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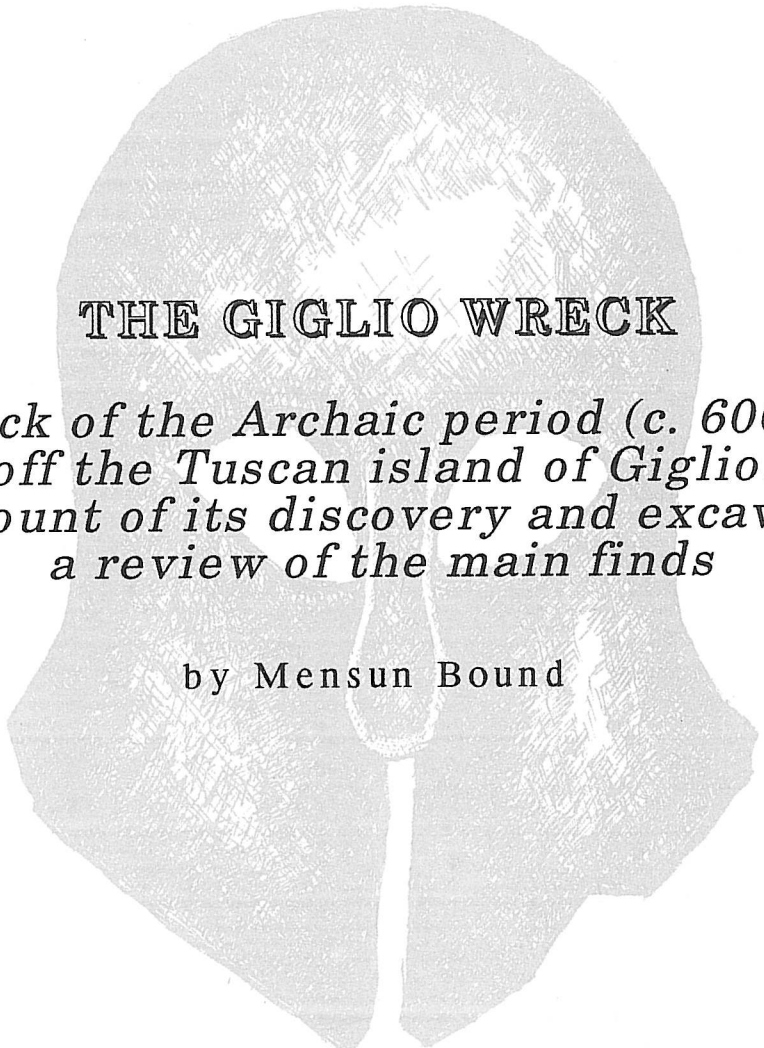

THE GIGLIO WRECK

A wreck of the Archaic period (c. 600 BC) off the Tuscan island of Giglio. An account of its discovery and excavation: a review of the main finds

by Mensun Bound

HELLENIC INSTITUTE OF MARINE ARCHAEOLOGY

ATHENS 1991

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The Giglio wreck is an important source of evidence for maritime trade and the interchange of products throughout the Mediterranean during the Archaic period. The richness of the cargo is an indication of the close commercial ties existing between the different cultures in the region and of the variety of goods traded at that time.

The valuable, the rare and even the everyday objects from the Giglio wreck considerably extend our knowledge of people's needs and tastes at the beginning of the 6th c. BC.

The tools and personal possessions of the crew that were found are also a valuable addition to research on shipping and nautical life in this period.

The surviving remains of the ship will help to advance the study of the development of ancient shipbuilding, especially for such a little known period. Numerous photographs and reconstruction drawings of the details of the construction of the ship are included in this volume.

Lastly, the account of the events leading to the refinding of the wreck, and the description of the carrying out of the excavation and the dangers faced by the excavators give a full picture of the problems of underwater excavation.

For all these reasons we considered it particularly important in this, the first *ENALIA SUPPLEMENT* volume, to publish this first overall report of the discovery and excavation of the Giglio wreck, together with a description of the finds.

We thank the excavator, who is also the author of this publication, for choosing to publish his report in this journal.

The Editors

A wreck of the Archaic period (c. 600 BC) off the Tuscan island of Giglio. An account of its discovery and excavation: a review of the main finds.

- by Mensun Bound -
Director of Archaeology
Oxford University MARE

Background

In 1961 a British diver called Reg Vallintine opened a diving school on the small Island of Giglio in the Tuscan archipelago off North Italy. According to his dive-log, it was on 2nd August 1961 that he saw the wreck for the first time beside the foot of an off-shore reef, called Secca I Pignocchi (Fig. 1), in Campese Bay on the North West side of the island (Fig. 2).

When Vallintine returned to England at the end of the summer he wrote about the events of that day in *London Diver,* a popular diving magazine. He described how they had anchored their boat over the crest of the Secca, and then how he and two others had followed the contours of the reef down to almost fifty meters:
"Over a dividing ridge we went and suddenly on the sandy "valley" below us were mysteriously scattered objects and amphorae. Every pot, amphora and bowl that we found here was a different shape".

Vallintine reported his discovery to the police and to the local commune on the island, but in those early days diving archaeologists were very few indeed, and, as a result, the authorities were unable to act.

Inevitably, word of the wreck leaked out and Vallintine found himself unable to prevent the plunder that began to take place. Wherever possible he photographed or sketched the objects he saw being taken, and finally when this did not work, he himself began to gather artefacts with the thought of starting a museum on Giglio; this, he hoped, might help discourage the destruction of the island's rich underwater cultural heritage.

At the end of the *London Diver* article, Vallintine expressed his dream in these words:

"Some of the anchors and amphorae that we found are now in store on the island awaiting the opening of a new museum which will be furnished entirely with objects brought from the sea. After nearly 3,000 years, the work of the ancient potters and artists will be seen again".

But it was not to be. When Vallintine returned to Giglio at the beginning of the 1962 diving season all the items he had recovered had disappeared, except for two shield-like bronze objects (Fig. 50).

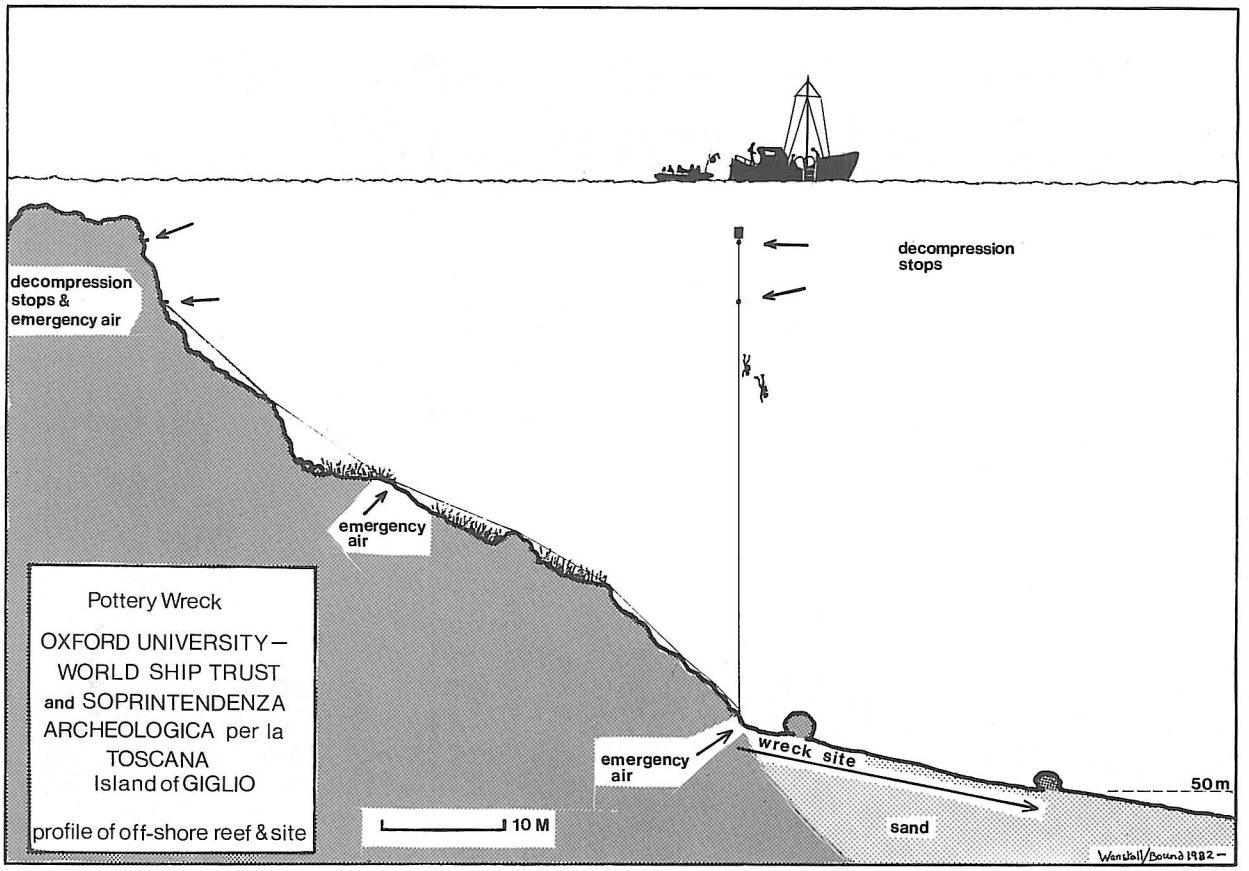


Fig. 1. Section through the reef in Campese Bay, island of Giglio.

At the end of the 1962 diving season Vallintine left Giglio to open a diving school in Tunisia. During the years that followed he tried several times, without success, to interest archaeologists in the wreck he had found.

The story behind this wreck now moves ahead two decades to 1981 when I and my wife, Joanna Yellowlees-Bound, met by chance one of the people, who, in the early sixties, had been taking items from the site. Along the top of a book shelf in his home he had on display a collection of three or four amphora fragments which were all from common Hellenistic or Roman forms, except one, which was instantly recognizable as the handle of an Etruscan amphora (Fig. 5)

Because it was covered in marine deposits it was obvious to me that it had come from the sea; but if it had actually come from a wreck, and if anything of this wreck had survived, then this would be a site of considerable archaeological interest. I was told that the items had indeed come from a sunken ship and that the site was situated off the island of Giglio but, if I wanted to learn more, I would have to speak to the wreck's discoverer, Reg Vallintine.

I went to see Vallintine at his London house and after considerable discussion (during which he sought to assure himself that my motives were archaeological rather than predatory) he went upstairs and returned with three old photographs. A glance at these was enough to confirm that I had indeed stumbled upon something of major archaeological interest.

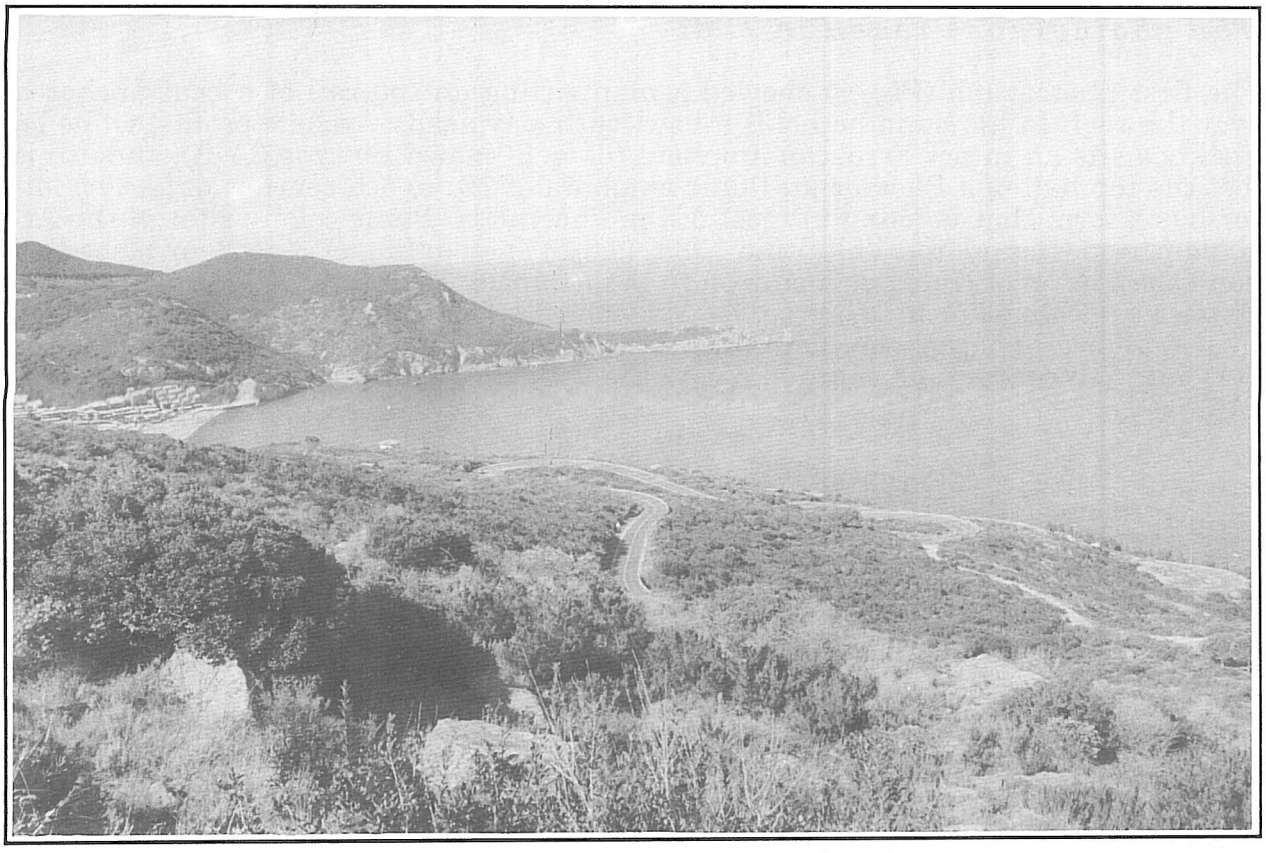


Fig. 2. Campese Bay, Island of Giglio.

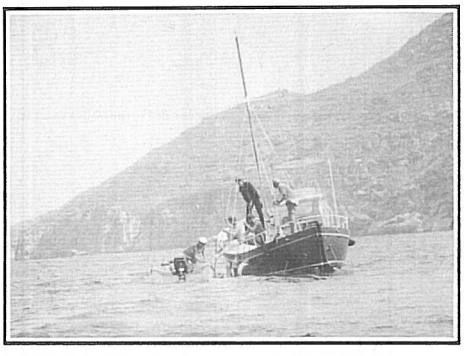


Fig. 3. The dive-boat anchored over the site.

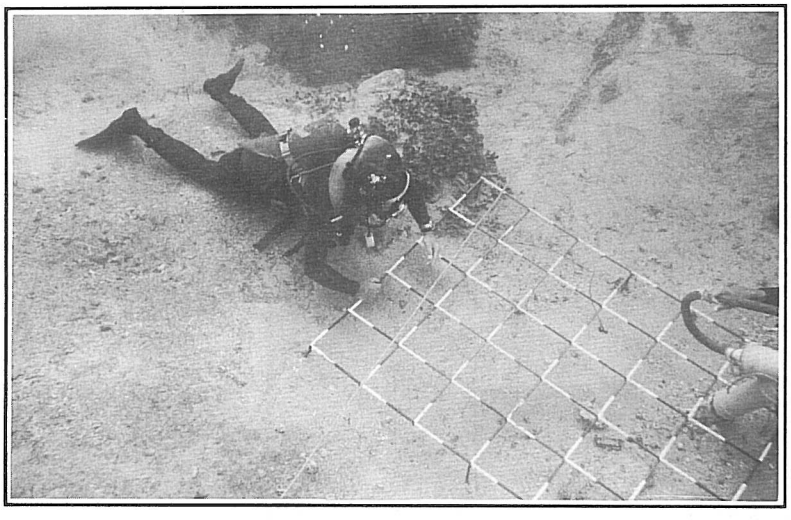


Fig. 4. Divers setting up mini-grid over part of the site at the beginning of the excavation.

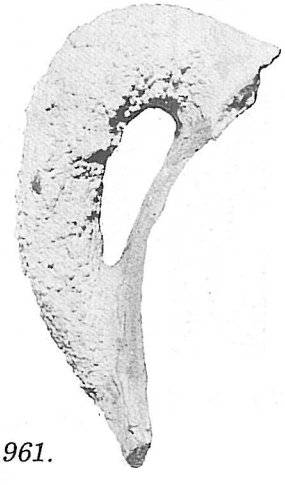


Fig. 5. Etruscan amphora handle taken from the wreck in 1961.

The photographs taken in 1961

The first photograph (Fig. 6) showed a man sitting on the rail of a boat anchored over the reef. In his hand he holds a bowl with a typically Archaic profile, while on his knee sits an intact Etruscan amphora (of well-known Py type 3A-B), and at his feet the top half of a Phoenician-Punic amphora of 7th to 6th century date. The latter has a form that is found in most of the Phoenician-Punic colony sites of the Archaic period (Bound and Vallintine 1983, 116-117) including at least four places beyond the Pillars of Hercules facing on to the Atlantic: Tartessos in Spain and Lixus, Banasa and Mogador in Morocco. At Mogador, for instance, over one hundred and fifty similar amphorae were found which have been dated by their excavator to the very late 7th century, or, more likely, to the very early 6th century BC (Jodin 1957, 21, Fig. 7).

Fig. 7. *Photograph taken in 1961 of broken Etruscan kantharoi from the wreck.*

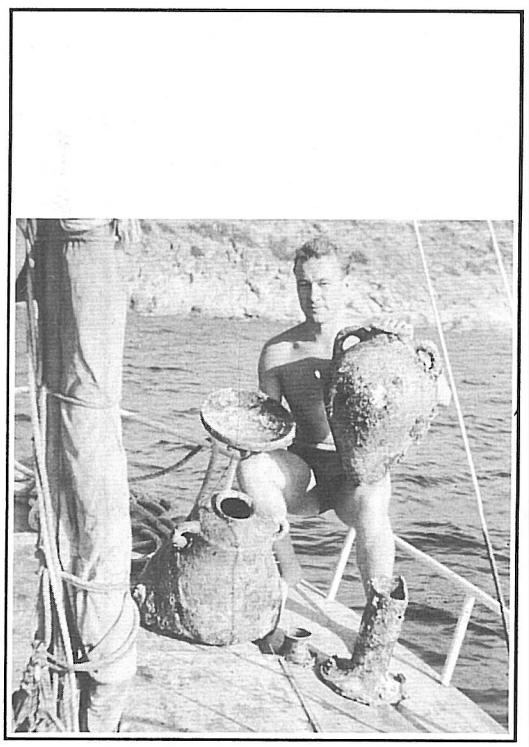


Fig. 6. *Photograph taken in 1961 with items taken from the wreck.*

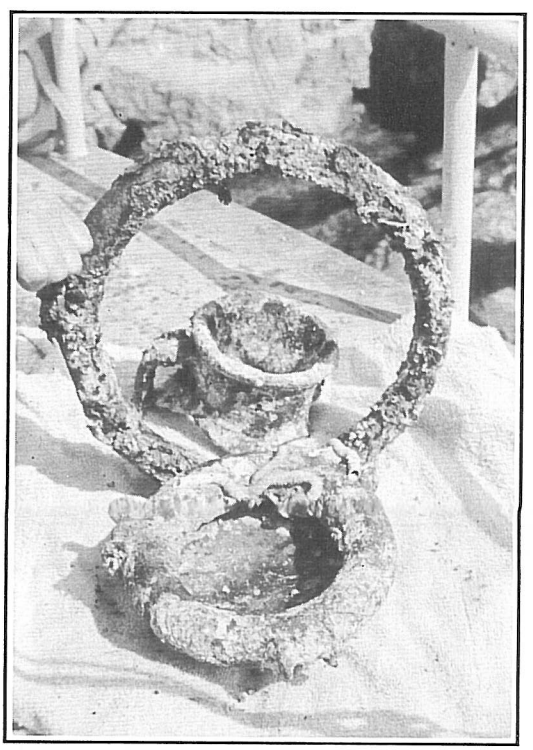


Fig. 8. *Photograph taken in 1961 of items recovered from the wreck. A Corinthian kothon in the foreground.*

The second photograph (Fig. 7) showed a woman holding up two pots which were clearly recognizable as semi-intact Etruscan kantharoi made from the distinctive black bucchero clay of Etruria. This particular form first appears in the last quarter of the 7th century (Bound and Vallintine 1983, 115).

The third photograph (Fig. 8) contained in the foreground what was recognizable, by its distinctive handles and curled wall, as a Corinthian kothon of a type that could be dated to c. 600 BC.

From these three photographs alone it could be determined that this was the earliest known wreck of the Archaic period, and that it had been carrying a rich cargo that included pottery from at least three separate locations in the Mediterranean. Furthermore, some of the fine ware, such as the Greek kothon, would have displayed painted decoration.

Tracing artefacts taken from the wreck in the early 1960's

It was decided at the meeting with Vallentine that I would ask Oxford University for permission to take an expedition to Giglio in order to relocate the site and establish whether anything survived.

At this stage we faced two problems: obtaining the permission of the Italian archaeological authorities and raising the necessary money. After a trip to Rome, we were put in contact with the Superintendent of Archaeology for Tuscany, Professor Francesco Nicosia, who gave the project his approval and recommended to the Ministry of Culture in Rome that the University be given the permits. The second problem, however, was more difficult to overcome because most people, including many at the University, were reluctant to accept our account of a wrecked vessel containing painted Greek pottery off some tiny, remote Mediterranean island which no one had heard of before. Professor Sir John Boardman, however, was particularly helpful at this critical stage and, ever since, has been a main supporter of the University's maritime archaeological programme.

To overcome this credibility problem (which, of course, affected our ability to find funding) we set about trying to contact some of the divers who had been taking items from the wreck in the early 1960's. There is not space to discuss this phase of our work in detail but mention should be made of the Corinthian kothon described above, and upon which we had based our chronology. This piece was found in a private collection in Monte Carlo. Another trail led to an apartment in the heart of London, where we found a Samian amphora from the wreck (Fig. 43). Amphorae of this type can be dated to c. 600 BC (Grace 1971, 68-69). They were most likely to have been used to transport olive oil, for which the island was famous in antiquity (Barron 1966, 7).

Of particular interest was a Corinthian helmet, which we knew (from the log-books of divers who had been on the island at the time) had been found by a German diver who had taken it with him back to Germany. After many months of frustration we eventually found this piece in a private collection in Hamburg where, for safety, it was being kept in a bank.

In figure 9 we show the helmet as it is today in conserved state (height 223 mm; maximum width 220 mm). Beaten from a single sheet of bronze, it is an outstanding technical and artistic achievement. At the front the metal is 11 mm thick, while at the back it is less than a millimeter. Wild boars charge down the cheek-pieces, while open-mouthed snakes run across the brows and curl upwards at the temples (Fig. 10). As well as being a functional item of defence, this helmet was also a very costly

prestige object that would have let everybody know the importance of its owner wherever he went.

Unfortunately we have not been able to arrange for the return of this helmet to Italy so that it could be with the other items from the wreck. Today it remains in Germany.

Fig. 9.

A Greek helmet taken from the wreck in 1961. Currently in Germany.

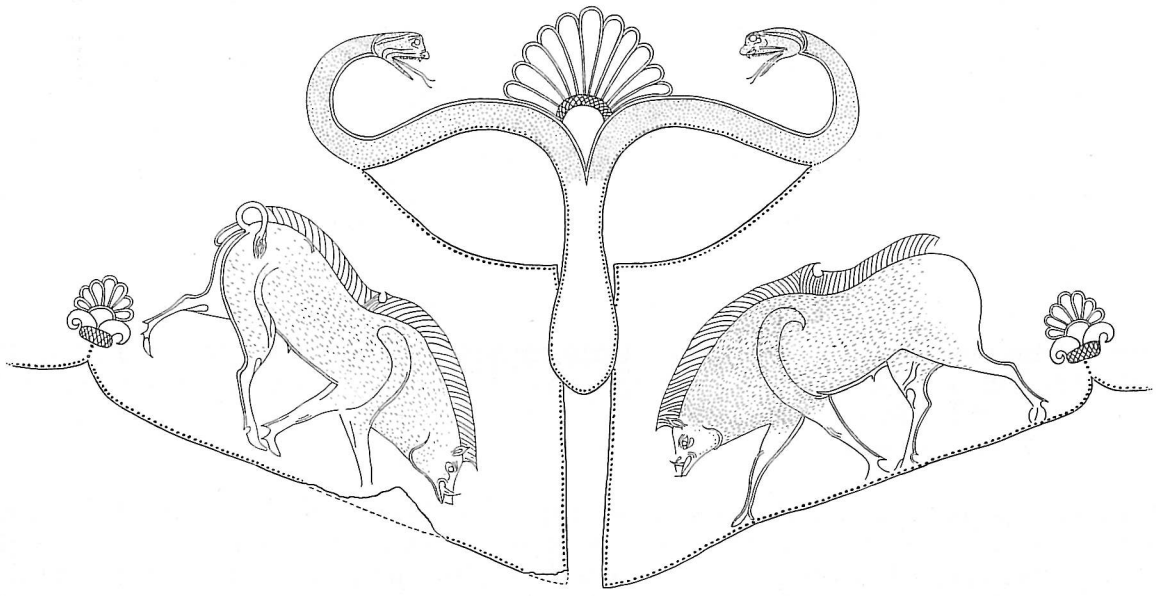


Fig. 10. *Tracing of the decoration on the helmet in fig. 9.*

The search for the wreck

We realized that after twenty years finding the wreck was not going to be easy. We knew that nothing would be showing on the surface of the seabed because Vallintine, on leaving Giglio for the last time at the end of summer 1962, had covered over with sand anything that had been left by the looters and was still showing.

In our search for the wreck we were pinning our hopes on three things. First, that we could find a cave in the underwater cliff face which, according to the log-book of Vallintine and others, was a feature they always passed on their way to the wreck. Find the cave and we would be on the route to the wreck, which we knew was situated somewhere near the foot of the reef below the cave. Second, Vallintine agreed to join the search for the first few days, and we hoped he would at least be able to find the cave quickly and perhaps also put us in the general vicinity of the wreck. Third, we had with us an underwater metal detector which had been developed at Oxford University by Professor Teddy Hall. We knew from Vallintine's description that the wreck had been carrying a number of large, round copper objects, which he likened to shields, but at the same time said they were too heavy for such items. These we imagined to be copper "bun" ingots, not all of which we reasoned, would have been taken by the vandals. If even only one ingot survived beneath the sand, it would represent a large metallic presence that would be easily picked up by the metal detector.

In September 1982 we assembled in Campese Bay, Giglio, to begin the search. With Vallintine's help we soon found the cave in the submerged reef face and some days later we came upon three or four tiny body fragments from an Etruscan amphora. Believing ourselves now to be in the vicinity of the wreck, we began a systematic search of the area with the metal detector. Several days later the equipment signalled a large concentration of metal beneath the sand. The following day we stripped back the sand to reveal a large iron concretion from which was protruding the handle of an Etruscan amphora identical to the one I had seen in England the year before.

During the same dive, several meters away, we came upon a Corinthian segment aryballos (Fig. 17); it was in two halves, but both halves were correctly together in an upright position.

The following day a semi-intact Laconian mug was uncovered in the same area (Fig. 28) and later, not far away, a lead ingot and an intact Ionian bowl (Fig. 30) were found together. Shortly afterwards we came upon a small concentration of fragments from a painted Corinthian oinochoe together with several joining fragments from a broken Samian amphora (Fig. 44) similar to the example we had seen in London.

At this point we knew we had found the site and that a significant amount of material had escaped the looters. Since our permits were for survey only, I called a stop to the work for that year. The following 1983 season we returned to begin an excavation which was to last until 1986.

The wreck site and its excavation

The main cargo concentration was found at a depth of approximately 45 to 50 meters in a zone that we had previously designated Area Victor (all areas were named after the NATO phonetic code). This area was situated in the interphase zone be-

tween where the rock of the reef ended and the soft sands and silt of the seabed proper began. It was an area characterized by coarse sand and other debris which had come down the reef (Fig. 1).

Directly below the point where the ship had hit the crest of the Secca, we found deposits of material beneath boulders which had come down the rock face after the vessel had sunk. From here we were able to follow a trail of debris which continued down the reef in a straight line to the keel in Area Victor, thus marking the trajectory of the sinking ship. By digging and burrowing under the boulders we were able to extract a number of artefacts, but in the end this activity became too dangerous and the work was halted. There still remains today an uncertain quantity of material from the wreck beneath the boulders.

The cargo was found to consist of a mixture of luxury and utilitarian goods: the former being best characterized by the painted fine wares, musical pipes (auloi) and pieces of carved wood and furniture; the latter is represented by amphorae, metal ingots and weaponry. To one side of the main cargo deposit we found in 1984 part of the ship's hull, which was raised to the surface the following year. The vessel was found to be of a type of laced construction which we call GBG technique (see below).

With proof of the vessel's existence and importance the funding worries began to recede; but now there was a new problem: looters. If word of the wreck were to spread, a new generation of looters, or *clandestini* as they are known in Italy, would be drawn to the site. For this reason it was decided with the Superintendency of Archaeology for Tuscany, that we would keep our activities a secret for as long as possible, but the following summer (1983), with a season lasting over three months and involving nearly 120 people, word of what we were doing soon spread and it was not long before we had our first night-time raid on the site. In fact there were several raids on the site in 1983, but the worst happened on the night of 24 June, 1983, when divers went in with a portable airlift and sucked up in a single dive what would have taken us about ten days to remove using our painstaking archaeological methods.

The first divers to go down the following morning were greeted by what can best be described as a bomb crater in the middle of the site. The vandals had taken two intact, painted Corinthian aryballoi on which we had been working and a possible third of which we had not been previously aware, but which had left a mould of its form in some pitch which had been covering that part of the site. It would seem certain that other items which we had not reached at that stage in our digging were also taken. Scattered by the looters all over the site were painted Corinthian pottery fragments. When these pieces were collected and assembled jig-saw fashion they were found to have come from a wine-mixing crater which had been decorated with a row of padded dancers over a row of animals (Fig. 25).

The thieves from that particular raid were never caught, but later in the same season we were successful in helping the authorities arrest two looters whom we had spotted on a nearby Roman wreck. On that occasion we radioed for the Carabinieri and and the *chandestini* were arrested while still in the water with an amphora they had just raised. They were later sentenced to three months in jail by a court in Grosseto.

After the raid in July 1983, the work had to become "rescue" archaeology. Before, it could take up to three days from when an artefact was first found to when it was brought to the surface; but after the raid every piece had to be raised the day it was uncovered, even if that meant working into the night with torches. Nothing could be left overnight by itself. It was not the way we liked to work, but under the circumstances we had no choice. The only time we relaxed this rule was when we found a

wooden plate (Fig. 61) for which we did not have a suitable container within which to take it from the sea. Reluctantly it was decided to leave it overnight on site whilst a special protective box was being prepared. That night looters visited the site and the next day we found the plate half way up the reef in four pieces. Fortunately, enough of it survived for us to be able to reconstruct on paper its original profile and dimensions.

The Finds

The Corinthian Ware

The Greek pottery from the wreck consisted mainly of types from Corinth, which was, of course, the commercial and cultural epicentre of the Mediterranean world at that time. The commonest Corinthian shape was the aryballos.

At present reconstruction of the pots is being carried out at the Centro di Restauro in Florence. While this work is in progress we cannot be sure of the precise totals of the individual shapes from the wreck because some joins were only obvious after laboratory cleaning. Thus certain fragments which we previously thought came from different pots can now be demonstrated to have come from the same vase. In the case of the aryballoi we currently believe that the pieces we excavated represent a total of 28 seperate pots (this figure includes the three taken from the site by looters in June 1983). Of the 28, 12 were from the black painted "segment" class, 3 were from the Warrior Group, 2 displayed quatrefoil designs (Fig. 16, ht. 94 mm; diam. of body 89 mm) and one had a single animal representation (Figs 14 and 15). 10 were of uncertain design mainly because of the abrasion and other damage they had suffered while on the seabed.

Two of the aryballoi from the Warrior Group were almost intact. One was decorated with two sphinxes heraldically positioned on either side of a water bird (Figs. 11 and 12; ht. 70 mm; diam. of body 66 mm); the other, which was more faded, displayed two combatting hoplites (Fig. 13; ht. 84 mm; diam. of body 78 mm). The warrior on the left is dressed in a short chiton, while the one on the right is naked except for his helmet, and carries a shield upon which is a winging bird. Both are

Fig. 11. Corinthian aryballos painted with two confronting sphinxes.

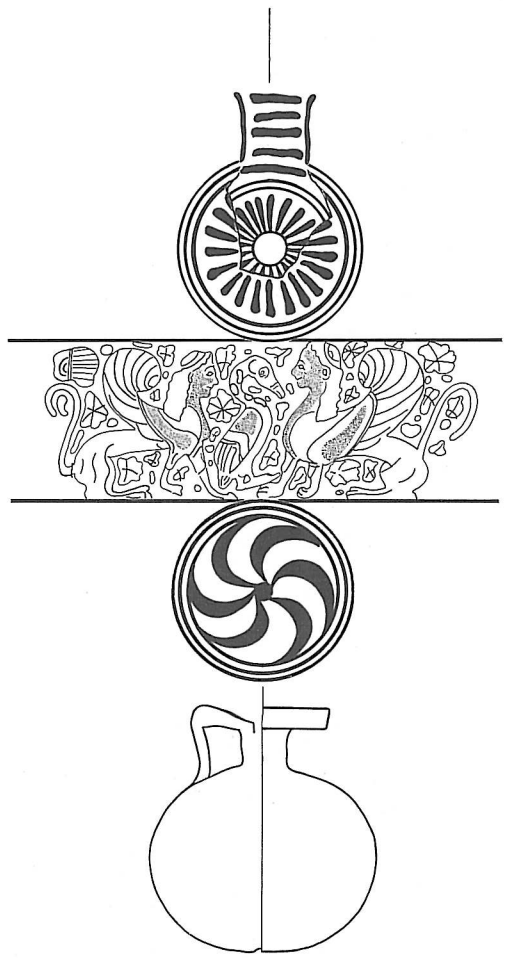
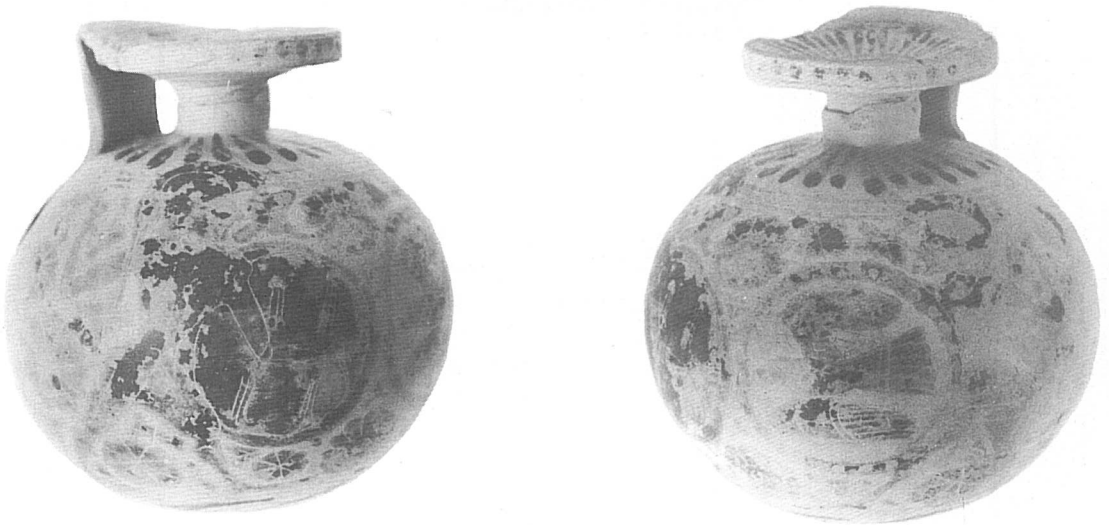
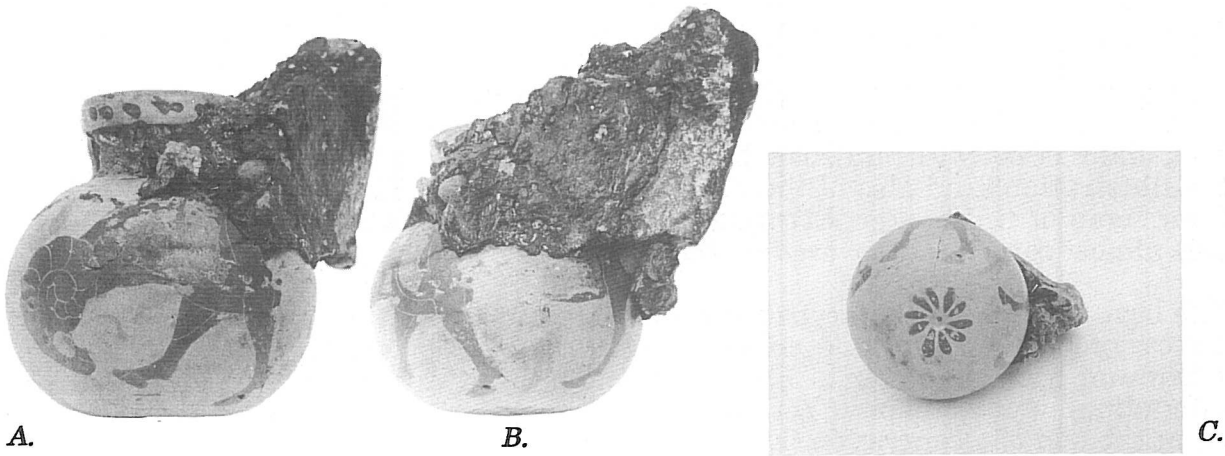


Fig. 12.
Drawing of the aryballos in figure 11.



A. B.

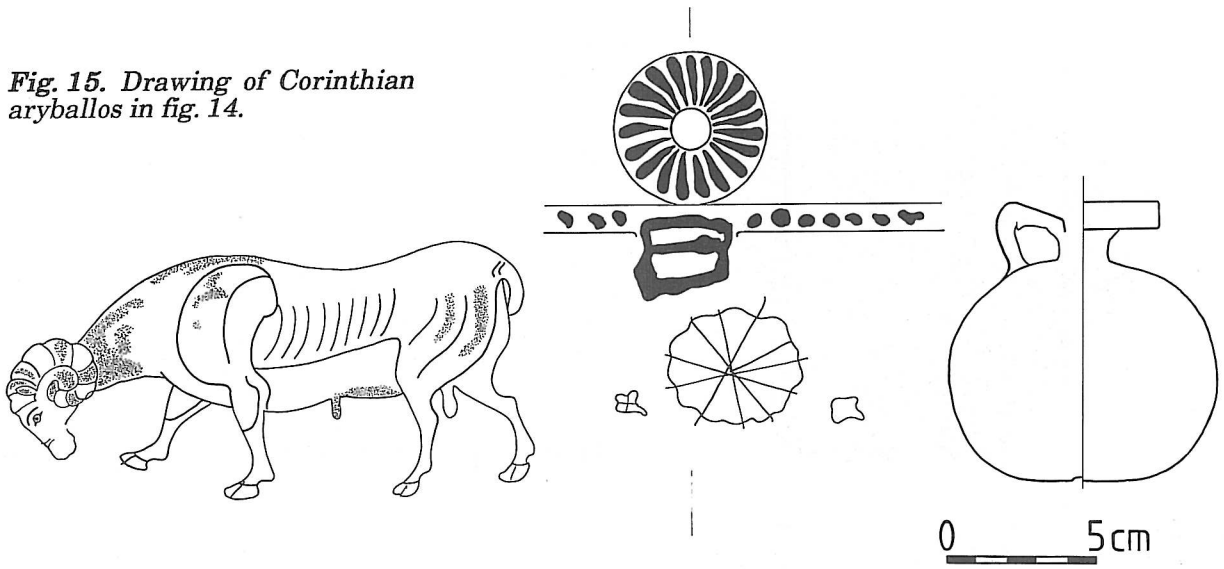
Fig. 13. A, B. Corinthian aryballos painted with two combatting hoplites.



A. B. C.

Fig. 14. A, B, C. Corinthian aryballos.

Fig. 15. Drawing of Corinthian aryballos in fig. 14.



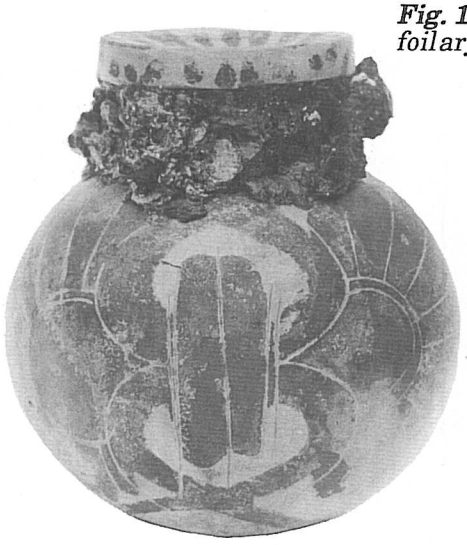


Fig. 16. Corinthian quatrefoil aryballos.

Fig. 17. Corinthian segment aryballos.

well known artistic designs from a workshop that is usually dated to the Early Corinthian period (Payne 1931, 288: Amyx 1969, 1-26). A single small fragment came from another aryballos decorated in the same manner with combatting warriors.

One Corinthian aryballos, that fortunately survived intact, was painted with a single ram, stretched out to cover as much space as possible (Figs 14 and 15; ht. 93 mm; diam. of body 91 mm). The black substance clinging to the neck of this vessel in the illustration (and also of the quatrefoil aryballos in Fig. 16), is pitch that spilled from some of the broken Etruscan amphorae. These two pots were found side by side almost completely covered by the substance.

The best example of the aryballos from the segment class is the one in Fig. 17. The discovery of this pot was described above. It had a surviving height of 70 mm and a maximum body diameter of 63 mm. Another from this class was found concreted into a bundle of iron spits. Yet another was found partially absorbed by iron deposits at the end of a concretion (Figs 19 and 20, also see Fig. 18).

It is worth observing that when one considers all the aryballoi together (including the Laconian and Etruscan examples which are described below) it would seem that they comprise a consignment that had been purposely assembled by a merchant to offer something for everybody. A few would have been for the more affluent customer, while others (such as the segment aryballoi) would have been intended for the lower end of the market. Function, or role, was also an obvious consideration, and in this regard some of the aryballoi were large capacity, while others were miniature (and thus presumably were used to contain more valuable fluids). The customer's artistic taste appears also to have been a factor because when considered all together as a batch, one is struck by the range of painted styles.

Fig. 18. Corinthian segment aryballos covered in iron deposits and adhering to an iron concretion.

Other Corinthian forms included the kothon mentioned earlier (Fig. 8) and a small number of trefoil mouthed oino-

choai, such as the one in figures 22 and 23 (see also Fig. 24). Some of the oinochoai were plainly decorated while others displayed rows of animals in the typical style of the time.

The ship was also carrying craters, but these, like the oinochoai, only survived in a fragmented state. One (Fig. 25) was decorated with a row of padded dancers over a row of animals and birds.

Two sets of fragments came from Corinthian skyphoi.

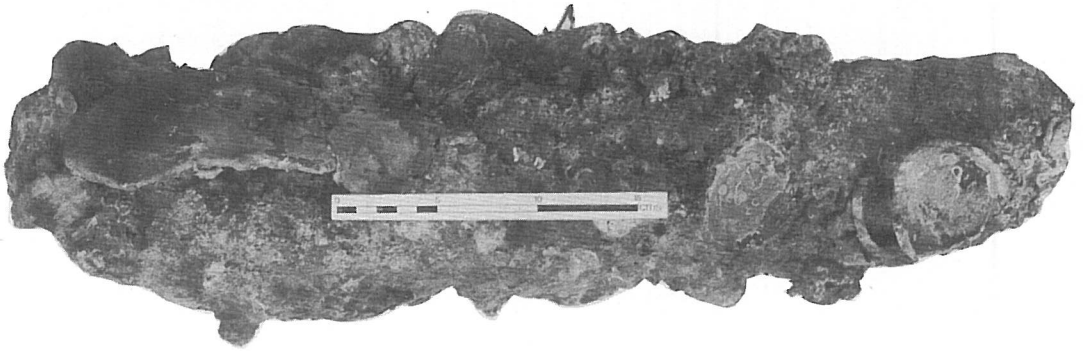


Fig. 19. Iron concretion with half an aryballos adhering to one end.

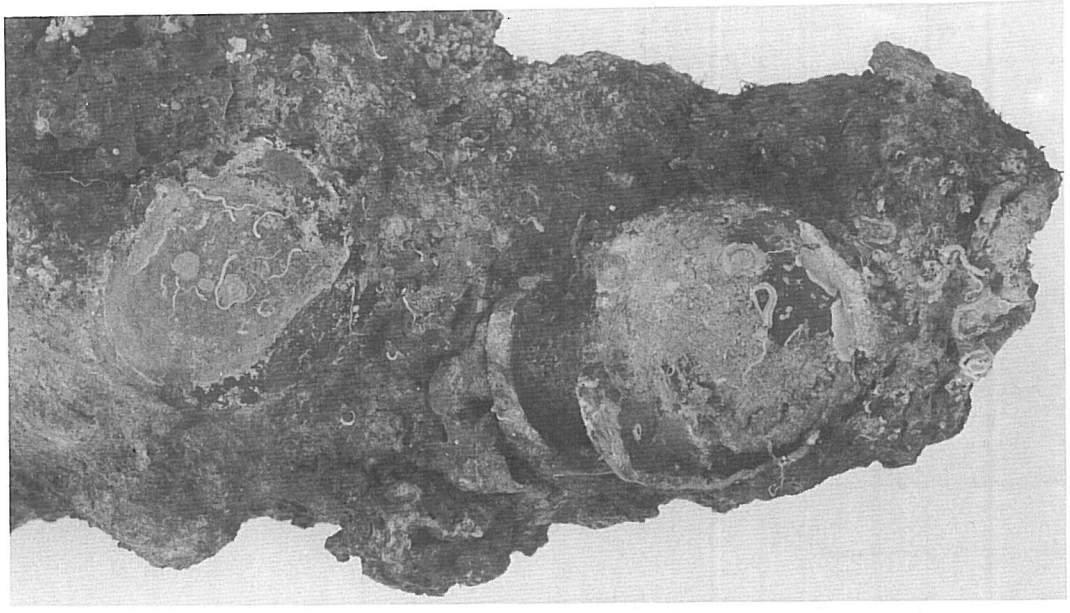


Fig. 20. Detail of the aryballos in figure 19.

Laconian

The Laconian pottery on board consisted of aryballoi, mugs and bowls. In all, six semi-intact, or fragmented aryballoi, were recovered. The most spectacular was an example with tongues on the disc, shoulder and base and a gorgon's head on the handle zone at back (Figs 26 and 27; ht. 59.8 mm, diam. of body 56 mm). Two were half painted with black tops and white lower bodies (Fig. 29 right; ht. 74 mm; diam. of body 74 mm). Another (ht. 43 mm; diam. of body 43 mm) was a miniature which appears to have seen completely black painted, but of which very little of the colouring survived.

Two mugs with strap handles were excavated (Fig. 28; ht. 74 mm. diam. of base 74 mm). These both carried the typical Laconian feature of a broad red band with white edges. The bowls, and possibly an oinochoe of Laconian origin, survived in fragmentary state and are currently undergoing reconstruction.

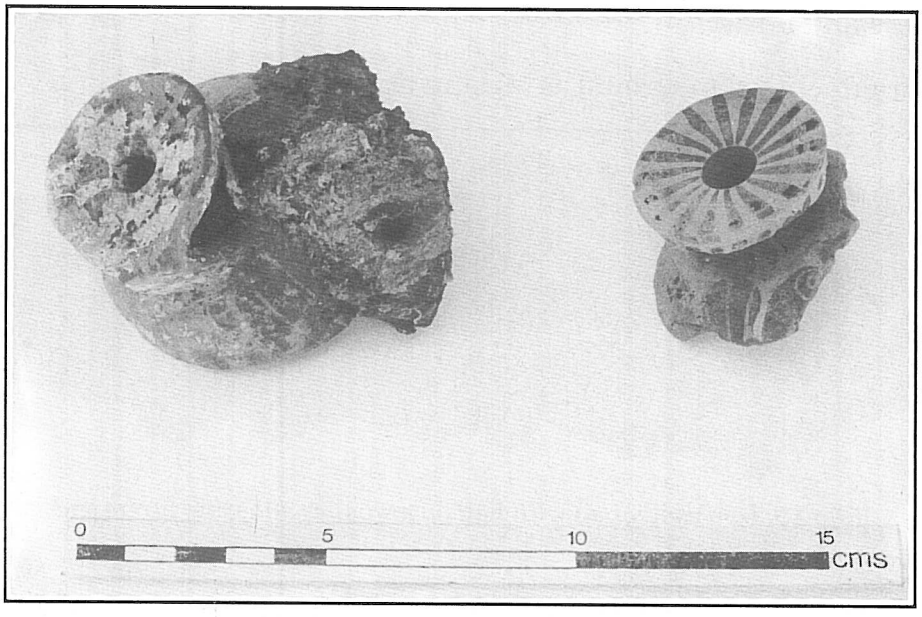


Fig. 21. Upper parts of two aryballoi.

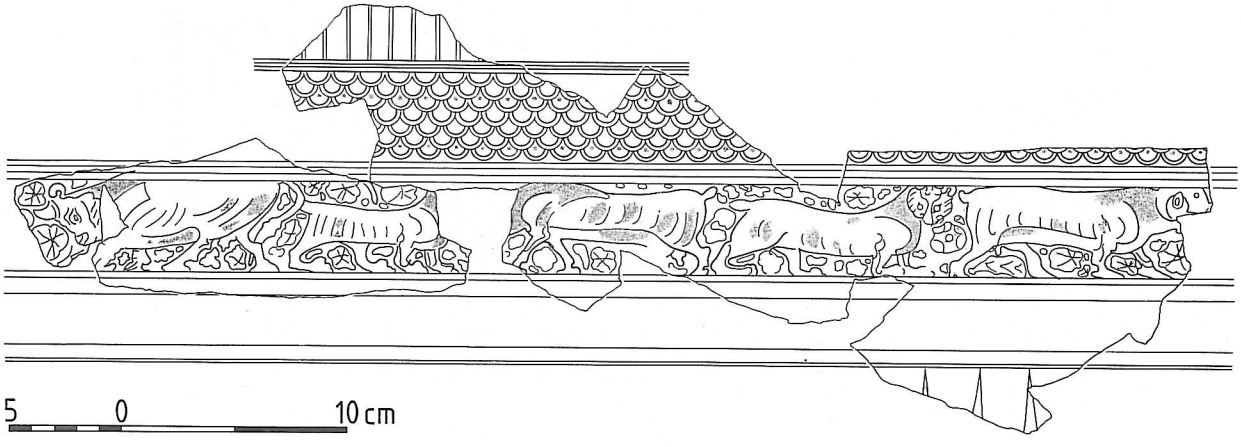


Fig. 22. Tracing of fragments from a Corinthian oinochoe.

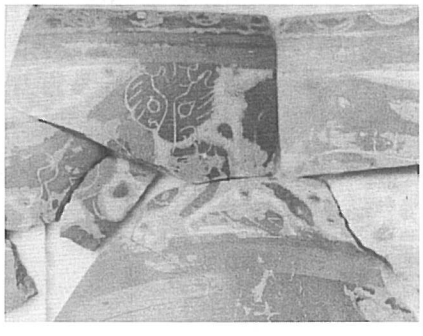


Fig. 23. Detail of one of the fragments in figure 22.

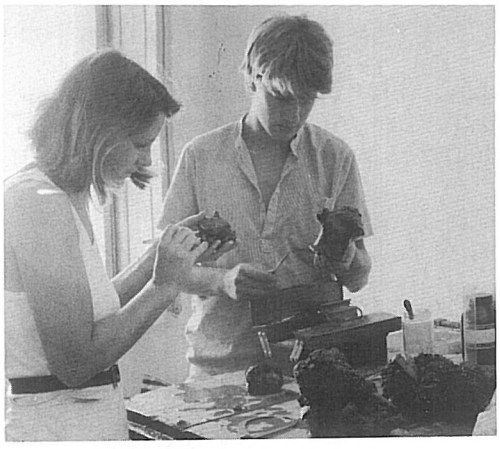


Fig. 24. Conservator and assistant extracting fragments of a Corinthian oinochoe from lumps of pitch.

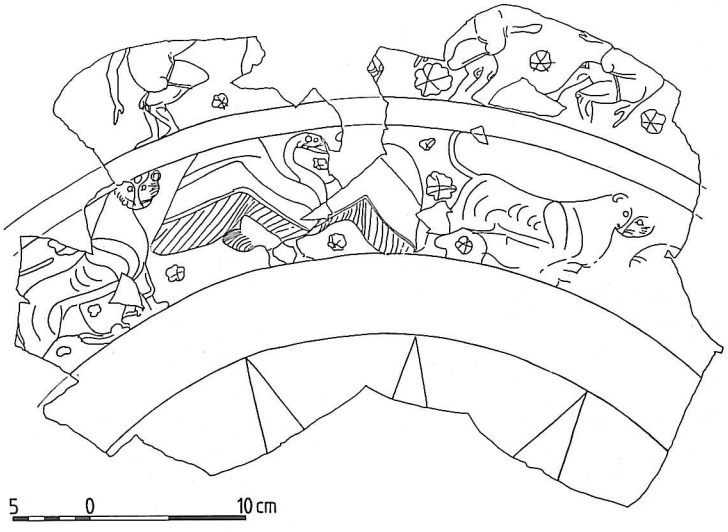


Fig. 25. Part of a Corinthian crater.

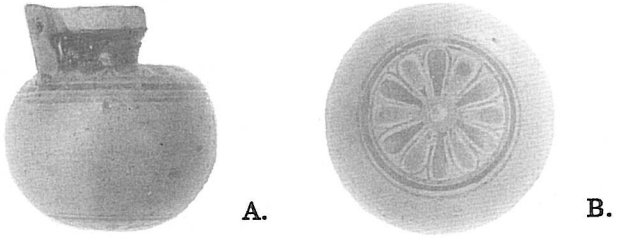


Fig. 26. A&B. Profile and bottom view of a Laconian aryballos.

Fig. 27. Drawing of the Laconian aryballos in figure 26.

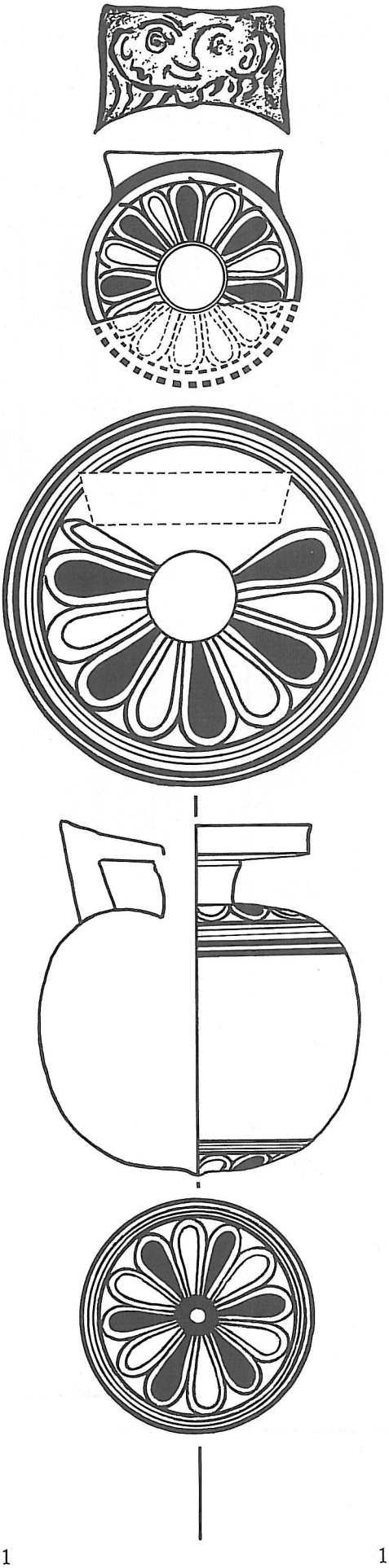


Fig. 28. Laconian mug.

Ionian Bowls

Over 80 fragments from Ionian bowls were found. The only intact example to have been recovered was that in figure 30, which had a height of 100 mm and was made from a hard, highly cohesive, red clay. Its black paint was lustrous and of high quality.

Fig. 29. *Etruscan aryballos painted with two boars; an olpe; a half-painted Laconian aryballos.*

Fig. 30. *Ionian bowl.*

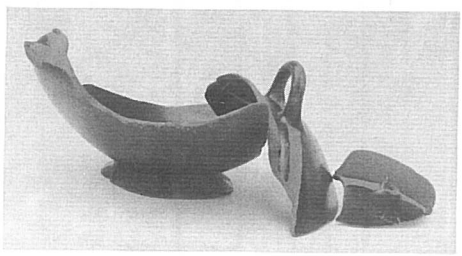


Fig. 31. *Ionian bowl.*

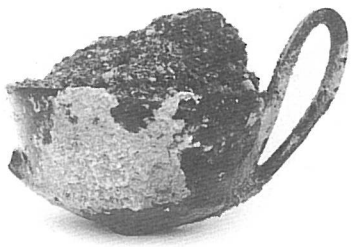


Fig. 32. *Etruscan bucchero kantharos full of pitch.*

Fig. 33. *Etruscan bucchero pot.*

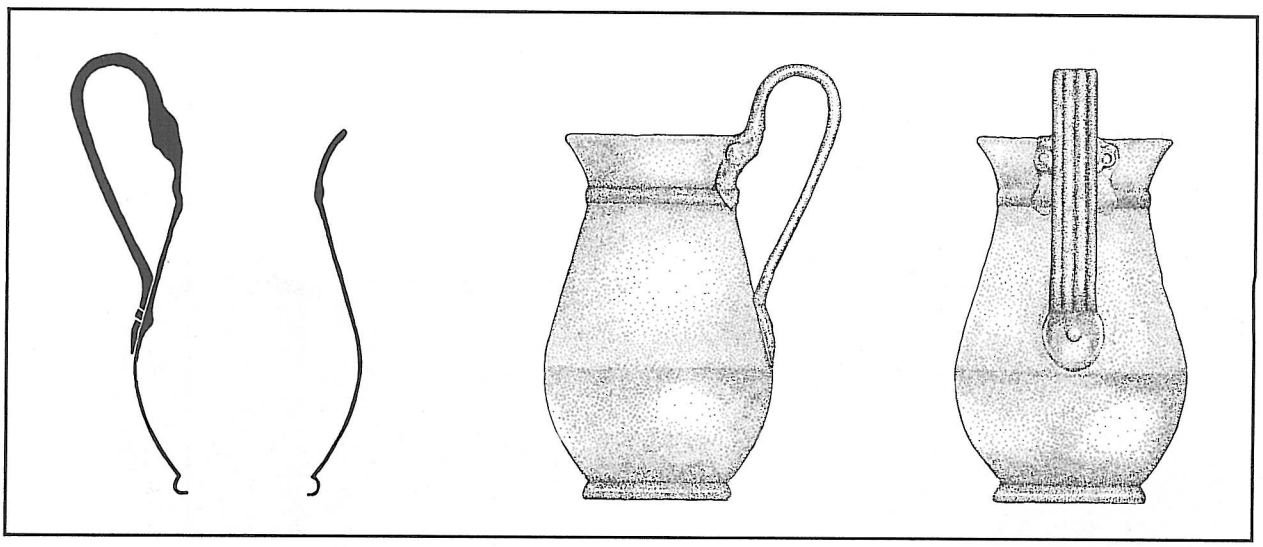


Fig. 34. *Silver olpe.*

Samian

The only other fine-ware pot of Aegean, or East Mediterranean origin, was a banded Samian lekythos. The mouth from another lekythos of likely Samian origin was also recovered. The colour and texture of the clay was roughly similar to that of the Samian amphorae.

Etruscan

The remaining fine wares came from Etruria. The most interesting was an aryballos painted in the so-called Etrusco-Corinthian style, that is to say, in a manner that imitated contemporary, or nearly contemporary, trends in Corinth (Fig. 29 left; ht. 88 mm; diam. of body 74 mm). Time spent comparing the boars on this pot with those by the Greek craftsman on the helmet (Fig. 10) is well rewarded.

A fragment from one other Etruscan aryballos was found. The remainder of the Etruscan wares were mainly pieces of Bucchero kantharoi, such as those in the 1961 photograph (Fig. 7) or an example that we found (Fig. 32) which was missing one handle and its base. Fragments from 10 or 11 other kantharoi were recovered.

Of particular interest was the small, open bucchero pot featured in figure 33 (ht. 48 mm; diam. of body 65 mm).

Fig. 35. Plain olpe.

Metal Ware

In addition to several clay jugs of uncertain origin (Figs 35 and 36) there was also a badly crushed silver jug with a riveted handle, which was recovered from under an iron concretion (Fig. 34; ht. 48 mm; diam. of body 65 mm). Its origin is uncertain but it is thought to be Grecian.

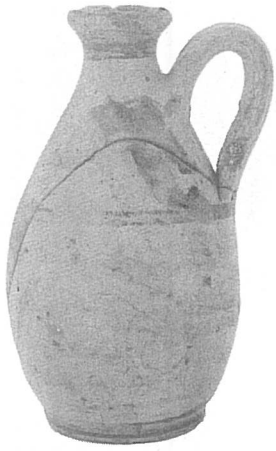


Fig. 36. Banded olpe.

Lamps

While considering the pottery, mention should also be made of the three intact, and three fragmented Greek lamps which were all excavated in Area Victor (Fig. 37). All were of the type with hollow tubes at their centres. Two of the three intact examples were charred at their nozzles, indicating that they belonged to the ship and were not part of the cargo. They varied in body diameter from 89 mm to 97 mm; and in height from 24 mm to 29 mm.

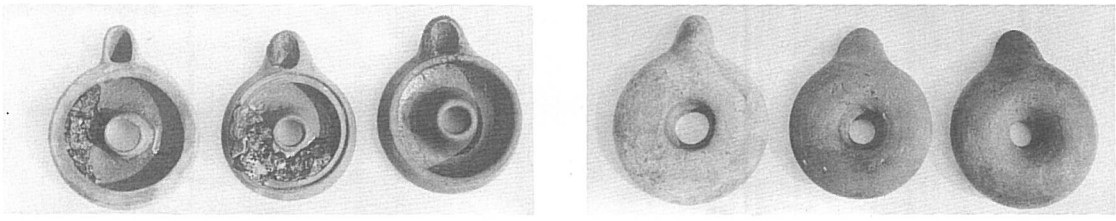


Fig. 37. A & B. Lamps from the wreck. Two are charred at their nozzles.

Amphorae

Four distinct amphora groupings from four distinct locations about the Mediterranean were found on the wreck: Etruscan, East Greek (Fig. 46), Samian (Figs 43 to 45) and Phoenician Punic. The overwhelming majority was Etruscan.

The Etruscan amphorae (Figs 38 to 42) can, in broad terms, be divided into two categories: those with flat bottoms (Py 1974, 1985, type 1; Gras 1985, type EMA) and those with rounded, or cone shaped bottoms (Py 1974, 1985, type 3A and 3B; Gras 1985, EMC).

Over 130 diagnostic amphora pieces were recovered. Of these, 33 could be identified as having come from flat-bottomed forms while 32 could be seen to have come from a round-bottomed form. It was not possible to determine with certainty from which families the remaining diagnostic fragments came. A majority, if not all of the jars, had been coated on their insides with pine pitch or resin. This is not surprising when we consider the poor quality, porous nature of the clay that was used in their manufacture.

Fig. 38.

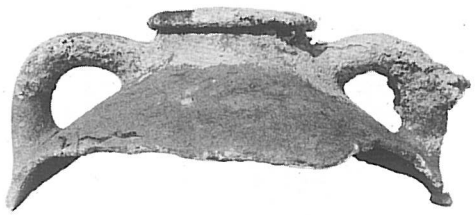


Fig. 39.

Fig. 40.

Fig. 41.

Fig. 42.

Figs 38 to 42. Etruscan amphorae.

Many handreds of olive pips were found littering the site. Two of the flat-bottomed jars were found to be carrying olive pips (Fig. 40). Also, in places, the site was blanketed with a thick layer of pitch which had spilled from broken Etruscan amhorae. In two instances we could demonstrate that roun-bottomed jars had been used to transport pitch. Although a pattern does seem to be emerging, it would be rash on the evidence of four jars to say that all the flat-bottomed ones carried olives, and that all the round-bottomed ones held pitch.

A number of large body fragments found *in situ* beneath the sand appeared to have contained neither pitch nor olives. They probably held wine.

One of the Etruscan amphorae still had part of its stopper surviving. This had been made from a disc of pine wood that had been given a bevelled edge.

It is interesting to note that at least some of the amphorae that were carrying pitch were themselves pitch lined; obviously for such a commodity a pitch coating on the body wall was redundant. Perhaps the jars had been automatically coated with pitch when they came out of the kiln but they may also have been reused containers.

Fig. 43. Samian amphora taken from the wreck in 1961.

Fig. 44. Parts of a Samian amphora found during the 1982 season.

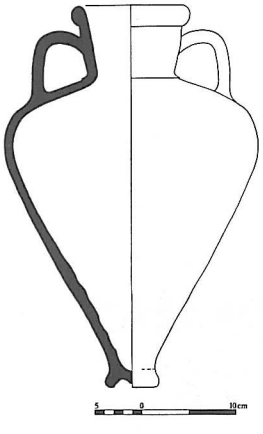


Fig. 45. Reconstructed drawing of Samian amphora in fig. 44.

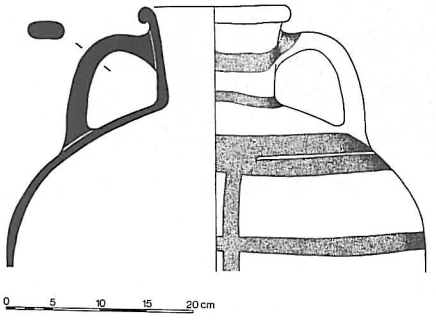


Fig. 46. Top of an East Greek amphora from the wreck.

Further evidence for the recycling of the Etruscan amphorae comes from the wide diversity of their clays and the details of their rim profiles. The proportions and cubic capacities of the individual jars also varied considerably. If all these amphorae were new and from one or two consignments, then we might reasonably expect to find greater uniformity in the detail of their shapes and a breakdown into recognizable sub-groups. The evidence in fact suggests that the Giglio amphorae came from a variety of kilns over a period of time.

Additional evidence for recycling came from two pieces with deep scratch marks that had been worn smooth well before the ship sank. These had been protected from seabed erosion by a covering of pitch.

Other amphorae

There was evidence to show that the vessel had been carrying at least six Samian amphorae. These were all small-capacity jars with short necks, oval lips and broad, high shoulders that diminished quickly towards the base (Figs 43, 44, 45). It is almost certain that these forms were used to transport olive oil, for which Samos was famous in antiquity (Baron 1966, 7; Grace 1971, 80, n. 69).

Fragments were also found from at least 4 East Greek amphorae that had been decorated with broad bands of dark paint (Fig. 46).

Another form carried by the ship was Phoenician Punic in origin (see discussion above). Several fragments from the wreck also suggested the presence of Laconian and Corinthian amphorae, but these identifications are not yet confirmed.

Metal Finds

Apart from the silver jug the metal finds consisted of weaponry, lead and copper ingots, copper nuggets, fishing weights and iron bars, or spits, which survived only as void concretions.

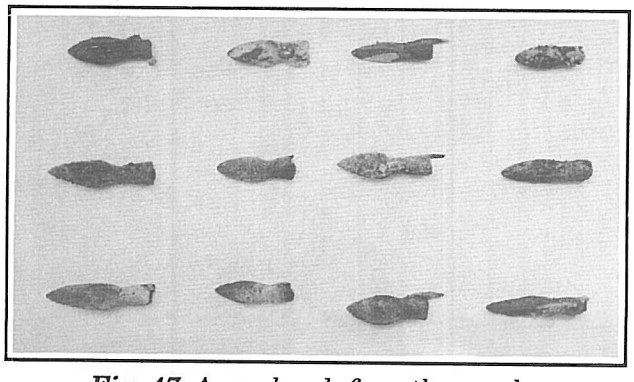


Fig. 47. Arrowheads from the wreck.

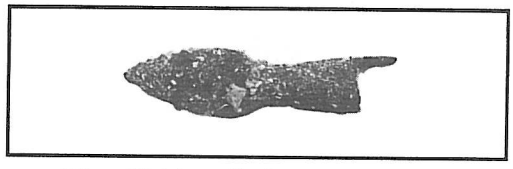


Fig. 48. Detail of an arrowhead.

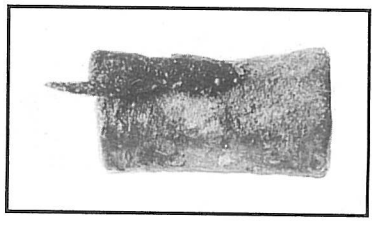


Fig. 49. Arrowhead adhering to the side of a lead weight.

Weaponry

The helmet from the Giglio ship (Figs. 9 and 10) has been described above. It was not, however, the only helmet that the vessel carried. Adjacent to the keel was found the nose of another example, but one of much inferior manufacture. The nose had come off where it had been riveted onto the brow. Clearly, the remainder of the artefact had been found by one of the *clandestini* in the early sixties and taken from the site.

30 socketed bronze arrowheads were also recovered during the course of the excavation. These can be divided into two main groups: those with two sides, and those with three. All were mould cast, and all except one had a barb, or spur, on one side. 20 of the arrowheads had the remnants of wood in their sockets, but in each case the remains were in such bad condition that an identification was impossible. It is believed that the vessel originally carried many more which did not survive. All that remained of some arrowheads were greenish stains in the sand.

Because these arrowheads vary in their lengths and proportions (thus reflecting a variety of moulds), it is believed that they belonged to the ship and were not part of the cargo.

The closest parallels for the Giglio arrowheads come from the Near East and date to the late 7th century or first quarter of the 6th century.

Fig. 50. *Copper ingot raised from the wreck in 1961.*

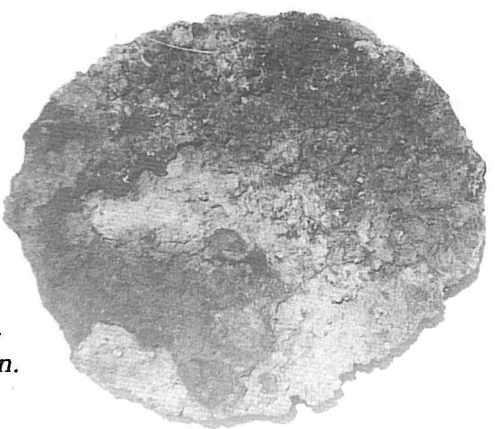


Fig. 51. *Copper ingot raised during the excavation.*

Fig. 52. *Copper ingot raised during the excavation.*

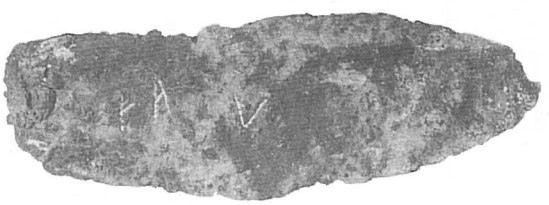


Fig. 53. *Lead ingot from the wreck.*

Ingots

The ingots were of copper and lead. Two copper "bun" ingots were raised (Figs 51 and 52), and two more were found in a Government storeroom on the island. These latter had been brought up from the wreck by Vallintine in 1961 (Fig. 50). According to Vallintine and others, who were diving on the wreck in the early sixties, the site originally contained many of these copper objects, which they likened to shields because of their roughly rounded outline and form.

The examples we raised had diameters of 450 to 550 mm, depths of 90 to 110 mm and weighed over 40 kilos. One particularly interesting example retained on one side the mould of the channel down which the molten copper had poured on its way into the receptacle (Fig. 52).

The lead ingots were long and flattish (lengths 395 to 530 mm; max. widths 115 to 200 mm; max. depths 34 to 51 mm), weighed between 8.4 and 11.4 kilos, and were irregular in outline (Fig. 53). We found 9 during the course of the excavation but, as with the copper ingots, we feel certain that the vessel had been carrying more which have been taken by *clandestini.*

Copper Nuggets

The ship was also carrying a number of copper nuggets which ranged from about the size of a pea to about that of a tangerine (Fig. 54). The Giglio ship went down prior to the arrival of coinage in Italy and we believe these lumps functioned as currency.

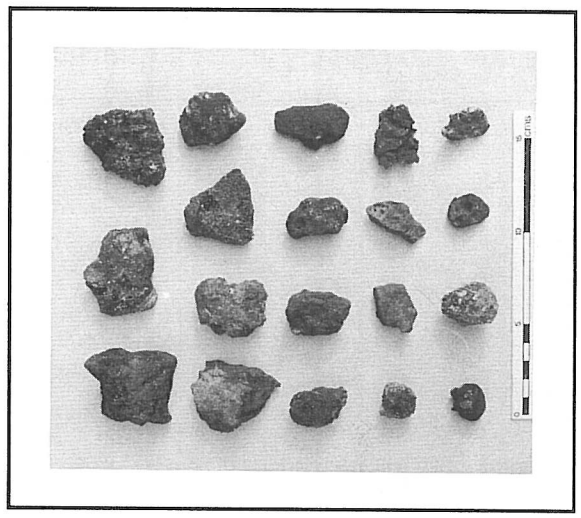


Fig. 54.

Copper nuggets.

Iron Bars

The vessel was also carrying a number of iron bars, or spits, which survived only as broken void concretions (Figs. 55 and 56). It is possible that these functioned as *fasces,* the symbol of authority in Etruria, but we think it is more likely, because of their number, that they were being used as currency. Iron bars, in certain places, were a common medium of exchange in pre-Classical times.

Fishing weights and hook

135 lead fishing weights were recovered from the wreck. These can be divided into six principal forms and were used for fishing with lines (Fig. 58), draw nets and casting nets. In figure 57 we illustrate some of the rolled weights that we presume were used for net fishing. A perforated clay disc (Fig. 59) was recovered that we think might have been used for a net weight. One fishing hook was also excavated.

Other metal finds included a plain bronze ring (exterior diameter 23.5 mm) and an

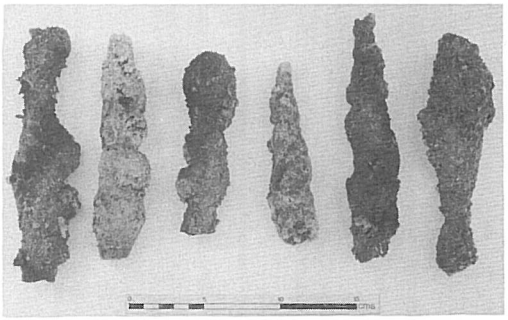


Fig. 55. Iron bar concretions.

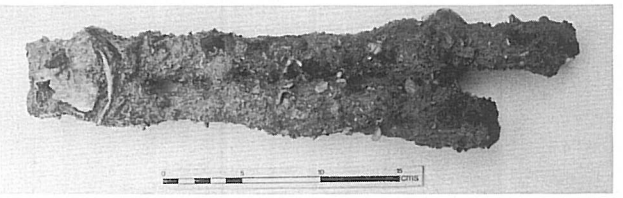


Fig. 56. Two concreted iron bars.

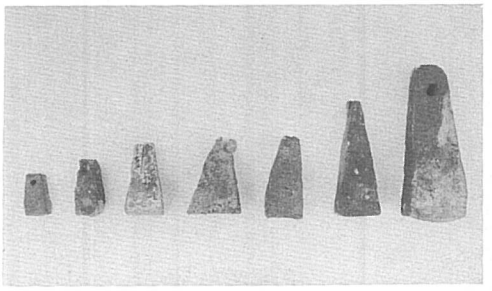


Fig. 58. Line fishing weights.

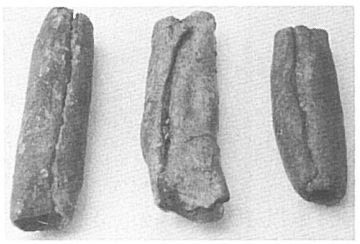


Fig. 57. Net fishing weights.

Fig. 59. Clay loomweight, possibly used as a net sinker.

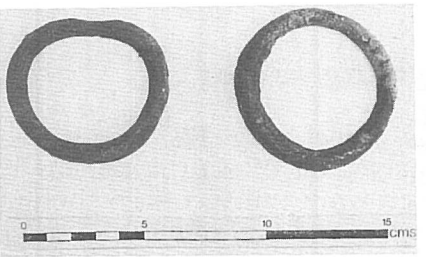


Fig. 60. Two lead rings.

object which we believe to have been either a fastener from the handle of a bucket, or a component from a weighing device (end to end 80.5 mm). One of the iron concretions was found to contain the void of an adze. Four lead rings (Fig. 60) were recovered with diameters that ranged from 58 to 77 mm (it should be noted that these rings were slightly squashed, thus these measurements do not reflect their original diameters).

Wooden Finds

Various wooden objects were recovered which were clearly unrelated to the ship's structure. These were either cargo or the possessions of passengers or crew. They ranged from simple utilitarian objects, such as a plate (Fig. 61) and a writing tablet (Fig. 62), to a highly ornate piece of a couch (Fig. 63) which reflects the Etruscan taste for oriental finery. On another level the wooden objects were noteworthy for their high standard of tooling and technical competence; this we see reflected in the boxwood lid with its ivory studs and highly intricate, turned, drilled and hand-carved decoration (Fig. 64). From the purely technical point of view the wooden finds were of interest for the methods of jointing used by the carpenters; these ranged from the crudely laced box ends of the small planks in figures 66 and 67 to the highly sophisticated techniques exhibited by the calipers with their mobile and interlocking units of wood (Fig. 65). This important tool is discussed at length in a forthcoming article for Tropis, the proceedings of the 1989 Athens conference on Mediterranean ship construction.

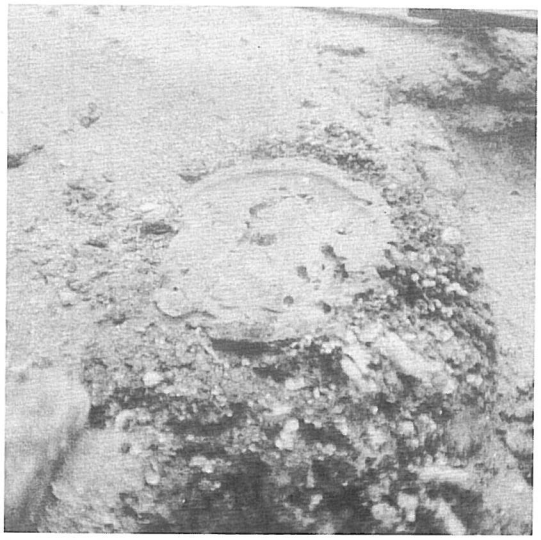


Fig. 61. Wooden plate partially enveloped by pitch on the seabed.

There is not space here to illustrate or discuss all the wooden artefacts (eg. Figs. 69 and 70) but special mention must be made of the writing tablet and the auloi.

Writing tablet

This object (Fig. 62) was made of boxwood and measured 169 X 111 mm. It was clearly part of a diptych, for in two of the corners there were neatly drilled holes which would have taken thongs of leather, or some other material, serving as hinges for a second leaf of equal dimensions that would have folded over the first.

Midway along the side of the tablet, opposite the holes, a chip of wood was missing. It seems safe to assume that originally there was at this point a fastener of some kind that would have locked the two leaves together.

No trace of wax, or other substance survived on the recessed writing surface; however a 252 mm long, narrow length of wood was found near the plaque which may have been its stylus.

Auloi

The wreck was carrying a number of musical pipes, or auloi (Fig. 68). One intact pipe and 17 fragments were recovered. All the pipes were made of boxwood except one, which was of ivory. A number of the broken fragments could be assembled to form complete lengths. These had five finger holes on top and a single hole on the underside at the mouth end. The intact pipe and several of the fragments were without holes. It is estimated that the vessel was carrying a minimum of nine or ten pipes. Since each pipe differed in length, bore and disposition of finger holes, the greater likelihood is that they were not cargo, but rather belonged to one of the passengers or crew. These pipes are currently being studied by scholars from the University of Florence Conservatoire of Music.

Other finds from the wreck include a clay bead (Fig. 71), a clay disc with a hole through its centre (Fig. 72), four astragals, or "knuckle-bones" (Fig. 73), and two pieces of uncut amber (Fig. 74). We believe that originally there may have been more amber, which floated away or was carried off in the current when the vessel sank. These two pieces survived only because they had been trapped in pitch.

Fig. 62. Wooden writing tablet.

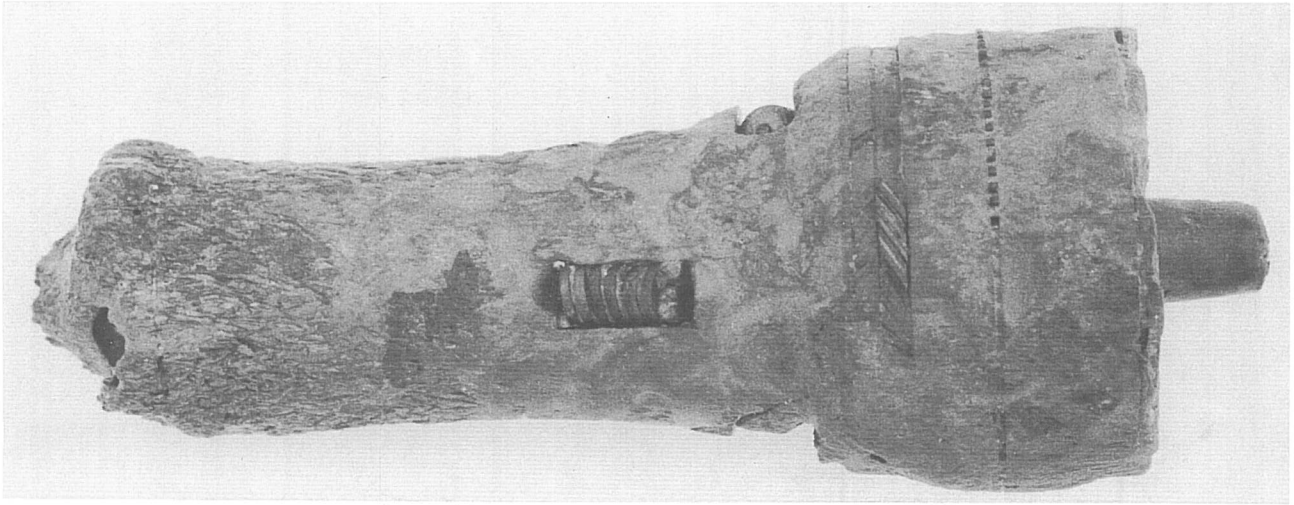


Fig. 63. Upper part of a wooden couch leg.

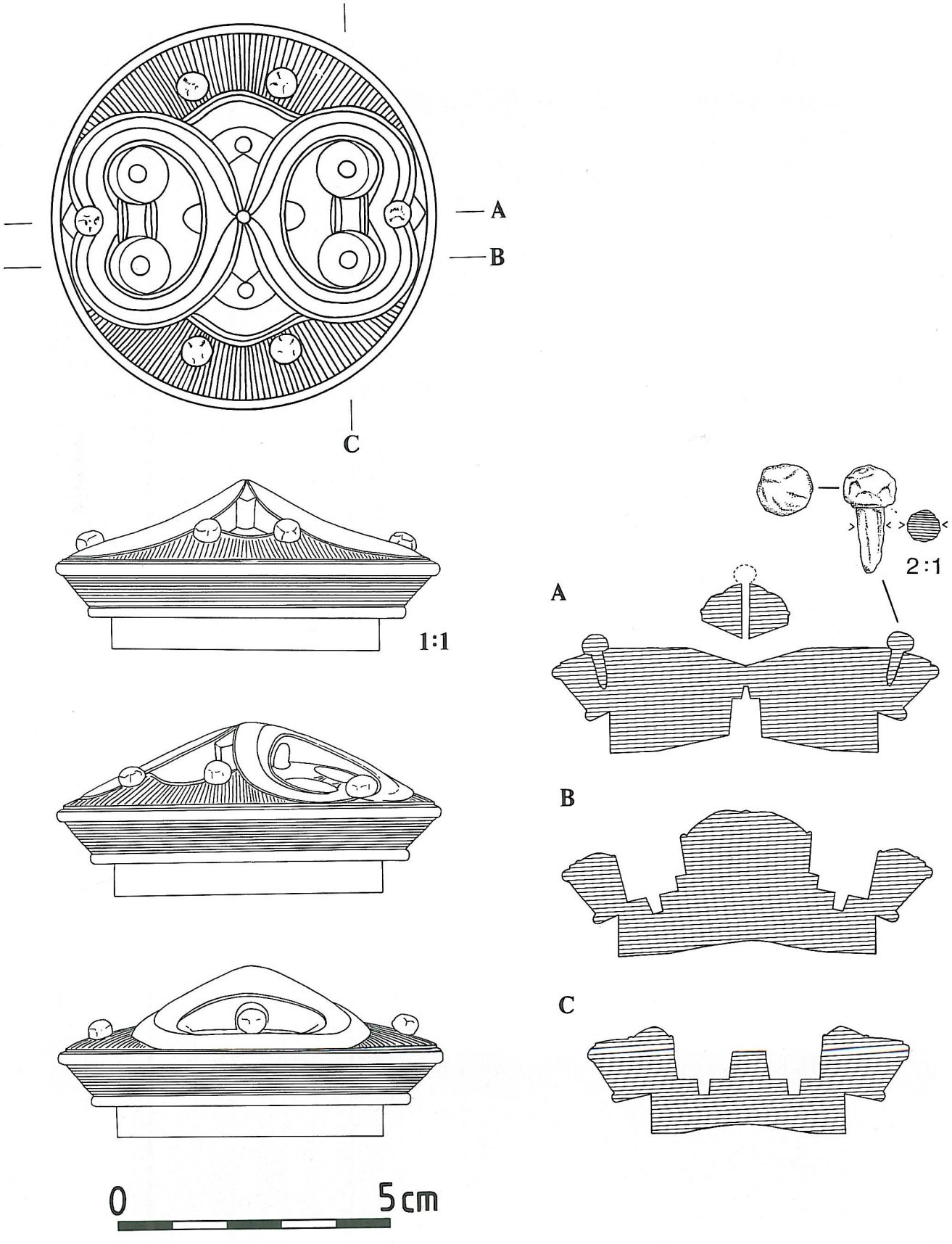


Fig. 64. Carved wooden lid.

The Ship

Hull Construction: the GBG Technique

A piece of heavy timber, along with some associated pinewood *(Pinus sylvestris L.)* planking, was recovered from area Victor. This timber we believe to have been from the after end of the vessel's keel (Fig. 75). It was oblong in section, rabbeted along its arrises and was slightly rockered (Fig. 76). The extreme after-end was chamfered and tongued to take the sternpost. There were no remains of fastenings along the topside inboard surface to indicate that it had ever taken a keelson, nor was there a shoe (false keel) or wales to give it added strength and protection against marine parasites. The thickness of the keel diminished towards the stern: at the broken forward end it had a moulded dimension of 206 mm and a sided dimension of 196 mm, while at the scarfed afterend it had a moulded dimension of 119 mm and a sided dimension of 196 mm.

The sides of the hull were of shell-first, laced construction (Fig. 77). The lacing was of a type which (to distinguish it from other types of lacing in other vessels from other periods) we have called the "GBG technique" after the three excavated vessels which best exemplify this method of edge-to-edge joining of their strakes: the Giglio ship (c. 600 BC), the Bon Porté ship (second half of 6th century BC; Joncheray 1976) and the Gela ship (c. 500 BC).

The technique consists of cutting triangular notches along both inboard edges of the planking (Fig. 77) and then drilling diagonally down from the notch so that the hole emerges, not on the outboard surface of the plank, but, rather, on the seam itself. This hole joins with a hole on the opposite side of the seam from a similar notched and drilled arrangement in the adjacent plank. Cord was passed back and forth through these holes and made tight. Each hole was then plugged with a small dowel. At intervals, between the holes for the lacing, horizontal wooden pins, or treenails, pass through and across the seams, in order to give additional strength and support. Pine pitch, or resin, was used for caulking.

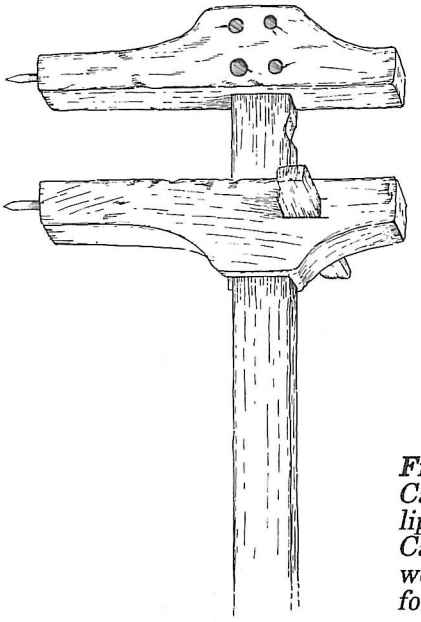


Fig. 65. Carpenter's calipers. Drawing Caroline Caldwell. (see Tropis, forthcoming).

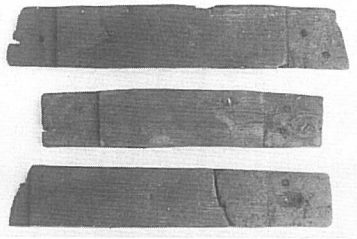


Fig. 66. Three small planks of wood held together by cord.

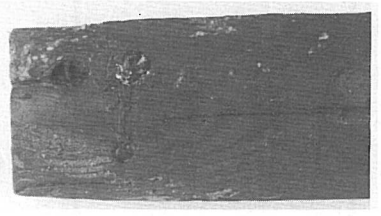


Fig. 67. Detail of one of the plank-ends in figure 66 showing the cord.

Fig. 68. A musical pipe, or aulos, made from boxwood.

Fig. 69. A toggle.

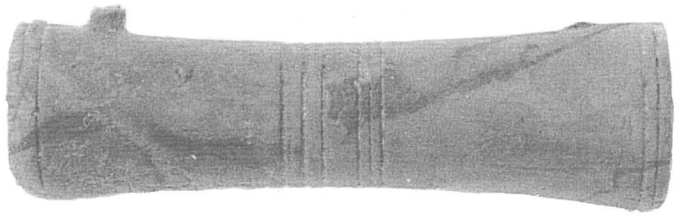


Fig. 70. Wood artefact of uncertain purpose.

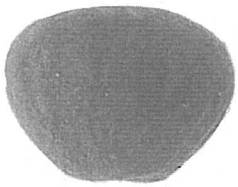
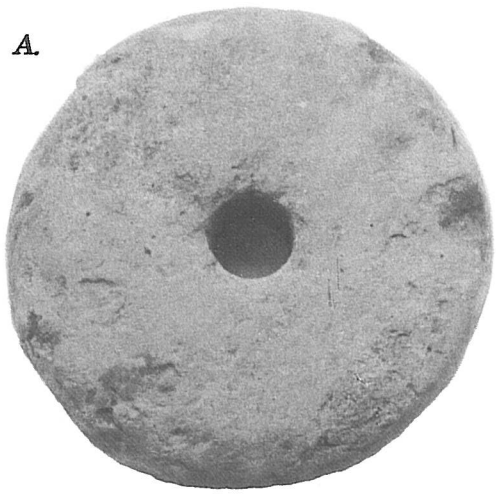


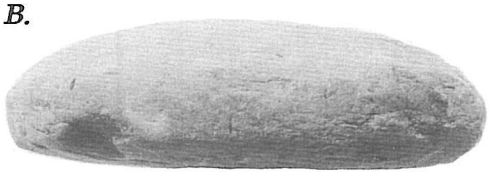
Fig. 71. Clay bead.

Fig. 72. A&B. Clay disc with hole at centre. Possibly from a spindle.

A.



B.



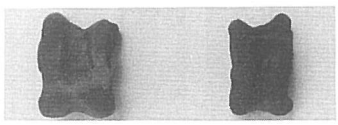


Fig. 73. Knucklebones, or astragals.

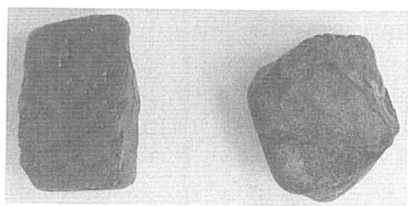


Fig. 74. Two pieces of amber that were found in pitch.

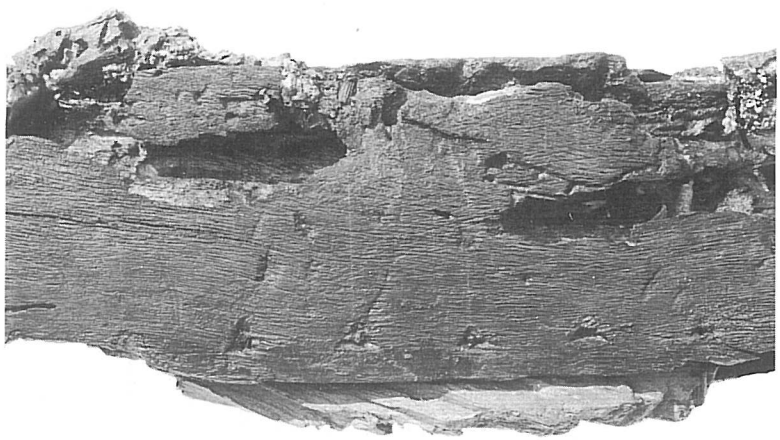


Fig. 75. Detail of ship's keel showing notches to take the lacing and piece of a garboard.

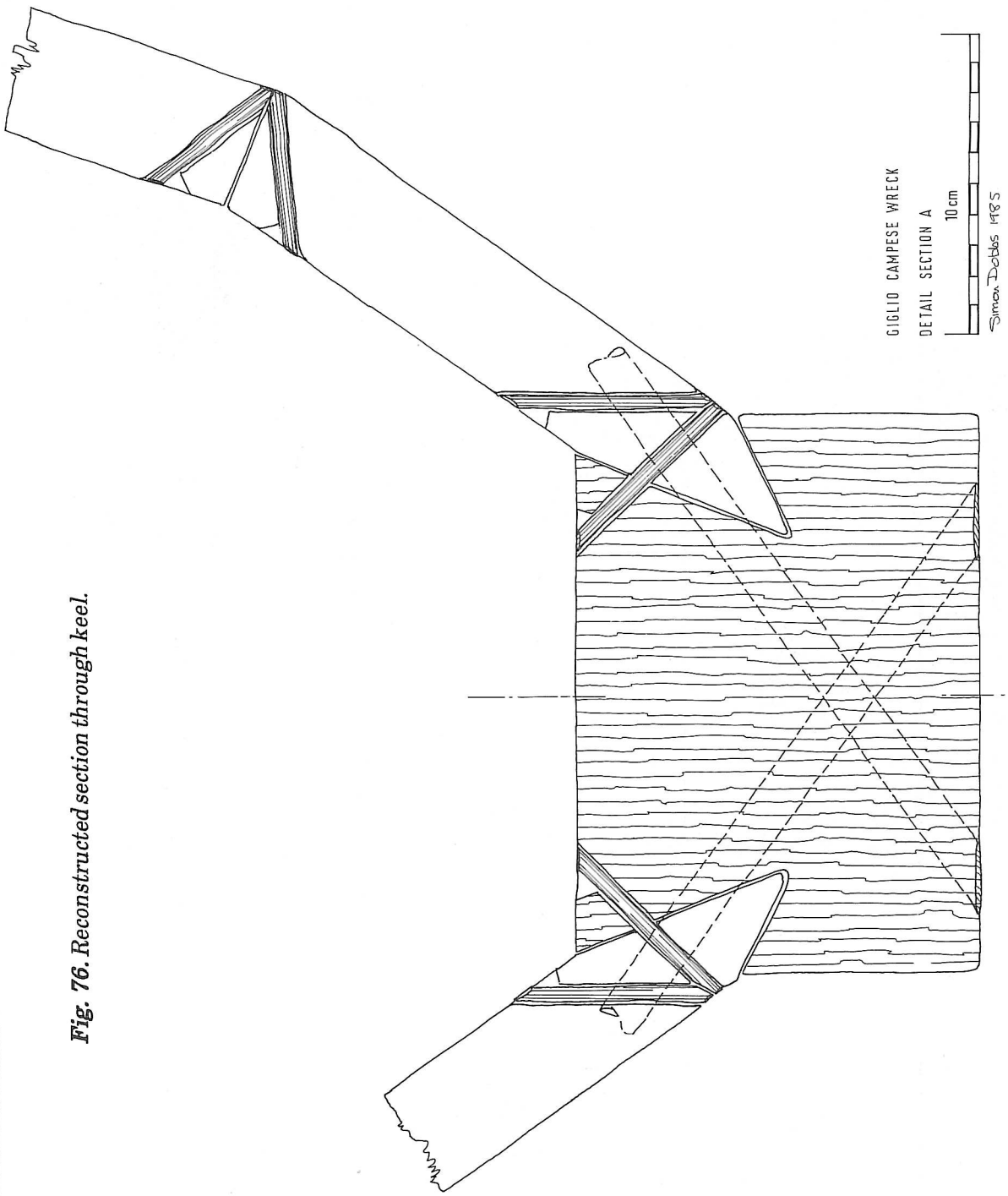


Fig. 76. Reconstructed section through keel.

132 samples of wood were put under an optical microscope for identification (Abbate Eldmann & Giacchi 1988, 156-157). Of these, 21 could not be identified because of decay. Of the 111 samples that responded to scrutiny, 14 different species were identified: 10 were from broad-leaf species: maple (*Acer* cfr. *campestris L.*), box (*Buxus sempervirens L.*), beech (*Fagus sylvatica L.*), phillyrea (*Phillyrea* cfr. *latifolia L.*), ash (*Fraxinus* cfr. *excelsior L.*), elm (*Ulmus campestris L.*), ilex-oak (*Quercus ilex L.*), oak (*Quercus sp. p.*), hazel (*Corylus avellane L.*) and olive (Olea europaea L.): 3 were from conifers: white fir (*Abies alba Mill.*), pine (*Pinus sylvestris L.*) and yew (*Taxus baccata L.*).

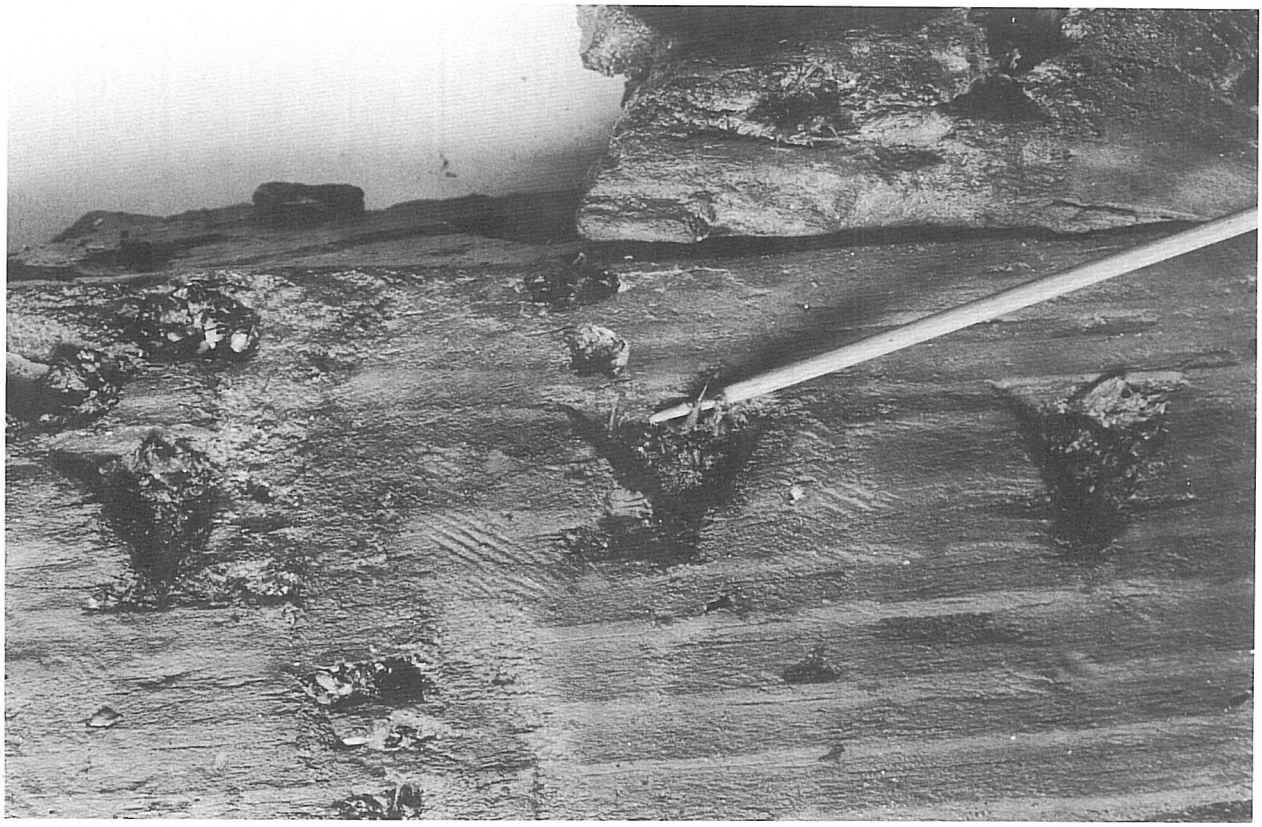


Fig. 77. *Detail from a fragment of planking showing the notches to take the lacing. Strands of lacing can be seen under the end of the pointer.*

Nine different species (namely pine, fir, box, oak, ilex-oak, elm, olive, hazel, and Phillyrea) can be positively identified as having been used in the vessel's construction and fittings. The remaining species represent objects that were being carried on the ship, or else were items whose origin and role is not understood. The majority of the latter were small fragments of wood that were without technical features of any kind.

It had been hoped that the identifications of the hull timbers and their lacing might provide some indication of the region in which the vessel had been built. All the samples, however, turned out to be from species that were common throughout the Mediterranean.

The Anchors

People who saw the site as it was in the early sixties describe having seen a number of cigar like pieces of stone (Fig. 78). Estimates of their number varied between 10 and 20.

Fig. 78.

Photograph of the wreck site taken in1970 showing one of the stone anchor stocks on the site (courtesy of Mario Brandaglia).

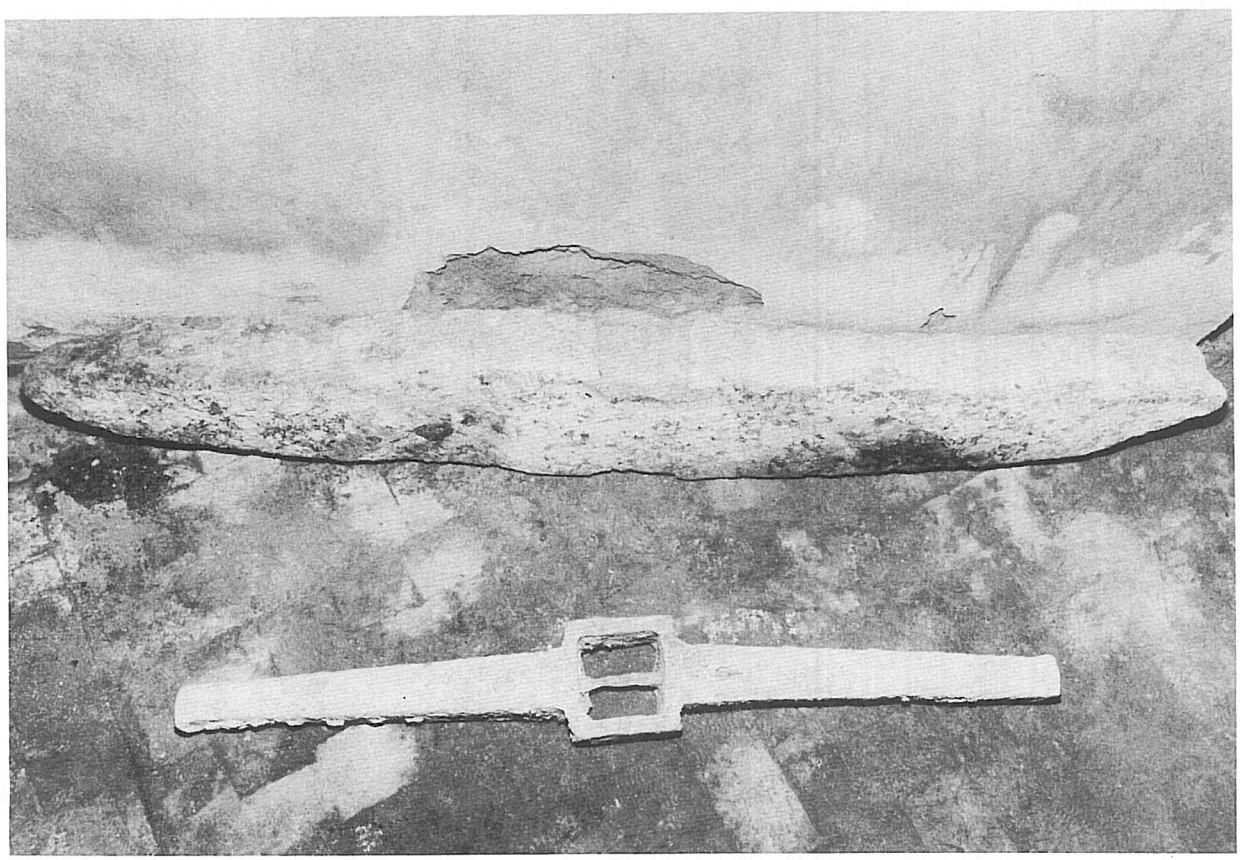


Fig. 79. *Stone anchor stock from the wreck in the basement of the Guardia di Finanza's office in Giglio Porto. The lead stock in the foreground is an isolated find from elsewhere off the island.*

Fig. 80. Half-finished stone anchor stock from the wreck. Work has been started on one side and also on the panel at centre.

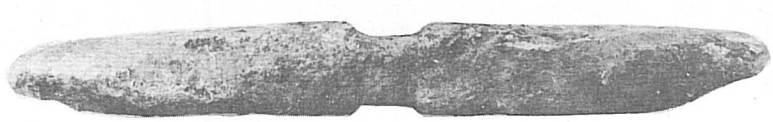


Fig. 81. Stone anchor stock from the site of contrasting size and design.

It was clear from the descriptions that these lengths of stone were anchor stocks, which, one by one, over the years, had all been taken. Fortunately, a single example survives today on Giglio. This was recovered by the coast-guard from looters who were caught raising it from the site some time in the first half of the seventies. Today it is in the basement of the coast-guard's headquarters in Giglio Porto (Fig. 79). It measures just over 2 m, is made of granite and is somewhat banana-shaped in profile. It has recessed panels at its centre where it was attached to the shank.

When we began work on the site, all that survived of the anchors were several fragments from a broken stone stock together with an odd-shaped length of the stone, the purpose of which at first had us puzzled. When it was raised, however, it became obvious that it was a half-finished stock (Fig. 80). Work had started on the panels at its centre and on one side the "banana" form had begun to emerge, whilst on the other side the stone was still in a squared-off, undressed state.

A smaller stone stock, which was recovered from the wreck by a local diver and which was given to the team, is now with all the other material from the wreck in Florence (Fig. 81).

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