWINDLER 1932 M. HAMILTON SWINDLER, *A terracotta altar in Corinth*, in «AJA», XXXI, 1932, pp. 512-520.
- TARDO 1999 V. TARDO, *Ceramica di importazione, coloniale e di tradizione greca*, in S. Vassallo (a cura di), *Colle Madore. Un caso di ellenizzazione in terra sicana*, Palermo 1999, pp. 162-198.
- TERROSI ZANCO 1974 O. TERROSI ZANCO, *Vie commerciali tra l'Etruria e la zona terramana*, in AA.VV., *Atti dell'VIII Convegno Nazionale di Studi Etruschi e Italici* (Orvieto, 27-30 giugno 1972), Firenze 1974, pp. 161-184.
- TORELLI 1971 M. TORELLI, *Il santuario di Hera a Gravisca*, in «PP», 26, 1971, pp. 44-77.
- VALENTINO 1997 M. VALENTINO, *La Montagnola di Marineo. Pesi da telaio e oscilla*, in AA.VV., *Archeologia e Territorio*, Palermo 1997, pp. 179-207.
- WACHMUTH 1967 D. WACHMUTH, *Pòmpinos ho daimon: Untersuchungen zu den antichen Sakalhandlungen bei Seerreise*, Berlino 1967.
- WHITBREAD 1995 I.K. WHITBREAD, *Greek transport Amphorae. A petrological and archaeological study*, Athens 1995.
- WILSON 1997 J. P. WILSON, *The Nature of Greek overseas settlement in the archaic period. Emporion or apoikia?*, in G. Mitchell - P. J. Rhodes, *The Development of the polis in archaic period*, Londra 1997, pp. 199-207.
- YAVIS 1949 C. YAVIS, *Greek Altars: origins and tipology*, Saint Louis 1949, pp. 137-139.

TABLE OF CONTENTS

TABLE OF CONTENTS

Part One

The Archaic Greek ship at Gela <i>by Rosalba Panvini</i>	pag.	15
Catalogue <i>edited by Rosalba Panvini and Lavinia Sole</i>	»	37

Part Two

The Second Wreck at Gela: preliminary observations <i>by Rosalba Panvini</i> . . . »		79
Catalogue <i>edited by Rosalba Panvini and Lavinia Sole</i>	»	85
The Second Wreck at Gela: notes on naval architecture <i>by Alessandra Benini</i> »		97

Appendix

Analysis of the wooden remains <i>by Francesca Terranova and Patrizia Lo Campo</i> . . »		109
--	--	-----

Plates	»	115
------------------	---	-----

Bibliography	»	155
------------------------	---	-----

Finito di stampare
nel mese di aprile 2001
dalla Lussografica
di Caltanissetta
per conto della
Salvatore Sciascia Editore