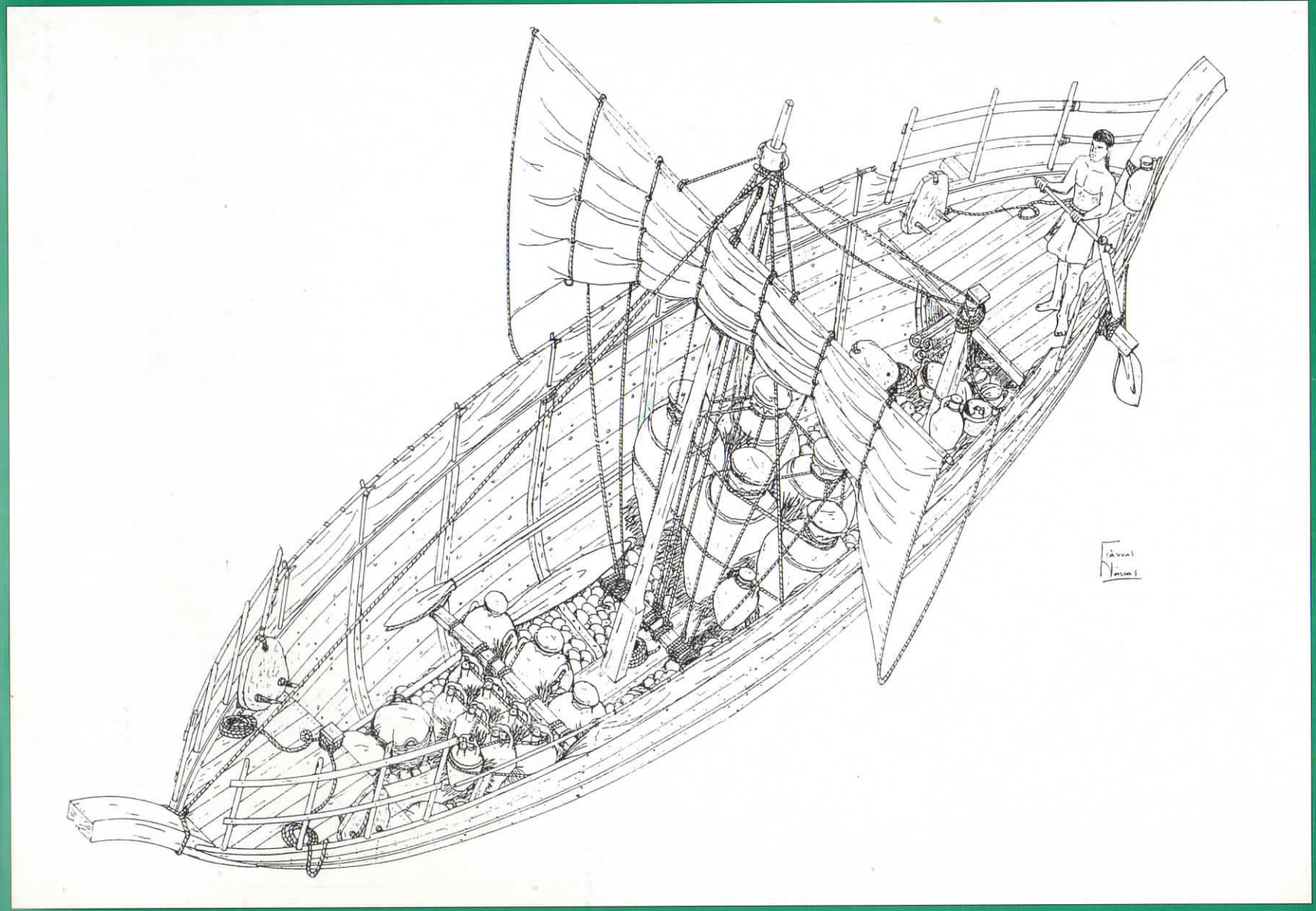
ENALIA

ANNUAL

HELLENIC INSTITUTE OF MARINE ARCHAEOLOGY

VOL. V, 2000-2001



ENALIA

ANNUAL

ENGLISH EDITION OF THE HELLENIC INSTITUTE OF MARINE ARCHAEOLOGY

PUBLISHER

NIKOS TSOUCHLOS

EDITOR

YANNIS VICHOS

EDITORIAL ADVISORS

WILLIAM PHELPS

YANNOS LOLOS

EDITORIAL COMMITTEE

KATERINA DELLAPORTA
CHRISTOS AGOURIDIS
TASSOS BELLAS
DIMITRIS KOURKOUMELIS
ILIAS SPONDYLIS

Designed on a Power Macintosh G4

ISSN: 1106-5834

ADDRESS: ENALIA
9 SARIPOLOU STR.
ATHENS, GR-10682 - GREECE
Tel/Fax: (30 10) 82 59 668
Email: ienae@org.gr

THE FIRST QUARTER CENTURY

"I was young and now have grown old"

The first twenty five years in the life of the Institute have passed. It was born as an idea during the excavation of the Byzantine wreck at Pelagonisi in 1970.

Sadly, the wreck is still a wreck, abandoned to its underwater fate in the ample embrace of the bay of Kyra Panayia in Pelagonisi island.The Institute, on the other hand, after a difficult start in difficult times, came into being in August 1973.

At first, in our search for a path, we attempted to find a balance between the enthusiam of the neophyte and the hard bureaucratic reality confronting us, between grudging recognition and the more usual rejection and indifference. Years passed, conditions changed and continously mutating circumstances have altered the scene. Through these upheavals we have gained invaluable experience that has helped us to reach our present maturity.

All of us who started out together were young and we have aged. Sadly, some of those who helped us importantly in different ways are no longer with us. However, young people with the same passion and same interests are constantly approaching the now established Institute in order to gain experience and to offer their own wisdom and youthful enthusiasm.

Twenty five years, a quarter of a century, are a long time for people. But for a young institution it is the first breath of life, the period when it takes shape and lays down the foundations that will secure its future and its perspectives.

We have worked hard and at times with passion as we advanced, dedicated to the realisation of our objectives. The results did not come

CONTENTS

COVER PAGE:
Hypothetical reconstruction of the Point Iria ship (Drawing by Y. Nakas, 1998)

easily. Yet little by little, perhaps without our fully realising it ourselves, imperceptibly, our expectations began to take shape and the picture became clearer. Enthusiasm was accompanied by experience and knowledge, the small exploratory sorties turned into important excavations (Dokos, Iria, Kythira), friendly contributions became serious sponsorships on the part of Greeks and foreigners, the rudimentary infrastructure was replaced by specialised technical equipment and substantial archival material. The need to communicate with the scientific community and to present our research and its results led to the Greek publication of ΕΝΑΛΙΑ and the English ΕΝΑΛΙΑ Annual and ENALIA Supplements. At the same time our presence at international conferences became more regular, our publications in foreign scientific journals more frequent and we started to participate, independently or jointly, with Greek and foreign bodies in communal projects. Thus demands have gradually grown and the outlook of the Institute has broadened.

Twenty five years have seen the end of a cycle for us. We celebrated it last September in the hospitable Archaeological Museum of Spetses with an exhibition of the cargo from the wreck at Cape Iria. It was the first exhibition in Greece of a whole underwater archaeological assemblage, the result of systematic excavation. The opening of the exhibition was coupled with an international conference: "The Point Iria Wreck: Interconnections in the Mediterranean ca.1200 BC." The Proceedings of the conference have already been published.

A new cycle is now beginning with more auspicious prospects and under more favourable circumstances. The knowledge and experience we have gained are being passed on to a new generation, a generation better prepared, more specialisd and with greater expertise. We expect the new direction in this new century to be more fruitful, and that the Institute will realise all its visions and become a permanent institution in the area in which it operates. Above all, we hope this new direction will in its turn preserve for us the creative element of physical and spiritual adventure which we all so richly experienced in those first years.

Nikos N. Tsouchlos
August 2000

DOKOS: 1992 CAMPAIGN

George Papathanasopoulos
Yannis Vichos
Yannos Lolos

THE UNDERWATER EXCAVATION

The 1992 excavation season at Dokos lasted from Wednesday 29 July until Tuesday 15 September 1992. Support for the work and the living and accommodation needs of the expedition were met by the *kaiki* Kalokyra (provided by Mr Adonis Kyrou), the vessel Pnoë (provided by Mr Andreas Potamianos) and a speedboat. During the season the following work was carried out:

1. A general review of the excavation site and replacement of the perimeter line. The perimeter of the trial trench 3 (T3) was also laid out in Sector A2. The site was then cleared of the rubbish that had accumulated during the winter and a dive was conducted to familiarise those diving on the site for the first time with the area.

2. Location of parts of the spherical jar (A1 Zone Δ, Fig.9) in the place west of the main site, where there is a small concentration of EH pottery. This place features two small concretions at a depth of 8 m, consisting of EH sherds and large and medium-sized stones, two of which were probably saddle querns. The area is covered by a thin layer of sand (some 10 cm thick), below which the bedrock appears.

3. Location, photographic plotting and recovery of hundreds of pottery finds in the surface layer, both fragmentary and complete, within the demarcated zone (A) (see plan, p. 6). Prominent among the surface finds was the sauceboat A470 (Fig. 4). In addition to the pottery there were many interesting stone objects (querns and rubbers, as well as obsidian blades, flakes and cores), organic finds (fish and animal vertebrae and teeth, small pieces of wood and charcoal).

4. Demarcation and excavation of the exploratory trench 3 (T3) in Sector A2 (see plan, p. 7).

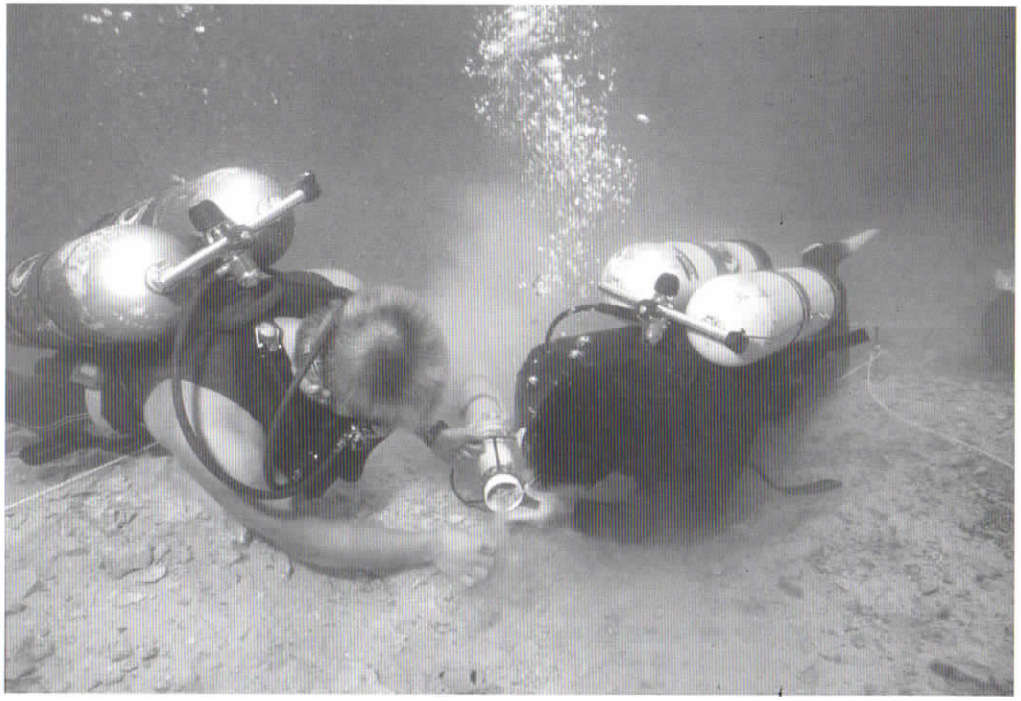


Fig.1. *Excavating Trial Trench 3 (Photo: K. Jachney)*

Trench 3 was divided into two separate Sectors: T3a and T3b. The excavation of trench 3 was particularly difficult because of the numerous small and medium stones, shells with calcareous deposits and hundreds of potsherds. The subsoil, apart from the stones and shells, consisted of hard and coarse sand and pebbles (Fig. 1). As the excavation progressed, reaching 60 cm below the surface of the bottom in some places, parts of the bedrock began to appear. Excavation was rendered more difficult by the steepness of the slope, which resulted in the continuous collapse of sand and stones from the sides into the trench, but the the excavators of trench 3 were rewarded by the discovery of hundreds of potsherds as well as of complete clay pots. Among the more important finds were a deep globular sauceboat (Fig. 5) with an excellent urfirnis slip (B46), an amphora neck (B42), part of a pot with a spout (Γ168), two almost complete one-handled cups "of neolithic appearance" (Γ185 and Γ190; see Fig. 2 and Figs. 1a, 1b and 2α , 2β on p. 27). Other finds included a perforated cylindrical neck forming part of a handleless cup of rare type (Γ203/2: Fig. 12, Pl. 1d), and two of the rare, if not unique, EH II pots (Figs. 14, 15, Pl. IIb). Trench 3 also yielded one of the most important clay finds from the excavation: a small fragment of a frying pan (A494, Fig. 13) with part of the impressed decoration of spirals and incised oblique strokes preserved. Among the clay finds were two interesting bricks (or two parts of a single brick) made of soft, almost unbaked clay (B41).

In the area of trench 3 a number of Late Helladic sherds were found among the Early Helladic ones.

5. The exploratory trench 4 (T4) was marked out and excavated in Sector B2 (see topographical plan on p. 9).

Measuring 1.60 x 0.90 x 0.95, it was laid out in the place where the complete sauceboat A470

had been found. The trench contained quantities of fine sand mixed with stones, sherds and shells. The finds were similar to those in trench 3. Apart from the sauceboat A470, the pottery from T4 included A470/2 (part of a jug with a vertical handle and clay imitation of a rivet), A483 (rim sherd with a horizontal relief band) B49/05 (part of a pyxis lid) and Γ162 (large fragment of a big bowl with an inverted rim).

All the finds, after being plotted and photographed in situ, were raised. They were then inventoried by a team of archaeologists and put in bowls containing seawater. The most important excavation tasks were filmed by the team of Nikos Vergitsis and Stratos Stasinou.

Taking part was a team of scientists from the Section of Marine Geology of the University of Patras led by Professor George Ferentinos. They team with them a large specialised equipment in order to carryout a geological survey of the area of the underwater excavation and the surrounding region.

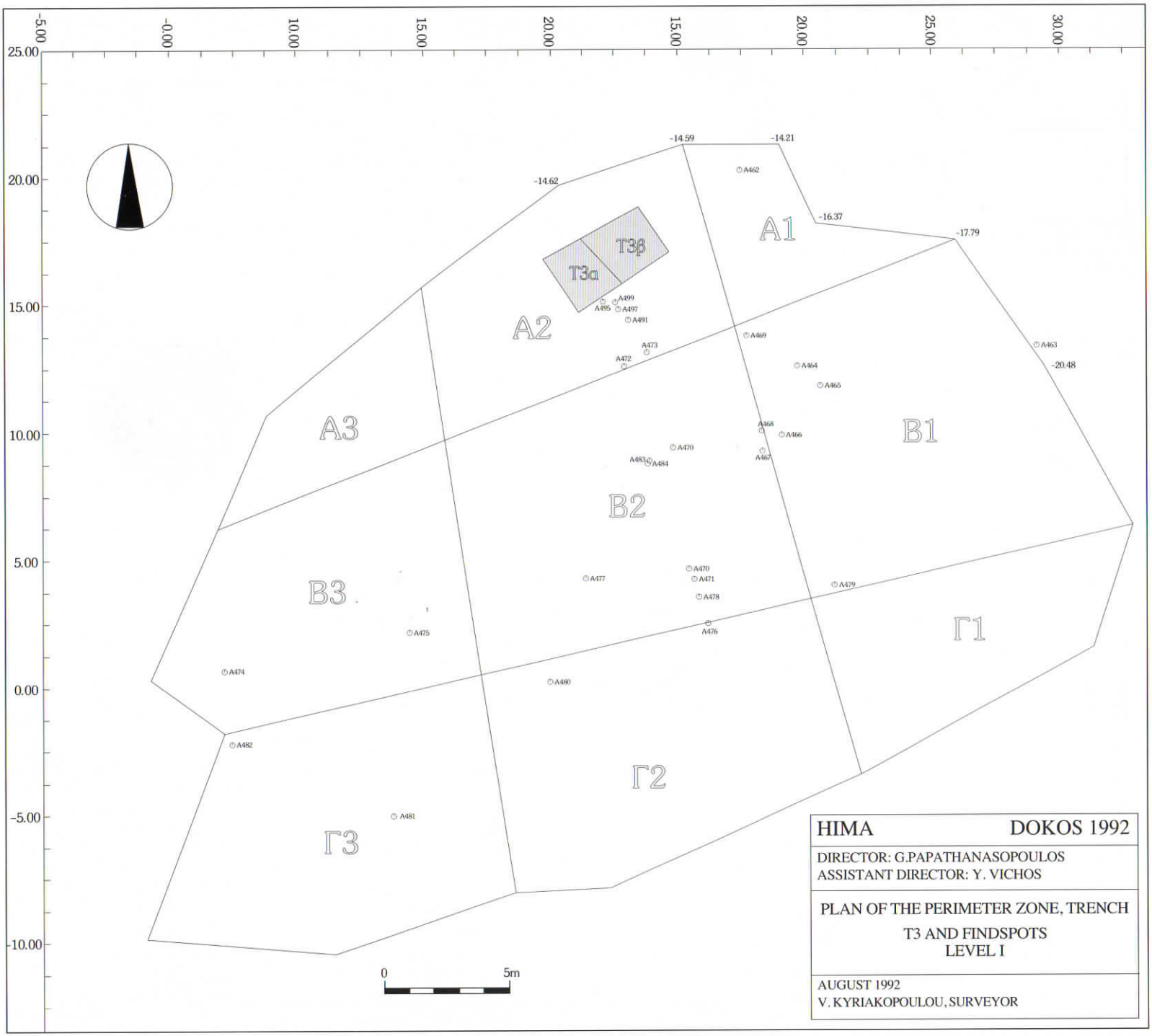
Seismic studies, geological survey, lateral scan

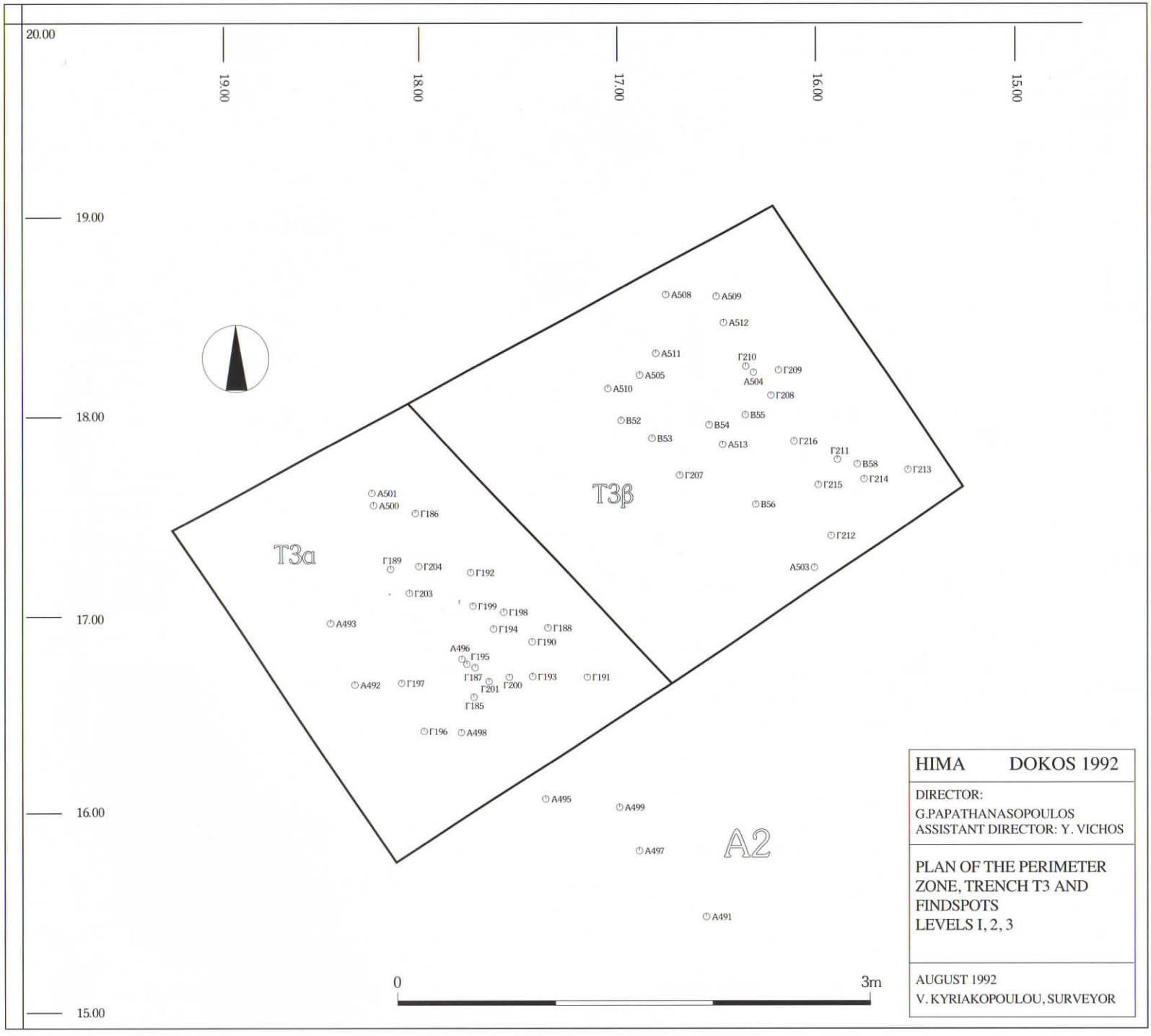
The group of geologists established themselves with their equipment on board the Kalokyra, to the side of which they attached a tomographic bottom scanner.

During the course of the 1992 campaign at Dokos, the geologists carried out surveys (longitudinal and transverse traverses) in the small bight of Skintos bay with a tomographic bottom scanner. These included the following:

1. Seismic survey of the small bight in Skintos Bay and the whole of the bay itself with a 3.5 kHz (0.R.E. Ferranti). A total of three profiles were run in the small bight (two longitudinal and one composite traverse) and two longitudinal profiles in Skintos Bay.
2. Seismic survey of the seabed outside the Myti Kommeni headland towards the Ermioni coast with a bottom sounding tomograph. Four profiles in all were run in a N-S direction.
3. Geological survey of the Myti Kommeni headland and the site of the archaeological excavation.

Fig. 2.
Marking the almost complete one-handled cup with the label Γ185 in T3α (Photo: K. Jachney)


-5.00
-0.00
10.00
15.00
20.00
15.00
20.00
25.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-14.59
-14.21
-14.62
-16.37
-17.79
-20.48
A1
A2
A3
B1
B2
B3
Γ1
Γ2
Γ3
Τ3α
Τ3β
A462
A463
A464
A465
A466
A467
A468
A469
A470
A471
A472
A473
A474
A475
A476
A477
A478
A479
A480
A481
A482
A483
A484
A491
A495
A497
A499
0
5m
HIMA
DOKOS 1992
DIRECTOR: G.PAPATHANASOPOULOS
ASSISTANT DIRECTOR: Y. VICHOS
PLAN OF THE PERIMETER ZONE, TRENCH
T3 AND FINDSPOTS
LEVEL I
AUGUST 1992
V. KYRIAKOPOULOU, SURVEYOR


20.00
19.00
18.00
17.00
16.00
15.00
19.00
18.00
17.00
16.00
15.00
T3a
T3β
A2
A508
A509
A512
A511
Γ210
Γ209
A505
A504
A510
Γ208
B52
B55
B54
B53
A513
Γ216
Γ211
B58
Γ213
Γ207
Γ214
Γ215
B56
Γ212
A503
A501
A500
Γ186
Γ189
Γ204
Γ192
Γ203
Γ199
Γ198
A493
Γ194
Γ188
Γ190
A496
Γ195
Γ187
Γ200
Γ193
Γ191
A492
Γ197
Γ201
Γ185
Γ196
A498
A495
A499
A497
A491
0
3m
HIMA DOKOS 1992
DIRECTOR:
G.PAPATHANASOPOULOS
ASSISTANT DIRECTOR: Y. VICHOS
PLAN OF THE PERIMETER ZONE, TRENCH T3 AND FINDSPOTS
LEVELS I, 2, 3
AUGUST 1992
V. KYRIAKOPOULOU, SURVEYOR

4. Reconnaissance of the orientations of the principal fissures.

5. Exploration outside the Myti Kommeni headland with the 3.5 kHz bottom sounding tomograph mounted on the Kalokyra.

6. Study and scale plan of the bottom morphology of the little bight in Skintos Bay with a side echo scanner (Side Scan Sonar, E.G&G., 100 kHz). A total of 10 transits were run with a different width of scan each time. The boat's position was fixed by the GPS system.

Owing to damage to the Benthos R.O.V. guided bathyscaph, it was not possible to perform a video survey of the seabed in the area of the excavation with this machine, but a diver with a video camera carried it out instead.

The geologists also carried out the following tasks at the site of Ledeza on Dokos, where in the past the HIMA excavation team had located submerged architectural remains and potsherds belonging to the Early Helladic period:

1. Geological survey of the sea and land site.

2. Underwater photographs of the natural rock at selected places of geological and geomorphologica interest.

At the end of the 1992 excavation season at Dokos all the finds recovered from the wreck site together with those from the land site on the Myti Kommeni headland were transported on the Kalokyra to the Spetses Archaeological Museum, where they were put in the storerooms and conservation laboratory for underwater finds organised by HIMA. The finds were accompanied and delivered to the Museum by George Papathanasopoulos, Director of the Dokos Excavations, Yannis Vichos, Assistant Director, and the archaeologists Yannos Lolos, Haralambos Kritzas, Lucy Blue and the archaeological student Christina Papachristopoulou.

At the same time another team on Dokos completed the job of dismantling the worksite and machinery under the supervision of the technical director Nikos Tsouchlos. Thirty eight members of HIMA took part in the excavation,

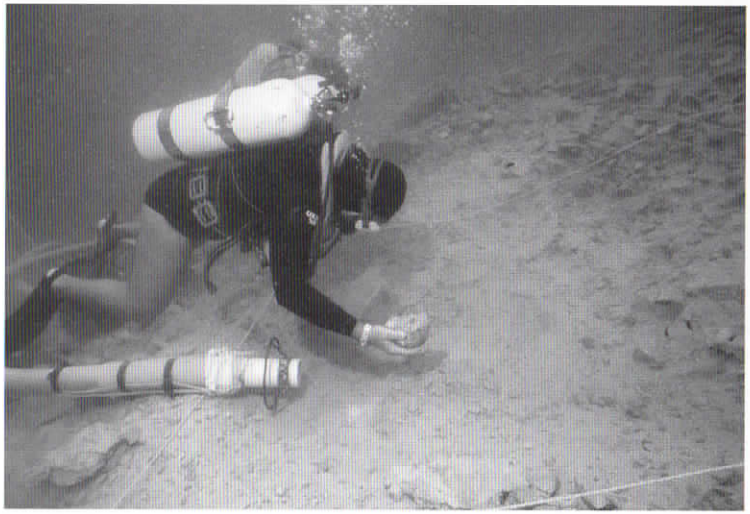


Fig. 3. Uncovering a pot during the excavation of T3α (Photo: K. Jachney).

chiefly archaeologists and archaeological students, topographers and engineers and also technicians, photographers and divers.

Members of the excavation team
Archaeological director: Dr George Papathanasopoulos, Honorary Ephor of Antiquities.
Archaeological assistant director: Dr Yannis Vichos.
Technical director and responsible for photography: Nikos Tsouchlos.
Archaeological associate: Dr Yannos Lolos.
Diving master: Faidon Antonopoulos.
In charge of machinery: Thanos Aronis-Webb and David Conlin, archaeological students.
Supplies (Ermioni): Achilleas Lagopatis and Elina Stamatatou, archaeologist.
Athens Office: Eirini Antonopoulou.

Archaeologists:
Dr Elpida Hatzidaki, Lucy Blue, Ioanna Efstathiou, Stella Demesticha, Dr Dimitris Kourkoumelis, Haralambos Kritzas, Christos Agouridis, Theodora Gartagani.

Technicians:
Vaso Kyriakopoulou, topograqphical surveyor, Anita Moraotou, conservator, Stavros Vosiniotis, chemical engineer, Kyle Jachney, photographer, Iason Lykourezos, physicist, Yannis Baltsavias, architectural engineer.
Archaeological students:
Christina Papachristopoulou, Dimitra Mytilinaiou, George Valvis, Yorgos Koutsouflakis, Rita Yeorgoulaki.

Divers:
Yannis Garras, Alkiviadis David, Ileana Antonopoulou, Yannis Tavoularis, George Makrymichalos, Ed Moore, Ioanna Tzala, Vasilis Exarchos.
The site was visited and inspected by the archaeologists Vasiliki Lazari and Stavroula Asimakopoulou and the geologist Eleni Hachamidou from the Ephorate of Marine Antiquities.

Geologists:
The team from the Section of General and Marine Geology of the University of Patras comprised: Dr George Ferentinos, Associate Professor, Dr George Papatheodorou, marine geologist, Dr Nikos Kastanos, oceanographical physicist, George Gkionis, MSc geomorphology, Thomas Hasiotis, marine geologist.

During the 1992 season the site was visited by the Minister of Culture at the time, Anna Psarouda-Benaki, who was briefed on the progress of the excavation. The excavation was also visited by the Honorary Chief of G.E.N., vice admiral retired Evangelos Lagaras with the presedent of the P.O.I.A.T. Mr Yannis Marangoudaki, and Professor of History at the University of Crete, Mrs Chrysa Maltezou.

THE POTTERY

The 1992 underwater excavation season on the site of the wreck at Myti Kommeni on Dokos produced a large quantity of pottery which can be securely dated, like that of the previous campaigns, to an advanced phase of the Early Helladic II period. In 1992 a good number of complete pots were found and raised from the rich cargo of the wreck and partly preserved vessels which could easily be restored.

As the cleaning, drawing and study of the finds proceeds the repertoire of EH II shapes from the wreck grows steadily. It is hoped that after its final publication the full body of Myti Kommeni material will become a reference point in any study of the material culture of the Early Helladic period.

Of the complete or almost complete sauceboats which have already been cleaned (see a selection in Papathanasopoulos, Vichos & Lolos 1994, 94: colour photo), the type with a deep cylindrical body and vertical handle is represented by A470 (Fig. 4; cf A21 from Ledeza Dokou, here Fig. 17 and Pl. IIc), and the type with a short spout by B46 (Fig. 5), which still preserves the original Urfirnis on the outside. The cylindrical sauceboat is known from published examples from major Early Helladic sites around the Argosaronic Gulf, like Lerna in Argolida and Kolona on Aigina (see Caskey 1960, fig. 1: type III; Walter 1985, fig. 24). The short-spouted type (B46) has close parallels from Voïdokoilia Pylias (Korres 1980, pl. 124β) and the Platyvola Cave in West Crete (Betancourt 1985, pl. 3B; Godart, Tzedakis 1992, pl. XLII:1). The Platyvola example is one of the rare appearances of this characteristic EH type in Prepalatial Crete.

Among the many open shapes (bowls, basins, cups, etc.) which have been cleaned and drawn, particular mention should be made of the partly preserved, but restorable, fine Urfirnis everted-rim bowl Γ153/00 (Fig. 6, Pl. Iα) which has a horizontal handle level with the rim. This shape occurs in the EH II Urfirnis phase, but is not usual.

To the distinctive group of bowl and basin types with a horizontal spout at the rim, which were found in the cargo of the wreck (see Papathanasopoulos, Lolos & Vichos 1995, 23, fig. 8), must now be added the cleaned examples A226 and Γ111. The latter (pres. h. 14.5 cm) has a horizontal loop handle on the body and is decorated with a horizontal plastic band on the body and a row of parallel oblique grooves just below the rim.

(Photos: N. Tsouchlos, K. Xenikakis)

Fig. 4. *Myti Kommeni. Sauceboat A470 (h. 18.3 cm).*

Fig. 5. *Myti Kommeni. Sauceboat B46 (h. 16.5 cm).*

(Photo: K. Xenikakis)

Fig. 6. *Myti Kommeni. Urfirnis everted-rim bowl (diam. 17.5 cm).*

Fig. 7. *Myti Kommeni. Fragment of open pot A81*

The wide-mouthed spouted type of vessel appears to have a wide distribution in Argolida and Korinthia. To the Argolid parallels of this type, which we have already noted. should be added one fro Tiryns (Weisshaar 1983, fig.13:3).

A fragment of a relatively large pot (A81, Fig. 7) bearing a double relief band on the rim must be classified with the already cleaned sherds of open vessels with plastic decorative bans on the outside of the rim.

The type of deep one-handled cup is represented by two (now restored) examples: Γ185 (h. 13 cm without the handle) and Γ190 (h. 13.5 cm) with a fine brown-black/black slip on the outside (see p. 25, Figs. 2a, 2b).

The type of small one-handled cup with a slightly carinated profile, known from two examples in our material (A310 and A2, Fig. 8, from Zone Γ, outside the Myti Kommeni headland), has already been provisionally studied (see Papathanasopoulos, Vichos, Hatzidaki & Lolos 1992, 11-12, fig. 13). This particular type of cup does not need to have an Anatolian origin, as used to be thought. Forerunners can now be recognised in monochrome cups dating to the beginning of the Bronze Age from the recent excavation by Dr M. Koumouzeli in the Profitis Ilias Cave at Rizoupoli (Attica) (see Vasilopoulou 1997, p. 1-4).

(Photo: K. Xenikakis)

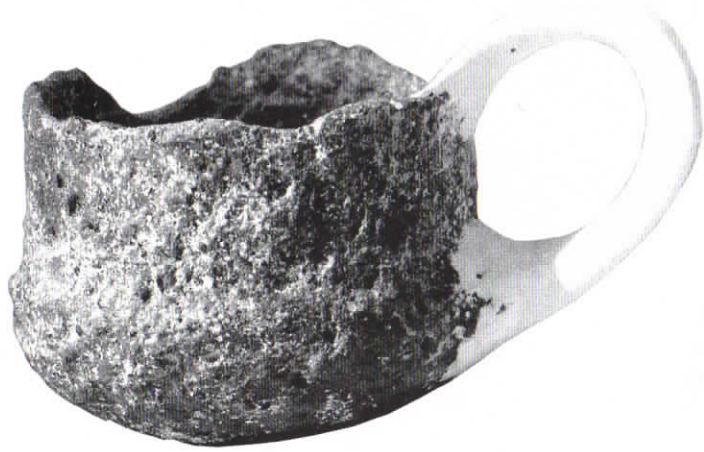


Fig. 8. *Myti Kommeni. One-handle cup. A2, Area Γ (h. 5 cm. diam rim. 6,4 cm.).*

(Photo: K. Xenikakis)

Fig. 9. *Myti Kommeni. Jar A1, Area Δ (h. 15.cm).*

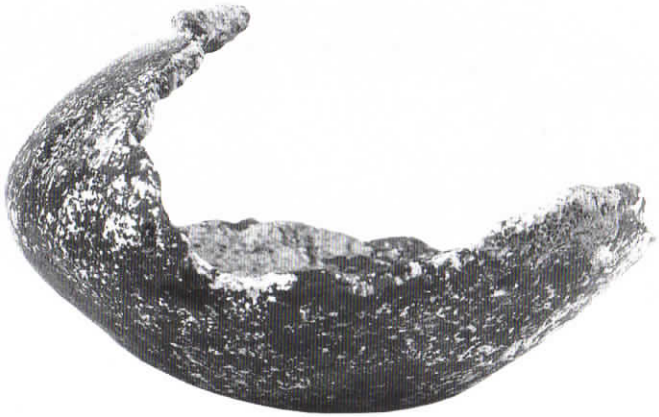


Fig. 10. *Myti Kommeni. Pyxis A8/14 (Max diam. 12.5 cm).*

Fig. 11. *Myti Kommeni. Fragment of juglet A279 (Pres h. 9, diam. neck 6.9 cm).*

Fig. 12. *Myti Kommeni. Perforated neck of handleless pot (h. 15 cm).*

(Photo: Y. Vichos)

Fig. 13. *Myti Kommeni. Frying pan fragment A494 (4.5 x 4.3 cm.)*

The complete, restored plain jar A1 with two handles (Fig.9) from the underwater site of Myti Kommeni (Zone Δ) is unique. It is 15 cm high and very heavy because of the unusual thickness of the walls. It has a spherical body, almost cylindrical neck and two horizontal handles on the shoulder. Its general shape can be compared with an ?unpubished Early Helladic jar, which is however bigger, now exhibited in the first case from the left in the Ancient Isthmia Archaeological Museum and with another from Lithares, near Thebes.

To the group of jugs from the cargo of the EH II wreck can be added A279 (Fig. 11, Pl. Ic). This a fragment of the body of a plain juglet with its neck and mouth, on which small parts of the upper and lower roots of the vertical handle are preserved. The particular class of jugs with "metallic" features (clay skeuomorphs of metal rivet heads or other projections) on the handles (see Papathanasopoulos, Vichos & Lolos 1991, 8) is now represented by a further example: A470/2, part of the body and neck of a jug with a vertical strap handle on the top of which is a small relief pellet clearly imitating a rivet head. A similar imitation rivet head can also be seen on the upper part of the strap handle of a small painted EH II pot (?juglet) from the nearby site of Ayia Marina on

Fig. 14. Myti Kommeni. Part of painted juglet Γ191 (pres h. 5.1 cm).

(Photo: K. Xenikakis)

Fig. 15. *Myti Kommeni. Fragment of painted juglet Γ202/38 (pres. h. 3.5, diam. base 2.5 cm).*

(Photo: K. Xenikakis)

(Photo: K. Xenikakis)

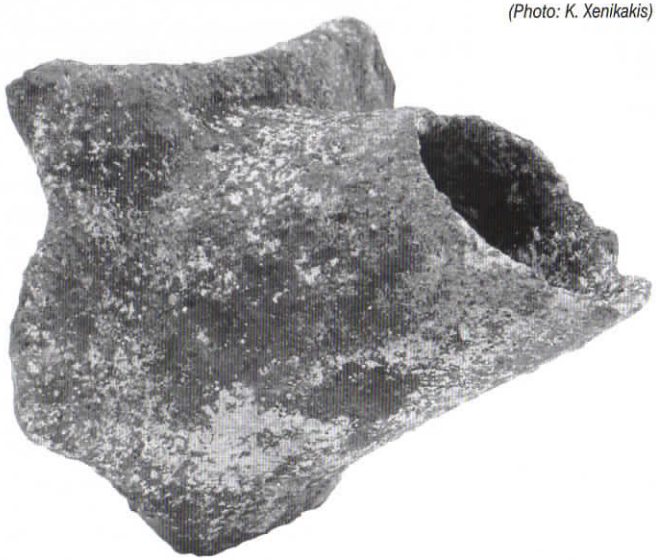


Fig. 16. Ledeza. Part of spouted pot A20 (pres. h. 11.2 cm).

Fig.17. Ledeza. Large part of sauceboat A21 (pres. h. 11 cm).

(Photo: K. Xenikakis)

Fig. 18. Ledeza. Part of open pot with raised handle A24 (pres. h. 7cm).

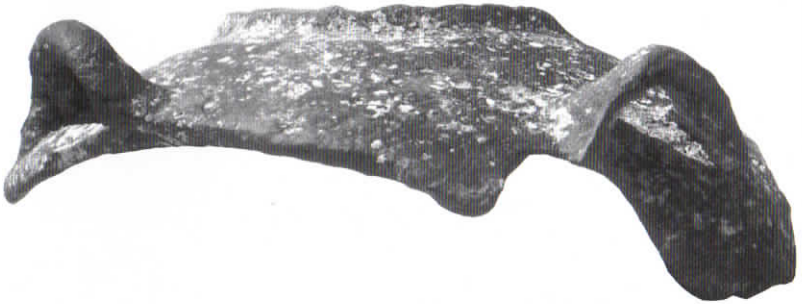


Fig. 19. Ledeza. Upper part of small pyxis A26 (Photo: K. Xenikakis)

Spetses (unpublished, on display in the Spetses Museum).

Among the fragmentary EH II pyxides which have recently been cleaned, one (A81/04, Fig. 10, Pl. Ib) has a complete profile, and a relatively large section of the body of a pyxis or askos type of vessel was found (A4 Zone B), with a horizontal cylindrical handle on the back.

Of particular interest is the partly preserved handleless pot Γ203/2 (pres. h. 15 cm) recovered from the wreck during the last excavation period (Fig. 12, pl. Id). It has a high cylindrical perforated neck slightly tapering towards the top, while the body with the remains of a black slip or glaze must have been spherical or hemispherical. This is a rare EH II type which must have had a specialised function, perhaps as an incense burner. There is a good parallel for this special shape in a similar vessel with a perforated neck from Voidkoilia Pylias (Korres 1978, 338, fig. 4, pl. 212γ, EH II period), the stability of which, however, perhaps depended on a cylindrical base open below which is now broken (Fig. 20). A higher perforated neck, probably from a similar vessel, was also found in Troy II (Saherwala 1985, 20, fig. 7:786).

Fragment A494 (Fig. 13) deserves special mention, because it is the first sherd in all the pottery finds from the wreck which can be attributed with certainty to the Cycladic frying pan type. It is a fragment of the body, on which a small part of the impressed and incised decoration is preserved on the bottom (outside), consisting of an impressed spyraloid motif and oblique parallel incised lines.This type of vessel is especially characteristic of Early Cycladic II, although it first appeared in the transition EC I-II phase (Barber 1987, fig. 58: 5, 12), but it often occurs among the pottery at EH sites in Attica, Boeotia, Euboia and Argolida-Korinthia.

Lastly, three painted fragments were found with the EH II sherds recovered in 1992 (for the presence of painted pottery in the Lerna III level, see Caskey 1968, 315). They are the first examples of painted EH II pottery to be found on the Myti Kommeni wreck site. They include:

Γ191: upper half of a juglet with a painted decoration of crosshatched triangles (Fig. 14, Pl. IIb). For this typical EH II decoration, cf Ayia Marina, Spetses (Theocharis 1971, 88, 91, drawing 6, and another, unpublished, in the Spetses Museum: SP. 71, No. 57) and one from the Ancient Isthmia area (displayed in the first case from the left in the Ancient Isthmia Archaeological Museum).

Γ202/38: body fragment of a small closed pot (?juglet) with a relatively thick wall. Both sherds are decorated with vertical lines having pointed ends. Cf unpublished sherds from Ayia Marina (Spetses) in the Spetses Museum: SP. 71, nos. 37, 7B, 13/9.

Fig. 20. *Voïdokoilia, Pylia. EH II Handleless pot with cylindrical perforated neck (Korres 1978, pl.. 212γ).*

While the work of cleaning the many sherds and pots in the laboratory of the Spetses Museum by the HIMA conservators was proceeding, the restoration (gap filling) of a number of pots and vessels from the large pottery cargo of the EH wreck was carried out. After restoration, the large brazier A41/A67/A96 with its four knob handles, mentioned in our previous publications, presented an impressive appearance.

LEDEZA

As part of the overall Dokos exploration programme, the processing continued of the pottery from the Early Helladic II site of Ledeza on the north coast of the island, now being cleaned in the Spetses Museum. The material, which appears to be contemporary with that of the Myti Kommeni wreck, comes from earlier rescue surface collections and from the underwater survey carried out by HIMA in August 1991 at the site of the EH harbout of Ledeza.

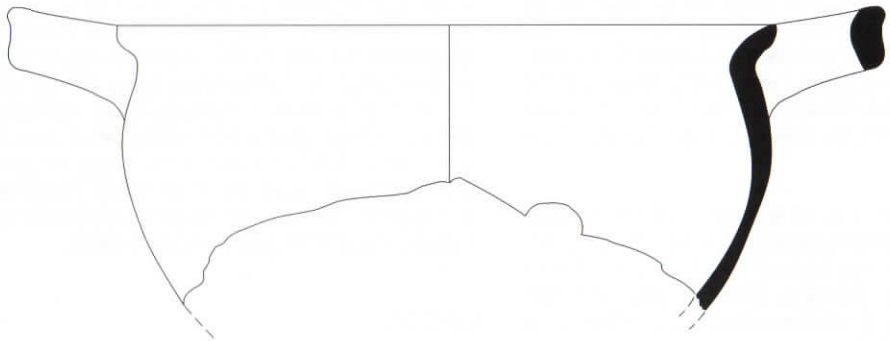
Among the EH II pots and utensils from the sea at Ledeza which have so far been conserved, in addition to those already published (see Papathanasopoulos, Lolos & Vichos 1991, 14-15, 17) the following pieces are of interest:

A20 (Fig. 16, Pl. IIa): part of a wide-mouthed spouted pot (cf other open spouted pots from the EH II wreck cargo; see Papathanasopoulos, Lolos & Vichos 1991, 8).

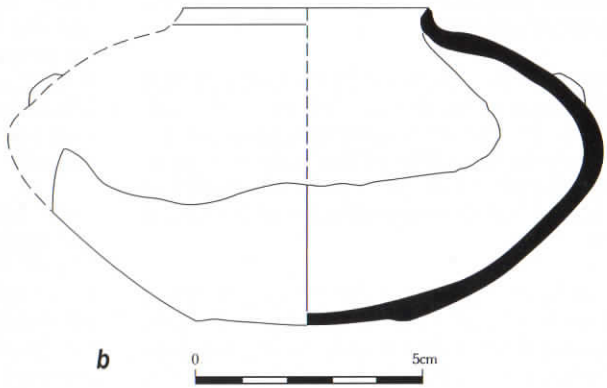
A21 (Fig. 17, Pl. IIc): body fragment of a sauceboat of cylindrical type with vertical handle.

A24 (Fig. 18): part of an open bowl with slightly raised ring handle of rather unusual type.

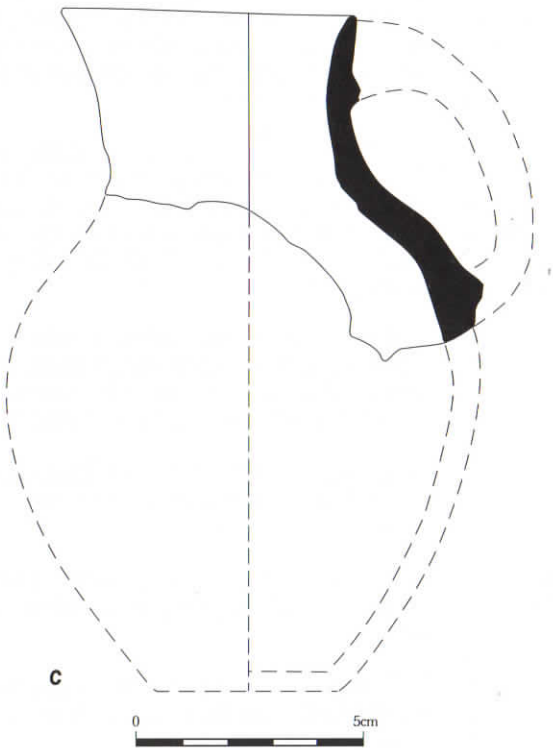
A26 (Fig. 19): part of a small pyxis with two horizontal handles preserved on the shoulder.



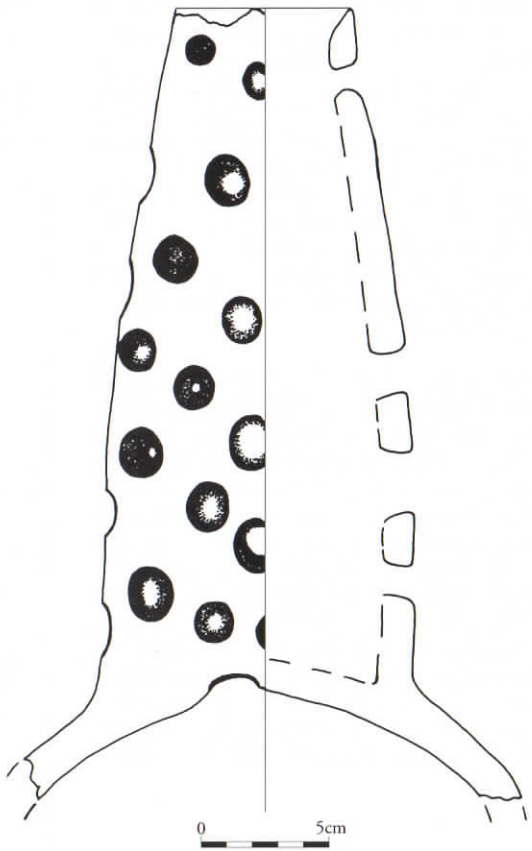
Γ153



A81/4



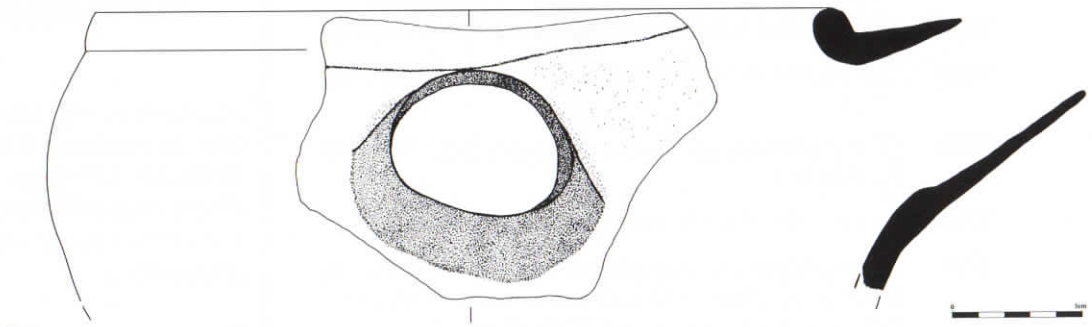
A279



Γ203/2

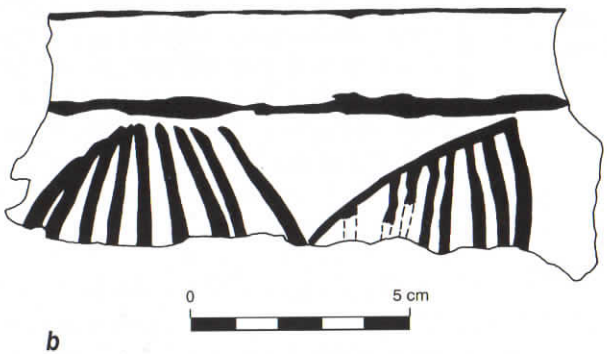
Pl. I

Drawings: Alexandra Mari



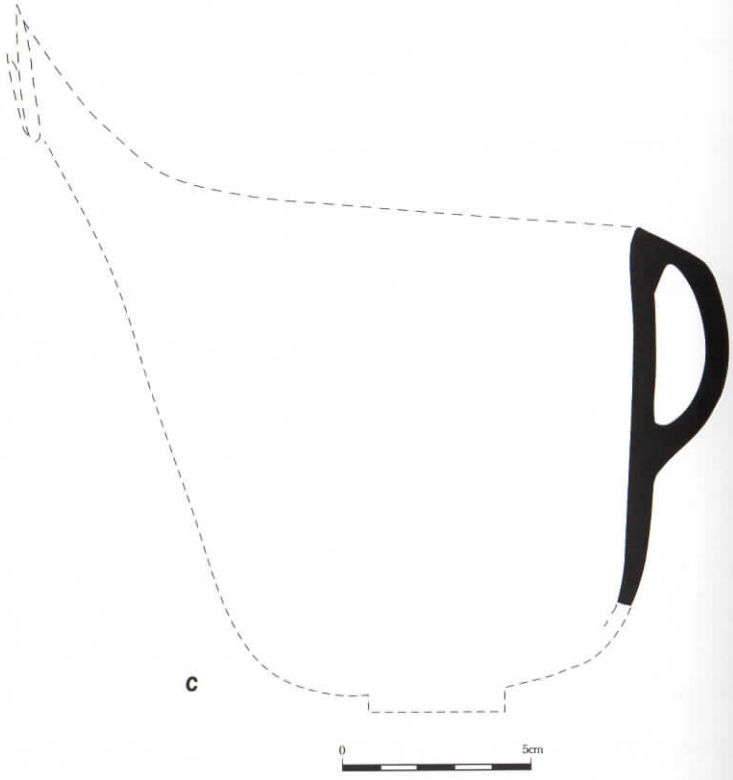
a

A20 (LEDEZA)



b

Γ 191 (painted decoration)



c

A21 (LEDEZA)

Pl. II

Drawings: Alexandra Mari

BIBLIOGRAPHY

Barber R. L. N., 1987: *The Cyclades in the Bronze Age*, Duckworth, London.

Betancourt P. P., 1985: *The History of Minoan Pottery*, Princeton University Press.

Caskey J. L., 1960: "The Early Helladic Period in the Argolid," *Hesperia* 29, 285-303.

Caskey J. L. 1968: "Lerna in the Early Bronze Age," *AJA* 72, 313-316.

Godart L., Tzedakis Y., 1992: *Témoignages archéologiques et épigraphiques en Crète occidentale du Néolithique au Minoen Récent IIIB* (*Incunabula Graeca* Vol. XCIII), Roma.

Korres G. S., 1978: "Έρευναι και ανασκαφαί ανά την Πυλίαν," *ΠΑΕ* 1978, 323-360.

Korres G. S., 1980: "Ανασκαφαί ανά την Πυλίαν," *ΠΑΕ* 1980, 120-187.

Papathanasopoulos G.N., Vichos Y., Hatzidaki E., Lolos Y., 1992: "Dokos: 1990 Campaign. Underwater Excavation," *ΕΝΑΛΙΑ ANNUAL* II (1990), 6-23.

Papathanasopoulos G.N., Vichos Y., Lolos Y., 1995: "Dokos: 1991 Campaign. The Underwater Excavation," *ΕΝΑΛΙΑ ANNUAL* III (1991), 17-37.

Papathanasopoulos N., Vichos Y., Lolos Y., 1994: "Δοκός:Το αρχαιότερο γνωστό ναυάγιο στον κόσμο," *Experiment*, Έτος 1, Αρ. 3 (Καλοκαίρι 1994), 76-113.

Saherwala G., 1985: "Στα ίχνη του Ομήρου," in *Τροία: Ανασκαφές και ευρήματα του Ερρίκου Σλήμαν*, Αθήνα Πολιτιστική Πρωτεύουσα της Ευρώπης, Υπουργείο Πολιτισμού και Επιστημών, 16-21.

Theocharis D. R., 1971: "Αγία Μαρίνα Σπετσών," *ΑΔ* 26 (1971), Μέρος Β' 1: Χρονικά (Αθήναι, εκδ. 1974)), 84-93.

Vasilopoulou V. (ed.), 1997: *Εφορεία Παλαιοανθρωπολογίας Σπηλαιολογίας, 1977-1997: Ημερολόγιο 1997*, Αθήνα.

Walter H., 1983: *Die Leute im alten Ägina, 3000-1000 v. Chr.*, Stuttgart.

Weisshaar H.-J., 1983: "Bericht zur Frühelladischen Keramik: Ausgrabungen in Tiryns 1981," *AA* 329-358.

Addendum: With regard to the perforated vessel (in Fig. 12, Pl. Id), the reader is now referred to V. Karageorghis "Notes on some enigmatic objects from the Prehistoric Aegean and other East Mediterranean regions," *AA* 1999, 501-514, where this as well as other similar objects from Pylos, Euboea and Troy are interpreted as handles of torches.

Y.G.L. (March 2001)

IMPORTANT NOTICE

Please note that the Greek edition of our periodical **ENALIA** and the **ENALIA ANNUAL** in English will stop being published in their present form. Both will end with the completion of volume V.

Our new periodical will bear the same title, "ΕΝΑΛΙΑ" (in Greek), a new format and size, and a larger number of pages. The articles published will be primarily in Greek and English. Each article published in one of the above languages will be complemented with a comprehensive abstract in the other. Occasionally, articles in French and German will be published accompanied by abstracts in Greek.

The articles will deal mainly with underwater and marine archaeology, HIMA's activities in Greece. We will also publish original articles from colleagues originated from Greece and abroad which will be accepted in one of the above languages accompanied by comprehensive abstracts (to be prepared by the author), which will be translated in Greek by us.

We hope you will appreciate our renewed efforts and supply us with your support as you have done so until now.

THE QUERNS FROM THE EARLY HELLADIC CARGO AT DOKOS

Christos Agouridis

The underwater excavation of the EH wreck by HIMA under the direction of Dr G. Papathanasopoulos produced many complete or nearly complete EH pots, thousands of sherds, two stone anchors, obsidian cores and blades, animal bones and teeth and a large number of querns.[1]

The pottery from the wreck belongs to an advanced EH II phase and includes all the basic types known from mainland sites. The number of different types increases as the cleaning and study of the thousands of sherds progresses. The total body of pottery from Dokos will make an important contribution to our knowledge of EH wares.

The numerous querns and rubbers[2] can be confidently dated to the same period, since many of them were found encrusted with EH sherds. The excavation team gave priority to the recording, study and conservation of the pottery finds, which required immediate attention and desalination. In a subsequent stage the study was begun of the querns and rubbers from the wreck. This study of the Dokos stone artefacts will afford new evidence for the traffic in stone raw materials in the Argosaronic Gulf as well as in the Aegean as a whole during the flourishing EH II period.

Useful comparative evidence for the study of the Dokos material is afforded by the stratified material from other sites and by C. Runnels's seminal work on the querns of Argolida (Runnels 1981, 1985, 1988).

Although the study of the Dokos querns is still in an early stage, some general remarks can be made here concerning the raw materials used, their provenance and typology, and their use and role on the island of Dokos in the network of transit trade in the Argosaronic Gulf.

photo. C. Agouridis

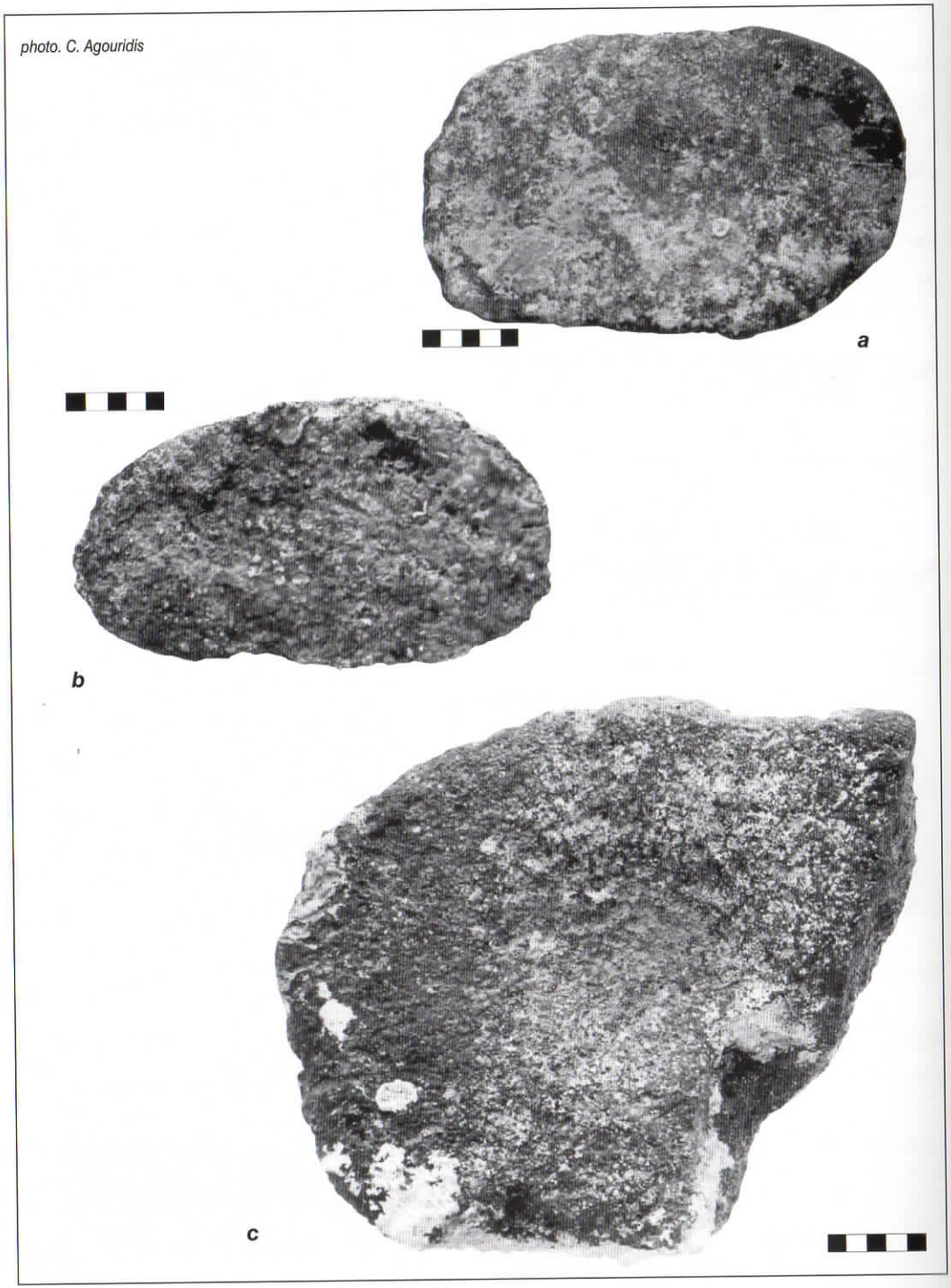


Fig. 1.
a: Quern A450, oval plan
b: Quern A37/3, elliptical plan
c: Quern A454, rectangular plan

Petrology of the querns

During the Early Helladic period a change can be observed in the method of quern production. The small limestone slabs of the Neolithic period give way to larger querns made from volcanic rocks, chiefly andesite (Runnels 1982, 101-105, fig. 17-9, pls. 2-4, and 1985, 35, fig. 3.2).[3] A petrographic analysis of the querns found in Attica (Kitsos Cave and Ayios Kosmas) and Argolida has shown that they derive from Aigina andesite (Runnels et al. 1981, 233-239).

An initial examination of the Dokos querns revealed the same characteristic coarse-grained volcanic rock of dark grey or brown colour. The typical white and black andesitic crystals are easily recognisable.

Ten samples from ten artefacts were examined under a microscope (Table. 1). Five of them are andesite, varying in colour from dark grey to brown. The different colours may be due to their long immersion in the sea or simply to their origin in a different part of the same quarry.

Three of the samples are microgranite, also a volcanic rock, which occurs in the same environment as andesite. Another sample is dacite and another probably hornstone. The latter (Γ202/20) comes from a spherical rubber. Most of the rubbers appear to be of the same dark brown or black rock, which is much harder than andesite, due to having been subjected to very high temperatures. It is a metamorphic rock formed by contact with other volcanic rocks and occurs in the same environment as andesite. This environment is found, as we know, in the South Aegean volcanic arc.

The stone assemblage probably came from the Saronic region (Aigina, Methana, Poros). A closer determination of the provenance requires more laboratory examination. The next step in the study will be a thin section petrographic analysis of a larger number of samples. In addition, a chemical analysis will provide a more precise answer to the problem of their provenance, including or excluding distant sources in the southeast segment of the volcanic arc, such as Milos, Thera, Kimolos,

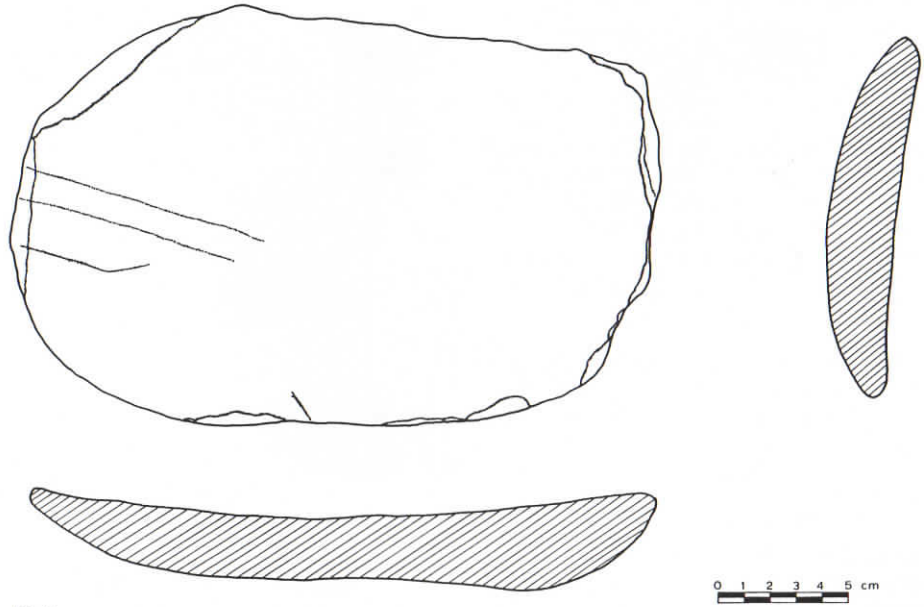


Fig. 2.
The ovoid quern A45
Drawing: Alexandra Mari

Fig. 3. *Examples of rubbers from Dokos,*

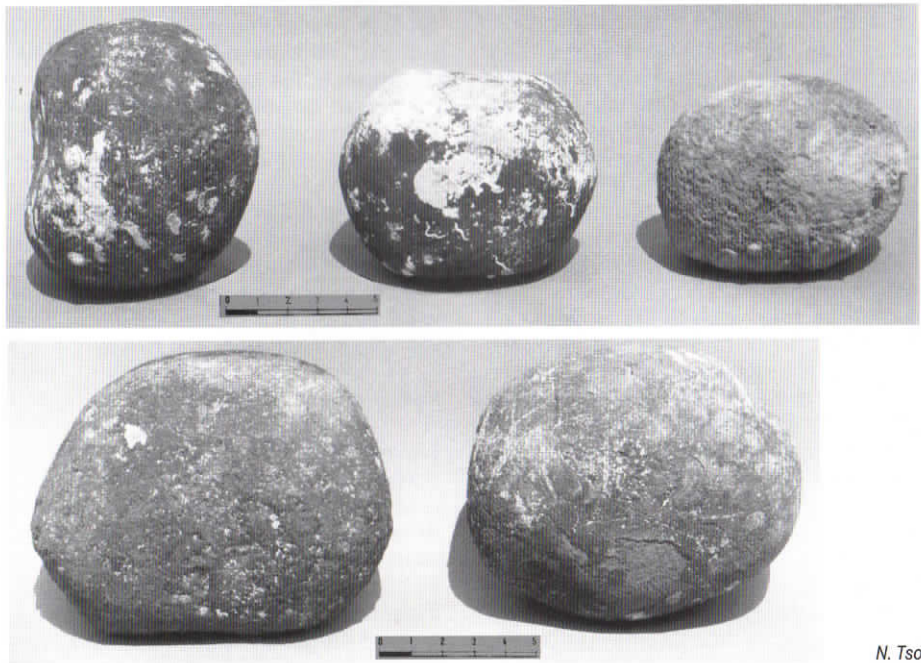


photo:
N. Tsouchlos

Fig. 4. Quern A406 photo: N. Tsouchlos

Nisyros and Kos. These analyses will be especially useful, since they may enable us to understand the way in which stone raw materials were traded in the Aegean during the EH period.

Quern typology

The Dokos assemblage contains all the basic EH quern types: ovoid, elliptical and rectangular (Figs. 1a, 1b, 1c and Fig. 2). The great majority of rubbers are spherical (Fig. 3). Nevertheless, two new types have been recorded so far: round-oval with a conical profile (Figs. 4 & 5), and rectangular with rounded ends and an elliptical profile (Fig. 6). The first (A406, Fig. 5) has a massive body with two circular flat surfaces. The upper, larger, one is the working surface and the lower one is the base, which was set in the ground. The second quern (A179/1, Fig. 6) is lighter, and its narrow surface suggests that it might have been used for sharpening stone or metal tools rather than milling cereals. Neither of the two querns shows signs of use.

The andesite querns were made by pecking. The desired shape was first rough-hewn from the blocks of raw material using a pointed stone or metal implement, and the surface was then dressed by pecking or smoothed with a harder stone. Many of the querns bear traces of the tools used to shape them, for example A129/01 (Fig. 7), which shows clear marks of dressing with a pointed, probably metal tool.

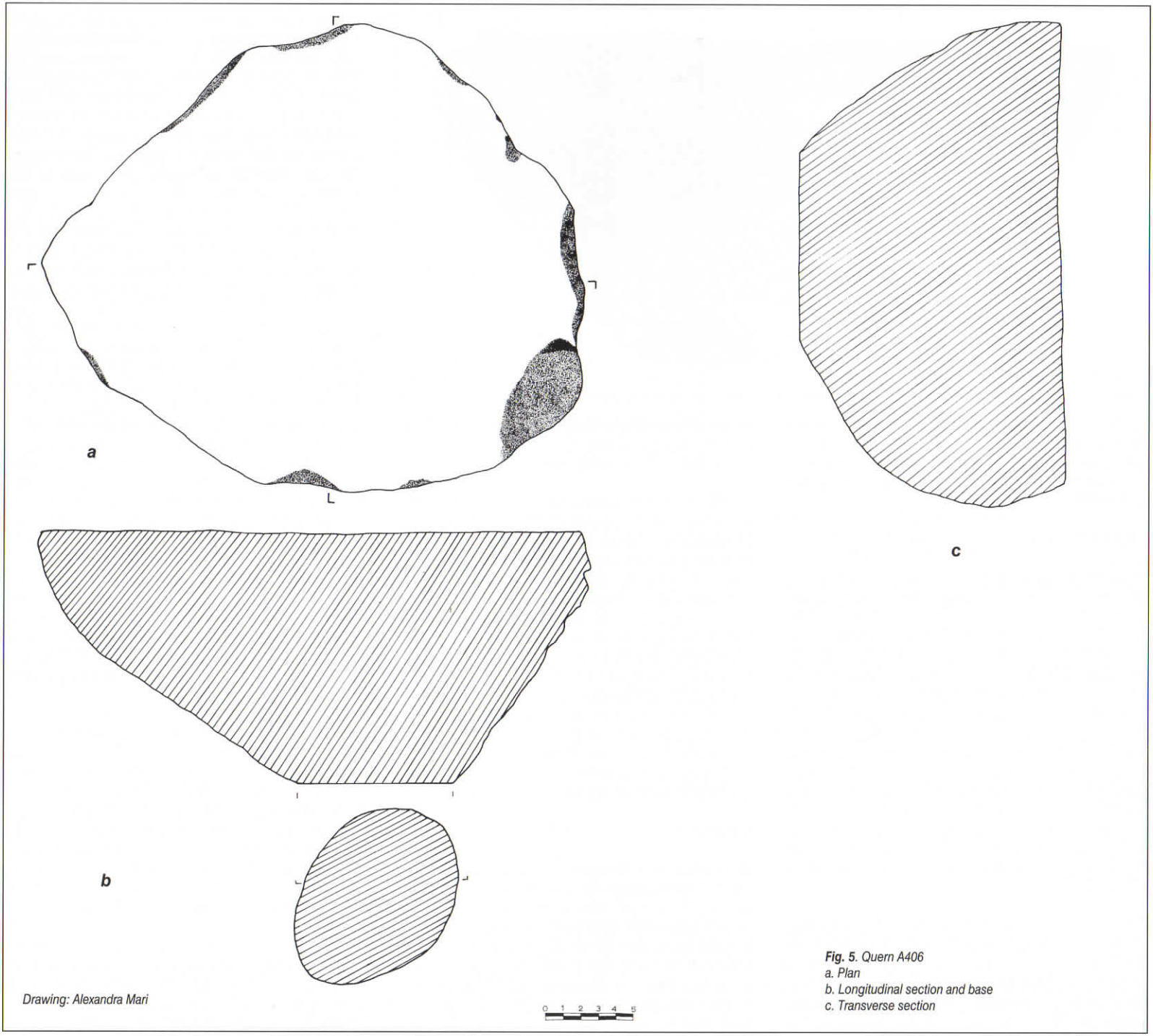
Numbers of the querns also exhibit extensive traces of use caused by the forward and backward or circular movements of the rubber on their concave surfaces (e.g. A454, (Fig. 1c), but the majority do not. Out of 123 stone implements (52 querns or fragments and 71 rubbers or fragments) among the stone material from Dokos, only 40 are complete specimens (15 querns and 27 rubbers). When the study of all the Dokos querns is completed, it will be possible to tell whether a few more examples can be restored from the fragments. We may then perhaps know whether all the querns were transported to Dokos whole or whether some were already in a broken condition, a fact that will help in interpreting the nature of cargo.

Remarks

The notion of a ship carrying a mixed cargo of pottery and ballast for barter is tempting and puts us in mind of later wrecks that have been excavated, which were carrying large querns as ballast (e.g. the Kyrenia, El Sec-Palma de Mallorca and two 4th c. BC wrecks). Hitherto there has been no archaeological evidence for large sea-going ships in the EH period. Runnels's suggestion must be revised, that long oared ships like those depicted on the Syros frying pans were the carriers of the Early Bronze Age merchandise in the Aegean, and by extension of the andesite querns as part of their cargo. If we accept the hypothesis that these ships were dugouts, perhaps with some superstructure, then the possibility that they carried ballast must be rejected. Their shape did not lend itself to transporting cargoes and they would not have needed ballast to improve their handling qualities, since they have a low freeboard and narrow beam. Their considerable length and the many oars depicted (some 20 on each side) clearly indicates that they were designed for speed.[4] This does not, of course, rule out transporting small but valuable cargoes, for example metal objects and obsidian cores. From the slight archaeological evidence available to date for Early Helladic ships,[5] it is clear that there were different types of vessels serving different purposes. Ballast, if it existed, would have accompanied a more elaborate construction, perhaps formed by planks fastened together. In this case, the ships would have had greater beam, a keel and perhaps a mast and sail. Such ships in the Aegean, however, are first depicted on Early Minoan III and Middle Minoan I seal stones, and since archaeological evidence is at present lacking for the existence of large merchant ships in this period, we cannot give convincing answers to questions of this sort. We can only speculate that perhaps in the EH period, if large seagoing vessels were not yet in existence, trade may have been carried on by large fleets of small craft.

On Dokos two contemporary coastal Early Helladic sites have so far been found. The first is on the tip of the Myti Kommeni headland, near the site of the Early Helladic cargo, where there are traces of wall foundations over a limited area. The traces continue as far as the neck of the headland, where a Late Helladic settlement has been excavated, which must have been built over that of the preceding EH period (Papathanasopoulos 1989, 34).

The second site is in the bay of Ledeza, south of Skintos bay, and has more extensive remains of walls, starting from the rocky beach and ending in the sea at a depth of 3-4 m (Kyrou 1990, 71-72, 250. Papathanasopoulos et al,



Drawing: Alexandra Mari

***Fig. 5**. Quern A406*
a. Plan
b. Longitudinal section and base
c. Transverse section

Photo: C. Agouridis

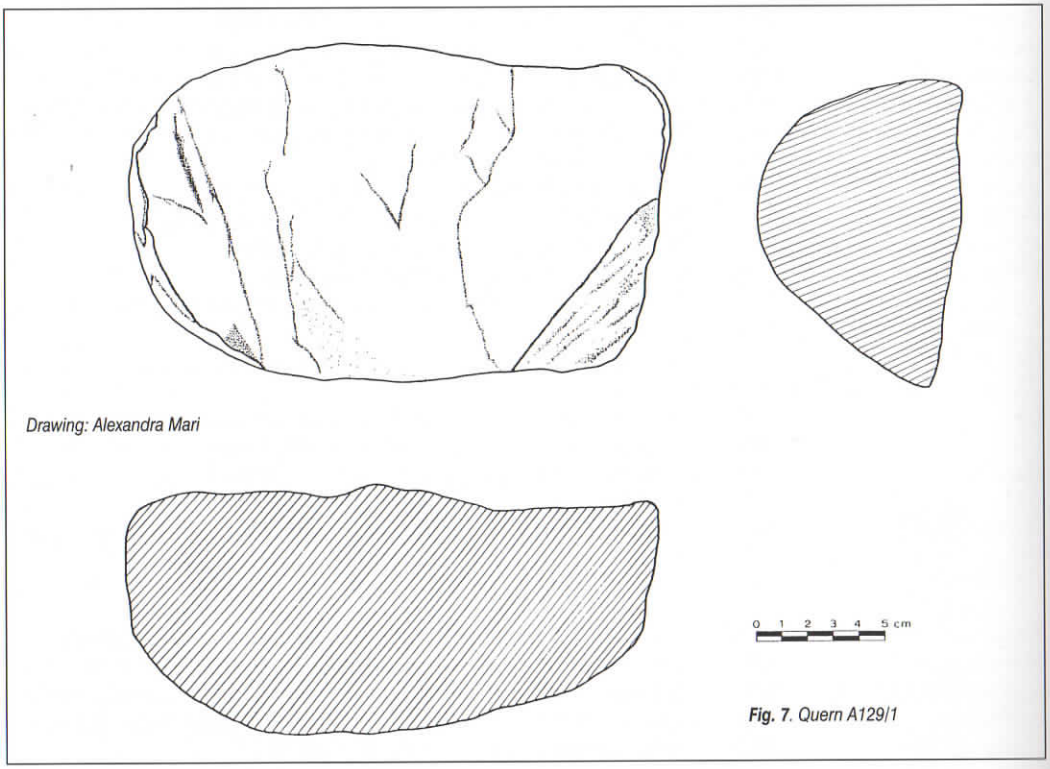
Fig. 6. *Quern A179/1*

1995, 17-37). Neither site suggests the existence of a settlement important enough to have absorbed such a large quantity and variety of pottery for the daily needs of its inhabitants or so many querns for their agricultural production. The andesite querns, as Runnels correctly stressed, represented a "costly capital investment" for the society that produced them and possessed the means to transport them by sea from their place of production (Aigina, Methana and Poros) to the place where they were used, which must have been one of the large Early Helladic centres in the Peloponnese (Runnels 1985, 37). The increase in the size and the numbers produced during the Early Helladic period must have been intended to increase productivity and thus free manpower for use in other productive occupations, like making fine pottery, metallurgy and boat building. This economic strategy points to a well organised society, and this is borne out by the excavations in large EH centres like Lerna, Tiryns (which was on the sea in that period), Askitario, Kolona or Akovitika, where we have tile-roofed megara, fortifications and seals.

The large Early Helladic centres in Argolida (Lerna, Tiryns, Asine) must have used the busy sea route along the Argosaronic coast to communicate with other centres in Attica and Aigina. To facilitate communications a large network of smaller sites was created on the islands lying along this sea route. Hydra, Dokos, Trikeri, Spetses and Spetsopoula were all inhabited at this time. As Kyrou rightly commented (1990, 73), the Early Helladic settlements on these islands have certain features in common: they are orientated in the direction of the prevailing local winds, on low headlands with sheltered coves and small sandy beaches, close to sources of fresh water in small valleys in which agricultural or stock farming activities could be carried on.

The nearest contemporary settlement to Dokos that has been excavated is Ayia Marina on Spetses. The excavator, commenting on the nature of the site, declared that Ayia Marina must have been a harbour station serving the transit trade between the Cyclades and the Argolic Gulf (abundant obsidian and imported Cycladic pots) rather than a self-sufficient Early Helladic centre (Theocharis 1971, 92).

It is thus evident that Dokos and its anchorages formed part of a network of coastal sites and islands which were engaged in the maritime transit trade and was closely connected with the large Early Helladic centres in Argolida we have already mentioned. Within this network querns were traded together with pottery, metals, obsidian and probably perishable goods like hides and wool. It remains for further archaeological research to show how far the network was local in character or whether it extended to other distant parts of the Aegean.



Drawing: Alexandra Mari

Fig. 7. *Quern A129/1*

A117	Microgranite
A179/01	Microgranite
A120/09	Microgranite
B57/13	Andesite
A461/02	Andesite
A406	Andesite
A63	Andesite
A37/03	Andesite
A461	Dacite
Γ202/20	Hornstone

Table 1. Petrology of querns from an optical examination with a microscope.

NOTES

[1] For the Dokos excavation and finds, see Vichos 1989, Papathanasopoulos et al.1989, Papathanasopoulos et al. 1992, Papathanasopoulos et al. 1995.

[2] A variety of terms is found in the international bibliography for querns and rubbers. The term millstones usually refers to the large stones used from Classical times to the present for miling grain and crushing fruit, while in a prehistoric context it includes both the querns (flat and saddle-shaped) on which cereals were ground by pounding or rubbing with a circular or back-and-forth motion, and the rubbers. For the former the terms grinding slabs, handmills, querns or saddle querns are used, and for the latter pestles, rubbers and handstones. Other names or variations in different combinations of the above also exist, for example saddle stones. Such a variety of names shows that no fixed terminology has yet been adopted internationally for these stone tools (on this question, see Runnels 1981, 1-4). In the present study the term quern will be used for the stone on which fruit and grains were processed, and rubber for the stone with which the hand processing on the surface of the quern was carried out.

[3] In spite of all this, very large querns made of the hard rock available in the region (examples are exhibited in the Volos Museum) have been found at the large neolithic settlements in Thessaly,

[4] For the types of long oared ships and relevant bibliography, see Basch 1987, 76-89. Broodbank 1989 and 1995, 54-61. Agouridis 1995, Ch. 3.

[5] The body of representations of Early Bronze ships contains two- and three-dimensional examples, testifying to the contemporary use of different types. The two-dimensional examples comprise thirteen engravings of ships on frying pans, for the most part from the Halandriani cemetery on Syros; one similar in the Ashmolean Museum at Oxford (Coleman 1985, pls. 33-37); an engraving of the same type of ship on a sherd from Orchomenos (Kunze 1934, pl. 29.3); two rock paintings from Korphi t'Aroniou on Naxos (Doumas 1965, fig. 4). Three-dimensional representations include four lead models, probably from tombs on Naxos (Renfrew 1967, 5, pls. 1, 3); a clay ship model from Thermi on Lesvos (Lamb 1936, pl. 24, no. 31.5), which the excavator stressed was probably a simple utensil, perhaps a container; and lastly, four clay ship models from Crete: one from Mochlos, one from Palaikastro and two from a tomb in the Messara, although the latter could also have been lamps (Johnston 1985, 18-23).

BIBLIOGRAPHY

Agouridis C., 1995: *Maritime Trade in the Early Bronze Age Aegean*, unpublished MA Thesis, Oxford.

Basch L., 1989: *Le Musée Imaginaire de la Marine Antique*, Athens.

Vichos Y., 1989: "Dokos 1989: Planning and Methodology .The Excavation. Methodological Results." *ΕΝΑΛΙΑ ANNUAL I* (1990), 18-23.

Broodbank C., 1989: "The Longboat and Society in the Keros-Syros Culture," *AJA* 93, 319-337.

Broodbank C., 1995: *This Small World the Great: An Island Archaeology of the Early Cyclades*, unpublished Ph.D. Thesis, Cambridge.

Coleman J., 1985: "Frying Pans of the Early Bronze Age Aegean," *AJA* 89, 191-219.

Doumas C., 1965: "Κορφή τ'Αρωνιού," *ΑΔ* 20, 41-64.

Johnston P. F., 1985: *Ship and Boat Models in Ancient Greece*, Annapolis: Naval Institute Press.

Kunze E., 1934: *Orchomenos III, Die Keramik der frühen Bronzezeit*, München.

Kyrou A., 1990: *Στο Σταυροδρόμι του Αργολικού*, τομ. Α', Αθήνα.

Lamb W., 1936: *Excavations at Thermi in Lesbos*, Cambridge.

Papathanasopoulos G. 1990: "Dokos Excavation 1989: "The Early Helladic Wreck at Dokos. The Prehistoric Settlement," *ΕΝΑΛΙΑ ANNUAL I*, 1989, 34-37.
Papathanasopoulos G. N., Vichos Y.,

Hatzidaki E., Lolos Y., 1992: "Dokos:1990 Campaign. Underwater Excavation," *ΕΝΑΛΙΑ ANNUAL II* (1990), 6-23.
Papathanasopoulos G. N., Vichos Y.,

Lolos Y., 1995: "Dokos:1991 Campaign. The Underwater Excavation," *ΕΝΑΛΙΑ ANNUAL III* (1991), 17-37.

Renfrew C., 1967: "Cycladic Metallurgy and the Aegean Early Bronze Age," *AJA* 71, 1-20.

Runnels C., 1983: *A Diachronic Study and Economic Analysis of Millstones from the Argolid*, Greece, PhD Diss. , Indiana University, Bloomington.

Runnels C., 1983: "The Stanford University Archaeological and Environmental Survey of the Southern Argolid: 1979-80," in *D. Rupp & D. Keller (eds), Archaeological Survey in the Mediterranean Area*, 30-43.

Runnels C., 1985: "Trade and Demands for Millstones," in *A. B. Knapp and T. Stech (eds), Prehistoric Production and Exchange: The Aegean and East Mediterranean*, 30-43.

Runnels C., 1985a: "The Bronze Age Flake-stone Industries from Lerna: A Preliminary Report," *Hesperia* 54, 357-391.

Runnels C., 1988: "Early Bronze Age Mortars from the Southern Argolid," *Hesperia* 57, 257-272.

Runnels C., Cohen, R., 1981: "The Source of the Kitsos Millstones," *in N. Lambert, La Grotte Préhistorioque de Kitsos (Attica), 233-239*. Paris ADPF.

Sampson A., 1988: *Μάνικα II, Ο Πρωτοελλαδικός Οικισμός και το Νεκροταφείο*, Αθήνα.

Theocharis D., 1971: "Αγία Μαρίνα Σπετσών," *ΑΔ* 26, Β' 1, 84-93.

CONSERVATION OF TWO ONE-HANDLED CUPS FROM THE DOKOS WRECK SITE

Konstantinos Vasiliadis

Margarita Venaki

Spyridoula Papanikou

The bulk of the cargo of pottery from the Dokos wreck consists of sherds belonging to the second Early Helladic period, EH II.

The predominant shapes are bowls, beaked jugs, basins, wide-mouthed vessels, braziers, kneading troughs, spit-supports and one-handled cups. These are the principal EH II pottery types, well known from many mainland sites. They are handmade; wheel-made pots only appeared in the third phase, EH III.

Description of the finds

The pots whose conservation is described here are numbers Γ185 and Γ190; they are handmade one-handled cups, typical of the EH II period.

Γ185 (Fig. 1). Preserved almost complete; it has a spherical body. The lower handle attachment is preserved, and the interior was packed with sherds from the body.

Γ190 (Fig. 2). The complete body has survived and the lower handle attachment. The interior was filled with mud and shells.

State of preservation

The bodies of the two cups were covered inside and out with calcareous deposits forming a thin layer on the surface and by deposits of biogenic and abiogenic origin.

More particularly we noted:

- Polychaite tubes, not very extensive, scattered over the clay surface.
- Colonies of Bryozoa growing in a flat, circular pattern.
- And bivalve mollusca were also present to a limited extent.

Extensive calcified Rhodophyceae were noted on cup Γ185 firmly adhering to the clay body, especially on the upper part and by the handle attachment. They were very difficult to remove even after the pot had dried.

Cup Γ190 had a heavy grey encrustation. It has some kind of black slip inside and out, which is brownish black in places, and gives the impression of being crazed. This kind of slip has been called proto-glaze and is often found on certain EH II wares. It is also preserved on the base of the cup, which is rough and has deep cavities, probably due to mechanical abrasion in its underwater grave.

The surface of Γ185 is rough and shows marked reduction, chiefly the result of mechanical abrasion. It has two cracks, one 5 cm long, probably the older, and the other 4 cm long extending vertically down the body. The lack of cohesion to be seen in the clay body is probably due to flaws caused during the preparation of the clay and the firing. There were iron oxide stains on the base of Γ190, either directly on the clay or on the calcareous deposit. They are probably the result of the proximity of the pot to iron objects in the sea.

There was a coating of a faunal nature on a small area of Γ190 only. It formed a thin brownish black layer, greasy to the touch.

The desalination of the two cups began after their arrival at the laboratory set up by HIMA in the ground-floor rooms of the Spetses Museum in collaboration with the 1st EBA. The method of desalination used was static immersion.

With this method the pottery is completely immersed in baths of water. Initially sea water is used, which is gradually replaced by tap water and finally by distilled water.

The long period the pottery has to remain in the baths in order to complete the desalination makes this process tedious, since months may be needed for the total removal of the salts if the water is changed frequently, or years, if it is changed less frequently. It is, however, a safe method, producing sure and positive results, and relatively economical.

Twenty four changes of water were used for Γ190 and Γ185. The desalination was judged complete when the conductivity of the water reached 60mS and 52mS respectively.

It was not thought necessary to use biocides, since no disintegration of live organisms was observed during the desalination of the finds. Mechanical cleaning is carried out in two stages:

a. In the first, the greater part of the calcareous deposit is removed, thus clearing the deposits which block the surface pores of the clay and prevent the salts from being flushed out.

b. The second stage is carried out after the pots are dry, in order to remove the remaining calcareous deposits.

The cleaning process is effected by mechanical means (scalpel, small hammer with a plastic head and vibrotool). No chemical cleaning was used, because while chemical combinations remove some of the deposits, they render the body of the clay soft and friable.

The rust stains on the base of Γ190 were removed with a weak solution of hydrogen peroxide (12 Vol). It may be noted that the mechanical cleaning of Γ190 proceeded more easily than that of Γ185, because the proto-glaze on Γ190 acted as a barrier between the surface of the pot and the deposits.

After the desalination was complete, it was followed by the drying stage. The finds were dipped in a dilution of ethyl alcohol and distilled water and left to dry.

Due to their underwater exposure, Γ185 and Γ190 showed signs of surface disintegration in places and they were consolidated with Paraloid B72 in acetone (2%) when the pot was dry. Particular attention was given to consolidating the cracks in Γ185. The consolidant was applied with the help of a

photos: N. Tsouchlos, K. Vasiliadis

Fig. 1a. *Cup Γ185 just after being raised*

Fig. 1b. *Cup Γ185 after cleaning and restoration*

Fig. 2a. *Cup Γ190 just after being raised*

Fig. 2b. *Cup Γ190 after cleaning and restoration*

syringe while the edges to be joined were held together with a clamp made of plasticised wire and gauze.

Γ185 was able to be partly restored, for two of the sherds found inside it made joins. The bonding was done with nitro-cellulose adhesive (h.M.G.).

Gap-filling — restoring original appearance

The restoration of Γ185 and Γ190 presented the following problems:

a. There was no similar intact find from the Dokos wreck to indicate the precise shape and size of the missing parts for restoration.

b. Since they were made by hand and not on the wheel, the shape of the body was irregular, with the result, especially in the case of Γ185, that a wax mould could not be used.

The finds were restored according to the instructions of the archaeologist in charge, Y. Lolos. Parallels were studied from Eutresis (Boeotia), Askitario (Attica), Lerna (Argolida), Argissa (Thessaly) (Hanschmann & Milojciç 1976, pl. 25, fig. 56; pl. 28, fig. 10; pl. 30, fig. 43; pl.. 32, fig. 64) (Caskey 1966, pl. LIV, fig. 121V 6) in order to determine the exact dimensions of the missing sections (the handle of Γ185 and part of its body, and the handle of Γ190.

The gaps were filled with Moldano plaster. To ascertain the dimensions of the handle on Γ190 (height and width) a plasticine model was shaped from which a plaster cast was made. The plaster was tinted with inorganic pigments. The plaster filling of Γ185 will be tinted before it goes on display.

There are supplementary special conservation reports in the Spetses Museum, numbered, progressively from 199 for Γ185 and from 204 for Γ190.

We warmly thank the HIMA organising committee and the conservators Th. Saramanti and A. Moraïtou for the help they gave and the confidence in us they showed from the beginning of our collaboration.[1]

BIBLIOGRAPHY

Βασιλειάδης K., 1995: *Συντήρηση Εναλίων Κεραμικών. Πτυχιακή Εργασία ΤΕΙ Αθηνών.*

Cronyn M. J., 1990: *The Elements of Archaeological Conservation*, Routledge.

Hanschmann E., Milojciç V., 1976: *Die deutschen Ausgrabungen der Argissa-Magoula in Thessalien III: Die frühe und beginnenden mittlere Bronzezeit*, Bonn.

Jedrzejewska H., 1970: "Removal of Soluble Salts from Stone," *Conservation of Stone and Wooden Objects*.

Last H. S., 1979: "The Desalinization of Ceramics," *Review of the Foremost Methods, 898 Project Reports, Dept. Art Conservation, Queen's University, Kingston, Ontario, Unpublished Manuscript*.

Lins A., 1984: "Technical Notes," *Dutch Tiles, Philadelphia Museum of Art, 178-189*.

Λωλος Γ., 1993: *Σημειώσεις Προϊστορικής Αρχαιολογίας, Β' έκδοση*, Ελληνικός Οργανισμός Τουρισμού, Αθήνα.

Olive J., Pearson C., 1975: "The Conservation of Ceramics from Marine Archaeological Sources," *Conservation in Archaeology and Applied Arts. Proceedings of the II Stockholm Congress*, 63-65.

Paterakis Boccia A., 1987: "The Deterioration of Ceramics by Soluble Salts and Methods for Monitoring their Removal," *Recent Advances in the Conservation and Analysis of Artefacts*, 67-72.

Pearson C., 1987: *Conservation of Marine Archaeological Objects*, Butterworths.

Saramandi T., Moraitou A. 1995 "Conservation of the Ceramic Finds from the Dokos Wreck," *ENALIA ANNUAL III* (1991), 38-45.

NOTE:

[1] The difficulties encountered by the team of conservators during the restoration of these two finds was the chief reason for devoting a separate article to them, since the main work of conservation of the Dokos finds has already been published in a previous article (Saramandi & Moraitou 1995).

UNKNOWN REPRESENTATIONS OF 14th AND 15th CENTURY SHIPS FROM CHURCHES IN BULGARIA AND SKOPJE

Nikolay Ovcharov

There has been an increased interest in graffiti with nautical subjects in recent years. Since nautical archaeology is a relatively new field, the study of nautical graffiti does not have a long history. Studies to date, however, have shown how valuable such pictorial evidence is, for these nautical engravings reveal unknown types of ships which have not been otherwise preserved.

It is remarkable that engravings with nautical theme are found the length of the entire Mediterranean coast, in countries with different languages and religions, largely on Medieval monuments; on French coasts[1], on the walls of San Marco in Venice[2], in Greek churches and monasteries[3], and in North African and Maltese churches and mosques[4].

In modern Bulgaria engravings of ships are found on numerous monuments. On the outer walls of Pliska and Preslava (9th-10th c.), both ancient capitals of Bulgaria, carved representations of Byzantine dromons and others types of ships of the period were found[5].
Also the rich collections of engraved ships on monuments at Philipoupoli and Mesimvria, which contain valuable information on ship-building and eastern Mediterranean ship types, have been published[6].

In this article we are publishing recent discoveries of nautical engravings from Bulgaria and Skopjian "Macedonia" (FYROM). All the representations are incised on church wall-paintings and date to the 14th and 15th c. The graffiti are found in the churches of Ayia Sophia and the Theotokou in Achrida (Fig. 1:6; Fig. 2:1-4 and 6; Fig. 3:1-2 and 4-6), in the church of Ayios Georgios in the village of Polosko in Kavantartsi (Fig. 3:3) and in the rock-built church of Moni Alatsa near Varna (Fig. 2:5).
The churches of Achrida have a series of wonderful representations (we found six) of the galley type. This series (Fig. 1) represents the characteristic galley type in the period of its hey-day, with a long, low hull, a bank of oars passing through special openings and a small superstructure on the stern. Above the shelters of these superstructures naval flags waving on high masts are often represented. The presence of one or two masts lends a note of realism, but the one-dimensional line drawing of the graffiti does not allow us to determine whether the oarsmen are ordered according to the "al

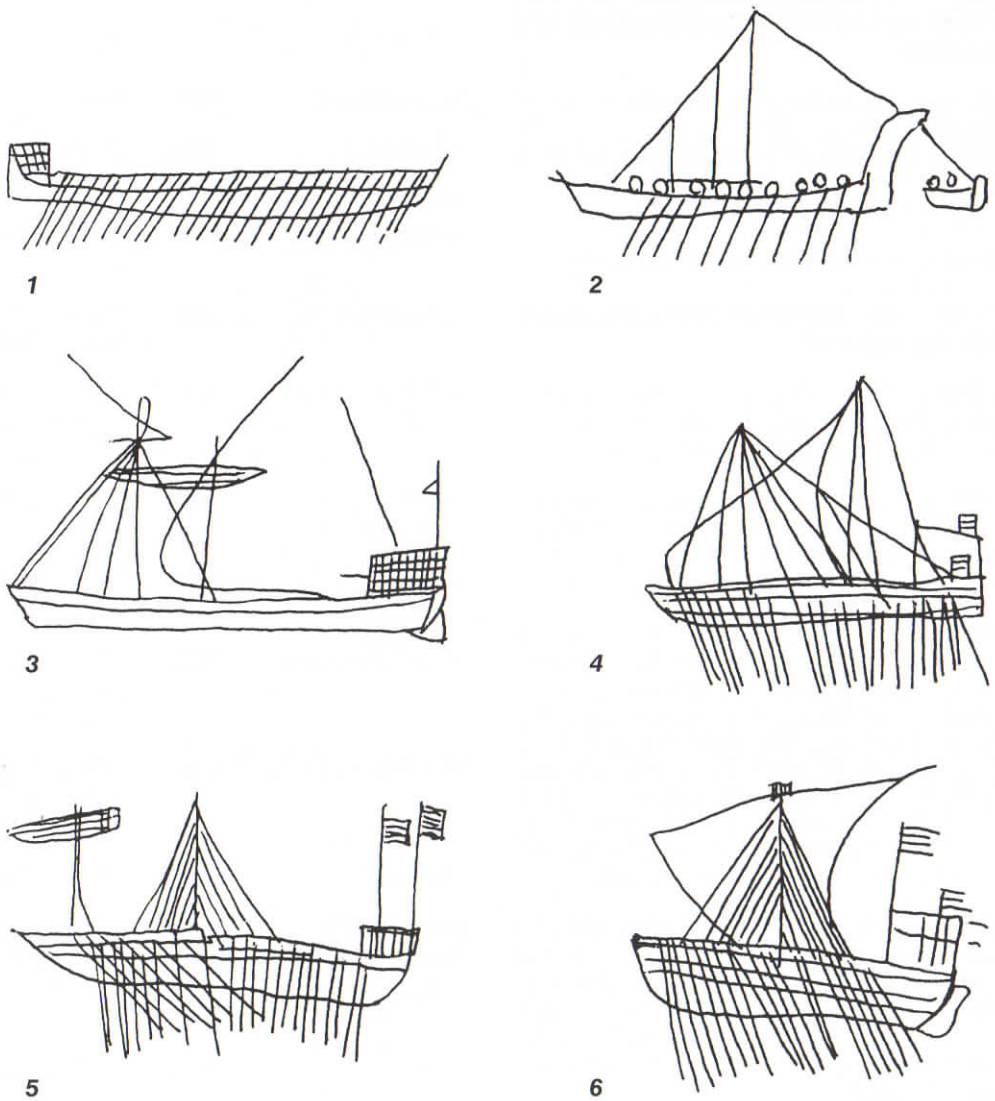


Fig.1 *Graffiti depicting galley type ships.*

scaloccio" or "a zenzile" system. The engraving in the church of the Theotokou is of particular interest as it shows the heads of the oarsmen, as well as a small boat being towed by the galley tied to its stern.

A second series of engravings (Fig. 2) represents the medieval type of "round" ship, which follows western prototypes. After a transitional type still propelled by oars as well as sail (Fig. 2:1), we come to the Classical type of round ship of the medieval period, the kog.
It is a ship with a compact high hull, one mast and high superstructures on the bow and stern. In our series of engravings we see characteristic details of this type, such as crow's-nests on the mast top and a rudder on the stern. These vessels first appeared as merchantmen in Germanic regions, but gradually came to be used in the Mediterranean as well.

The ships represented in the engravings on Moni Alatsa and the church of Ayia Sophia are dated to the 14th and 15th centuries, which a high point in Mediterranean ship-building (Fig. 2:5-6). These were large vessels of the carrack type with three masts, used by the Italian republics and the city of Dubrovnik in their commercial enterprises.

The large displacement, sophisticated rigging and central fixed rudder on the stern establish the carrack as the prevailing type of vessel of its time. We can surmise that this ship depicted in the engraving at Alatsa (Fig. 2:5) was built in Genoa, for the economic ties between Varna and this Italian republic during the 15th c. are well known. The engraving from Achrida (Fig. 2:6) probably represents a Venetian carrack, which would have been a normal sight in Adriatic waters.

The third series (Fig. 3), includes engravings of different types of 14th and 15th c. ships that sailed the coasts of the regions where the engravings were found. The engraving in Fig. 3:1 depicts a Byzantine dromon with a fixed central stern rudder, which was innovative for the time. On the other hand the engraving in Fig. 3:6 shows a ship still using oars and a steering oar, a device that was out of date in the 14th c.
The recent uncovered nautical engravings shown here show once again the particular value of this iconographic source of graffiti. Considerable numbers of nautical engravings are found in Orthodox churches throughout the Balkans. It remains for them to be discovered,

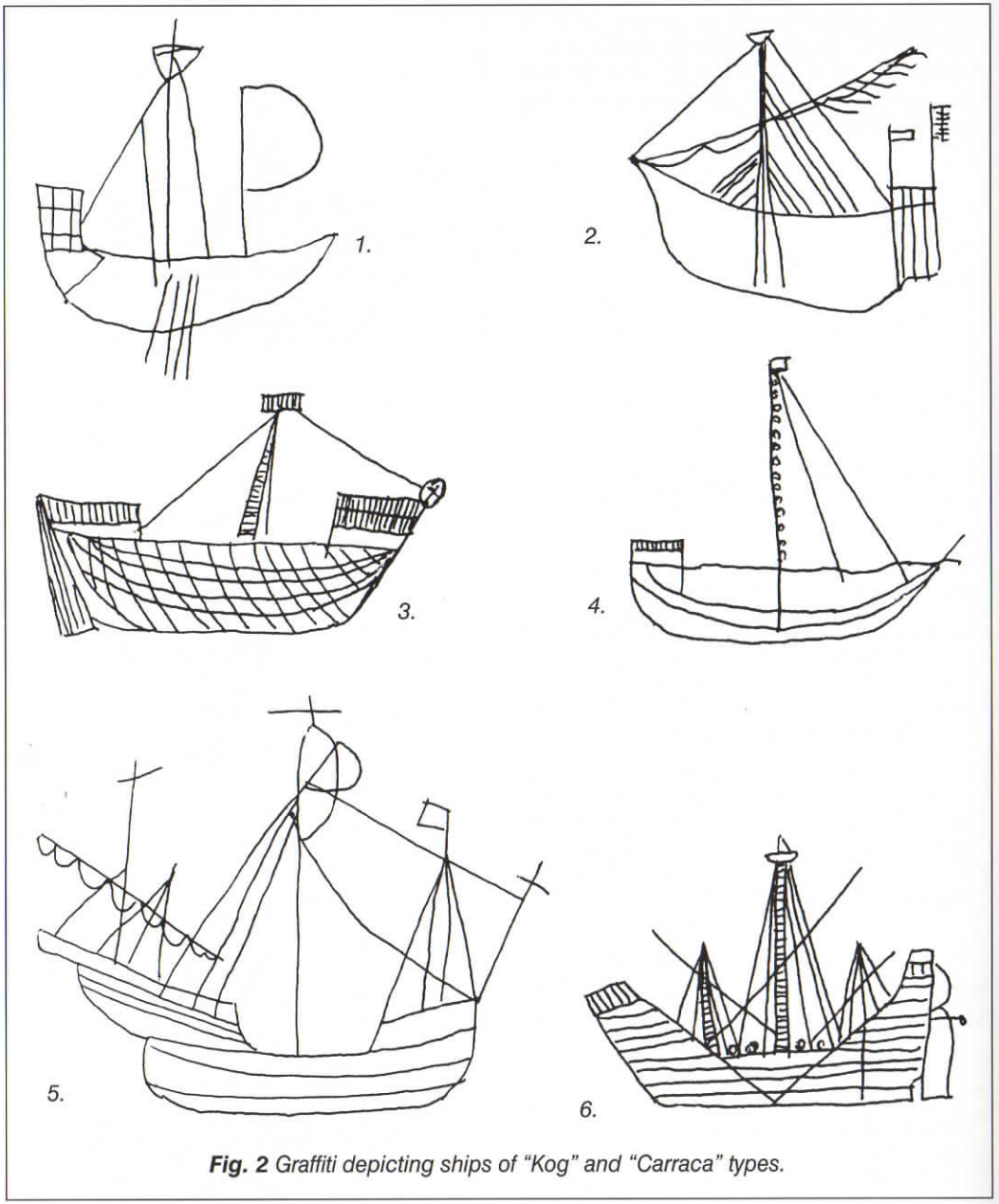


Fig. 2 *Graffiti depicting ships of "Kog" and "Carraca" types.*

recorded and studied in order to add significantly to an understanding of the development of ship-building and the types of ships sailing the eastern Mediterranean during medieval times.

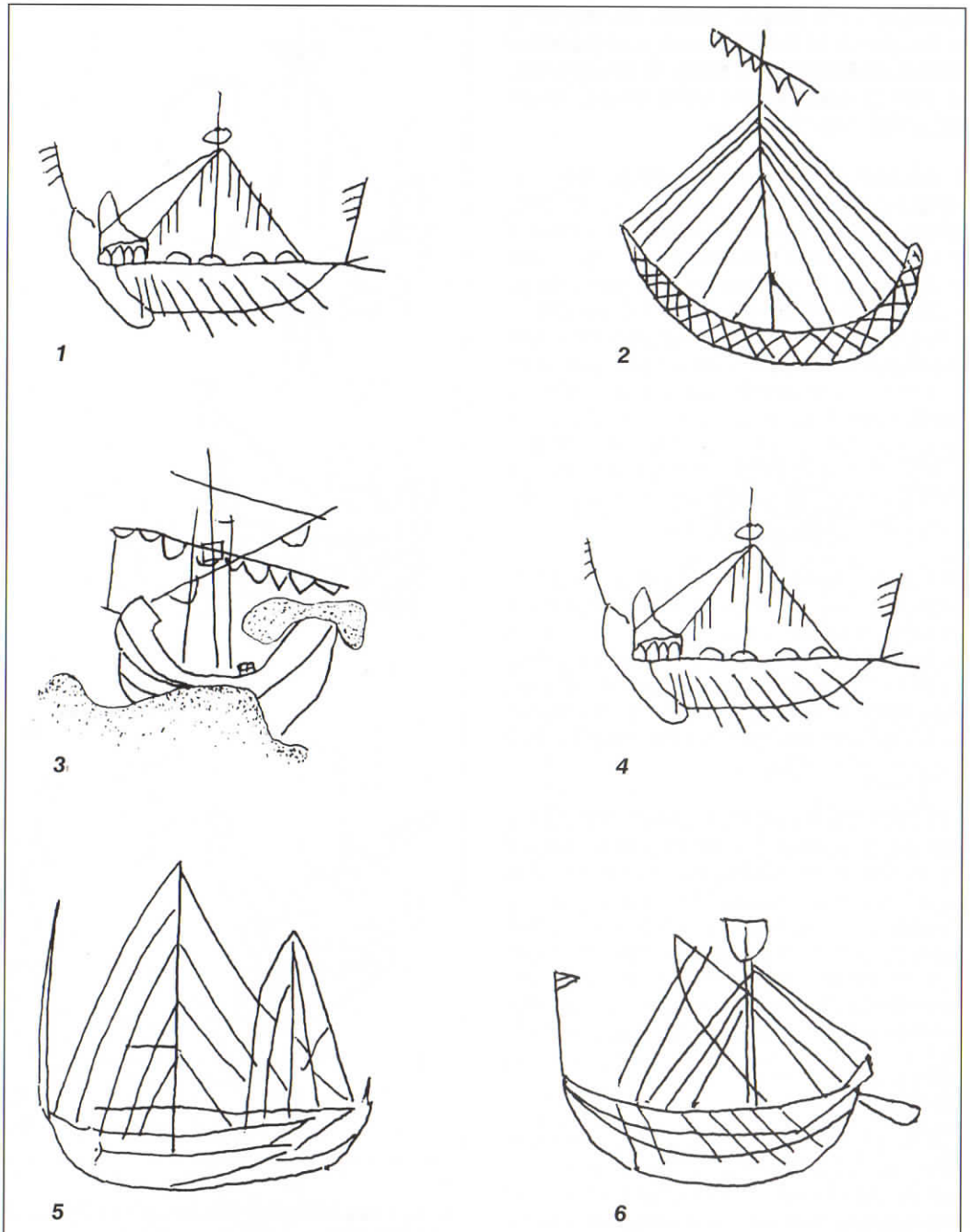


Fig 3. *Graffiti depicting various types of medieval ships.*

NOTES

[1] Ex-voto marins du Ponant (Nantes-Caen-Dunkerque, Novembre 1975 à Mai 1976), Paris 1975.

[2] S. Helms, "Ship Graffiti in the Church of San Marco in Venice," *IJNA* 1975, 4, 229-236.

[3] O.Meinardus, "Mediaeval Navigation According to Akidographemata in Byzantine Churches and Monasteries," *Deltion tis Christianikis Archaiologikis Hetaireias*, 1972, 29-52; L.Basch, "Graffiti navals grecs," *Le petit peroquet*, 22, 1978, 43-46.

[4] M.Carlake, "Early Ship Engravings in the West African Coast," *Tanganika Notes and Records*, 1964, 197-206; J.Muscat, "Maltese Ship Graffiti," in *Medieval Ships and the Birth of Technological Societies II. The Mediterranean Area and European Integration*, Malta, 1991, 323-381.

[5] D.Ovcharov, "Ship graffiti from medieval Bulgaria," *IJNA*, 137, 6, 53-61; N.Ovcharov. "Byzantine Dromon as shown on Bulgarian Graffiti Drawings," in *Medieval Ships and the Birth of Technological Societies, II. The Mediterranean Area and European Integration*. Malta, 1991, 381-388.

[6] Ch.Villain-Gandossi, "Graffiti des bateaux à Nessebar," *Byzantinobulgarica* VII (Sophia, 1981), 406 ff.; N.Ovcharov, Ship and Shipping in the Black Sea (XIV-XIX s.), Sofia, 1993; N. Ovcharov, "Legendes et rites maritimes refletes dans les dessins-graffiti des eglises de Nessebar (XIV-XVIII s.)," *Tropis III, 3rd International Symposium on Ship Construction in Antiquity, Athens 1989* (ed.1995), 327-333.

THE POINT IRIA WRECK (1994)

Haramlambos Pennas
Yiannis Vichos
Christos Agouridis

I. COMPLETION OF THE EXCAVATION

During the 1994 season on the Point Iria wreck excavations were completed in the demarcated area where the main bulk of the ship's cargo was found. The second and last excavation of the Point Iria wreck was carried out between 15 July and 30 August 1994.

The first week was spent in preparations for the excavation. A team of technicians performed the necessary maintenance tasks on the installations and readied the HIMA encampment on the Iria beach. To the existing 1993 installations was added a second transport container, supplied by the Olympic Metro company, in which the work of drawing took place, the first conservation treatment of the finds was carried out, and the computer for recording the inventory of finds was housed. The diving boat Siomos belonging to Kostas Nizamis was once again used to assist the underwater excavation, together with HIMA's inflatable boat and a chartered *kaiki*.

Excavation work began on 24 July, and over a period of 45 days the Institute's excavation team carried out a series of tasks in order to complete the excavation of the demarcated zone. The following tasks were carried out:

Reinstallation of the perimeter line in the areas of the previous excavation and its extension.

During the excavation the perimeter line was extended a few metres to the south-west in order to include within the boundary a new stirrup jar (A37), which must have belonged to the ship's cargo of pottery.

The extension of the perimeter created a fourth Sector (SIV) , which contained sandy areas worth excavating and as in similar small patches of sand among the rocks in other parts of the demarcated area a number of finds were discovered.

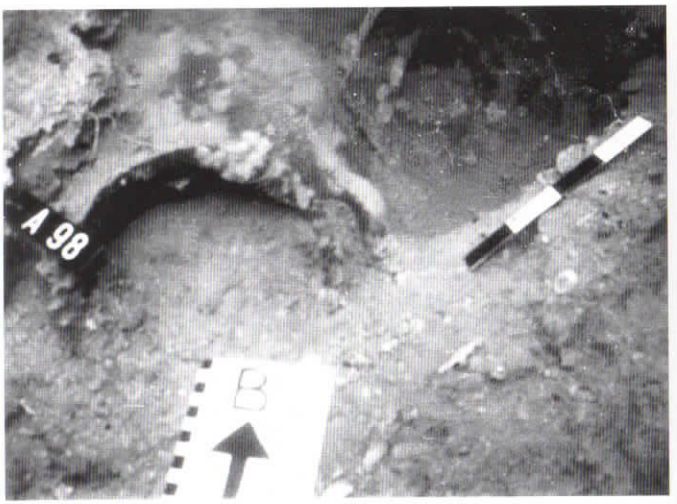


Fig. 1.
Jar A98 on the bottom. To the left can be seen part of the Mycenaean amphora A99 (photo: N. Tsouchlos).

Completion of the excavation in Sector SII

The excavation of Sector SII yielded three more important finds, two of which were touching each other: an intact jar (A98), the third of its kind from the cargo, and the upper part of a Mycenaean amphora in three pieces with incised marks on the handles (A99). The excavation of these two finds was very difficult, due in part to the steeping sloping seabed, which caused the sand to constantly cover the excavated places, and the presence of concretions on the finds, as well as to the nature of the finds themselves (Fig.1). It took the team five continuous days of work to free and raise the jar because of its size and fragility (Fig. 2), and at the same time great care was needed to uncover the amphora A99 with its thin walls.

The third important find in the area (Fig. 3), between Sectors SI and SII was another stirrup jar (A93). This excavation was not particularly difficult because it was only lightly concreted to the bottom and lay only few centimetres below the surface of the seabed.

Fig. 2.
Jar A98 raised from the bottom to the deck of the Siamos. (photo: N. Tsouchlos).

Fig. 3. *Stirrup jar A93 just after its discovery (photo: N. Tsouchlos).*

During the 1994 excavation season, the whole area in Sectors SI and SII was excavated. Sector SIII had been fully excavated during the previous season (Fig. 4).

In order to ascertain whether any finds from the ship's cargo had rolled down to the lower part of the area (where the bottom levels out at a depth of about 30m) the team carried out two combined tasks:

A. Bottom sounding with a metal rod in an area some 2 x 30 m, starting from point 5 in the perimeter and moving southwards.

B. An exploratory trench down to bed rock to the west of side 4-5 in Sector SIII, where there was a thick layer of deposits. Although the area was investigated down to bed rock (at a depth of about 40 cm below the surface of the bottom), no new finds or any evidence of the existence of finds were discovered.

A survey of the seabed over a wider area, marking, photographing, videoing and plotting additional finds visible outside the perimiter boundary

At a depth of 12 metres, 60 metres NW from the tip of the point and thus, 200 metres east of the main bulk of the cargo, a stone anchor (Ω102) with three holes in it (Fig. 5) was found. The considerable distance from the main bulk of the ship's cargo means it is unlikely to be part of the Cypro-Mycenean wreck. A microscopic study of a sample taken from its base will provide useful information on the origin of the rock

It is nearly triangular and slab-like withthree tubular apertures, one at the top for the attaching the rope and two at the base for the wooden spikes which caught in the bottom. It weighs 35 kilos, is 42 cms wide and 7 cms thick, and is made from a dark, dense, volcanic

Fig. 4.
The concretions made excavating extremely difficult (photo: N. Tsouchlos).

rock with characteristic black crystals. Like the other two stone anchors (A29 and Ω2) found in the area of the wreck (Vichos 1996, 15-18), Ω102, although having general prehistoric characteristics, cannot be positively dated on the basis of its type, since similar anchors were in use from the Bronze Age up to the beginning of the 20th century.

In the same area a group of ceramic tiles was discovered at a depth of 18 metres. They were concreted together in the order in which they sank, showing almost unaltered the manner in which they were first stacked on the ship. No incisions or marks were observed on their surfaces. The tiles are of two types: one flat and one slightly convex. Concretions from several of the first type were brought up as samples. The archaeologist Marie-Francoise Billot, who examined them, believes they were used for covering the inner walls or floors of buildings, probably in medieval times, confirming our initial opinion.

The marking out and excavation of the new sector SIV

During the excavation of the new sector SIV another stirrup jar (A37) was discovered and ploted. The excavation subsequently carried out in the borrom around it did not yield further significant finds, except for a small sherd that must have belonged to pithos A7. In order to determine the thickness of the argillaceous stratum in sector SIV, bottom soundings were made with a metal rod. The overburde in many places was up to 50 cm thick. Next, an exploratory trench was cut (plan 1) in order to study the morphology of the sea-bed and the possibility of the presence of finds close to the bedrock.

Topographic and photographic scale plan and documentation

All the finds were recorded and photographed in situ and work was documented in photographs and videos.

Due to the morphology of the sea-bed, the relatively small number of finds and the considerable distance of some finds from the main bulk, it was judged that the classic three dimensional method was the best for the technical topographic scale plan.

Other finds

During the 1994 excavation numbers of different sized rounded stones of different rocks were discovered in many places. Most of them must have formed part of the ship's ballast (fig. 6) , as the majority of them were of volcanic rock which is unrelated to the grey limestone of the area and their almost spherical shape was due to having been worked and not to natural erosion. It is not impossible that some of the ballast stones were millstones trading as merchandise at some point in the voyage. This practice is known from later wrecks which have been studied, such as for example the Kyrenia and the El Sec-Palma de Mallorca wrecks, both from the 4th C. BC, which were carrying large millstones as ballast. Some of these were brought up as samples.

Some organic remains were also raised: small pieces of wood (Fig. 7) and rope fibres (Fig. 8).

Raising the finds, first conservation measures, recording, photography and drawing.Transport of all the finds to the Spetses Museum

As soon as they were brought to the surface all finds were immersed in tanks of sea-water and the desalination process was begun with the gradual addition of fresh water. Next, a team of conservators carried out a preliminary mechanical cleaning and took the first steps in

Fig. 5. *Stone anchor Ω102 (photo: N. Tsouchlos)*

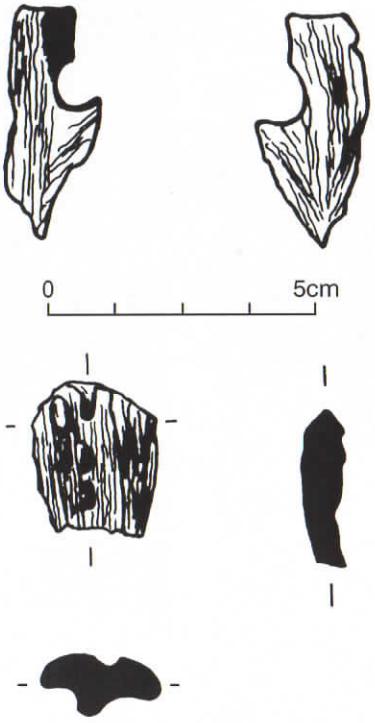


Fig. 7. *Two of the wood fragments recovered. Top: part of a hole that may have held a trunnel (drawing: A. Mari).*

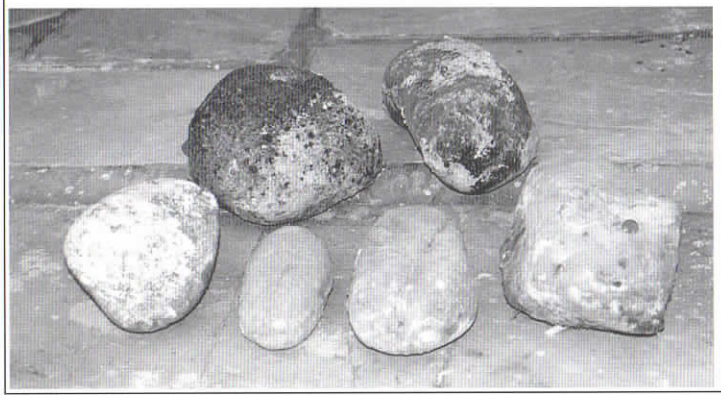


Fig. 6.
Examples of probable ballast stones (photo: N. Tsouchlos)

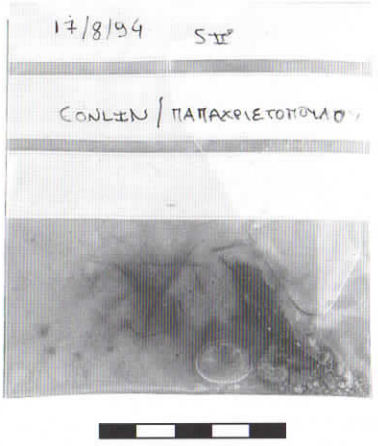


Fig. 8.
One of the two rope samples recovered (photo: Y. Vichos).

Fig. 9.
Condition of jar A98 photographed just after raising and before conservation (photo: Sergio Garbari).

the conservation of the finds. (Fig.9). The whole pots were carefully emptied of their contents and samples of the contents were taken for further laboratory analysis. Inside jar A98 a small triangular sherd from deep bowl (A100, see Figs. 10a and 10b, p. 44) was found, as well as a sherd from amphora A99.

During the excavation season, the conservator Anita Moraïtou organised seminars in conservation for Greek and foreign conservation students (Fig.10). In addition, members of the reseach team recorded, drew and photographed all the objects on the spot. At the end of the period, all the finds were transported by boat to the Spetses Museum, where the desalination, cleaning and conservation work was continued.

Results of the research period

During the 1994 season the excavation of the demarcated area was completed and exploratory trenches and bottom soundings were carried out in other places where it was thought likely that isolated finds from the ship's cargo might be discovered.

A number of new finds were located and raised, completing the three groups of pottery (Mycenaean, Cretan and Cypriot) that had already been identified in the previous season.

In particular, two further examples (A37 and A93) were added to the group of Cretan stirrup jars, bringing the total discovered to eight. A third jar, the complete A98, was added to the group of Mycenaean jars and a sherd from a painted deep bowl was added to the examples of fine Mycenaean pottery. Lastly, some of the fragments recovered belong to the three pithoi from the Cypriot group.

To the few finds that may have belonged to the actual ship, some rounded stones from its ballast were added along with the organic remains, which probably came from the rigging or hull.

Our conclusions about the site, the morphology of the sea bottom, and the stratigraphy of the 1993 excavation (Pennas & Vichos, 1996, 14) were confirmed and strengthened by the evidence and observations in 1994. Regarding the geomorphology of the area around the headland, Ilias Spondilis made some interesting comments: "Along the entire coastline from the wreck to the tip of Point Iria, the limestone shows natural erosion at the present mean sea level owing to the konwn bio-chemical processes. Below this line, however, at a depth of about 1.50 m, another similar line of erosion is clearly visible. Also discernible in places at a depth of about 1.65 m below the second (i.e. 3.15 m below the present mean sea level) is a third, which is less obvious."

Following the excavations of 1994 the excavators are convinced that all the cargo on board the "Cypro-Mycenaean" ship at the time it sank was recovered during the excavation, with

Fig. 10.
Archaeologists busy with first conservation steps (photo: S. Garbari).

Fig. 11. Archaeologists, members of the research team in meeting at Iria.(photo: Sergio Garbari).

the exception of the fifth Cypriot pithos, which had been stolen from the site in the period between the original discovery of the wreck and the start of the excavation.

Since it is virtually impossible to totally excavate any archaeological site, and all the more so a shipwreck scattered over an irregular sea-bed, the Iria excavation team is considering the possibility of returning to the site in the future. Perhaps the use of sophisticated instruments for detecting objects beneath the surface of the sea-bed in the wider area around the main concentration might yield further fragmentary finds possibly belonging to the ship's cargo, although it would not radically change the present overall picture.

The 1994 excavations were carried out by the following 45 member team of the Hellenic Institute of Marine Archaeology (Fig. 11):

Members of the excavation team:

- Haralambos Pennas, director of the excavation
- Yannis Vichos, deputy director of the excavation
- Christos Agouridis, assistant director of the excavation
- Dimitris Kourkoumelis, assistant director of the excavation
- Yannos Lolos, responsible for the study of prehistoric pottery
- Nikos Tsouchlos, technical director of the excavation, president of HIMA
- Phaidon Antonopoulos, diving master
- Vasilis Koniordos, mapping and plotting and video-filming, architect
- Anita Moraitou, in charge of conservation

Archaeologists:

Ilias Spondylis, David Conlin, Stella Demesticha, Thanos Aronis-Webb, Haralambos Kritzas, Elina Stamatatou, Georgos Valvis, Alexandra Mari, Christina Papachristopoulou, Vasiliki Lazari, Theotokis Theodoulou, Roxani Margariti, Dimitiris Sotirakis, Konstantina Benisi.

Historians:

Christos Artopoulos, Viki Stefatou

Students of archaeology:

Mari Karamanzani, Dimitra Mitilinaiou, Richard Fawcett, Kostas Paravadis

Technicians:

Iason Lykourezos, physicist, assistant diving master; Eleftheria Papadima, conservator of antiquities; Sergio Garbari, photographer; Yannis Baltsavias, architect/civil engineer; Stavros Vosiniotis, mechanical engineer; Georgos Vosiniotis, chemist; Paraskevi Papageorgiou, conservator of antiquities; Vasilis Kavoulakos, aeronautical engineer, diver; Nikos Tzanoudakis, diving instructor; Kostas Kirklis, **mechanic;** Sergios Tefarikis, electrician; Petros Vakondios, technician, diver; Nikos Miliadis, technician, diver; Yannis Garras, technician, diver; Markos Garras, technician, diver; Ileana Antonopoulou, student, diver; Dexippos Agouridis, diver; Christos Palantzas, student, diver.

Representatives of the Ephorate of Underwater Antiquities:

Georgos Mavrofridis, Angelos Ritsonis, Maria Gotzamani, Frosso Mantziou, Magda Athanasoula, Katerina Brillaki, Georgia Tsartsidou, Dionysis Evangelistis, archaeologists.

Personnel:

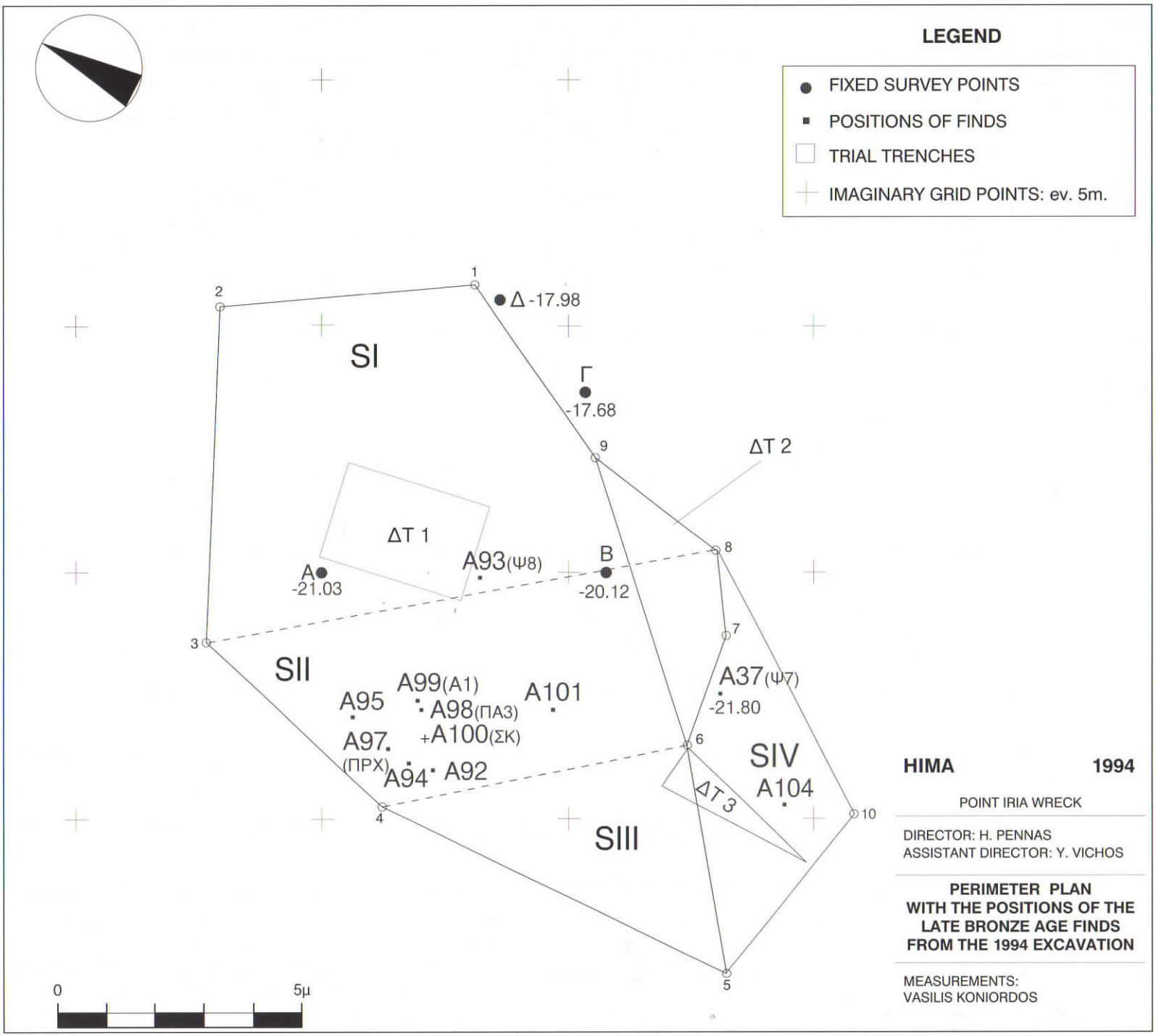
Georgos Gikouris, skipper of the Siomos, diver; Panayotis Christofileas, cook; Dionysis Lekas, skipper of the Kalokyra.

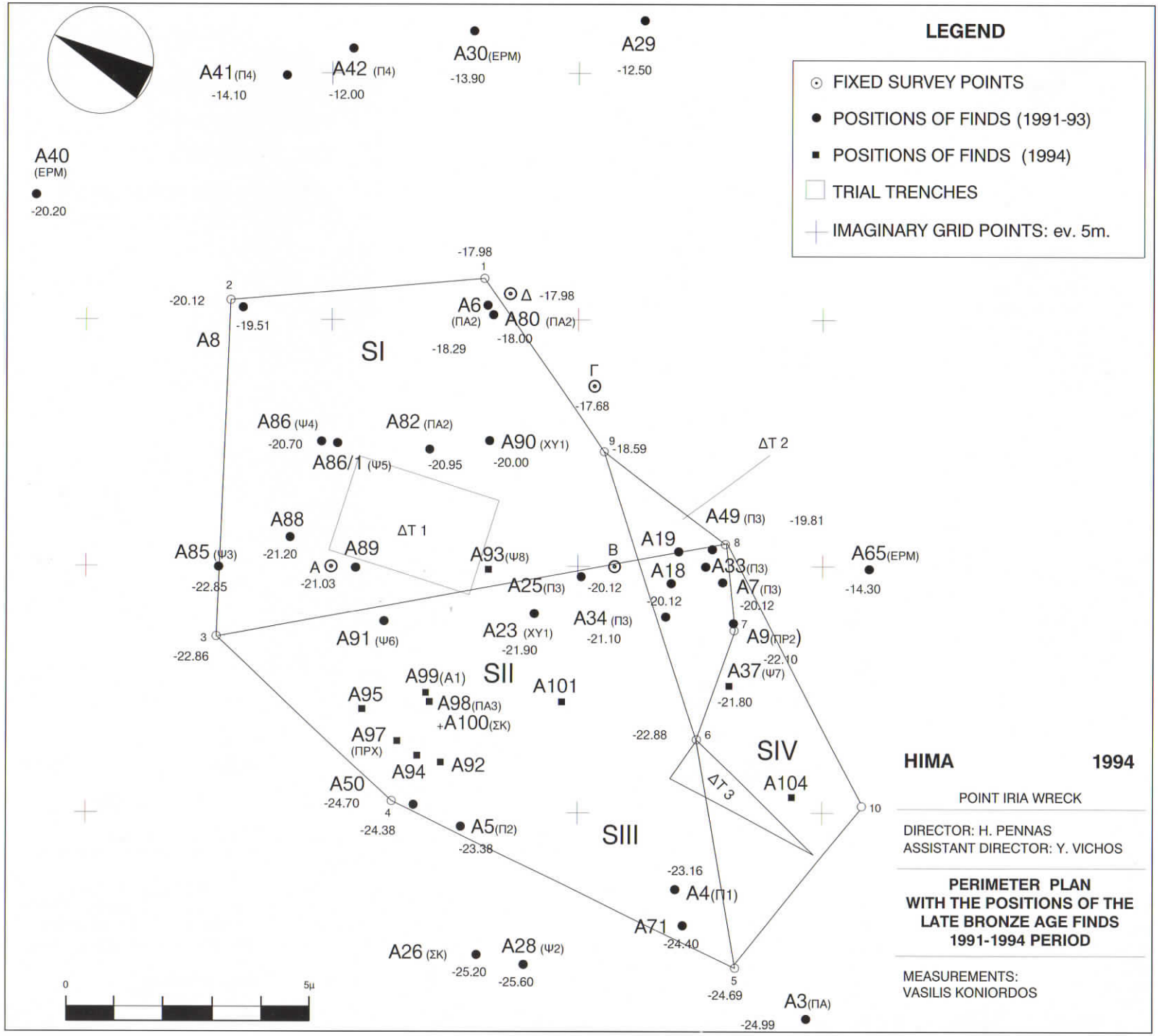
Conservation seminar team:

Yannis Staikopoulos; Metaxia Ventikou; Penelope Demesticha; Sindy Brayshaw; Marston Hunt Morgan; Thomas Schmitzehe.

Visitors:

The excavation was visited by the academician Mr. Spiros Iakovidis. The HIMA encampment was also visited by Mr Alexandros Lykourezos, the HIMA sponsor.


LEGEND
FIXED SURVEY POINTS
POSITIONS OF FINDS
TRIAL TRENCHES
IMAGINARY GRID POINTS: ev. 5m.
1
2
Δ -17.98
SI
Γ
-17.68
9
ΔT 2
ΔT 1
A93(Ψ8)
A
-21.03
B
-20.12
8
3
7
SII
A95
A99(A1)
A98(ΠΑ3)
A101
A97.
(ΠΡΧ)
+A100(ΣΚ)
A94
A92
A37(Ψ7)
-21.80
6
SIV
A104
ΔT 3
4
10
SIII
5
0
5μ
HIMA 1994
POINT IRIA WRECK
DIRECTOR: H. PENNAS
ASSISTANT DIRECTOR: Y. VICHOS
PERIMETER PLAN
WITH THE POSITIONS OF THE
LATE BRONZE AGE FINDS
FROM THE 1994 EXCAVATION
MEASUREMENTS:
VASILIS KONIORDOS


LEGEND
FIXED SURVEY POINTS
POSITIONS OF FINDS (1991-93)
POSITIONS OF FINDS (1994)
TRIAL TRENCHES
IMAGINARY GRID POINTS: ev. 5m.
A41 (Π4) -14.10
A42 (Π4) -12.00
A30 (EPM) -13.90
A29 -12.50
A40 (EPM) -20.20
-17.98
1
2
-20.12
A8
-19.51
A6 (ΠA2)
A80 (ΠA2) -18.00
Δ -17.98
SI
-18.29
Γ -17.68
A86 (Ψ4) -20.70
A82 (ΠA2) -20.95
A90 (XY1) -20.00
A86/1 (Ψ5)
9 -18.59
ΔT 2
A88 -21.20
ΔT 1
A85 (Ψ3) -22.85
A89
A93 (Ψ8)
A -21.03
B -20.12
A25 (Π3)
A49 (Π3) -19.81
A19
A18 -20.12
A33 (Π3)
A7 (Π3) -20.12
A65 (EPM) -14.30
8
7
A9 (ΠP2) -22.10
3 -22.86
A91 (Ψ6)
A23 (XY1) -21.90
A34 (Π3) -21.10
A99 (A1)
SII
A101
A37 (Ψ7) -21.80
A95
A98 (ΠA3)
+A100 (ΣK)
A97 (ΠPX)
A94
A92
-22.88
6
SIV
ΔT 3
A104
A50 -24.70
4 -24.38
A5 (Π2) -23.38
SIII
10
-23.16
A4 (Π1)
A71 -24.40
A26 (ΣK) -25.20
A28 (Ψ2) -25.60
5 -24.69
A3 (ΠA) -24.99
0
5μ
HIMA 1994
POINT IRIA WRECK
DIRECTOR: H. PENNAS
ASSISTANT DIRECTOR: Y. VICHOS
PERIMETER PLAN
WITH THE POSITIONS OF THE
LATE BRONZE AGE FINDS
1991-1994 PERIOD
MEASUREMENTS:
VASILIS KONIORDOS

THE POINT IRIA WRECK (1994)

Yannos G. Lolos

II. THE POTTERY

During the 1994 excavation season a number of base and body fragments were recovered, belonging to the large Late Cypriot IIC/IIIA pithos A5 (see Pennas, Vichos & Lolos 1993, fig. 5d). They include nos. A92, A92/1, A2/2, A2/3, A95, A101 and a fragment found inside jar A98. Finding these sherds has made it possible to fully restore pithos A5. Also, in the ongoing study of the Cypriot pottery, two sherds have now been recognised as coming from a fourth Cypriot pithos. These are A58 and A41 (parts of a base and lower body), the clay of which contains many relatively large grog inclusions.

Also of certain or almost certain Cypriot provenance is the half of a jug (now restored) A97 (figs. 1a, 1b), which quite possibly had been inside the Cypriot pithos AA5/A92, since it was found directly under its fragments. The partially preserved rim of the jug may have been round with a small spout, or it may have had a rudimentary trefoil mouth. In its general shape, jug A97 is closer to known Late Cypriot jugs than to small Late Mycenaean versions, which are generally better made. A small trefoil mouth jug was found amongst the Cypriot material from the Uluburun wreck (Bass 1987, 711: upper left).

A striking find from the 1994 excavation was the complete two-handled jar A98 (Fig. 2), h. 65 cm, dating to the Late Helladic IIIB2 period (for which see also Vichos & Lolos 1997, fig. 13). This is third such vase to have been recovered from the main body of the Iria wreck (the other two examples are A3 and A6/1-A80-AA80/1-A82). The clay, full of inclusions and badly fired, closely resembles that of the other two jars.

Among the pottery from the wreck we have in the intact example A98 for the first time a complete profile of this type of jar, which is rather unusual for plain Late Bronze Age. Aegean pottery. Close parallels for plain two-handled jars of the Iria type are found amongst the published pottery from Tomb II at Prosymna

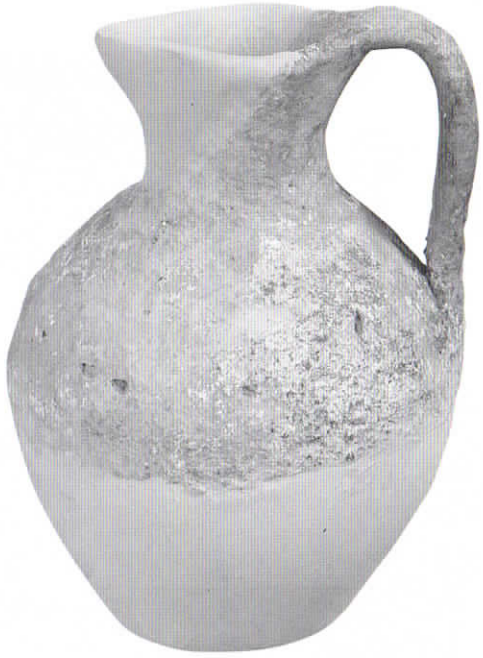


Fig. 1a. *Jug A97 after restoration (photo: N. Tsouchlos).*

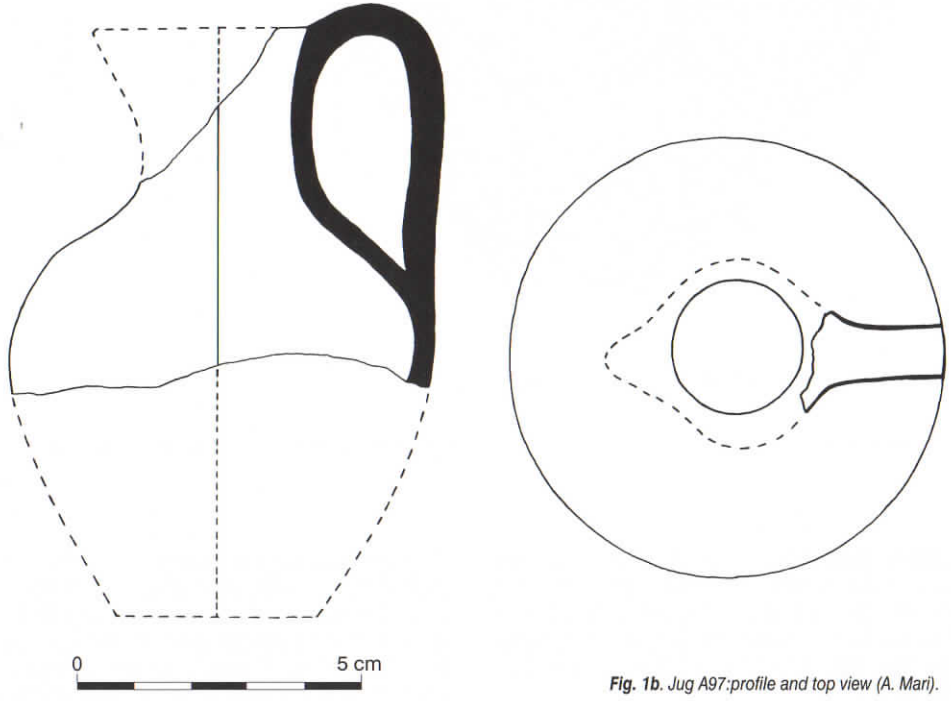


Fig. 1b. *Jug A97:profile and top view (A. Mari).*

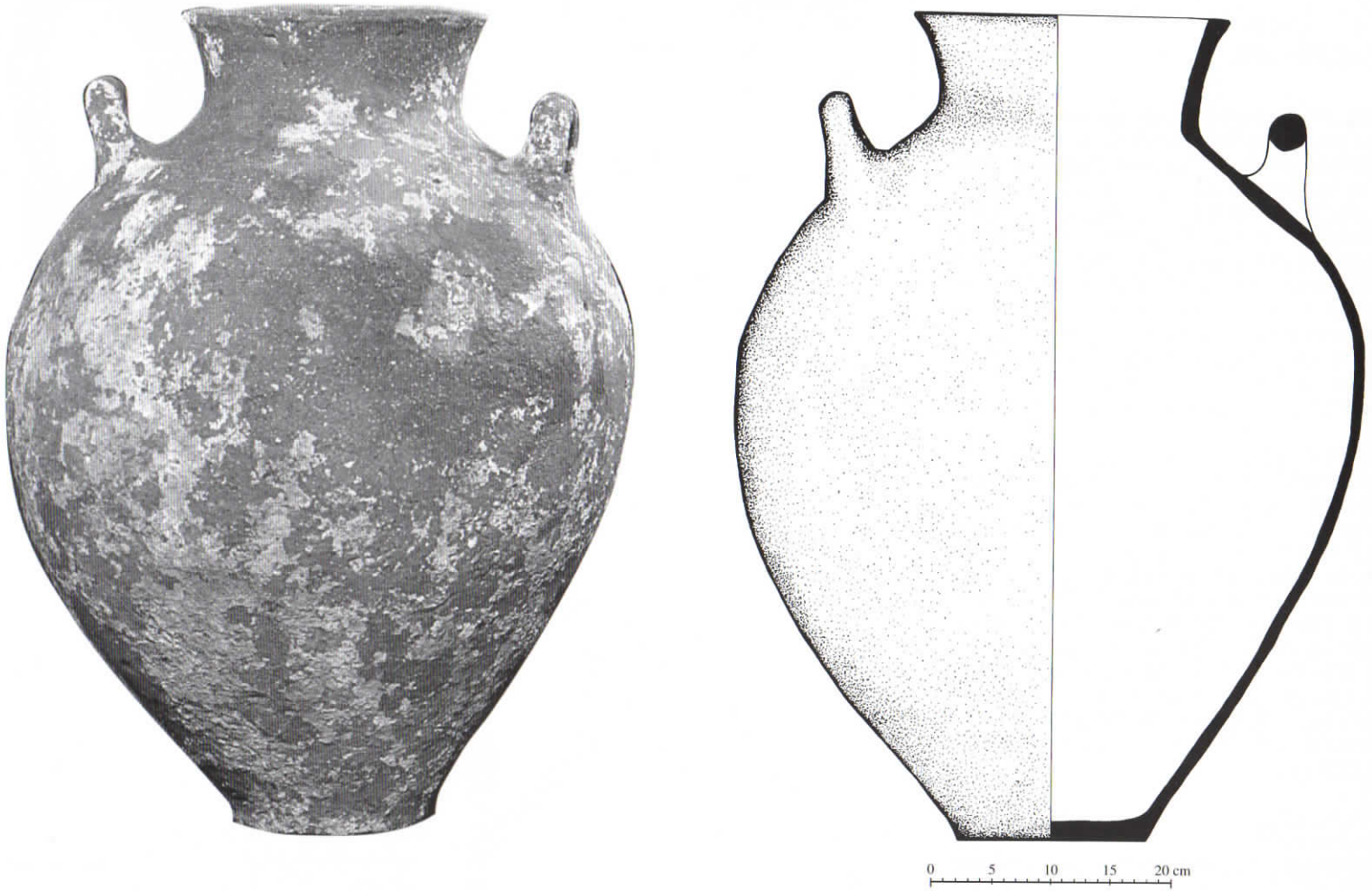


Fig. 2. Jar A98 (photo: K. Xenikakis; drawing A. Mari).

in Argolida (see Blegen 1937, fig. 430) and from Storeroom 38 in Nestor's Palace at Pylos (plain example in the 2nd storeroom of the Archaeological Museum of Chora in Triphylia, Excav. Inv. No. 55.611, and Chora Mus. Inv. No.1419).

With the discovery of the commercial stirrup jars A93 (Fig. 3) and A37 (Fig. 4) in the main concentration of pottery during the 1994 excavation, the total number of stirrup jars from the Point Akrotiri wreck comes to eight. This represents a considerable underwater group of pots of this kind, almost equal to the earlier (by some 100 years) group of tall stirrup jars of the coarse type from the Uluburun wreck off Lycia (ca. 1305 BC).

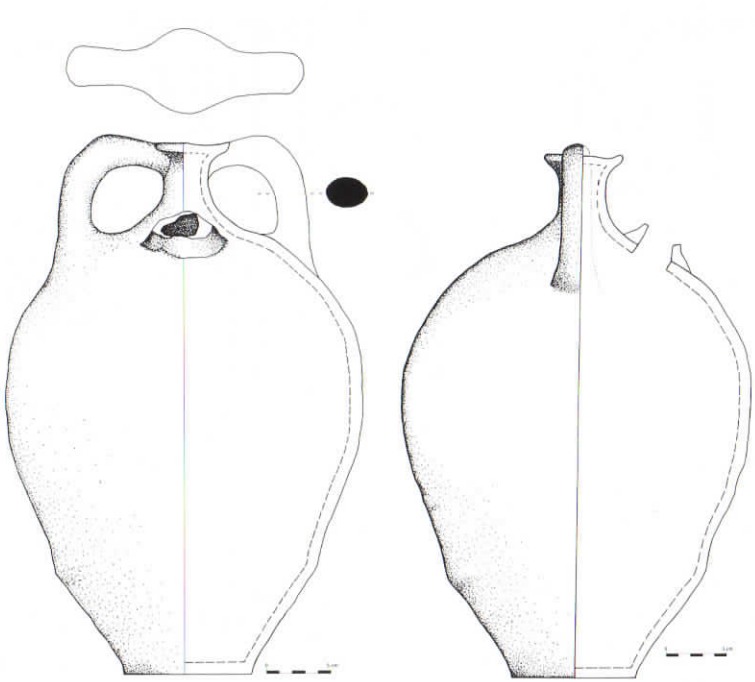


Fig. 3.
Stirrup jar A93. Left: front view. Right: side view (S. Demesticha).

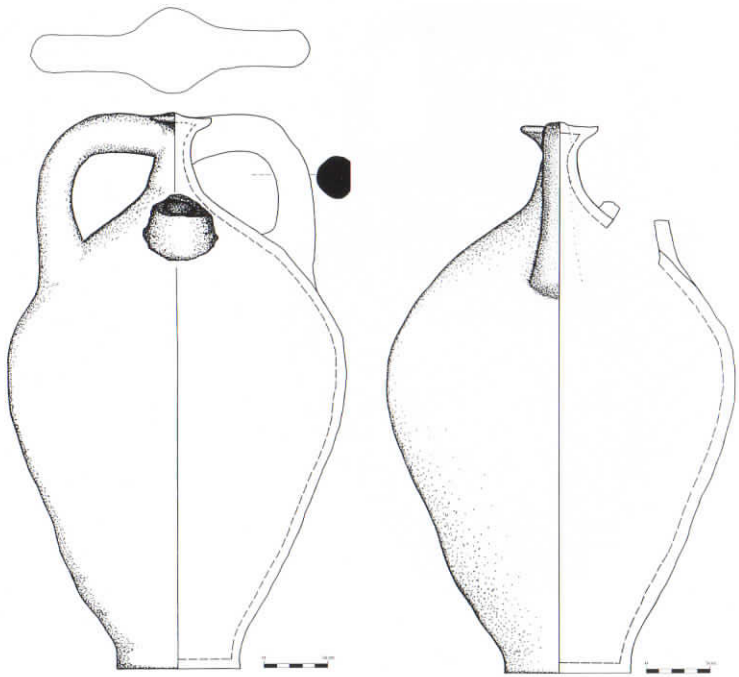


Fig. 4.
Stirrup jar A37. Left: front view. Right: side view (S. Demesticha).

Both 1994 stirrup jars are nearly complete, with only their vertical cylindrical mouths missing. Based on the first results of the petrographic examination of the clay by Dr Peter Day, they appear to be Cretan products like the rest of the examples from the wreck.

Of particular is the partly preserved (now restored) plain amphora A99 (Figs. 5, 6a, 6b) with two flattened handles from rim to shoulder, which was found during the excavation of Sector SII. Although this is a well-known type of Late Helladic IIIB amphora (see Furumark 1941, shape 69; also Blegen 1937, figs. 177: 316, 303, 289; 455: 134, 116, 118), this vessel acquires special importance because of the existence of a large incised linear sign or symbol resembling the Arabic numeral 1 on each of its handles. The two incised symbols, which appear to have been made after firing, cannot be regarded as the potter's marks. They have almost exact parallels in incised linear signs on the handles of Late Mycenaean vases from the large Tomb VI at Minet-el Beida, the port of Ugarit in Syria (Schaeffer 1949, fig. 59: 1e, j).They should rather be assigned to a large group of incised signs on Aegean vases of the 14th and 13th c. BC from different localities in the Eastern Mediterranean, which according Mrs Nicolle Hirschfeld in her special study (1993) concludes belong to a special Cypriot system of vase marking, arising from the commercial needs of the time and related to the Cypro-Minoan 1

Fig. 5.
Amphora A99, after conservation (photo: K. Xenikakis).

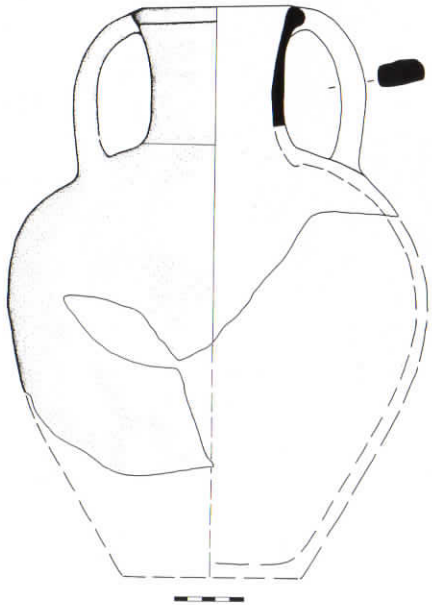


Fig. 6a.
Amphora A99. Front view and section (A. Mari).

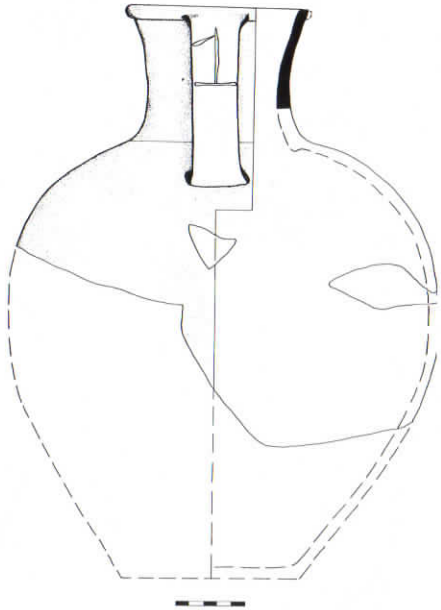


Fig. 6b.
Amphora A99. Side view and section, with incised mark on handle (A. Mari).

script. The incised signs on amphora A99 in fact show a great similarity with those recently recognised on Cypriot copper ingots from the Uluburun wreck (see Sibella 1996, 9, 10, fig. 1: 6a).

In the case of the fine Mycenaean vases from the cargo, the painted rim and wall fragment of the deep bowl A100, which was found in 1994 inside jar A98, does not belong with the large deep bowl fragment A26 from the 1993 excavation (see Pennas, Vichos & Lolos 1996, 26, fig. 7). The latter, after cleaning, can be identified (I have Dr Aikaterina Demacopoulou to thank for this suggestion) as a stemmed bowl (for the type, see Furumark 1941, shape 305; Mountjoy 1986, 132, 133 fig 165).

The deep bowl sherd A100 (Figs. 10a, 10b), the only fragment to date of a fine Mycenaean vase from the wreck that has preserved part of its painted decoration, should be dated to the end of Late Helladic IIIB2, based chiefly on its panelled pattern-triglyph decoration (see Furumark 1941, motive 75; Mountjoy 1986, 121, 123, figs. 158: 24; 159: 1; 161: 9).

The pottery cargo of the wreck: General comments

With the completion of the 1994 excavation in the area of the main concentration we are now in a position to make some definitive general comments about the chronology, composition and importance of the cargo of pottery from the Point Iria wreck.

First of all this underwater pottery assemblage (see cover picture) constitutes one of few such groups that have been recovered to date from the wreck of a Late Bronze Age merchant ship in the Mediterranean.

Fig. 7. Group of Cypriot pithoi (photo: K. Xenikakis).

It contains 25 complete, fully restored or partly preserved pots, and originally included a Cypriot pithos, now lost, which was earlier photographed by Nikos Tsouchlos on the seabed. These pots appear to have formed the main bulk of the pottery cargo of the wrecked ship, if not in fact the whole of it.

The exact date of the cargo may safely be assigned to a very late phase of Late Helladic IIIB2, around 1200 BC, and this is further supported by the painted deep bowl fragment, which dates to the latest LH IIIB2 phase.
Indirect external confirmation of a date for the cargo and wreck in the years around 1200 BC, or the decade 1200-1190 BC at the latest, is offered by two pottery finds from the destruction level in Storerooms 32 and 38 of Nestor's Palace at Ano Engliano in Western Messenia: a tall commercial stirrup jar of the coarse variety, and a two-handled jar, both of them Aegean types of transport vessels found in the wreck cargo and present together in the same Palace destruction level, which the excavator, Carl Blegen and also more recent excavators date to the end of Late Helladic IIIB2 (Blegen & Rawson1966, 395 shape 56, 403 shape 65a, figs. 329: no. 402, 330: no. 611, 384: no. 611, 389: no. 402, 390: no. 402; Shelmerdine 1998, 88; Griebel & Nelsen 1998, 97; Bennet 1998, 126).

Summarising the evidence from the 1990-1994 excavations, the cargo of the Point Iria wreck comprises three different categories of pottery:

1. a Cypriot group (Late Cypriot IIC/IIIA) consisting of eight pots;
2. a Cretan group (Late Minoan IIIB2) of eight pots; and
3. a Helladic/Mycenaean group (Late Helladic IIIB2) of nine pots.

Fig. 8.
Group of Cretan stirrup jars (photo: K. Xenikakis).

Fig. 9. Group of Mycenaean jars (photo: K. Xenikakis).

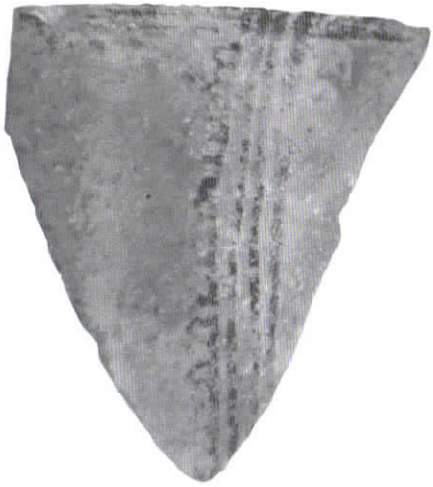


Fig. 10a.
Deep bowl sherd A100 after cleaning (photo: Y. Lolos).

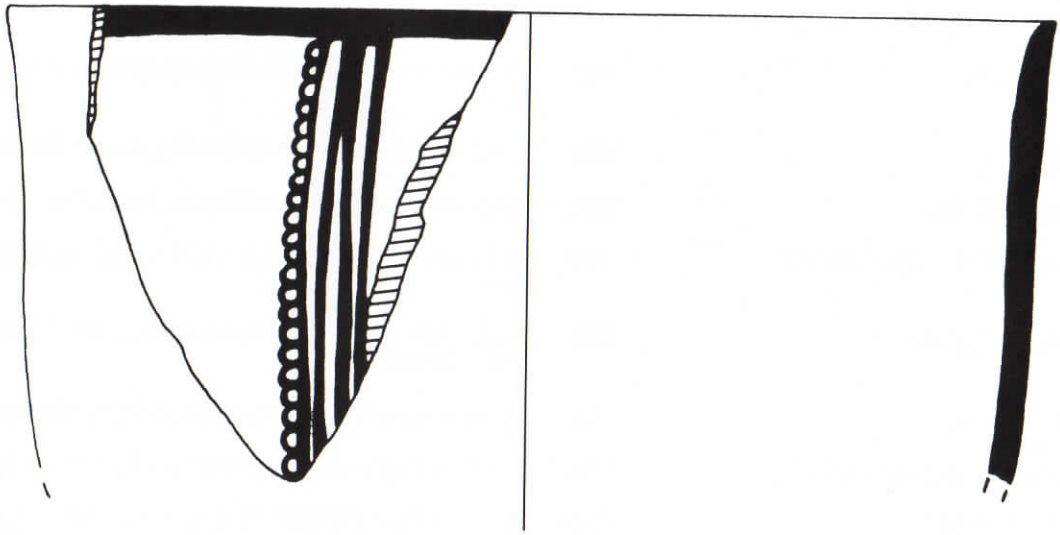


Fig. 10b.
Deep bowl sherd A100. Section and decoration (A. Mari).

All three groups are characterised by the presence of large transport vessels (Figs. 7, 8, 9). Cypriot pithoi, durable vessels with a variety of uses, are predominant in the first group. The second group consists of stirrup jars of Cretan origin, made of coarse gritty clay and known as chlareis from the Linear B texts at Pylos; they were intended mainly to store and transport olive oil. The third is dominated, because of their size, by three jars of Helladic type. The handleless Cypriot pithos with an ovoid-conical body and the tall Aegean stirrup jar were well established types with an international circulation in the late 14th and the 13th centuries BC, and they are found from Ugarit in Syria as far as Sicily and Sardinia.

The mixed character of the Point Iria cargo is a feature of the pottery found on nearly all ancient wrecks (see Parker 1990, Treister 1993, Lone Wriedt Sørensen 1997), and this is partly related to the nature and way in which sea trade was carried on in antiquity.

The basic composition of the cargo as determined by the combined presence of Cypriot and Aegean pottery types, including the widely diffused transport vessels, has clear parallels in the large pottery assemblage from the Uluburun wreck of ca. 1305 BC, and it may also be partly found in that from the Cape Gelidonia wreck of ca. 1200 BC on the south coast of Turkey.

A difference between the pottery from these two wrecks on the Asia Minor coast and that of Point Iria is the absence from the latter of any Syrio-Palestinian vases, such as small pots for everyday use and Canaanite amphoras, which are known from five sites in Argolida and Korinthia (Nemea-Tsoungiza, Mycenae, Argos, Tiryns and Asine).

Nevertheless, although the pottery cargo from Point Iria seabed as a one-phase underwater unity so far has no parallel in the Aegean region, the coexistence and synchronous circulation of Aegean, Cypriot and also Syrio-Palestinian pottery types would not be out of place in major coastal centres with developed external relations during the 14th and 13th centuries BC such as Tiryns, Kydonia (Chania), Poros near Herakleion and Kommos on the south coast of Crete.

The contents of the Point Iria wreck therefore may be taken as confirmation of an established pattern of movement of particular types of transport vessels and products connected with the barter trade between Eastern Mediterranean and Aegean centres in around 1200 BC rather than as emphasising the distinctiveness of this cargo.

BIBLIOGRAPHY

Bass G. F., 1987: "Oldest Known Shipwreck Reveals Splendors of the Bronze Age", *National Geographic* 172, 693-733.

Bennet J., 1998: "The Linear B Archives and the Kingdom of Nestor", in Davis 1998, 111-133.

Blegen C. W., 1937: *Prosymna: The Helladic Settlement Preceding the Argive Heraeum*, Cambridge.

Blegen C. W. , Rawson M., 1966: *The Palace of Nestor at Pylos in Western Messenia* I, Princeton University Press, Princeton, New Jersey.

Davis J. L. (ed.), 1998: *Sandy Pylos: An Archaeological History from Nestor to Navarino*, University or Texas Press, Austin, Texas.

Furumark A., 1941: *The Mycenaean Pottery: Analysis and Classification*, Stockholm.

Griebel C. G., Nelson M. C., 1998: "The Ano Englianos Hilltop After the Palace," in Davis 1998, 97-100.

Hirschfeld N., 1993: "Incised Marks (Post-Firing) on Aegean Wares," in Zerner C., Zerner P., Winder J. (eds.), *Proceedings of the International Conference: Wace and Blegen, Pottery as Evidence for Trade in the Aegean Bronze Age 1939-1989*, J. Gieben, Amsterdam.

Mountjoy P. A., 1986 *Mycenaean Decorated Pottery: A Guide to Identification* (*SIMA* Vol. 73), Göteborg: Paul Åströms Förlag.

Parker A. J., 1990: "Classical Antiquity: The Maritime Dimension," *Antiquity* 64, 335-346.

Pennas H., Vichos Y., Lolos Y., 1995: "The 1991 Underwater Survey of the Late Bronze Age Wreck at Point Iria," *ΕΝΑΛΙΑ ANNUAL* III (1991) 4-16.

Pennas H., Vichos Y., Lolos Y., 1996: "Ναυάγιο Ακρωτήριου Ιρίων (1993)," *ΕΝΑΛΙΑ* IV, 3/4, (1992), Αθήνα, 4-29.

Schaeffer C. .F.-A., 1949: *Ugaritica* II, Paris

Shelmerdine C. W., 1998: "The Palace and its Operations," in Davis 1998, 81-96.

Sibella P., 1996: "Continuing Study of the Uluburun Shipwreck Artifacts: The Copper Oxhide and Bun Ingots", *The INA Quarterly* 23, 1, 9-11.

Sørensen, Lone Wriedt, 1997: "Traveling Pottery Connections Between Cyprus, the Levant and the Greek World in the Iron Age," in Swiny et. al. 1997, 285-299.

Swiny S., Hohlfelder R., Wylde Swiny H. (eds.), 1997: *Res Maritimae, Cyprus and the Eastern Mediterranean from Prehistory to Late Antiquity, Proceedings of the Second International Symposium "Cities on the Sea," Nicosia, Cyprus, October 18-22, 1994, CAARI Monograph Series* 1, Scholars Press, Atlanta, Georgia

Treister M. Y., 1993: "Notes on International Trade in the 6th - 4th Century BC," in Guldager P., Nielsen I., Nielsen M., (eds.), *Aspects of Hellenism in Italy, Acta Hyperborea* 5, University of Copenhagen, Copenhagen.

Vichos Y., Lolos Y., 1997: "The Cypro-Mycenaean Wreck at Point Iria in the Argolic Gulf: First Thoughts on the Origin and the Nature of the Vessel," in Swiny et. al. 1997, 321-337.

EXHIBITION OF FINDS FROM THE POINT IRIA WRECK IN THE SPETSES MUSEUM

Organisation and administration
Fotini Vlachaki

An exhibition of finds from the wreck, with the title "From Sea-born Cyprus to the Bight of Thirsty Argos: the Point Iria wreck", was organised at the Spetses Archaeological Museum (Fig. 1) as part of the programme for the study, publication and report of the results of the Point Iria excavation.[1]

The exhibition was opened on Sunday 20 September 1998 by the General Secretary of the Ministry of Culture Mr. Evgenios Yannakopoulos, in the presence of the former Minister of Culture Mrs Anna Psarouda Benaki, the Mayor of Spetses Mr Yorgos Thimaras and a large number of guests.

In 1998 the 2nd E.B.A., under whose jurisdiction the Spetses Museum falls, gave HIMA three rooms and part of a third, 72m^2 in all, in the eastern wing of the ground floor of the Hadziyannis Mexis mansion to mount the Point Iria wreck exhibition.

Designs were begun in the winter of 1998 for a museum display that would chronicle the voyage and wreck of a 3200 year old ship. The visitor would be introduced to an assemblage of archaeological finds which, apart from its general historical value, constitutes the visible evidence of a nautical tragedy that occurred in those distant times, under weather conditions as familiar then as they are today in that area.
The full measure of man's nautical perigrinations through the centuries and the secrets hidden beneath the seas of every land do not easily fit into the limited space of an exhibition nor are best conveyed in the context of a museum display. Our team of designers,[2] therefore, set out to incorporate the information yielded by the archaeological study of the finds into a scenic presentation of their functional naturen and of the underwater environment in which they were found. Our first priority was to ensure as far as possible the visitor's direct contact with the finds themselves in spite of the obvious

Fig. 1

Photos: Kostas Xenakis

Fig. 2

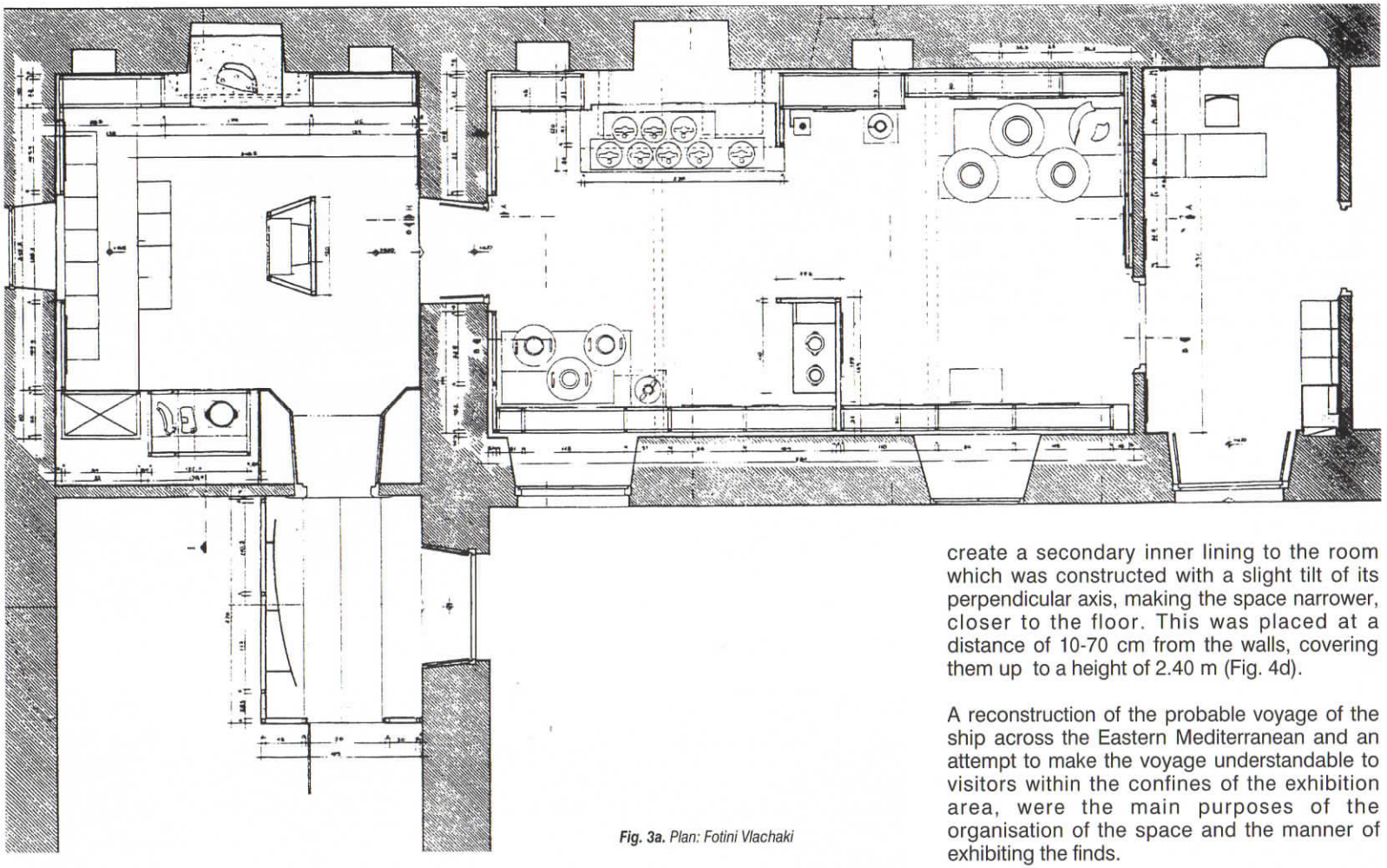


Fig. 3a. Plan: Fotini Vlachaki

limitations set by the use of showcases, as well as with the conditions of underwater archaeological excavation; these we tried to recreate by audio-visual means.

Starting with a the complete plan of the area at our disposal, we realised that the first important task was to repair the rooms, in which the plaster was badly damaged and the electrical fittings were dubious.

However, the biggest challenge faced by the exhibition design team was to incorporate the material to be exhibited into a divided area consisting of kitchen, dining-room with fire-place and the room with the mansion's concealed cistern, in such a way as to display the cargo as a single entity (it represents a ship's cargo). Our aim was also to emphasise the existence of three pottery groups of different provenances (Cypriot, Minoan and Mycenean) and to bring in the nautical evidence of the ship itself (anchors, ballast).

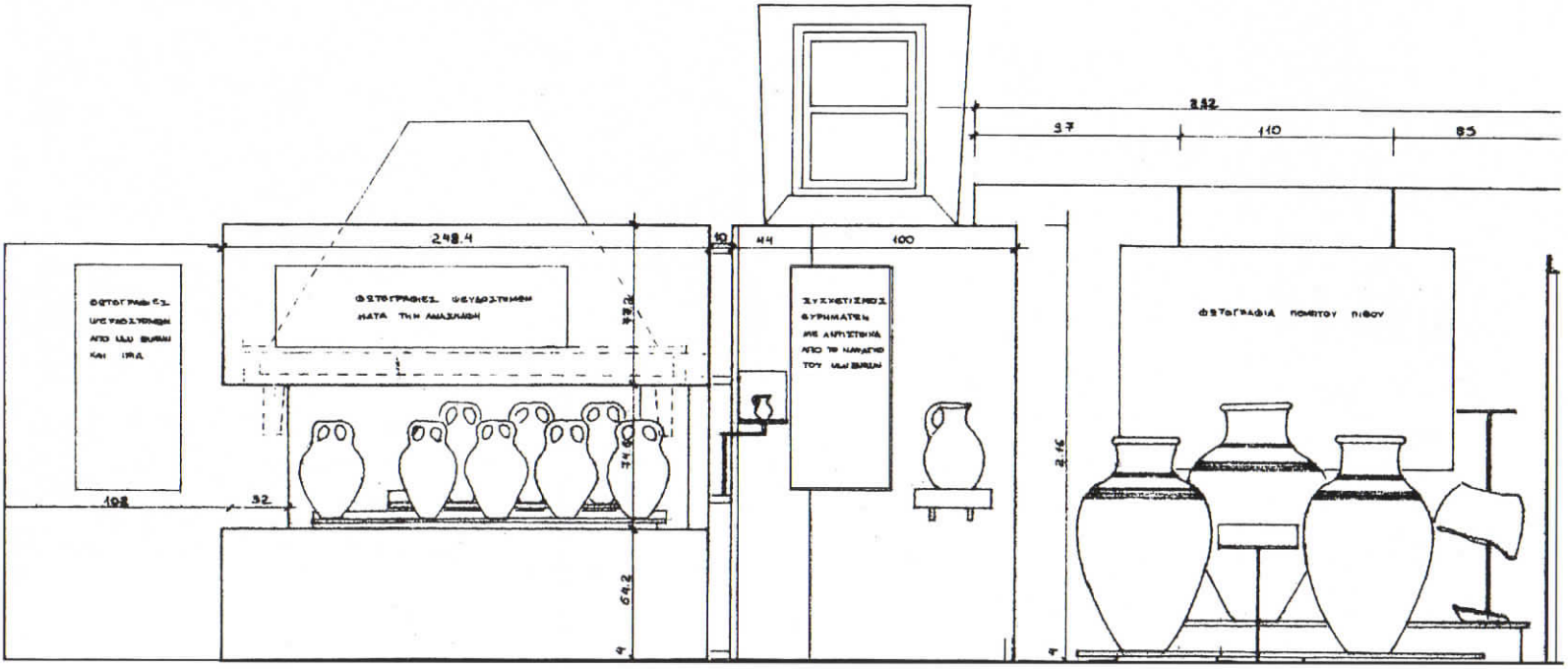
Another difficulty was the requirement that any re-modelling of the space undertaken for the needs of the exhibition had to be temporary and reversible, respecting the historical character of the building which was to house it. Self-supporting structures were therefore used to create a secondary inner lining to the room which was constructed with a slight tilt of its perpendicular axis, making the space narrower, closer to the floor. This was placed at a distance of 10-70 cm from the walls, covering them up to a height of 2.40 m (Fig. 4d).

A reconstruction of the probable voyage of the ship across the Eastern Mediterranean and an attempt to make the voyage understandable to visitors within the confines of the exhibition area, were the main purposes of the organisation of the space and the manner of exhibiting the finds.

As the visitor enters the first room of the exhibition from the specially re-modelled entrance hall, helped by the optical material displayed there (maps of the Mediterranean, showing the probable route of the ship, reconstruction of the the ship, pictorial parallels with contemporary ships), he is informed about the cultural background of the period, the principal trade routes from Cyprus to mainland Greece and on the other hand, and about navigation and ship-building at that time (Fig. 3a).

The visitor begins his tour through space and time at the ship's starting point, represented by the four large Cypriot pithoi and two jugs (Fig.1,

Fig. 3b. Plan: Fotini Vlachaki.



3a, 3b). Next he can follow the ship to the probable destinations on its last voyage: Crete, represented by eight stirrup jars and Mycenean Argolida, represented by three jars, a ring based krater and other smaller pots of various uses Fig. Fig. 2, 3a, 3b).

The Cypriot pithoi, eight Cretan stirrup jars and three Mycenaean jars are placed on planks made of pine with an invisible metal support frame, in order to give an impression of the hold of an ancient merchant ship in which the pottery cargo was stowed. Details of the structure and type vessel are not portrayed as we had no evidence of that kind from the excavation.

The predominant colour in the exhibition area is a bright blue covering the surfaces of the background against which the finds are displayed and the show cases and boards (with texts, drawings and photographic material from the excavation) are mounted. To display the pottery finds and visual material in the blue surroundings of the room, a combination of cool diffused and warm beamed lighting was used. Moving spot lights were also projected onto photographic representations of the sea bottom.[3]

Following the probable route of the ship, the visitor now enters the second room of the exhibition and arrives at the actual site of the wreck. Here the stone anchors, samples of the ship's ballast (Fig. 4c), photographic material and drawings from the excavation area and the projection of a short video film with underwater shots and scenes of the tasks performed by the archaeologists, architects, consevators, divers and various technicians convey the atmosphere of an underwater archaeological excavation. They also give an understanding of the combined effort needed for the fragmented, scattered cargo of the ancient ship at the bottom of the sea, to reach the exhibition hall and to constitute a unique historical witness and a rich treasure of knowledge.

NOTES

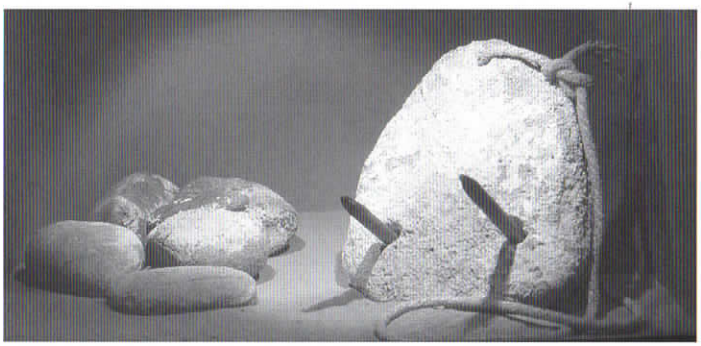
[1] The final title of the Exhibition was thought up by Haralambos Kritzas, Director of the Epigraphical Museum, the first archaeologist to dive on the wreck and member of of the HIMA team of which worked on it.

[2] The team of the Exhibition designers included the architectural engineers Vasilis Koniordos, Fotini Vlachaki and those in charge of the excavation team.

[3] The lighting was devised by Dr Yorgos Païsidis.

4a

4b



4c

4d

Fig. 4 *(a, b, c, d). Photos: Kostas Xenakis*

UNDERWATER INVESTIGATIONS AT THE ISLET OF ANTIDRAGONERA (1994-1995)

Dimitris Kourkoumelis

Introduction

The first HIMA[1] underwater exploration took place in 1993 at the same time as the land excavation by Prof. Iannis Sakellarakis of the Minoan peak sanctuary at the site of "Aï-Giorgis sto Vouno".

The importance of the underwater group of nine pyrimadal anchors found on the north shore of the islet of Antidragonera and the archaeological interest aroused by the brief preliminary excavation prompted its continuation with the aim of investigating the possibility of an ancient wreck on the site and identifying the find typologically and chronologically.

1994 excavation season

In September 1994 the first full investigation of the site was carried out over a period of ten days.[2] It began with a survey from the adjacent islet (plan 1) to plot the underwater area with the nine anchors[3] and the bottom was excavated between anchors A2, A3 and A9. During the preliminary investigation a large number of potsherds had been found at this point and there were signs of the existence of a wreck. Many dives were subsequently made in the area north of the anchors in order to locate any possible traces of a wreck. Unfortunately none were discovered and the excavation concentrated on the seabed between the anchors of Group 2, comprising anchors A1, A2, A3, A8 and A9 (plan 1). Here a number concretions of sherds was found, mainly utility types, some of which were recovered (fig.1). At the same time the anchors were measured and samples of lead and the stone they were made of were taken for archaeometric analysis. During the cleaning of the surfaces of anchors A2 and A3 and underneath them many sherds were found (fig.1). They were concreted between the anchors and the rocks and it was decided they had to be removed before the anchors could be raised. The fact that they were found underneath the anchors suggests the existence of a wreck, because it is difficult to imagine that the two anchors fell on top of them at a later period. The fact, also, that these two anchors had fallen one nearly on top of the other[4] further strengthens the view that they belonged to the ship which probably sank here with whatever pottery it was carrying. In various places, chiefly among the rocks, collections of concreted sherds were found in small groups. The site of the wreck must be located between anchors A2, A3 and A9, thus stretching over an area some 30 m in length. Concentrations of sherds were also found in small sandy patches among the rocks in the same area.

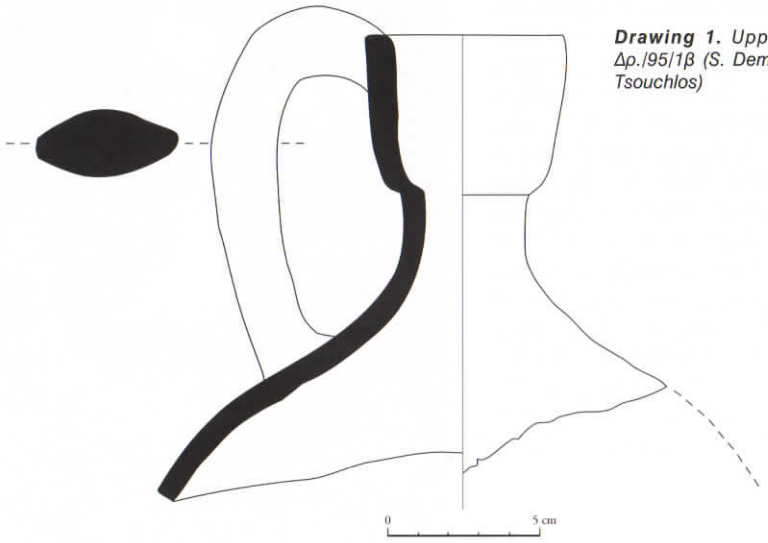
The purpose of this first excavation in 1994 was chiefly to familiarise the diving team with the excavation site, and also to prepare for the following excavation seasons.

1995 excavation season

The second excavation campaign took place in September[5].
Interest focused on the area of anchors A2 and A3, with the object of readying them to be raised, and on the area between them and anchor A9, in the hope of locating other possible groups of concreted sherds (plan 2). Based on the original plan of the site, a new larger scale one was made by the architects V. Koniordos and G. Baltsavias and the archaeologist S. Demesticha, which included the area containing A2, A3 and A9. The area around anchors A2 and A3 was also laid out (Trench I).

Fig. 1. Finds beneath anchors A2 and A3. (Photo: N. Tsouchlos).

Fig. 2. Group of sherds A-Δρ./95/2 (photo: N. Tsouchlos).



Drawing 1. *Upper part of jug A-Δρ./95/1β (S. Demesticha; photo: N. Tsouchlos)*

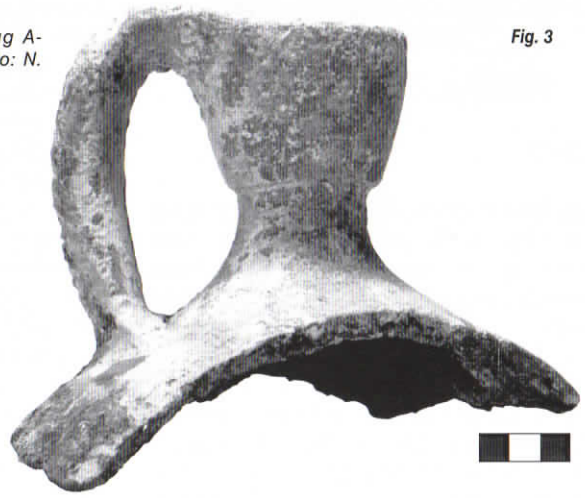
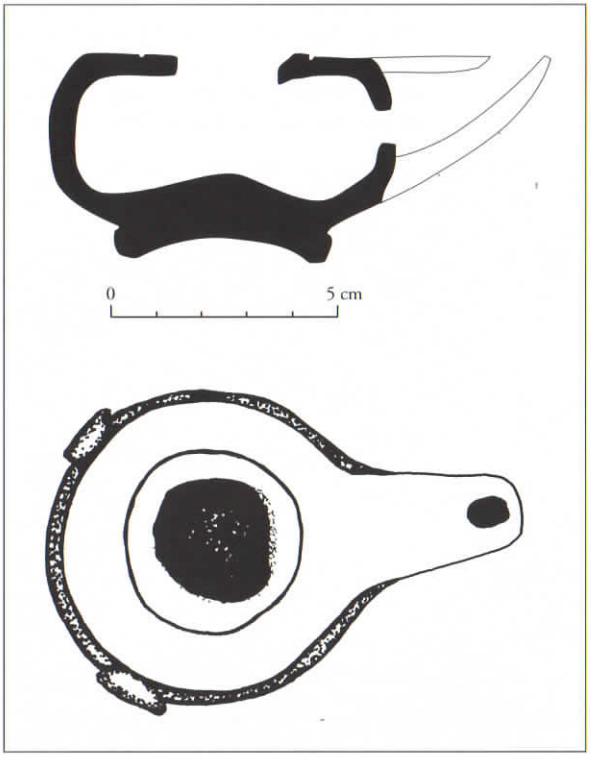
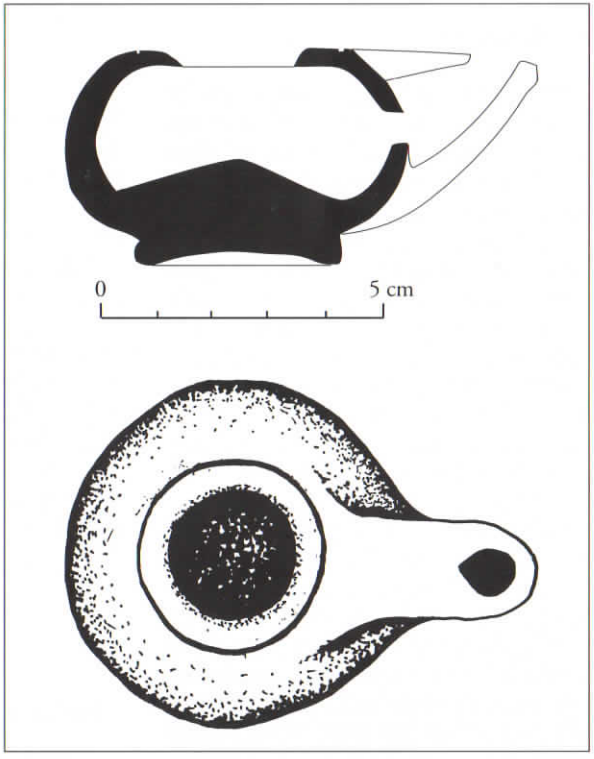


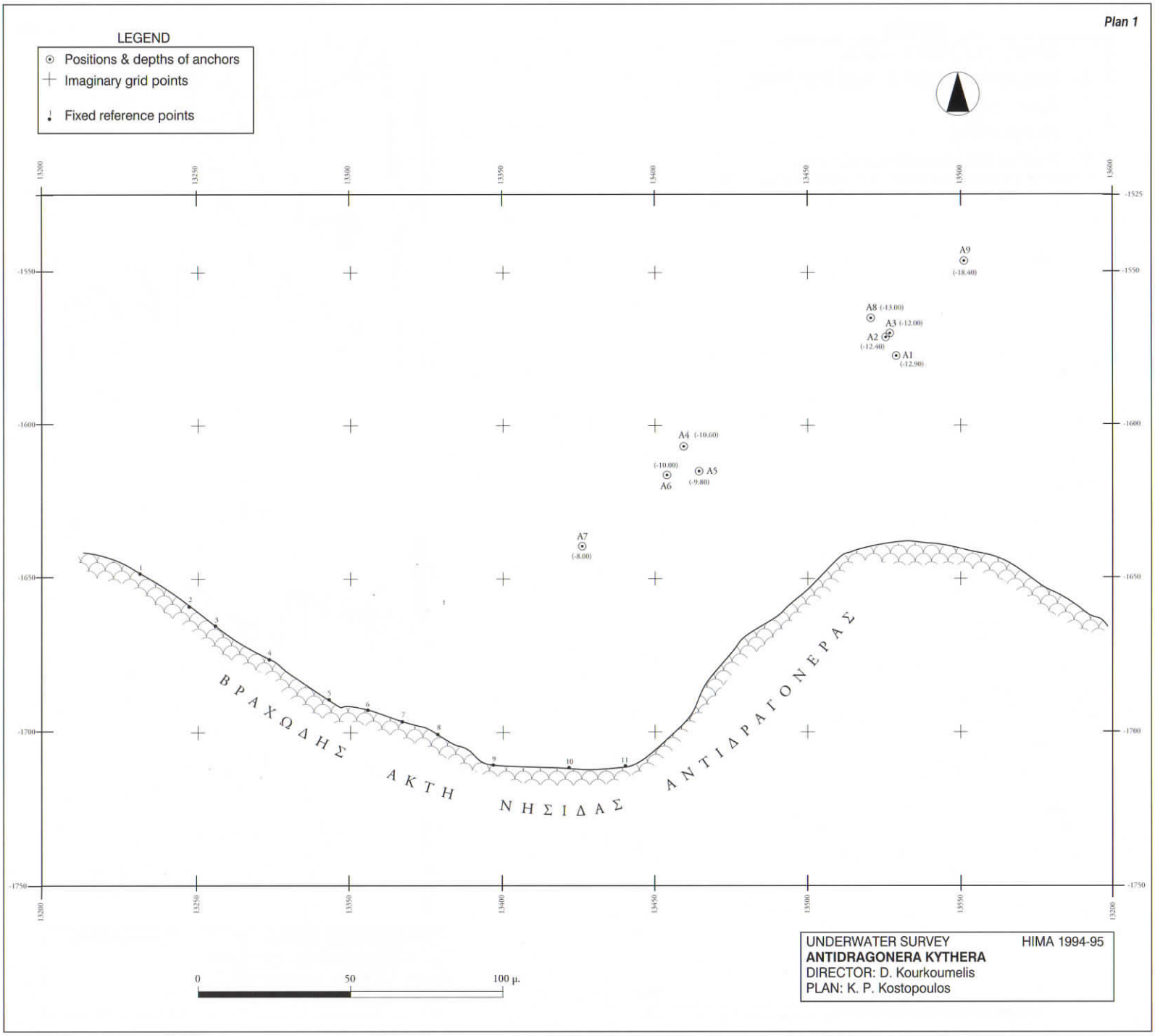
Fig. 3



Drawing 2.
Section and plan of the complete plain lamp (A-Δρ./95/2β) (S. Demesticha)



Drawing 3.
Section and plan of the complete plain lamp A-Δρ./95/2ε S. Demesticha)


Plan 1
LEGEND
Positions & depths of anchors
Imaginary grid points
Fixed reference points
A9 (-18.40)
A8 (-13.00)
A3 (-12.00)
A2 (-12.40)
A1 (-12.90)
A4 (-10.60)
(-10.00)
A6
A5 (-9.80)
A7 (-8.00)
ΒΡΑΧΩΔΗΣ
ΑΚΤΗ
ΝΗΣΙΔΑΣ
ΑΝΤΙΔΡΑΓΟΝΕΡΑΣ
0
50
100 μ.
UNDERWATER SURVEY
HIMA 1994-95
ANTIDRAGONERA KYTHERA
DIRECTOR: D. Kourkoumelis
PLAN: K. P. Kostopoulos

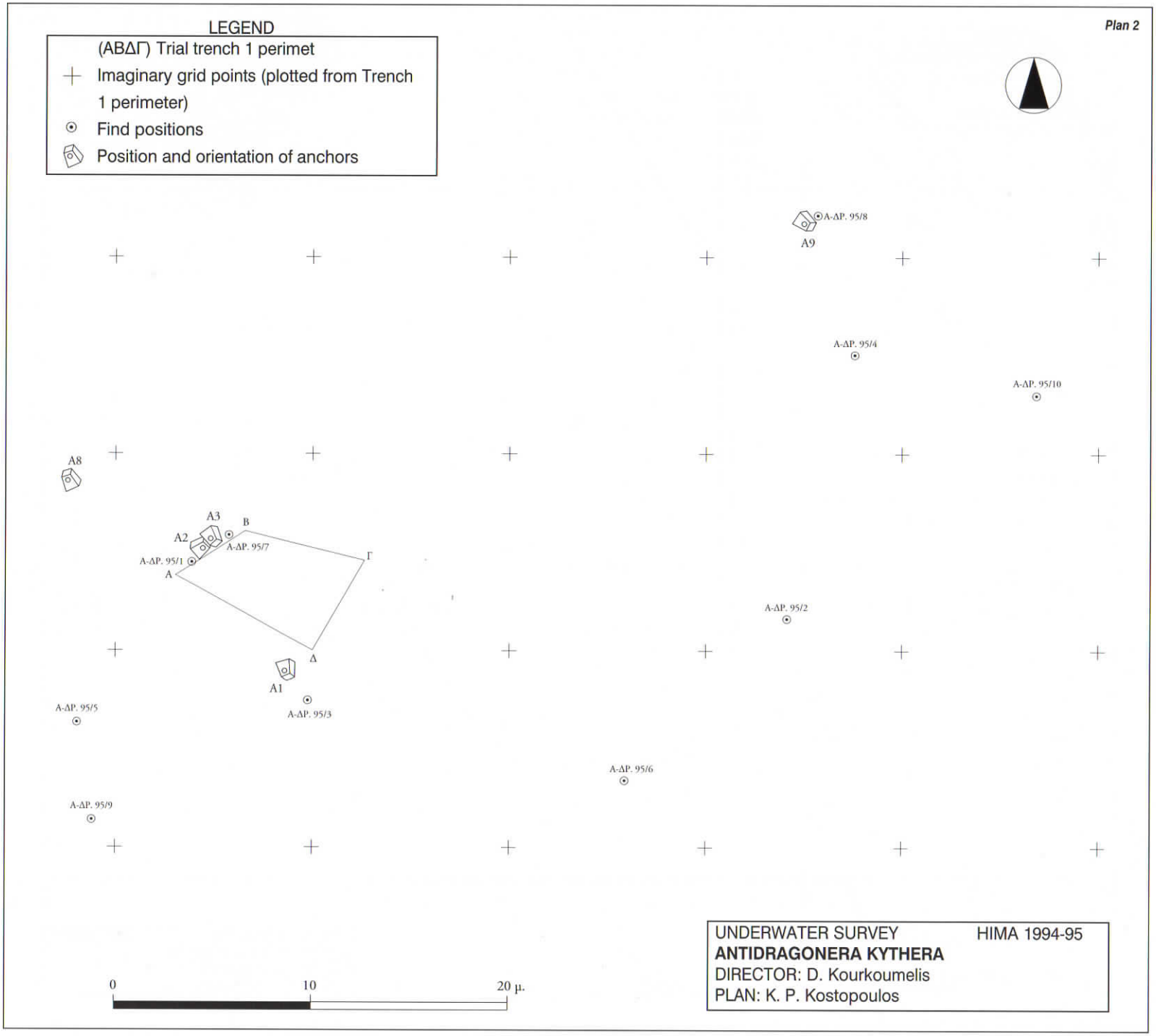

LEGEND
(ABΔΓ) Trial trench 1 perimet
Imaginary grid points (plotted from Trench 1 perimeter)
Find positions
Position and orientation of anchors
Plan 2
A-ΔP. 95/8
A9
A-ΔP. 95/4
A-ΔP. 95/10
A8
A3
B
A2
A-ΔP. 95/7
A-ΔP. 95/1
A
Γ
Δ
A1
A-ΔP. 95/3
A-ΔP. 95/2
A-ΔP. 95/5
A-ΔP. 95/6
A-ΔP. 95/9
0
10
20 μ.
UNDERWATER SURVEY
HIMA 1994-95
ANTIDRAGONERA KYTHERA
DIRECTOR: D. Kourkoumelis
PLAN: K. P. Kostopoulos

Fig. 4. Rim of pointed-base amphora (A-Δρ./95/1α) (photo: N. Tsouchlos).

The four corners of the perimeter were labelled A, B, Γ and Δ (plan 2), and all the anchors and finds within demarcated area were plotted in from the fixed points on the perimeter.

It became clear during this work that detaching anchors A2 and A3 was going to be a laborious task, because they were solidly concreted to the rock. During an initial attempt some sherds were removed in order to facilitate the continuation of the excavation (fig.1).

Prominent among the pottery finds recovered were the neck of a pitcher (A-ΔP.95/1β, fig.3, plan 1) and the neck and expanded rim of a pointed-base amphora A-ΔP.95/1α, fig.4). Also of interest was the large rim of a storage jar (A-ΔP.95/7α, fig.5). The finds had been found in the previous season, but were not recovered on that occasion. Numbers of smooth pebbles, probably from a river, were found around the anchors, which could have formed part of a ship's ballast, yet a further indication of the existence of a wreck in this place. It proved impossible to detach and raise the anchors in 1995 owing shortage of time. It was therefore decided in the time left to concentrate on the different groups of sherd concretions, some ten in all, which were given a code mark. This contained the initial letter of Antidragonera and the seqential number of the find (e.g. A-ΔP.95/1). The most important group was A-ΔP.95/2 (plan 2, fig.2). This included a mass of sherds, chiefly of utility vessels, as well as two complete lamps[6] (A-ΔP.95/2β, fig. 8, drawing 2 and A-ΔP.95/2ε, drawing3), two small handleless bowls, one of them black-painted, of the saltcellar type (A-ΔP.95/2γ,[7] drawing 4, and A-ΔP.95/2κ,[8] fig. 7) and a shallow plate (A-ΔP.95/2ι, fig.9). With these small vases were also found some sherds of pointed-base amphoras,[9] like the two button bases A-ΔP.95/2α (fig.11, drawing 5) and A-ΔP.95/2θ fig.10), and other utility vases (basins, jugs, etc.),

Fig. 5. Rim fragment of pithos (A-Δρ./95/7α) (photo: N. Tsouchlos).

(drawing 6), most of them unslipped. In another group, near anchor A9, a complete little bowl was found[10] (A-ΔP.95/8α, drawing 7), and close to A1 a small ring-footed bowl with an everted lip (A-ΔP.95/3α, drawing 8). The pottery can provisionally be dated to the 2nd half of the 4th c. BC.

It is interesting that the Antidragonera wreck has many features in common with the Ognina 4[11] and La Madonnina[12] wrecks.

Drawing 4. Handleless black-painted bowl (saltcellar type) A-Δρ./95/2γ (S. Demesticha)

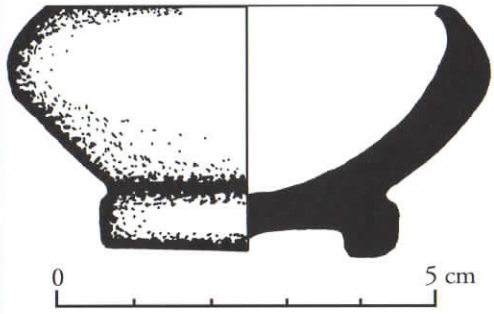


Fig. 6. Complete plain lamp (A-Δρ./95/2β) (photo: N. Tsouchlos)

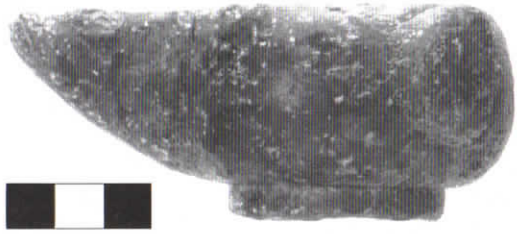


Fig. 7. Handleless plain bowl (A-Δρ./95/1k) (photo: N. Tsouchlos)

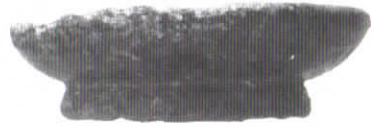
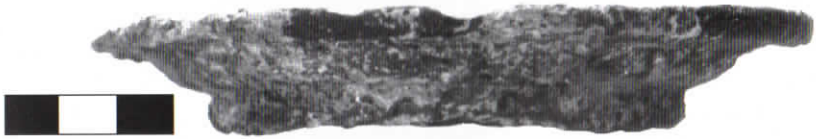


Fig. 8. Shallow lid of a vase (A-Δρ./95/2η) (photo: N. Tsouchlos).

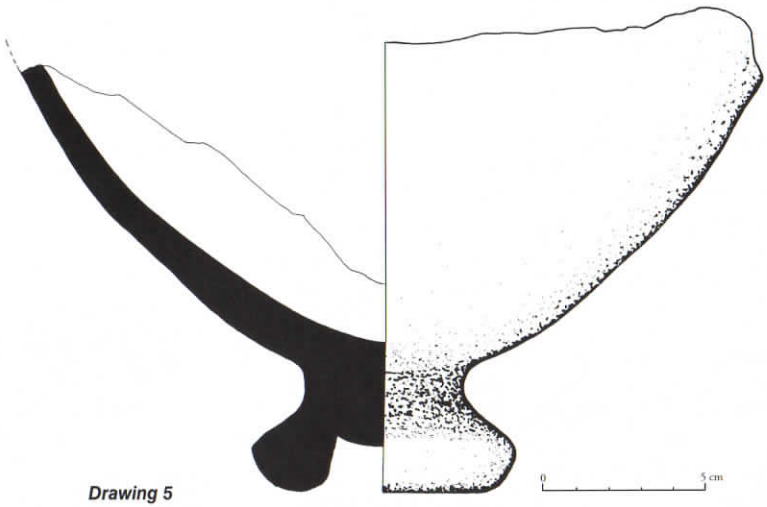
Fig. 10. Button base of a pointed-base amphora (A-Δρ./95/2θ) (photo: N. Tsouchlos).

Fig. 9. Shallow dish (A-Δρ./95/2ι) (photo: N. Tsouchlos).

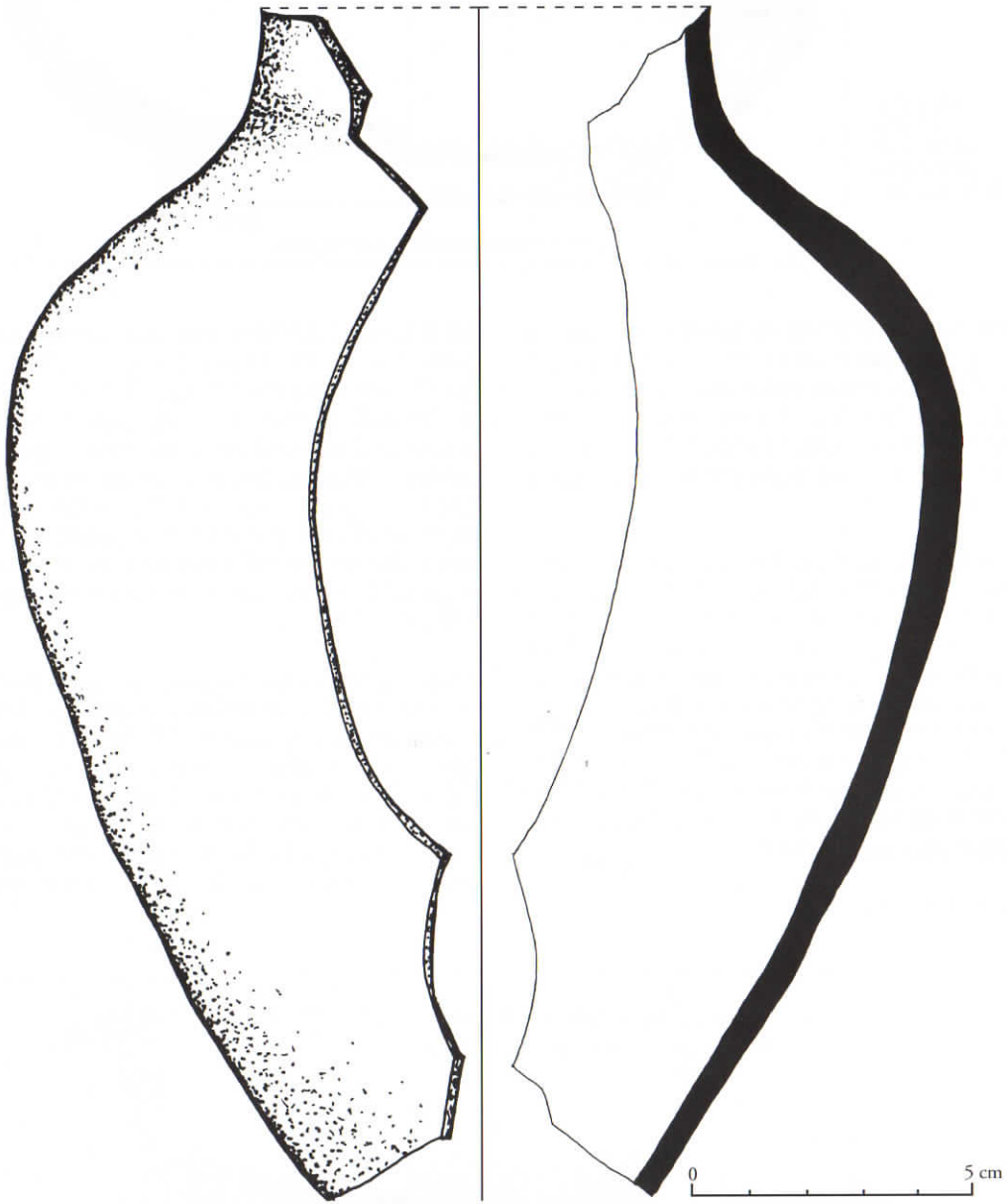


Knob foot of a pointed -base amphora (A-Δρ./95/2α) (photo: N. Tsouchlos, Drawing S. Demesticha).

Fig. 11



Drawing 5



Drawing 6. *Body and neck fragment of a jug (Α-Δρ./95/2στ) (S. Demesticha).*

The pottery found at Antidragonera is similar to those from the Ognina 4 at Syracuse: storage jars, a few pointed-base amphoras, lamps, plates, cooking pots, basins, etc. That wreck also dates to the 4th c. BC and a similar stone pyramidal anchor was found on it. La Madonnina, near Taranto in Southern Italy, was also 4th c. in date and had three anchors of the same type. All three wrecks lay in relatively shallow water: La Madonnina at 10 m, the Ognina 4 from 3.5 to 6 m and the Antidragonera wreck at 9 to 18.5 m.

It seems probable that all three ships were carrying a small cargo of mainly utility pottery, which was unusual for merchants vessels of this period.

The question is, what type of ship were they? Were they in fact merchant ships? In that case a much larger number of pointed-base amphoras or other transport containers would have been found. Even had the cargo been salvaged or looted, a great many more amphora fragments and sherds, the classic telltale of a shipwreck, would have been found.

At Antidragonera no evidence of looting was observed, and even the fishermen were unaware of its existence. The rocky bottom prevented the use of trawls, which often cause such damage to wrecks, and only traditional nets can be used in the area, which would not seriously damage a cargo of pottery.

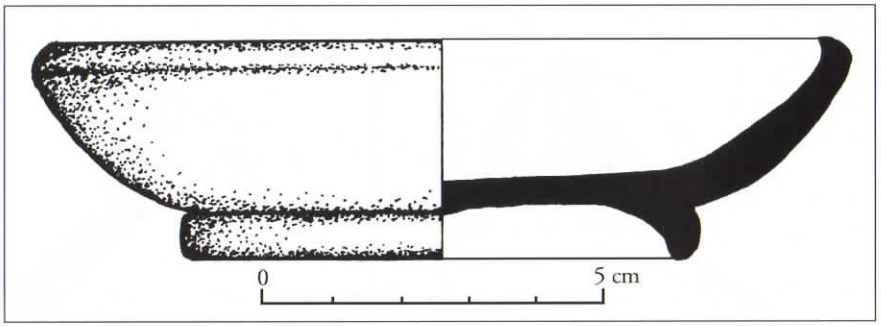
There is the possibility, of course, that the three ships were laden with bulk perishable cargoes that were not transported in storage containers,[13] such as corn, which was one of the principal commodities traded between Classical Athens, Egypt and the Black Sea, although it is not certain whether this trade also existed with South Italy, where the Ognina and La Madonnina wrecks were found. It is, however, difficult to believe, on the strength of our present knowledge of ancient commerce, that the three ships were voyaging without any cargo.

In view of this, it seems probable that we are dealing here with warships. It is known[14] that warships of this period carried earthenware containers for the crew's supply of food and water during the voyage, as well as necessary vessels like lamps, plates, bowls, cooking pots, etc. Just such an assemblage was found on the Antidragonera wreck, and in a quantity that suggests use rather than trade.

Another question is the provenance of the ship. The petrological analysis[15] of the initial samples produced important information about the place where the anchors were made. The rock belongs to the calcialkalic porphyritic rhyolite/dacite series. The petrological kinship of the nine samples implies that they probably came from the same geological source. According to Dr Basiakos, a research geologist at the NRCPS of Dimokritos, the rhyolite/dacite volcanic rocks occur in many coastal areas in Greece (Chios, Antiparos, Milos, Santorini, Nisyros, Aigina, Methana Peninsula and elsewhere).The petrological parameters and the existing evidence indicate with considerable probability that the material came from some locality on the seashore on Aigina or the Methana Peninsula.[16] The source of the stone material in these areas is especially important because it indicates a probable provenance for the anchors in the general region of the Argosaronic Gulf.[17]

Another question, which it is difficult to answer on today's evidence, is whether the nine anchors came from one or more ships. Could only one ship have been carrying nine anchors of their size and weight? If only one ship was involved, then from the positions of the anchors we can say that it would have anchored with A4, A5, A6 and A7 (plan 1) inside the bight, seeking shelter from a southerly or southeasterly wind, but for some reason it sank some 75 m to the northeast with the remaining five anchors, which it never used (A1, A2, A3, A8 and A9, (plan 1).

This hypothesis, however, does not explain why the ship preferred to anchor in such a dangerous place, when only 1.5 miles away it could have found safer shelter behind the Souroumi headland,[18] which is also protected from southerly winds. As with all shipwrecks, we cannot know the circumstances that led up to them.

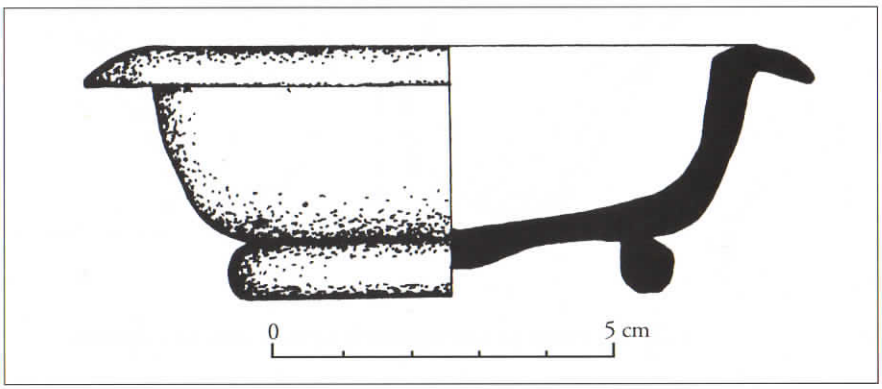


Drawing 7. *Complete shallow bowl (A-Δρ./95/8α) (S. Demesticha).*

It is thus more likely that we have to do with more than one vessel, if we take into account the large number of nine anchors which were found. In the case of the Ognina and La Madonnina wrecks the anchors numbered one and three respectively, and these figures correspond precisedly with those in the inscriptions in the Ancient Agora listing the equipment carried by the triremes,[19] which are mentioned as possessing one or two anchors, and in rare cases, three.[20]

The nine stone Antidragonera anchors, therefore, could have come from three to five ancient warships forming part of a naval convoy. The Athenians are known[21] to have organised naval convoys to protect their merchant ships, mainly against pirates, particularly the grain ships, on whose safety Athens depended. If this was the case, then probably one of the warships sank where it was anchored and the others cut their cables in an attempt to save themselves from the danger overtaking them.

According to Casson,[22] stone anchors were not used on warships in the Classical period, a view shared by Julia L. Shear.[23] Today this view appears overbold in view of the lack of archaeological evidence, since to date no warship wreck has been found. On the other hand we know that some of the ships still used gear of an older type, for whatever reasons



Drawing 8. *Complete vase with everted rim (A-Δρ./95/3α) (S. Demesticha).*

economy, attachment to old traditions, or lack of modern equipment. Anchors fall into this class. The Antidragonera wreck confirms the contemporary use different types of anchor. It can now be said with authority that pyramidal stone anchors, although they may be considered typologically earlier then the wooden versions with a stone or lead stock, were in contemporary use in the period from the 5th to the beginning of the 3rd c. BC. In the Classical merchant ship wreck at Peristera, near Alonnisos (425-400 BC),[24] a lead anchor clamp and stock were found. This wreck, about a century later than the Antidragonera one, shows that both types of anchor were in use at the same time.

The Antidragonera site has not produced any evidence for the types of ship or ships involved, but a further campaign is planned to raise all or at least most of the anchors and to excavate the site wherever the rocky bottom permits. It is hoped in this way to confirm or disprove the various theories.

I would like to thank warmly the fifteen members of HIMA who took part in the two expeditions, as well as the head of the Ephorate of Underwater Antiquities, Mr D. Kazianis and the conservators of the Ephorate, the Mrs P. Papadima, S. Simeonidou and E. Kiomisoglou, who were in charge of the cleaning and conservation of the finds in the Ephorate laboratories.

NOTES

1 Kourkoumelis 1996, 32-36.

2 Those taking part in the excavation were D. Kourkoumelis as director, N. Tsouchlos as technical director, P. Antonopoulos diving master, the archaeologists T. Aronis-Webb, C. Papachristopoulou, E. Stamatatou-Vosinioti and the technicians I. Lykourezos, P. Vakondios, and I. Antonopoulou. The Ephorate of Underwater Antiquities was represented by E. Hatzidaki. The excavation was supported by the trechandiri "Kalokyra" captained by S. Barous.

3 The survey of the site was carried out by the topographer K. Kostopoulos from Potamos, Kythera.

4 Kourkoumelis 1996, 35 fig. 6.

5 Those participating in the third campaign were D. Kourkoumelis as director, N. Tsouchlos as technical director, P. Antonopoulos diving master, the archaeologists C. Agouridis, S. Demesticha, E. Stamatatou-Vosinioti, C. Papachristopoulou, D. Conlin, the architect V. Koniordos, the topographer G. Baltsavias, the technitian P. Vakonidios and I. Antonopoulou. The Ephorate of Underwater Antiquities was represented by E. Hatzidaki. The excavation was supported by the trechandiri "Kalokyra" captained by D. Lekkas.

6 The lamps have been provisionally classified as types 25A (269) and 25B (308) according to Howland's typology (Howland 1959) and dated to the 2nd half of the 4th c. BC.

7 Sparkes & Talcott 1970, no. 944 (375-350 BC) or no. 949 (350-325 BC).

8 Sparkes & Talcott 1970, no. 828 (375-350 BC).

9 The two bases and the neck (fig.4) can be identified with amphoras having a mushroom-shaped rim of the Solocha I type (Zeest 1960).

10 Sparkes & Talcott 1970, no. 887 (350-325 BC).

11 Kapitän & Naglschmid 1982.

12 McCann 1972.

13 Γκόφας 1993, 221, §34, "Τα φορτία μεταφέρονταν είτε σε πήλινα δοχεία τους αμφορείς, είτε σε σάκους είτε και χύμα."

14 Thucydides, Histories III, 49, 3: "Παρασκευασάντων δὲ τῶν Μυτιληναίων πρέσβεων τῇ νηὶ οἶνον καὶ ἄλφιτα καὶ μεγάλα ὑποσχομένων, εἰ φθάσειαν, ἐγένετο σπουδὴ τοῦ πλοῦ τοιαύτη ὥστε ἤσθιόν τε ἅμα ἐλαύνοντες οἴνῳ καὶ ἐλαίῳ ἄλφιτα πεφυρμένα, καὶ οἱ μὲν ὕπνον ἠροῦντο κατὰ μέρος, οἱ δὲ ἤλαυνον."

15 The analysis of the samples was carried out in the Archaeometric Laboratory of the NRCPS Dimokritos by the geologist Dr. I. Basiakos.

16 It was decided not to analyse the lead samples, because the isotopic method, which is the appropriate one, can determine only the age of the deposits, and the existing data banks do not cover all the lead sources in Greece.

17 In a conversation with Mr H. Tzalas, whom I thank for the valuable information, the latter assured me that the pyramidal anchors found in Zea harbour came from the same geological area.

18 Kourkoumelis 1996, 33, map 1.

19 Shear 1995, 179-224, fig. 42-44, and especially the inscription I 2012b, p. 203-204. This important article gives much information not only about anchors, but about the ships' equipment. Concerning the anchors, the inscription IG II2 1611 mentions 18 anchors for nine ships and the inscription IG II2 1612 mentions 107 anchors for 53 ships (107 H 43 = 2 + 1). In numbers of instances where inscriptions mention specific ships by name, it is stated that they carried two anchors.

20 It should be noted that the number of anchors found on the two other wrecks, the Ognina 4 and La Madonnina, was the same as that given by the inscriptions in the Ancient Agora.

21 Γκόφας 1993, 211, ' 24, Pseudo-Demosthenes, To Polyclea, L 17, "...πλεῖν ἐφ' ἱερὸν ἐπὶ τὴν παραπομπὴν τοῦ σίτου," and Xenophon, Hellenica, V, 4, 65.

22 Casson 1971, 256, n. 131.

23 Casson 1971, 204. h. Shear (Shear 1995, 204) emphasises that some inscriptions mention iron anchors, and supposes that when the material of the anchors is not mentioned, it may mean anchors with a stock, adding "...like the commercial anchors," and refers to Casson, 253-256. As we pointed out above, this hypothesis does not stand up, since it is now confirmed that pyramidal stone anchors were still in use in the mid 4th c. BC along with the type of anchor with a stock, which had already appeared.

24 Hatzidaki 1996.

BIBLIOGRAPHY

Casson L.,	1971:	*Ships and Seamanship in the Ancient World*, Princeton.
Γκόφας Δ.,	1993:	*Θάλασσα και συναλλαγές στην Αρχαία Ελλάδα, Μελέτες Ιστορίας του Ελληνικού Δικαίου των Συναλλαγών, Αρχαίου, Βυζαντινού, Μεταβυζαντινού*, Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας, αριθ. 133, Αθήνα.
Doulgéri-Intzessiloglou A., Garlan Y.,	1990:	"Vin et amphores de Preparéthos et d'Ikos," *BCH* 114, 361-398.
Grace V.,	1971:	"Samian Amphoras," *Hesperia* 40, 52-95.
Hatzidaki E.,	1996:	"Excavation of a Classical Shipwreck at Alonnesos (5th c. BC)," *ΕΝΑΛΙΑ ANNUAL* IV, 37-45.
Howland E. H.,	1959:	*The Athenian Agora IV. Greek Lamps and their Survivals*, Princeton.
Κάντζια Χ.,	1994:	"'Ενα κεραμεικό εργαστήριο αμφορέων του πρώτου μισού του 4ου αι. π.Χ. στην Κω," *Γ' Επιστημονική Συνάντηση για την Ελληνιστική Κεραμεική, Χρονολογημένα σύνολα - Εργαστήρια*, Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας αριθ. 137, Αθήνα.
Kapitän G., Naglschmid F.,	1982:	"A 4th century BC dispersed amphora cargo on the Secca di Ognina, Siracusa, Sicily (site Ognina 2)," *Proceedings of the 6th International Science Symposium CMAS*, eds. J. Blanchard, J. Mair and T. Morisson, Edinburgh 1982, 229-239.
Kourkoumelis D.,	1996:	"Underwater survey of the Avlemonas Region of Eastern Kythira (1993 Season)," *ΕΝΑΛΙΑ ANNUAL* IV (1992), 32-36.
McCann A.,	1972:	"A Fourth Century Shipwreck near Taranto," *Archaeology, vol.* 25, no. 3, 181-187.
Shear T. L.,	1972:	"Fragments of naval inventories from the Athenian Agora," *Hesperia* 64, no. 2.
Sparkes B. A., Talcott L.,	1970:	*The Athenian Agora XII. Black and Plain Pottery of the 6th, 5th and 4th centuries B.C.*, Princeton.
Zeest I. B.,	1960:	"Lemballage céramique du Bosphore" (in Russian), *MIA* 83.

UNDERWATER INVESTIGATIONS AT THE ISLET OF ANTIDRAGONERA (1996)

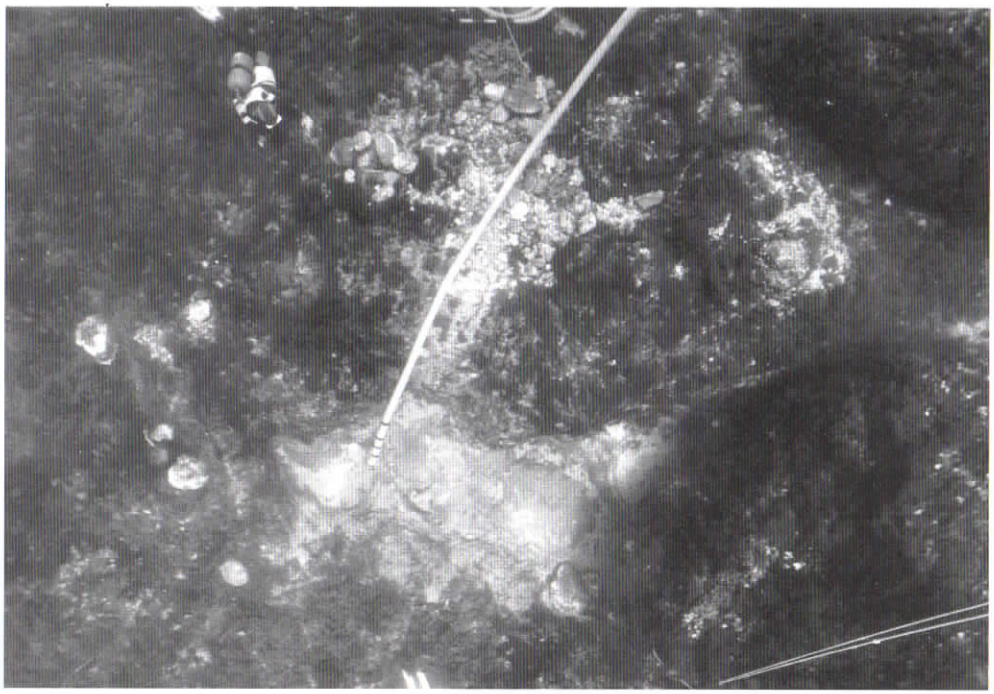
Dimitris Kourkoumelis

The underwater exploration by HIMA of the Antidragonera wreck[1] continued for the fourth season in succession from 15 June until 5 July 1966.[2] This year the *kaiki* "Thanasis" was used for transporting the team to the site and the HIMA speedboat for ancillary tasks. Our goal was to raise anchor A9 and to excavate the area around and under it.

Anchor A9, the most northerly and the deepest (-18.5 m) of all the anchors located at the wreck site had fallen among rocks on a small patch of sand (fig. 1). It was decided for this reason to raise the anchor first, in order to facilitate the excavation of the locality. The excavation that followed the raising of the anchor presented many difficulties, chiefly because of the very strong north-easterly current running in the area. This is probably due to the great difference in depth between the east and north sides of Antidragonera.

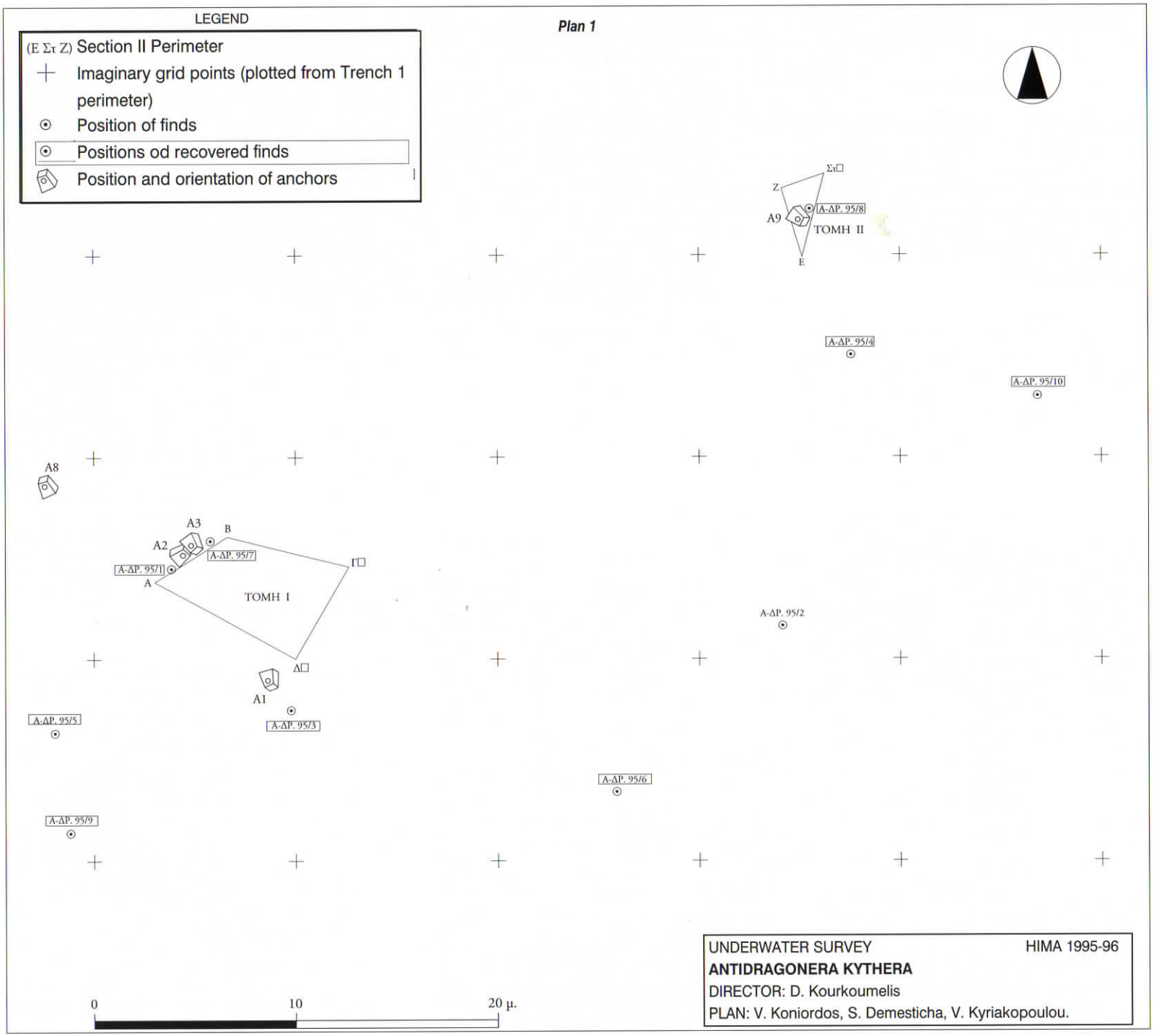
Fig. 1. *Sector II before the start of the excavation (photo : N. Tsouchlos)*

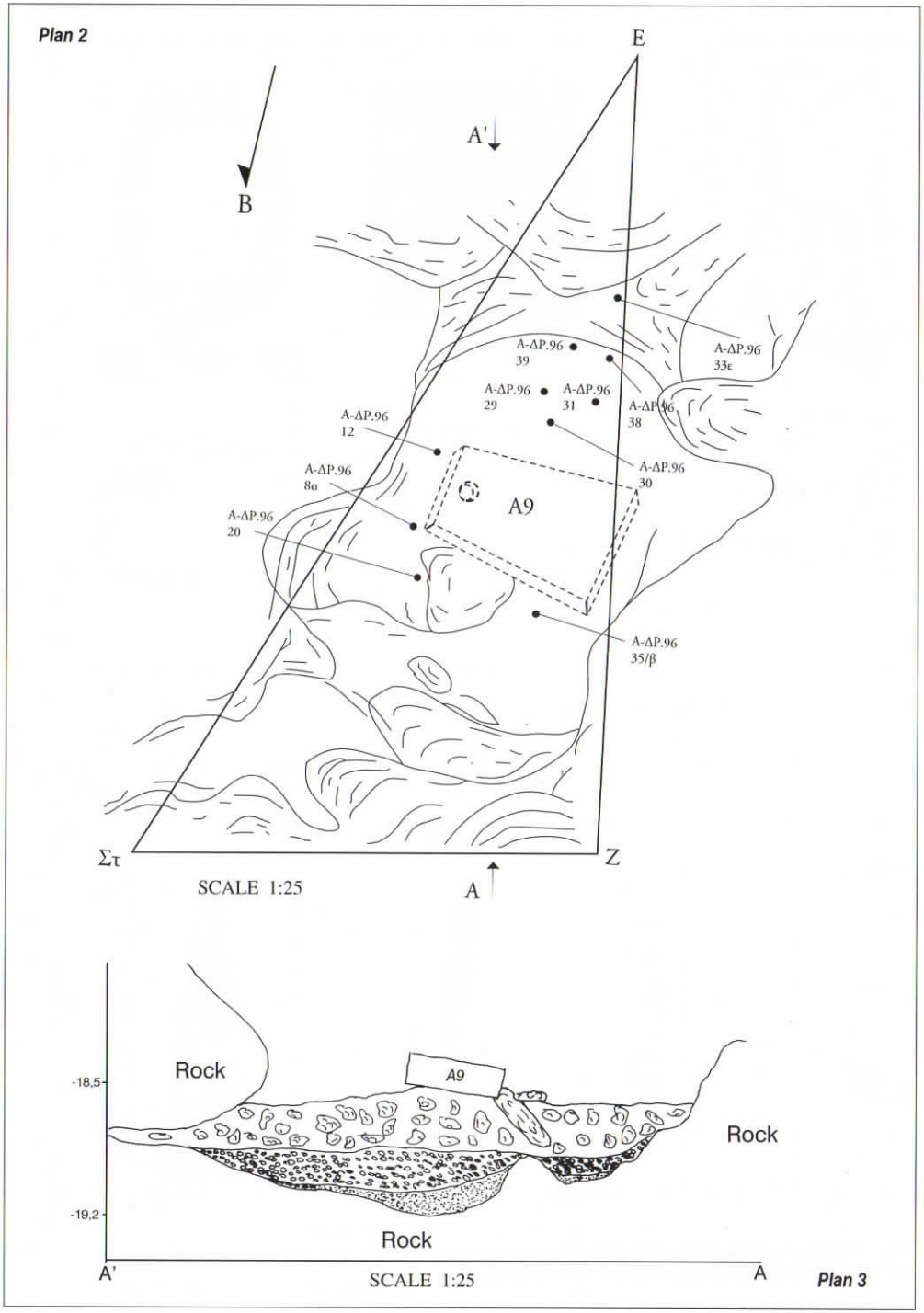
Fig. 2. *Sector II after the excavation (photo : N. Tsouchlos).*



The area to be excavated was defined by three points [E, Στ, Z (E-Στ =4.26 m, Στ-Z = 2.10 m, Z-E = 3.60 m)] and was named Sector II (fig. 1 and plan 1), which was plotted from Sector I and anchors A2 and A3 of the 1995 excavation season.[3] The excavation was carried out using an airlift connected to a low pressure compressor mounted on the *kaiki*.

During the excavation no particular stratigraphy was observed (plan 3). A layer of coarse sand and stones overlay a thin layer of mud and fine sand, and a thin layer of mud covered the area just over the natural rock. This conformation of the strata appears to be the result of natural causes. The overall depth of the excavation did not exceed 40-70 cm from the surface of the


LEGEND
(Ε Στ Ζ) Section II Perimeter
Imaginary grid points (plotted from Trench 1 perimeter)
Position of finds
Positions od recovered finds
Position and orientation of anchors
Plan 1
Στ□
Z
A9
A-ΔΡ. 95/8
TOMH II
E
A-ΔΡ. 95/4
A-ΔΡ. 95/10
A8
A3
B
A2
A-ΔΡ. 95/7
A-ΔΡ. 95/1
A
Γ□
TOMH I
A-ΔΡ. 95/2
Δ□
A1
A-ΔΡ. 95/5
A-ΔΡ. 95/3
A-ΔΡ. 95/6
A-ΔΡ. 95/9
0
10
20 μ.
UNDERWATER SURVEY
HIMA 1995-96
ANTIDRAGONERA KYTHERA
DIRECTOR: D. Kourkoumelis
PLAN: V. Koniordos, S. Demesticha, V. Kyriakopoulou.



sand down to the natural rock. (Fig. 2 and Plans 2, 3). Interesting finds were recovered. The pottery collected from the area was not large in amount, but much of it was diagnostic and will help to date the wreck more closely.

An important group of finds from Sector II was 26 lead objects presumably forming part of the ship's gear.[4] A number of these objects were of interest because of their shape, which may indicate their function, like find no. A-ΔP.96/12 (Fig. 3). This is a conical lead object 7.2 cm long with a greatest width of 4.3 cm. It has a longitudinal perforation, one end of which is rectangular in section and the other is divided into two smaller apertures. It must have served to connect two dissimilar objects, for example a wooden shaft to a metal point. It is made of cast lead and has a tongue-like projection which is bent back to grip the objects better. Another solid lead object, oblong and parallel-sided, A-ΔP.96/36B (Fig. 4) is 15.5 cm long with a greatest width of 3.3 cm, whose function is hard to guess. It has a transverse groove in the middle of the two opposite faces and a lengthways one along half of one of the sides, and was clearly joined to some other object of a different material.

To these two lead objects may be added two others with a tubular shape, A-ΔP.96/29/α (Fig. 5) and A-ΔP.96/39 (Fig. 6). The first has a length of 4.4 and a width of 5.6 cm, and the second 4.9 and 5.9 cm respectively. Both are made from heavy lead sheet, with an oval section that is angular on one side. They have a slightly conical shape and a projection at one end. They probably served to hold one object inside another.

The lead object A-ΔP.96/33/ε (Fig. 7) was found in the same area; it has a wedge shape with a rectangular section, 5.4 cm long and greatest width 0.9 cm. There is semicircular cut a short distance from one end. The shape resembles a forged nail, but the material precludes this, and it was probably a kind of wedge to attach some other material. Two pyramidal lead fishing weights, A-ΔP.96/20 and A-ΔP.96/38 (Figs. 8

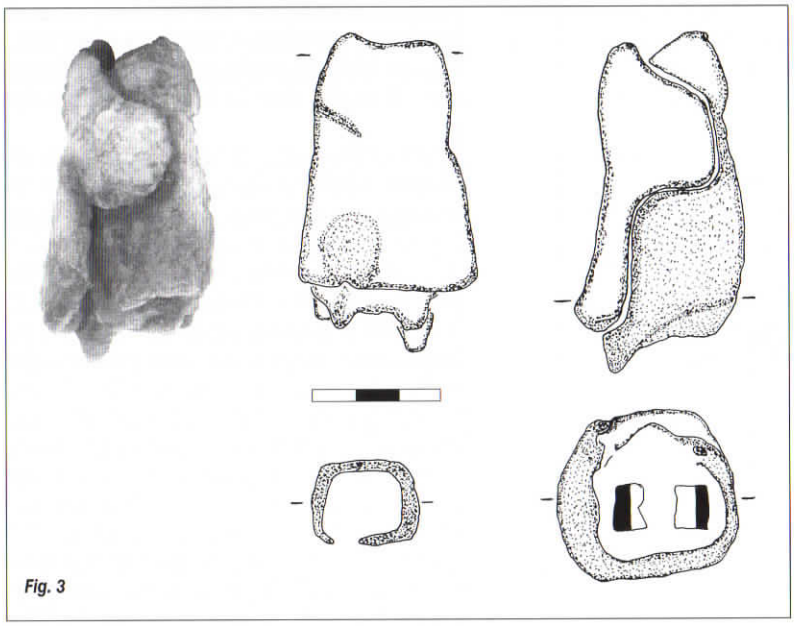


Fig. 3

Fig. 5

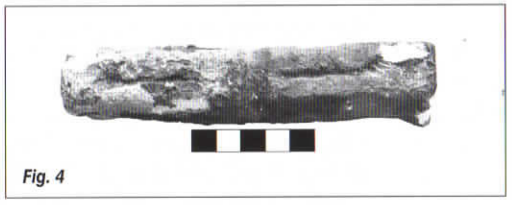


Fig. 4

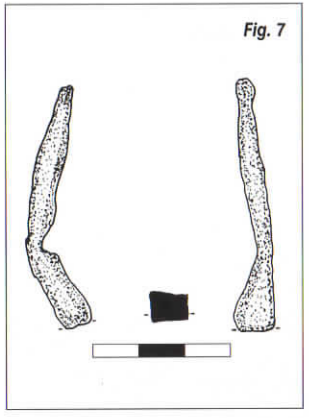


Fig. 7

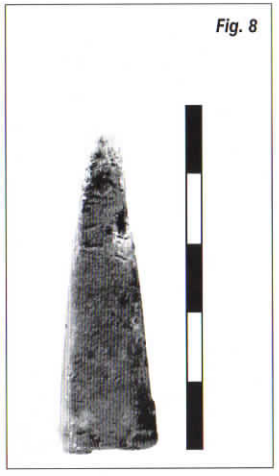


Fig. 8

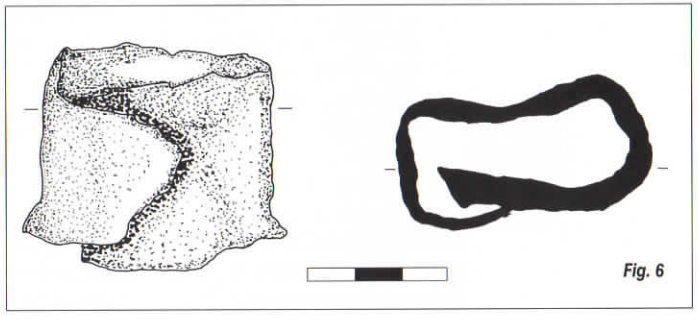


Fig. 6

Lead objects found in the excavation of Sector II.
photos : N. Tsouchlos, drawings A.Mari, F. Georma and C.Papachristopoulou

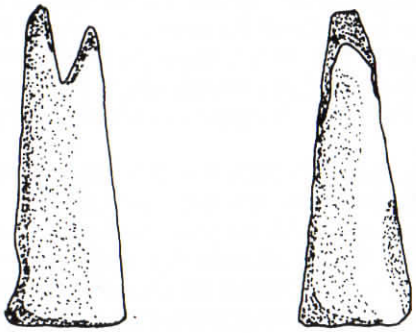
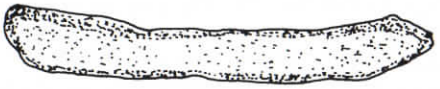


Fig. 9. Lead fishing weight (A. Mari)



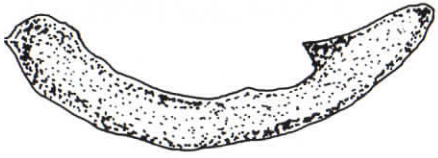


Fig. 10. Metal hook (photo: N. Tsouchlos, drawing: A. Mari)

and 9), were also found in Sector II, and a large hook A-ΔP.96/31 (Fig. 10) of a material difficult to identify without a laboratory examination. It is probably the concretion formed by seawater electrolysis around an iron hook completely corroded, leaving only the shape. Lastly numbers of small fragments of lead and lead sheet were collected, most of them shapeless (Fig. 11).

During the 1995 excavation a complete small dish (Fig. 12) was found (A-ΔP.96/8/α).[5] No complete vases were found in 1996, but quite a number of diagnostic fragments which will assist in dating the wreck. The majority were from utilitarian vessels (handleless bowls, amphoras, small pithoi, cooking utensils and pots, basins, etc.). Typical and very useful for the chronology are the rims of handless bowls like A-ΔP.96/α[6] (Fig.13), which was found underneath anchor A9 and dates to the third quarter of the 4th c. BC, and A-ΔP.96/β (Fig. 14), which was found in Sector II, which confirm a date for the wreck in the second half of the 4th c. BC.[7] The everted round rim of the handleless bowl A-ΔP.96/30 (Fig.15)[8] can be dated a little earlier, to the first half of the 4th c. BC. Among the sherds of larger vessels may be mentioned the bottom of a pointed-base amphora (A-ΔP.96/γ, Fig.16), similar to those found during the 1995 excavation[9], and a rim of a small storage pithos (A-ΔP.96/δ, Fig. 17).

During the 1996 season we continued to detach and raise sherds from the concretion A-ΔP.95/2[10] (Plan 1). Numbers of fine and medium sized vases were detached and also a complete handleless bowl A-ΔP/96/2μ, (Fig. 18), dating to the mid 4th c. BC.[11] It bears an incised group of letters on its bottom, probably an M and a P. From the same concretion came a complete amphoriskos (A-ΔP.96/2λ, fig. 19)[12] and two handleless bowl rims.[13]

The underwater work in 1996 ended with the raising of anchor A1, but without further excavation, since it lay on solid bedrock.

Lastly we explored the area north and west of the anchors in the hope of finding new bits of the wreck. This area was chosen because our observations of the weather peculiarities in the locality (strong northeasterly current, wind directions, etc.). These suggested the possibility that the current had swept part of the wreck into deeper water, perhaps on the east side of the island where the bottom falls away steeply and exceeds 50 metres only a few metres from the shore, while the parts of the ship on which the anchors had been stowed sank close inshore. No new evidence was discovered, however, even though the area was searched to a depth of about 40 metres and some distance from the shore.

Fig. 11. Various lead objects from the excavation site (photo: N. Tsouchlos)

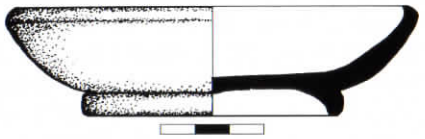


Fig. 12. Complete small dish (S. Demesticha)

Fig. 13. Rim of a handleless bowl (F. Georma)

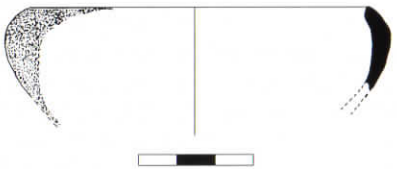


Fig. 14. Rim of a handleless bowl (F. Georma)

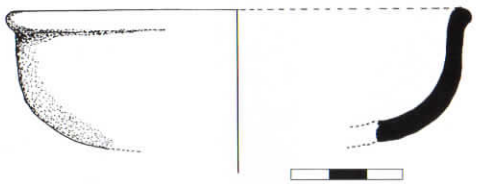


Fig. 15. Everted round rim of a handleless bowl (C. Papachristopoulou)

This fourth excavation season has still left unanswered many of the questions and problems originally posed concerning the Antidragonera wreck.[14] Nevertheless it can be said with certainty that it dates to the second half of the 4th century BC. Although some of the vase types may according to the typology presently known and accepted be dated some decades earlier, in no case could they precede the second quarter of the 4th century BC.

The wealth of types of fine everyday vases recovered from the site is very important for the dating of the pottery of this period. The divergencies in the dates of the vases prove to be more useful than problematic, because It is a fact that earlier types of pots remained in use alongside later ones and were not replaced by them on a regular basis except when they were damaged beyond repair. Thus a closed group like that of the wreck, in which earlier and later pots coexist, is a great help in correlating the different types.

The coexistence of a large number of different types in a closed group raises another important question about the cargo of the ship. Was the pottery destined for commercial markets or were the pots for the personal use of the crew? In the event that many pots were found of the same shape, type and quality, it might be suggested that they were intended for trade, a supposition that cannot at present be confirmed. The pottery assemblage consists chiefly of everyday wares, many of them unpainted, with only some black painted vases of good quality, but they cannot be really described as trade types. It is therefore more likely that they were pots for the crew's own use.

Equally significant is the group of lead artefacts recovered from Sector II. Although they do not provide much evidence for the chronology of the wreck, since dating lead by chemical means is still uncertain, they nevertheless constitute an interesting group which was probably part of the ship's gear. It is obviously very difficult to determine their exact function, since on a ship the function of an object is often largely based on the ingenuity of the sailors. An object that appears at first sight to have one function may often be used in an entirely different way on a ship. Its identification poses an added problem.

The collection of finds from the Antidragonera wreck presents another difficulty in its interpretation, for no parts of the hull have survived. We do not know for example to which part of the ship Sector II corresponds, since this might have suggested possible uses for them.

In the case of the lead objects it should be pointed out that this metal was commonly on ships for many reasons. One was its weight, another that it did not corrode and was therefore not easily damaged. For sailors this gave it a great advantage over other metals. It was easy to use, pliable and could be shaped by hammering alone. Even when it had to be melted, this was easily done, because the melting temperature of lead is low, and could be effected even on portable braziers.

The excavation of the Antidragonera wreck is not yet finished. This is largely due to the short annual excavation seasons and difficult weather conditions found in the region. Progress in the excavation, however, has been considerable in spite of the difficulties (weather, currents, inaccessible shore) and the results have been most encouraging.[15] The group of anchors, the pottery, mainly everyday wares or storage vessels, and the lead finds form a significant body of material which will assist in dating certain types of vases and other objects found together in a closed context like that of the Antidragonera wreck, and in understanding the use of other materials and equipment on ancient ships.

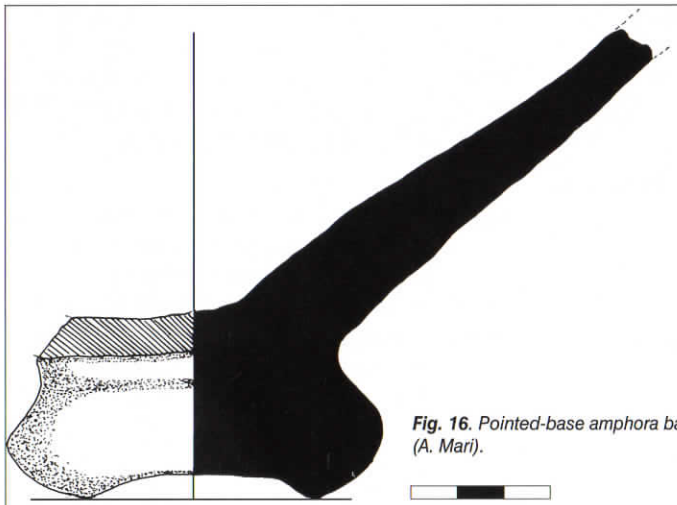
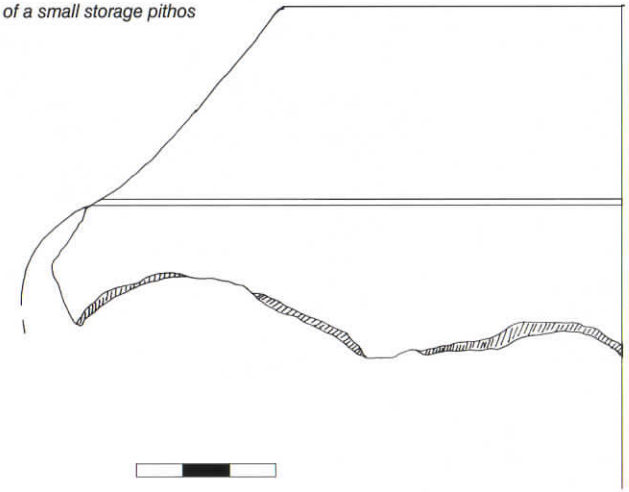


Fig. 16. Pointed-base amphora base (A. Mari).

Fig. 17. Rim of a small storage pithos (A. Mari)



NOTES

1 Those taking part in the 1996 excavation season were D. Kourkoumelis, director, N. Tsouchlos, technical director, P. Antonopoulos diving master, archaeologists C. Agouridis, H. Papachristopoulou, L. Blue, A. Mari, T. Gartagani, E. Stamatatou, F. Georma, B. Creevy, surveyor V. Kyriakopoulou, conserator V. Papayeoryiou, technicians Y. Vosiniotis, S. Kolovouris, photographer K. Petrinos, divers I. Antonopoulou and A. Mazouridis. Archaeologist Ilias Spondylis represented the Ephorate of Underwater Antiquities. The excavation was attended or visited by Y. Lolos, Y. Pikoulas, A. Kyrou and D. Papadas. The support vessel was the *kaiki* "Thanasis" captained by its owner, Yannis Thymaras. During the underwater excavation a team from the 2nd EPCA lead by the archaeologist A. Tsaravopoulos carried out a short excavation on the west side of Antidragonera. The *kaiki* transported the team to the site.

2 For the previous excavations see Kourkoumelis 1996 for the 1993 season and the present volume for 1994-1995 seasons.

3. Kourmoumelis 1998, p. 35, plan 2.

4. Although lead artefacts have been found on numbers of wrecks, very few have been published. In all the publications they are mentioned as forming parts of the ship's gear; the tubular lead objects are thought to have been connected with the ship's pumps (for metal objects in general, see Fiori & Joncheray 1973; Lamboglia 1952, 1964; Tchernia 1969).

5 Sparkes & Talcottt 1970, no. 837 (325-310 BC). The handleless bowls with incurving rims are mentioned on p. 131: "The bowl with an incurving rim is essentially a 4th century creation."

6 These belong to a group of sherds that do not have separate inventory numbers, only a general group number. See for A-ΔP.96/α Sparkes & Talcottt 1970, no. 832 (350-325 BC), and Edwards 1977, p. 31, no. 23, pl2:43 (end of 4th c. BC).

7 For A-ΔP.96/β, see Sparkes & Talcottt 1970, no. 828 (375-350 BC) and Edwards 1977, p. 32, no. 34, pl. 2: 44 (end of 4th c. BC).

8 Sparkes & Talcottt 1970, no. 803 (ca. 380 BC, and Edwards1977, p.34, no. 73, pl. 3: 44 (2nd quarter of 4th c. BC).

9 Kourkoumelis, present volume, p. 55, Figs. 10 & 11, Drawing 5.

10. Kourkoumelis, present volume, p. 53, Plan 2.

11. Sparkes & Talcottt 1970, nos. 944 and 946, (375-350 BC and ca. 350 BC). The ring feet of the smal handleless bowls are mentioned on page 137: "The late series with a ring foot (nos. 942-950) is concentrated mainly in the second and third quarters of the 4th century," and Rotroff 1997, no. 1076 (350-325 BC).

12 Sparkes & Talcottt 1970, no. 1466 (340-310 BC).

13 Thompson 1934, p. 324, fig 8, A56 (340-310 BC) and Sparkes & Talcottt 1970, no. 828 (375-350 BC).

14 Kourkoumelis, this volume, pp 55-56.

15 The finds from this year's excavation, except for the anchors, were all taken to the laboratories of the Ephorate of Underwater Antiquities.

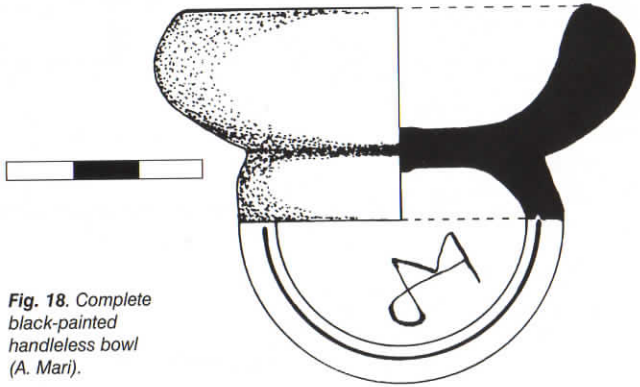
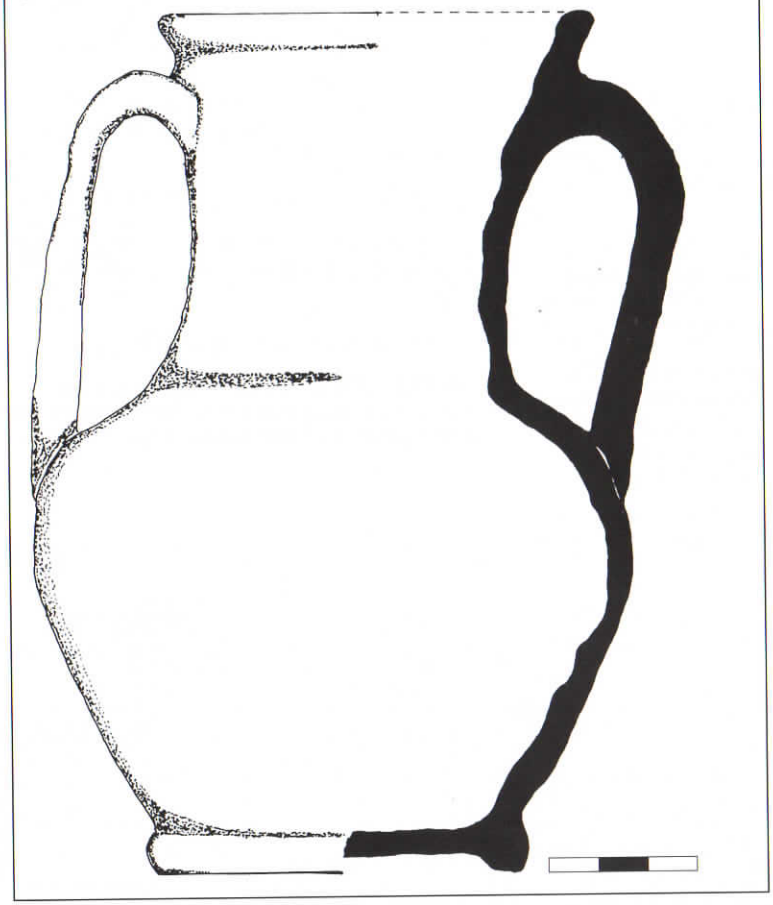


Fig. 18. *Complete black-painted handleless bowl (A. Mari).*

Fig. 19. *Complete amphoriskos (C. Papachristopoulou)*



BIBLIOGRAPHY

Edwards G. R.,	1977:	*Corinth, vol. VII, part III, Corinthian Hellenistic Pottery*, New Jersey.
Flori P., Joncheray J.-P.,	1937:	"Mobilier métallique (outils, armes, pièces de gréement) povenant de fouilles soumarines," *Cahiers d'Archéologie Subaquatique* 11, 73-94.
Kourkoumelis D.,	1996:	"Underwater Survey in the Avlemonas Region of Eastern Kythira (1993 Season)," *ΕΝΑΛΙΑ ANNUAL* IV(1992) 32-36.
Kourkoumelis D., This volume:		"I. Underwater Investigations at the Islet of Antidragonera (1994-1995)," *ΕΝΑΛΙΑ ANNUAL* V, 50-59.
Lamboglia N.,	1952:	"La nave romana di Albenga," *Revue d'Études Ligures*, XVIII.
Lamboglia N.,	1964:	"Il primo saggio de scavo sulla nave nave di Albenga," *Revue d'Études Ligures*, XXX.
Miller S. G.,	1974:	"Menon's Cistern," *Hesperia* 43, 29-49.
Rotroff S. I.,	1997:	*The Athenian Agora XXIX. Hellenistic Pottery. Athenian and Imported Wheelmade table ware*, Princeton.
Sparkes B. A., Talcottt, L.,	1970:	*The Athenian Agora XII. Black and Plain Pottery of the 6th, 5th and 4th centuries BC*, Princeton.
Tchernia A.,	1969:	"Informations archéologiques, Recherches sous-marins," *Gallia* XXVII, 476 ff.
Thompson H. A. ,	1934:	"Two Centuries of Hellenistic Pottery," *Hesperia* 3, 311-480.

COMMANDANT COUSTEAU

Jacques-Yves Cousteau
1910-1997

Haralambos Kritzas

The news that the great explorer of the deep and honorary member of our Institute, J.-Y. Cousteau had passed away into the Silent World saddened people all over the world. Had he been an ordinary man, one would simply have said of him that he departed this life at the ripe old age of 87, lively and active to the end.

But for the restless Commandant Cousteau even a last peaceful voyage to the Isles of the Blessed would be difficult to imagine, although his adventurous life should have earned him this tranquillity after death.

The lean, patrician figure with the gold-rimmed glasses, red knitted cap and ever-present smile had become linked to the icebergs of Antarctica and the jungles of the Amazon, to the underwater caves and "blue holes" of the Pacific, to sea-beds and desert islands as well as the mythical waters of the Mediterranean and the Nile.

His voice was often raised prophetically to predict unavoidable catastrophes on earth if the hubris of its present inhabitants continued, and he fiercely denounced governments and individuals who failed to respect the environment. Never before had the rights of the Silent World been so vociferously defended.

Such a voice is not to be silenced by death. It resounds in every protest over the destruction of the environment, in every ecological movement and in every agonised cry about the pollution of the seas.

It is this growing awareness of public opinion and the popularisation of knowledge surrounding the sea which are Captain Cousteau's greatest contributions to mankind.

Greece has particular reason to remember and honour him . He was an admirer of the Classical tradition and Greek mythology, and they are reflected in the name "Calypso" that he gave his beloved ship. He admired the structure and richness of the Greek language, which has given names to countless marine organisms.

He first met the Greek sponge-divers with their heavy diving-suits when he was making the legendary "Silent World".

He returned to the Aegean at the end of the fifties as part of a program to explore the waters of the Mediterranean.

Fig. 1. *Dia, September 1976. Cousteau discusses with Kritzas the island's role through the centuries (photo: H. Kritzas archive).*

Fig. 2. *Commandant Cousteau with Albert Falco and archaeologist Lazaros Kolonas (right) holding bronze statuettes just after they were recovered from the Antikythira wreck in 1976 (photo: H. Kritzas archive).*

But his ties with the blue waters of Greece became indissoluble when in 1975 he and the crew of the Calypso were invited by the Foreign Ministry to make a series of films under the general title of "The Search for Atlantis".

The country had just emerged from the 7 year dictatorship and the gathering cloud of hostile designs led the Greek government to call on Captain Cousteau. His popular films would remind the world of the primeval Greekness of the Aegean and at the same time boost Greek tourism. Thus he would not be searching for the remains of the mythical Atlantis, but rather seeking out the sources that had created the myth.

The Archaeological Service faced with a fait accompli, tried to take advantage of the presence of the Calypso with its up-to-date technical equipment to rediscover the sites of known ancient shipwrecks and to find others as yet unknown.

Since the Ephorate of Marine Antiquities had not yet been established, the supervision and scientific direction of these research projects were allocated to several young epimelites in the Archaeological Service, principally Haralambos Kritzas and Lazaros Kolonas, and to a lesser extent Isidoros Kakouris, Manolis Borboudakis, Haralambos Pennas and Nikos Papadakis. The administrative co-ordination and general supervision of the whole program were carried out by the then Ephor of Antiquities, George Papathanasopoulos. The Hellenic Institute of Marine Archaeology played an active part in the project with its volunteers (to mention a few: the topographers L. Tsavliris and V. Vitalis and the divers P. Antonopoulos, G. Garras, P. Nikolaïdis and S. Rakopoulos).

During the eight months or so that the Calypso remained in Greece, it literally ploughed all the waters of the South Aegean, exploring bays and barren islets, reefs and windswept headlands.

Fig. 3. *Commandant Cousteau holding bronze statuette from the Antikythera wreck (photo: H. Kritzas archive).*

I shall omit various sites where the explorations yielded nothing and briefly mention the most important ones investigated at the time.

1. Cape Artemision in Northern Evia. An attempt was made to locate the site of the ship-wreck, but without success due to the bad visibility and the presence of anti-submarine nets, which hampered the electronic equipment.

2. Bay of Pylos. The positions of the ships that sank during the naval battle of Navarino were charted and other ancient wrecks in the area were filmed.

3. Helike. A fruitless endeavour was made to locate the ancient city, which was submerged after the earthquake of 373/372 BC. The survey revealed various anomalies on the seabed, which Marinatos had thought might be ruins of buildings, but they proved to be simply geological formations.

4. Kea. The huge wreck was located of the Vrettanikos, which had served as a hospital ship in World War I and sunk between Kea and Makronisos.

5. The island of Dia (Crete). At this now deserted island lying opposite Heraklion, which thanks to its four sheltered bays played such an important role in navigation throughout the centuries, some six wrecks were discovered dating from the 1st c. BC to the Turkish period, and any visible part of their cargoes was recovered. At the

same time an underwater excavation was carried out in the natural harbour of Ayios Yeoryios, which yielded numerous finds, chiefly pottery, and showed that it had been in continuous use since prehistoric times.

6. Islet of Pseira (Crete). At this uninhabited islet in the Gulf of Mirabello, with its important Minoan site, the bottom, which was strewn with Minoan pottery, was explored and typical examples were brought up.

7. Cape Sideros (Crete). At this windswept headland on the eastern tip of Crete wrecks of the Roman and Early Christian periods were located and filmed.

8. Antikythira. The site was reinvestigated of the famous shipwreck, the main body of which lies at a depth of 62 m. The hard encrustation formed by the action of the sea was broken and a large number of impressive finds was raised, including bronze statuettes, lamps, glass and clay vases, amulets, various small objects and in particular a series of silver cistophoric coins from Pergamon, minted in 84 BC, which gave clear evidence of the provenance of the ship and also gave a date for the wreck in the 1st c. BC.

The Calypso visited and filmed many other sites such as Thira, Milos, Falkonera, Marathon Bay, Kyra Panayia, Dokos, Diktynnaio, Ayia Pelayia, Tsoutsouros and Methoni.
After the expedition left Greece, the Ephorate of Marine Antiquities was formed and took on the formidable task of investigating and preserving the rich underwater heritage of the Greek seas.

Cousteau visited Greece for the last time in 1988 on the occasion of the 31st International CIESM (Comité International pour l'Exploration Scientifique de la Mediterranée) of which he was general secretary for 25 years. It was an opportunity for the international community to honour the old seadog who, though he may not have possessed university degrees, wore both the wet suit of a diver and the robes of an academician with equal distinction. It was then that HIMA awarded him the title of Honorary Member.

Commandant Cousteau, A Fair Voyage!

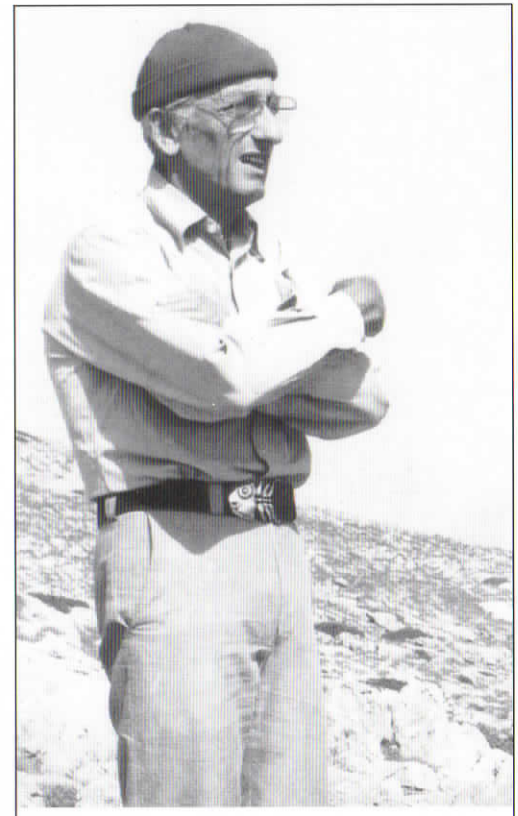


Fig. 4. *Cousteau with archaeologist Haralambos Kritzas in September 1976 on Dia Island (photo: H. Kritzas archive).*

HELLENIC INSTITUTE OF MARINE ARCHAEOLOGY

Founded1973

ADDRESS: I.EN.A.E., 9 Saripolou Str., Athens GR-10682, Greece
TEL / FAX: (30 10) 82 59 668

ISSN: 1106-5834