Hellenic Institute of Marine Archaeology

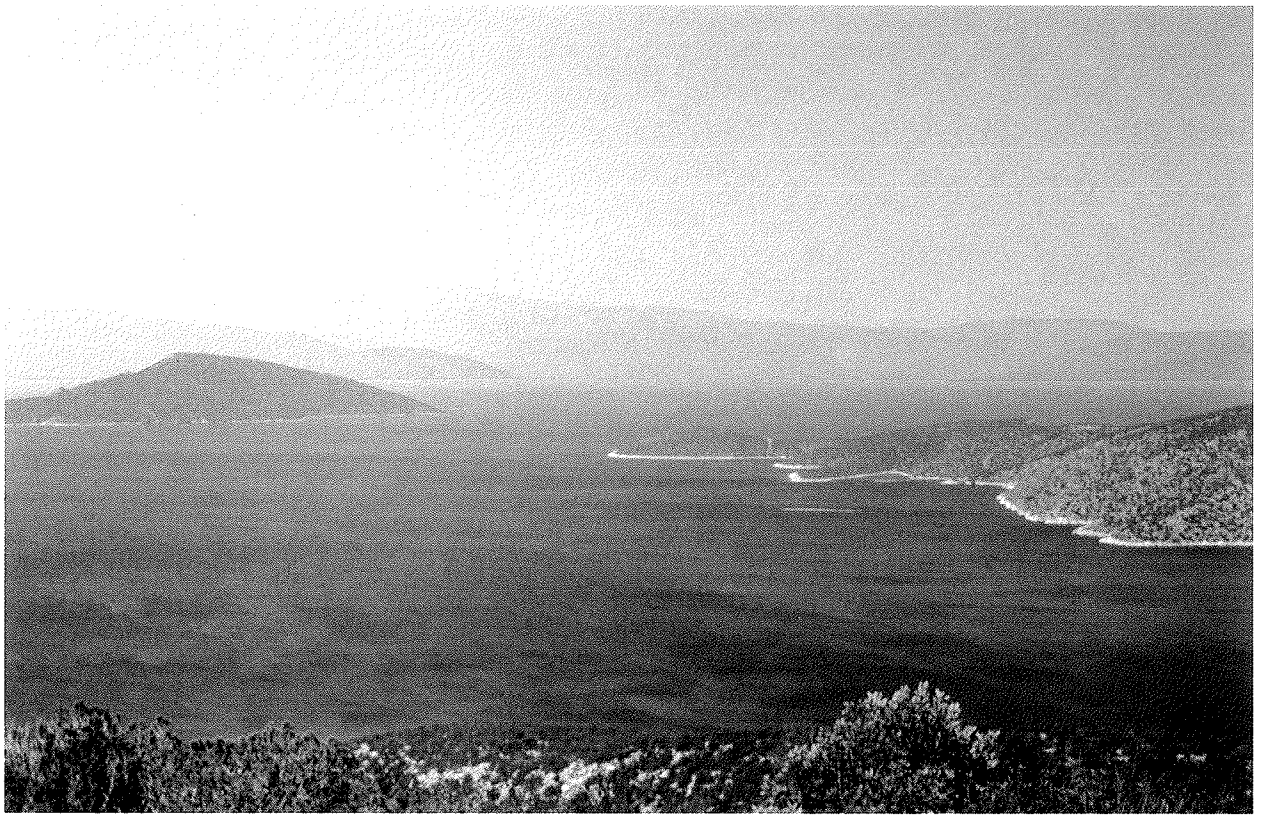
The Point Iria Wreck:
Interconnections in the Mediterranean *ca.* 1200 BC

Proceedings of the International Conference
Island of Spetses, 19 September 1998

Edited by
William Phelps, Yannos Lolos, Yannis Vichos

Second Edition

Athens 1999



Point Iria and the islet of Hypsili; view from east (Photo Y. G. Lolos, 1993)

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of Marine Archaeology

Ινστιτούτο Εναλίων
Αρχαιολογικών Ερευνών

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Το Ναυάγιο του Ακρωτηρίου Ιρίων:

Διασυνδέσεις στη Μεσόγειο περί το 1200 π.Χ.

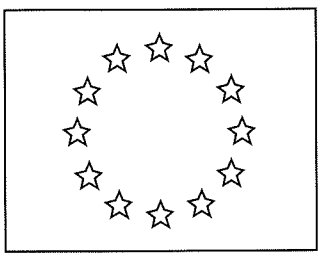
Πρακτικά
της Διεθνούς Συνάντησης,
Σπέτσες,
19 Σεπτεμβρίου 1998

Επιμέλεια Έκδοσης

William Phelps
Γιάννος Λώλος
Γιάννης Βήχος

Αθήνα 1999

Η έκδοση αυτή έγινε στο πλαίσιο του προγράμματος *«ΙΡΙΑ: Μελέτη, δημοσίευση και προβολή του ναυαγίου του Ακρωτηρίου Ιρίων»* το οποίο υποστηρίχθηκε από την Ευρωπαϊκή Επιτροπή, Γενική Διεύθυνση X.



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Φωτογραφία εξωφύλλου: Ακέραιος Κυπριακός πίθος στο χώρο του ναυαγίου του Ακρωτηρίου των Ιρίων. (Νίκος Ν. Τσούχλος,1974)

Photograph on cover: Complete Cypriot pithos on the wreck site at Point Iria. (Nicos N. Tsouchlos, 1974)

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Dedicated to Nicos N. Tsouchlos
who discovered the Point Iria Wreck in 1962

Αφιερώνεται στον Νίκο Ν. Τσούχλο
που ανακάλυψε το ναυάγιο του Ακρωτηρίου Ιρίων το 1962

Point Iria Wreck. Cargo of pottery and stone anchor (Photo K. Xenikakis, 1998)

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PROFESSOR SPYROS IAKOVIDIS

Ladies and Gentlemen,

As you know, the Institute has given me the honour and pleasure of presiding at this conference. I ask myself whether they could have found a more unsuitable person for this task, since, having suffered from otitis as a child, I have never in my life dived. I am not sure, therefore, how proper a person I am for the job. Since, however, they have entrusted me with it, I shall perform it as best I can.

Now, just before we begin, I have two messages to read you, if I may. The first is from Mr George Papathanassopoulos, Honorary Ephor of Antiquities:

"Warm congratulations on the 25th anniversary of your foundation" –meaning, of course, the Institute– "and on the inauguration of the Exhibition of Cypro-mycenaean finds from the wreck at Point Iria. I wish your conference every success."

ΧΑΙΡΕΤΙΣΜΟΙ

Πρόεδρος: Καθ. Σπύρος Ιακωβίδης.

Αντιπρόεδροι: Καθ. Βάσος Καραγιώργης και Paul Åström

ΚΑΘΗΓΗΤΗΣ ΣΠΥΡΟΣ ΙΑΚΩΒΙΔΗΣ

Κυρίες και κύριοι,

Καθώς θα γνωρίζετε το Ινστιτούτο μού έκανε την τιμή και μου έδωσε την ευχαρίστηση να προεδρεύσω αυτής της συνεδριάσεως. Διερωτώμαι αν θα μπορούσαν να βρουν πιο ακατάλληλο άνθρωπο γι' αυτή τη δουλειά, διότι για συγκεκριμένους λόγους –ωτίτιδες που έπαθα μικρός– δεν έχω ποτέ μου βουτήξει. Επομένως δεν ξέρω κατά πόσον είμαι ο ενδεδειγμένος γι' αυτή τη δουλειά, αλλά εν πάση περιπτώσει, εφόσον μου το ανέθεσαν θα προσπαθήσω να το διεκπεραιώσω όσο μπορώ καλύτερα.

Έχω μερικά, δύο συγκεκριμένως, μηνύματα, τα οποία θα μου επιτρέψετε να διαβάσω πρίν αρχίσουμε. Το ένα είναι από τον κύριο Γιώργο Παπαθανασόπουλο, Επίτιμο Έφορο αρχαιοτήτων.

«Θερμά συγχαρητήρια για 25η επέτειο ίδρυσής σας», προς το Ινστιτούτο βεβαίως απευθύνεται, «και εγκαίνια έκθεσης ευρημάτων Κυπρο-μυκηναϊκού ναυαγίου Ακρωτηρίου Ιρίων. Εύχομαι επιτυχία συνεδρίου σας».

The other message is from the president of the committee of the Hellenic Institute for the Preservation of Nautical Tradition, Mr Harry Tzalas:

"As I explained to my good friend Yannis Vichos yesterday, particular obligations make it impossible for me to attend the three days of events you are organising on Spetses. I am genuinely sorry that I shall be deprived of the pleasure of taking part in an archaeological event of such importance. I would like to express to all the members of the organising committee my warmest wishes for a great success, because I know how much all of you have laboured to bring it about. My best wishes to everyone."

I think this message expresses the thoughts of all of us, more or less. I shall therefore conclude my role for the present and I will ask Mrs Benaki, to address the meeting.

Το άλλο μήνυμα είναι από τον Πρόεδρο του διοικητικού συμβουλίου του Ελληνικού Ινστιτούτου Προστασίας Ναυτικής Παράδοσης, τον κυρίο Χάρη Τζάλα.

«Όπως εξήγησα χθες στον αγαπητό μας φίλο Γιάννη Βήχο μού είναι αδύνατον, λόγω εκτάκτων υποχρεώσεων, να παρευρεθώ στις τριήμερες εκδηλώσεις που οργανώνετε στις Σπέτσες. Λυπούμαι ειλικρινά ότι θα στερηθώ τη χαρά της συμμετοχής σε ένα αρχαιολογικό γεγονός τόσο σημαντικό. Θέλω να εκφράσω σε όλα τα μέλη της οργανωτικής επιτροπής τις θερμές ευχές για μια μεγάλη επιτυχία, γιατί γνωρίζω πόσο μοχθήσατε όλοι σας για να φέρετε σε πέρας αυτό το έργο. Την αγάπη μου σε όλους».

Νομίζω ότι αυτό το μήνυμα εκφράζει και τις σκέψεις όλων μας, λίγο πολύ. Λοιπόν, εδώ τελειώνει ο ρόλος μου προς το παρόν και θα παρακαλέσω την υπουργό κυρία Μπενάκη να χαιρετίσει την ημερίδα.

ANNA PSAROUDA-BENAKI
Former Minister of Culture

Thank you, Mr. Chairman. I should like to express my pleasure at this conference, speaking simply in my capacity as a friend of the Hellenic Institute of Marine Archaeology. I also speak as a person who has closely followed, almost on the spot, you might say, the work that has been carried out up till now. I have tried to assist this effort with all the means in my power in the past and I hope to continue to do so in the future. I think therefore that I can stress from my own first-hand experience how inspired the members of the Institute are, and with how much determination, self-denial, persistence and personal effort they have worked on the project. I followed the work on the wreck at Dokos and I now see with the Iria wreck that there has been much progress and that there are impressive finds on display in the exhibition, which the experts can judge properly. I believe this conference will enable a wider number of scholars to share in these discoveries, and that it will surely enrich archaeology with much new evidence. With these thoughts it only remains for me to welcome the members to the conference and hope it may enjoy productive and rewarding speeches, and in particular that the Institute will always carry on with the same spirit and constancy the work that it is doing now and in the future. We who are from this region, and I mean Argolida as a whole, would like to be able to see these finds not only in storerooms or at some conference, but as a permanent exhibition, so that every scholar, every interested person, and all the people who live in the region can be proud to see these finds and appreciate their significance. I wish you every success in your conference.

ΑΝΝΑ ΨΑΡΟΥΔΑ-ΜΠΕΝΑΚΗ
πρώην Υπουργός Πολιτισμού

Ευχαριστώ πολύ κύριε πρόεδρε. Θέλω να εκφράσω τη χαρά μου γι' αυτό το συνέδριο, μιλώντας υπό μία πολύ απλή ιδιότητα, της φίλης του Ινστιτούτου Εναλίων Αρχαιολογικών Ερευνών. Υπό την ιδιότητα ενός ανθρώπου που έχει παρακολουθήσει από πολύ κοντά, επί τόπου σχεδόν, τις εργασίες που έχουνε γίνει μέχρι τώρα και με όλες τις δυνάμεις που διέθετα στο παρελθόν και διαθέτω και στο παρόν και θα διαθέτω ελπίζω και στο μέλλον, έχω βοηθήσει αυτή την προσπάθεια. Μπορώ επομένως να τονίσω έτσι, από εμπειρία και από πρώτο χέρι, πόσο εμπνευσμένα είναι τα μέλη του Ινστιτούτου, με πόσο πείσμα, αυταπάρνηση, επιμονή και προσωπικό και σωματικό μόχθο έχουν δουλέψει μέχρι σήμερα. Εγώ έχω παρακολουθήσει από κοντά τις ερευνητικές εργασίες στο ναυάγιο στο Δοκό. Βλέπω ότι και τώρα με το ναυάγιο στα Ίρια, έχει γίνει μια πολύ μεγάλη πρόοδος και εντυπωσιακά ευρήματα εκτίθενται και οι ειδικοί θα τα εκτιμήσουν ανάλογα. Πιστεύω ότι αυτό το συνέδριο θα καταστήσει μετόχους αυτών των διαπιστώσεων και ανακοινώσεων ένα ευρύτερο φάσμα επιστημόνων και θα εμπλουτίσει ασφαλώς την επιστήμη της Αρχαιολογίας με πολλά νέα δεδομένα. Με αυτές τις σκέψεις, δεν έχω παρά να χαιρετίσω το συνέδριο, να ευχηθώ πλούσιες και αποδοτικές εργασίες και κυρίως το Ινστιτούτο να συνεχίσει πάντα με την ίδια ζωτικότητα και επιμονή το έργο που κάνει και να το προωθήσει ακόμη παραπέρα. Θα θέλαμε εμείς της περιοχής τουλάχιστον, να μιλήσω έτσι για την ευρύτερη Αργολίδα εδώ, να δούμε αυτά τα ευρήματα όχι μόνο σε αποθήκες ή επ' ευκαιρία κάποιων συνεδρίων, αλλά ως ένα μόνιμο εκθετήριο, ώστε να μπορούν όλοι οι επιστήμονες, όλοι οι ενδιαφερόμενοι, αλλά και οι κάτοικοι της περιοχής να υπερηφανεύονται βλέποντας αυτά τα ευρήματα και μαθαίνοντας από κοντά τη σημασία του τόπου τους. Εύχομαι καλή επιτυχία στο συνέδριο σας.

EUGENIOS GIANNAKOPOULOS
Secretary of the Ministry of Culture

Mr. Chairman, Ladies and Gentlemen,

Just before the start of a scholarly conference, polititians usually feel rather embarrassed and wonder what they should say by way of a greeting. This embarrassment can only be overcome if one says in two minutes quite simply what one is thinking. Well, the first thing we think is that the activity of the Institute, organised in the way we see it today on the occasion of the Iria wreck conference, is the kind of activity of which the Ministry of Culture has need, because the Ministry and its Archaeological Service have need of all the assistance they can get from the organised efforts of scholars and scientists both in Greece and abroad. These efforts must consequently be encouraged and supported by the State, and the presence of Mrs. Benaki and myself here representing the State and the Ministry is meant to convey this support.

The second is that our underwater archaeological wealth, as you know better than I, is highly important and a rich source of knowledge, and needs many specialised persons, expert scholars and scientists. The Ministry of Culture is very active at present in pursuit of this end and will be even more so in the future, because the special aspects of underwater archaeology limits the choice of people. You will presently all have the opportunity to hear some good news in the field of underwater antiquities, which I am not yet ready to disclose. I am happy that the director of the excavation, Mr. Haralambos Pennas, who is a distinguished member of

ΕΥΓΕΝΙΟΣ ΓΙΑΝΝΑΚΟΠΟΥΛΟΣ
Γενικός Γραμματέας Υπουργείου Πολιτισμού

Κύριε πρόεδρε, κυρίες και κύριοι,

Οι πολιτικοί, συνήθως λίγο πριν την έναρξη των επιστημονικών συνεδρίων, βρίσκονται αμήχανοι, σκεπτόμενοι τι πρέπει να πουν στους χαιρετισμούς. Η αμηχανία αυτή μπορεί να καταπολεμηθεί μόνον αν κανείς απλώς πει αυτά τα πράγματα τα οποία σκέπτεται για δυο λεπτά. Σκέπτομαι ότι η δραστηριότητα του Ινστιτούτου, όπως οργανωμένα παρουσιάζεται σήμερα με την ευκαιρία της Έκθεσης του ναυαγίου των Ιρίων είναι μια δραστηριότητα που το Υπουργείο Πολιτισμού έχει ανάγκη, όπως έχει ανάγκη το υπουργείο και οι υπηρεσίες του από κάθε βοήθεια που μπορούν να λάβουν από τις προσπάθειες που κάνουν οι επιστήμονες με την οργανωμένη μορφή, τόσο στην Ελλάδα, όσο και στο εξωτερικό. Και κατά συνέπεια αυτές οι προσπάθειες πρέπει να ενθαρρύνονται και να υποβοηθούνται και αυτό το νόημα έχει, το νόημα της στήριξης της πολιτείας, τόσο η παρουσία της κυρίας Άννας Ψαρούδα Μπενάκη, όσο και η παρουσία η δική μου, ως εκπροσώπου της πολιτείας και του υπουργείου.

Το δεύτερο είναι ότι ο ενάλιος αρχαιολογικός μας πλούτος, όπως είναι πολύ περισσότερο γνωστό σε σας, είναι πολύ σημαντικός, πολύ αποκαλυπτικός. Χρειάζονται από την άλλη πλευρά πολλοί άνθρωποι ειδικευμένοι, πολλοί ειδικοί επιστήμονες και στην κατεύθυνση αυτή το Υπουργείο Πολιτισμού δραστηριοποιείται και θα δραστηριοποιηθεί ακόμη περισσότερο, διότι η ενάλια αρχαιολογία έχει ιδιαιτερότητες που περιορίζουν τη δυνατότητα επιλογής ανθρώπων. Βρισκόμαστε σε μια περίοδο, μετά από την οποία θα έχετε όλοι την ευκαιρία να ακούσετε διάφορα καλά νέα για τον τομέα των εναλίων αρχαιοτήτων, τα οποία δεν είμαι ακόμη έτοιμος να σας πω. Χαίρομαι διότι ο διευθυ-

the Archaeological Service, is now the head of the 2nd Ephorate of Byzantine Antiquities and therefore in charge of the Museum where we shall see the fine exhibition tomorrow. Let me thank you and urge you to continue these scholarly meetings and conferences with the aim always of advancing your science, a science which reaches out beyond national boundaries, a science that is keenly international.

ντής της ανασκαφής, ο κύριος Χαράλαμπος Πέννας, είναι και διακεκριμένο στέλεχος της Υπηρεσίας, και τώρα προϊστάμενος της 2ης Εφορείας Βυζαντινών Αρχαιοτήτων και επομένως υπό τη δική του αρμοδιότητα είναι και το Μουσείο στο οποίο αύριο θα δούμε την ωραία έκθεση. Θέλω να σας ευχαριστήσω και να σας προτρέψω να συνεχίσετε αυτές τις συναντήσεις επιστημονικού χαρακτήρα, τις συνευρέσεις, με σκοπό πάντα να βοηθήσετε την επιστήμη, μια επιστήμη η οποία ξεπερνάει τα όρια της χώρας, μια επιστήμη η οποία έχει και έντονο διεθνή χαρακτήρα. Ευχαριστώ».

NICOS N. TSOUCHLOS
President of the Hellenic Institute of Marine Archaeology

I should like to thank you all warmly for accepting our invitation to attend this conference on the Point Iria wreck. But before you hear the papers presented by my colleagues at the Institute and our friends who have come to share their own experiences with similar finds and talk about interconnections and maritime commerce at the end of the second millennium, I must tell you a little personal story, which began thirty years ago and which through a series of coincidences has led to this conference today.

Personally I have no scholarly standing as regards the subject, but I may say that I share the same interest as you in the sea, in man's activities to do with it and especially his progress in seafaring, shipbuilding and marine trade.

By the 1960s I was a fairly experienced scuba diver and in my underwater excursions I very often came across ancient finds, either scattered or in concentrations, the probable remains of shipwrecks. This was how, some thirty years ago, in one of my dives I happened on the Iria wreck. But this time, unlike the past, it aroused a strong interest in me. It might have been the large size of the pots, or possibly their completely different shapes; perhaps also it was the culmination of my interest in our nautical history. This time I didn't see them as isolated lifeless objects; I felt I was looking at the living evidence of the last tragic moments of a ship and its crew.

ΝΙΚΟΣ Ν. ΤΣΟΥΧΛΟΣ
Πρόεδρος του Ινστιτούτου Εναλίων Αρχαιολογικών Ερευνών

Θέλω να σας καλωσορίσω όλους και να σας ευχαριστήσω θερμά που αναταποκριθήκατε στην πρόσκλησή μας, να παρευρεθείτε σ' αυτή την Ημερίδα. Αντικείμενο της είναι το ναυάγιο του Ακρωτηρίου Ιρίων. Πριν όμως ακούσετε τις ανακοινώσεις των συναδέλφων μου στο Ινστιτούτο και των φίλων μας που ήρθαν να καταθέσουν τις δικές τους εμπειρίες από αντίστοιχα ευρήματα ή εκείνων που θα μιλήσουν για τις διασυνδέσεις και το θαλασσινό εμπόριο στο τέλος της 2ης χιλιετίας, θα ήθελα να σας πω μια μικρή προσωπική ιστορία, που ξεκίνησε πριν από 30 χρόνια, περίπου, και που μέσα από διάφορες συγκυρίες οδήγησε στην σημερινή εκδήλωση.

Προσωπικά δεν έχω καμία επιστημονική ιδιότητα σχετική με το αντικείμενό μας, όμως πρέπει να σας πω ότι μοιράζομαι και εγώ τα ίδια ενδιαφέροντα με εσάς, γύρω από τη θάλασσα, τις δραστηριότητες του ανθρώπου σ' αυτήν και κυρίως τις επιδόσεις του στη ναυτιλία, στην ναυπηγική τέχνη και το θαλασσινό εμπόριο.

Στη δεκαετία του 1960 ήμουνα ήδη ένας αρκετά έμπειρος αυτοδύτης και στις περιηγήσεις μου στο βυθό συναντούσα, πολύ συχνά, αρχαία ευρήματα, είτε σκόρπια, είτε συγκεντρωμένα, πιθανόν κατάλοιπα κάποιων ναυαγίων. Με αυτό τον τρόπο, πριν τριάντα χρόνια περίπου, εντόπισα σε μια από τις καταδύσεις μου και το ναυάγιο των Ιρίων. Όμως αυτή τη φορά, σε αντίθεση με το παρελθόν, το ενδιαφέρον μου και οι αντιδράσεις μου ήταν πάρα πολύ έντονες. Ίσως ήταν το μεγάλο μέγεθος των κεραμικών αγγείων, ίσως το τελείως διαφορετικό τους σχήμα, ίσως ακόμα η κορύφωση του ενδιαφέροντός μου γύρω από τη ναυτική μας ιστορία. Αυτή τη φορά δεν έβλεπα τα μεμονωμένα

άψυχα αντικείμενα, αλλά ένιωθα ότι είχα μπροστά μου ζωντανή τη μαρτυρία των τελευταίων τραγικών στιγμών ενός πλοίου και του πληρώματός του.

The Iria wreck was the cause of a change in my approach, which took me down a new road and in a certain way determined my future course. And so in 1970 I managed to get myself taken on as a volunteer in the team that was excavating the Byzantine wreck at Pelagonisi. That was where I first met Peter Throckmorton, who was the technical director of the expedition. I imagine many of you will have known Peter personally, or heard a lot about him and even read some of his books, so I don't have to explain why his fascinating talk about wooden ships and nautical history and archaeology were what clinched my involvement in this field.

Το ναυάγιο των Ιριών ήταν η αφορμή της αλλαγής της προσέγγισής μου, που με οδήγησε σ' ένα νέο δρόμο, ο οποίος κατά κάποιο τρόπο καθόρισε και τη συνέχεια της πορείας μου. Έτσι το 1970 κατάφερα να συμπεριληφθώ ως εθελοντής στην ομάδα που έκανε την ανασκαφή του βυζαντινού ναυαγίου στο Πελαγονήσι. Εκεί συνάντησα για πρώτη φορά τον Peter Throckmorton, που ήταν ο τεχνικός διευθυντής της έρευνας. Επειδή φαντάζομαι ότι πολλοί από σας τον γνωρίσατε προσωπικά ή θα 'χετε ακούσει πολλά γι' αυτόν ή ακόμα θά 'χετε διαβάσει κάποια από τα βιβλία του, είναι περιττό να σας εξηγήσω πως η γοητεία του λόγου του για τα ξύλινα πλοία, και τα θέματα της ναυτικής ιστορίας και αρχαιολογίας, ήταν αυτή που έκανε οριστική την εμπλοκή μου σ' αυτόν το χώρο.

It was there at Pelagonisi that the idea came to me of forming a private organisation that would be free of bureaucratic obligations and able to give effective assistance to the Archaeological Service in this new field of research. As soon as the excavation was over, long discussions and active planning started with Peter, the archaeologists George Papathanasopoulos and Haralambos Kritzas and other friends, which resulted in the official foundation of the Hellenic Institute of Marine Archaeology in August 1973. After a number of mistakes, a lot of enthusiasm and many disappointments, in 1985, after the experience gained in the intervening years, the Institute began again on a new footing. Since 1989 it has taken on a new dynamic role in underwater archaeology, with three full excavations at Dokos, Iria and Antidragonera

Εκεί στο Πελαγονήσι, γεννήθηκε στη σκέψη μου η ιδέα της δημιουργίας ενός ιδιωτικού φορέα, που απαλλαγμένος από γραφειοκρατικές δεσμεύσεις, θα μπορούσε να βοηθήσει αποφασιστικά την Αρχαιολογική Υπηρεσία σ' αυτόν το νέο κλάδο της έρευνας. Αμέσως μετά την ανασκαφή ξεκίνησαν μακρές συζητήσεις και ενέργειες για τη δημιουργία του νέου φορέα, με τη συνεργασία του Peter, των αρχαιολόγων Γιώργου Παπαθανασόπουλου, Χαράλαμπου Κριτζά και άλλων φίλων, που κατέληξαν στην επίσημη ίδρυση του Ινστιτούτου Εναλίων Αρχαιολογικών Ερευνών, τον Αύγουστο του 1973. Μετά από πολλές περιπέτειες, ενθουσιασμούς και απογοητεύσεις, το 1985 το Ινστιτούτο έχοντας την εμπειρία των περασμένων ετών επιχειρεί ένα νέο ξεκίνημα σε νέες βάσεις. Η προσπάθεια αυτή το οδήγησε, από το 1989 και

in Kythera as well as the publication of the journals *ΕΝΑΛΙΑ* and *ΕΝΑΛΙΑ ANNUAL*. At the same time the Institute has given training to young archaeologists, technicians and other scientists through its excavations and seminars. The Institute's new activities include participation in joint projects in Greece and abroad. Today, twenty-five years after its foundation, we are delighted to share the anniversary with you at this conference and at the opening tomorrow of the exhibition of the finds from Iria. It is the first exhibition in Greece of a ship's cargo, the full excavation of which was only completed in 1994.

Lastly, I should like to thank all the people and organisations in Greece and abroad who have given us their material and moral support during these twenty-five years, because without their assistance none of this would have happened. They are the invisible workers and creators of the Institute's success.

I hope that the years to come will bring more success and that the future has new ventures in store for us, like those we have experienced up to now.

έπειτα, σε μια δυναμική και ουσιαστική παρουσία στο χώρο της υποβρύχιας αρχαιολογίας, με τρεις συστηματικές έρευνες, στο Δοκό, στα Ίρια και στην Αντιδραγονέρα των Κυθήρων, καθώς και την έκδοση των περιοδικών *ΕΝΑΛΙΑ* και *ΕΝΑΛΙΑ ANNUAL*. Παράλληλα εκπαιδεύτηκαν νέοι αρχαιολόγοι, τεχνικοί και άλλοι επιστήμονες, τόσο στις ανασκαφές του, όσο και σε σεμινάρια του. Στις νέες δραστηριότητες του Ινστιτούτου συμπεριλαμβάνεται και η συμμετοχή σε σχετικά Κοινοτικά προγράμματα στην Ελλάδα και στο εξωτερικό. Σήμερα, 25 χρόνια μετά την ίδρυσή μας, έχουμε τη χαρά να εορτάζουμε μαζί σας αυτή την επέτειο, με την Ημερίδα και με τα αυριανά εγκαίνια της έκθεσης των ευρημάτων των Ιρίων. Είναι η πρώτη έκθεση στην Ελλάδα του φορτίου ενός πλοίου, που προέρχεται από μια συστηματική ανασκαφή, η οποία ολοκληρώθηκε μόλις το 1994.

Τελειώνοντας θέλω να ευχαριστήσω τα μέλη του ΙΕΝΑΕ, καθώς και όλους τους ανθρώπους και τους φορείς, στην Ελλάδα και στο εξωτερικό, που μας στήριξαν υλικά και ηθικά τα 25 αυτά χρόνια, γιατί χωρίς τη βοήθειά τους τίποτα απ' όλ' αυτά δεν θα είχε πραγματοποιηθεί. Αυτοί είναι οι αφανείς εργάτες και δημιουργοί της επιτυχίας του Ινστιτούτου.

Ελπίζω τα χρόνια που έρχονται να είναι πιο ευνοϊκά για το Ινστιτούτο και το μέλλον να μας επιφυλάσσει και νέες σημαντικές εμπειρίες, σαν αυτές που βιώσαμε μέχρι σήμερα.

HARALAMBOS PENNAS

Director of the Point Iria Wreck Excavation

As former President of HIMA, my absence from Athens on Chios and in England in the 1980s cut me off from its activities, as well as from the developments that took place during this period. The proposal that I should undertake the direction of the excavation at Iria, even though it did not fall within my special field of knowledge as a Byzantine archaeologist, gave me the opportunity to renew contacts with its members once more.

Apart from old sentimental ties with HIMA, another reason for accepting this invitation was the colleagues on whom I counted and to whom I entrusted the various sectors of the underwater project, and particularly those to whom I finally assigned the scientific treatment, conservation, display and promotion of the finds.

In addition, the survey, covering an area of 5,000m², showed the finds extended into the Byzantine period, which could potentially form a new chapter in the archaeological exploration of Point Iria and the secrets hidden in its depths.

In the first report on the excavation of the Point Iria Wreck in the review *ΕΝΑΛΙΑ*, I wrote that the members of HIMA were faced with the challenge to overcome, with their ingenuity, the difficulties of the excavation. My expectations were in fact greatly surpassed, since this is the first wreck which, only a few years after its underwater excavation, can be visited by the public in an archaeological museum. And here we have in our hands the abstracts of the

ΧΑΡΑΛΑΜΠΟΣ ΠΕΝΝΑΣ

Διευθυντής της ανασκαφής του ναυαγίου του Ακρωτηρίου Ιρίων

Ως τέως πρόεδρος του ΙΕΝΑΕ, η απουσία μου από την Αθήνα στη Χίο και την Αγγλία τη δεκαετία του 1980 με είχε αποξενώσει από τις δραστηριότητες του Ινστιτούτου καθώς και από την πρόοδο που είχε συντελεστεί σ' αυτό το διάστημα. Η πρόταση να αναλάβω τη διεύθυνση της έρευνας στα Ίρια, παρόλο που δεν εμπίπτει στο γνωστικό αντικείμενο της εξειδίκευσής μου, ως βυζαντινού αρχαιολόγου, μου έδινε τη δυνατότητα να συνδεθώ και πάλι με τα μέλη του.

Εκτός από το συναισθηματικό δεσμό με το ΙΕΝΑΕ η άλλη αιτία να αποδεχθώ την πρόσκληση αυτή ήταν οι συνεργάτες στους οποίους θα βασιζόμουν και στους οποίους ανέθεσα τους ποικίλους τομείς της υποβρύχιας έρευνας και ιδιαίτερα σ' αυτούς που ανέθεσα τελικά την επιστημονική επεξεργασία, συντήρηση, προβολή και ανάδειξη των ευρημάτων.

Άλλωστε η έρευνα που επεκτάθηκε σε 5000 τ.μ. απέδειξε ότι στη περιοχή αυτή υπάρχουν ευρήματα που φτάνουν μέχρι τη Βυζαντινή εποχή και ενδεχομένως θα αποτελέσουν ένα νέο κεφάλαιο στην αρχαιολογική έρευνα του Ακρωτηρίου των Ιρίων και στα μυστικά που κρύβει ο βυθός του.

Στην πρώτη παρουσίαση του ναυαγίου των Ιρίων στο περιοδικό *ΕΝΑΛΙΑ* είχα γράψει ότι από τα μέλη του ΙΕΝΑΕ εξαρτάται να ξεπεράσουν με την ευρηματικότητα τους τις δυσκολίες της έρευνας. Οι προσδοκίες μου ξεπέρασαν κάθε προηγούμενο, μια που είναι το πρώτο ναυάγιο που, λίγα μόλις χρόνια μετά την έρευνα, είναι επισκέψιμο στο δημόσιο χώρο ενός Αρχαιολογικού Μουσείου. Έχουμε μπροστά μας τις περιλήψεις των ανακοινώσεων του ειδικού διε-

papers of an international conference on the Iria wreck and a provisional catalogue of finds has already been printed with scholarly articles on their significance and their attribution to the period of the Late Bronze Age. I am moreover hopeful that within 1999 we shall also have the final publication of the excavation.

The Cypriot pithoi, Cretan stirrup jars and Mycenaean jars, together with the deep bowls and anchors, have made it possible for the members of HIMA and their colleagues from America and Europe to create a compact, homogenous team whose common purpose is to find solutions and answers, not only to scholarly questions, but also to the variety of daily problems that arise in the course of carrying out an underwater excavation, which by its very nature is complex and demanding of immediate solutions.

The course of the excavation of the Iria wreck has also not been without consequences for my own advancement within the Archaeological Service. For while I used to visit the Spetses Museum from time to time as a guest to watch the progress of the work of conservation with an eye to the future publication and exhibition, today I am concerned with the future promotion and display of the finds from another viewpoint, since the museum belongs to the Ephorate of Byzantine Antiquities, of which I have recently been put in charge.

I hope that this gathering will be the occasion for a fruitful discussion on both the importance of the Iria wreck and on maritime trade routes in the Mediterranean in around 1200 BC.

θνούς συνεδρίου με θέμα το ναυάγιο των Ιρίων, έχει κιόλας τυπωθεί προκαταρκτικά ο κατάλογος των ευρημάτων, με επιστημονικά άρθρα για τη σημασία τους και την ένταξη τους στην Ύστερη Εποχή του Χαλκού και ευελπιστώ ότι εντός του 1999 θα έχουμε τον πλήρη τόμο της οριστικής δημοσίευσης της έρευνας.

Οι κυπριακοί πίθοι, οι κρητικοί ψευδόστομοι αμφορείς και οι μυκηναϊκοί πιθαμφορείς με τους σκύφους, καθώς και τις άγκυρες, έδωσαν τη δυνατότητα αυτή στα μέλη και τους συνεργάτες του ΙΕΝΑΕ από την Αμερική και την Ευρώπη, να δημιουργήσουν μια ομοιογενή, συμπαγή ομάδα με κοινό στόχο να δώσουν λύσεις και απαντήσεις, όχι μόνο σε επιστημονικά θέματα, αλλά και στα ποικίλα καθημερινά προβλήματα που προκύπτουν κατά την εκτέλεση μιας υποβρύχιας έρευνας, που από τη φύση της είναι πολύπλοκη και απαιτεί άμεσες λύσεις.

Η εξέλιξη της έρευνας του ναυαγίου του Ακρωτηρίου Ιρίων φαίνεται ότι επέδρασε και στην υπηρεσιακή μου εξέλιξη, όπως επεσήμανε προηγουμένως ο κύριος γενικός. Έτσι λοιπόν, ενώ κατά καιρούς επισκεπτόμουν το Μουσείο των Σπετσών για να παρακολουθώ την πρόοδο των εργασιών της συντήρησης με στόχο τη μελλοντική τους δημοσίευση και έκθεση, σήμερα με προκαλεί με σκέψεις μελλοντικής ανάπτυξης και ανάδειξης των ευρημάτων από μια άλλη σκοπιά, δεδομένου ότι ανήκει στην Εφορεία Βυζαντινών Αρχαιοτήτων για την οποία πρόσφατα έχω ορισθεί υπεύθυνος.

Ελπίζω ότι η σύναξη αυτή θα δώσει την αφορμή να γίνει μια γόνιμη συζήτηση, τόσο για την σημασία του ναυαγίου των Ιρίων, όσο και για τις θαλάσσιες εμπορικές οδούς επικοινωνίας στη Μεσόγειο γύρω στο 1200 π.Χ.

PROFESSOR SPYROS IAKOVIDIS

We thank Mr. Pennas for his contribution to this excavation, which was more than substantial, and we will now begin with the communications.

But before we do so, I should like to say a few words to those of you who are not of the profession, by which I mean archaeologists, about the importance of underwater excavations, in which as you know, I am unable to take part. Although they are very expensive, difficult and sometimes hazardous for those carrying them out, and certainly not as outwardly impressive as a land excavation, which people can follow and see on the spot, they nevertheless have one great advantage over a land excavation. They are closed finds, and it is this that gives them their importance. When, for example, you bring to the surface the contents of a ship, because that is what we are talking about, you know that they were in use by people at exactly the same moment in time, and consequently if there are synchronisms between the finds, which are not found in land finds and possibly even run contrary to them, this gives us the key to accurate chronologies. They do not give us absolute chronologies —that is very difficult and one would not expect it— but the synchronism of underwater finds is a criterion which we cannot ignore: not only does this make the excavation worthwhile, but it makes it a necessity.

ΚΑΘΗΓΗΤΗΣ ΣΠΥΡΟΣ ΙΑΚΩΒΙΔΗΣ

Ευχαριστούμε τον κύριο Πέννα του οποίου η συμβολή είναι βέβαια, όχι απλώς ουσιαστική, αλλά κάτι παραπάνω για την ανασκαφή αυτή και θα αρχίσουμε τώρα με τις ανακοινώσεις, αλλά θα μου επιτρέψετε να καταχραστώ τη θέση μου ως προεδρεύοντος και να σας απασχολήσω για λίγα λεπτά.

Θέλω να εξηγήσω σε όσους από σας δεν είναι του επαγγέλματος, δεν είναι αρχαιολόγοι δηλαδή, τη σημασία των υποβρυχίων ερευνών, στις οποίες όπως σας είπα εγώ δέν μπορώ να λάβω μέρος. Η υποβρύχια έρευνα, ενώ είναι πολυέξοδη, δύσκολη, επικίνδυνη καμμιά φορά, για εκείνους οι οποίοι την κάνουν και οπωσδήποτε όχι τόσο εντυπωσιακή όσο μία ανασκαφή χερσαία, την οποία μπορούν να παρακολουθήσουν και να δουν οι άνθρωποι, έχει όμως ένα μεγάλο πλεονέκτημα το οποίο σχεδόν καμμιά χερσαία ανασκαφή δέν έχει. Πρόκειται για ευρήματα «κλειστά» και αυτή είναι η μεγάλη σημασία των υποβρυχίων ερευνών. Δηλαδή όταν φέρνει κανείς στην επιφάνεια το περιεχόμενο ενός πλοίου, διότι περί αυτού πρόκειται, ξέρει ότι το περιεχόμενο αυτό χρησιμοποιήθηκε από ανθρώπους την ίδια χρονική στιγμή ακριβώς και επομένως, εάν προκύψουν συγχρονισμοί μεταξύ των ευρημάτων, οι οποίοι δεν είναι γνωστοί από τα χερσαία ευρήματα ή ενδεχομένως και αντιβαίνουν τα χερσαία ευρήματα, το στοιχείο αυτό είναι το κλειδί το οποίο θα μας δώσει τις σωστές χρονολογίες. Δεν θα μας δώσει απόλυτες χρονολογίες, αυτό είναι πάρα πολύ δύσκολο, δεν το περιμένει κανείς, αλλά ο συγχρονισμός των εναλίων ευρημάτων είναι ένα κριτήριο το οποίο δεν μπορούμε να αγνοήσουμε με κανένα τρόπο και ως εκ τούτου, όχι μόνο αξίζει να γίνεται αυτή η έρευνα, αλλά και επιβάλλεται.

Now let us proceed to the communications, and I will hand over my position to my colleague and friend, professor and member of the Athens Academy, Mr. Karageorghis, who will direct the discussion during the communications, and I thank him for relieving me of this.

Λοιπόν, κατόπιν τούτου προχωρούμε στις ανακοινώσεις και θα παραχωρήσω τη θέση μου στο συνάδελφο, φίλο και καθηγητή και μέλος της Ακαδημίας Αθηνών, τόν κύριο Καραγιώργη, ο οποίος θα διευθύνει την συζήτηση στις ανακοινώσεις και τον ευχαριστώ πάρα πολύ που με ελαφρύνει κατά τούτο.

PROFESSOR VASSOS KARAGEORGHIS

Thank you, Mr. Colleague. I would like in my turn to congratulate HIMA on its twenty-fifth anniversary. I shall follow the next twenty-five years of its activities with interest.

My greetings and congratulations come from me personally, but also from the Leventis Foundation, with which I collaborate and which from the outset perceived the significance of this wreck and has supported your efforts in every way. In the course of this symposium I too shall undoubtedly come to understand —something which I have not hitherto— why this wreck, this ship is called Cypromycenaean. It was something Mr Pennas whispered to me this morning, but from a scholarly viewpoint I fancy this terminology is not quite orthodox: either Cypriote or Mycenaean, but not both.

As Mr. Iakovidis has rightly pointed out, underwater archaeological excavations have now acquired cogency and respect. When I was a student, I remember that none of the archaeologists, our professors, thought much of underwater excavations. They considered it an occupation for young boys and girls who liked to dive down to the bottom of the sea and enjoyed the mystery of the excavation. Now things have changed and we are learning a great deal from underwater excavations. I need only mention how much archaeology has changed, how greatly our knowledge of interconnections in the Mediterranean has been enriched by the great excavations of my friend and colleague Cemal Pulak in his excavation of Uluburun; and now comes the Iria excavation to tell us more about this very critical period for interconnections in the Mediterranean, espe-

ΚΑΘΗΓΗΤΗΣ ΒΑΣΟΣ ΚΑΡΑΓΙΩΡΓΗΣ

Ευχαριστώ κύριε συνάδελφε. Θα ήθελα και εγώ με τη σειρά μου να συγχαρώ το ΙΕΝΑΕ για τα εικοσιπεντάχρονά του. Θα πρακολουθήσω με πολύ ενδιαφέρον τα επόμενα είκοσι πέντε χρόνια των δραστηριοτήτων του.

Ο χαιρετισμός μου και τα συγχαρητήρια μου προέρχονται από μένα προσωπικά, αλλά και από το Ίδρυμα Λεβέντη με το οποίο συνεργάζομαι και το οποίο απαρχής εκτίμησε τη σημασία αυτού του ναυαγίου και συμπαραστάθηκε παντοιοτρόπως στις προσπάθειες σας. Ασφαλώς κατά τη διάρκεια του συμποσίου αυτού θα αντιληφθώ και 'γω, κάτι που δεν αντιλήφθηκα ως τώρα, γιατί αυτό το ναυάγιο, αυτό το πλοίο, ονομάζεται Κυπρο-μυκηναϊκό· κάτι μου είπε σχετικώς ο κύριος Πέννας σήμερα το πρωΐ, αλλά επιστημονικά φαντάζομαι να μην είναι και απόλυτα δόκιμη αυτή η ονομασία: ή Κυπριακό είναι ή Μυκηναϊκό, δεν μπορεί να είναι και τα δύο.

Όπως πολύ σωστά επεσήμανε ο κύριος Ιακωβίδης σήμερα οι ενάλιες αρχαιολογικές έρευνες έχουν αποκτήσει πειστικότητα και υπόληψη. Όταν ήμουν φοιτητής, θυμάμαι ότι κανένας από τους αρχαιολόγους, τους καθηγητές μας, δεν εκτιμούσε τη σημασία των εναλίων ερευνών. Νόμιζαν ότι είναι μια ενασχόληση νέων, αγοριών και κοριτσιών, προκειμένου να βρίσκονται στον πυθμένα της θάλασσας, και να απολαμβάνουν το μυστήριο της έρευνας. Σήμερα όμως τά πράγματα έχουν αλλάξει και μαθαίνουμε πάρα πολλά από τις ενάλιες ανασκαφές, αρκεί να πω πόσο άλλαξε η Αρχαιολογία της εποχής του Χαλκού, πόσο πλουτίστηκαν οι γνώσεις μας για τις διασυνδέσεις στη Μεσόγειο, με τις μεγάλες ανακαλύψεις που έχουν γίνει από το φίλο και συνάδελφο Τζεμάλ Πουλάκ στην ανασκαφή του Ουλουμπουρούν ενώ έρχεται και η ανασκαφή των Ιρίων να προσθέσει

cially the Eastern Mediterranean, the period around 1200 BC, the period the Point Iria wreck is dated to. With these thoughts, then, and the satisfaction I feel at having been one of the first to follow, not on the bottom of the sea, but from above, the Iria excavation, I express my thanks for being given the opportunity to chair the communications at this conference.

κάτι πολύ σημαντικό για μια πολύ κρίσιμη περίοδο στις διασυνδέσεις στη Μεσόγειο, κυρίως την Ανατολική Μεσόγειο δηλαδή, την περίοδο γύρω στο 1200 π.Χ., περίοδο στην οποία χρονολογείται το ναυάγιο του Ακρωτηρίου των Ιρίων. Με αυτές λοιπόν τις σκέψεις και αυτήν τη χαρά την οποία νοιώθω, διότι ήμουν από τους πρώτους οι οποίοι παρακολούθησαν, όχι στο βυθό της θάλασσας, αλλά από πάνω, την ανασκαφή των Ιρίων, εκφράζω τις ευχαριστίες μου, διότι μου δίνεται η ευκαιρία να προεδρεύσω αυτής της συνεδρίας.

Ladies and Gentlemen, we now start our morning session of communications. I would like to ask all the speakers to be very punctual. Each one has only twenty minutes, and this will allow us to finish in time and to have time for discussion at the end.

Κάθε ανακοίνωση θα διαρκέσει είκοσι λεπτά, όχι είκοσι ένα, και παρακαλώ όλους τους ομιλητές να σεβαστούν αυτό τον όρο για να τελειώσουμε στήν ώρα που έχει διατεθεί και για να έχουμε επίσης και χρόνο για συζήτηση που είναι πολύ σημαντική κατά το τέλος των ανακοινώσεων.

The Late Bronze Age Shipwreck at Point Iria: Discovery and Excavation

by Christos Agouridis

THE DISCOVERY

The wreck at Point Iria was first discovered in 1962 by the current president of the Hellenic Institute of Marine Archaeology, Nicos Tsouchlos.

The 1960s and 1970s were formative years in maritime archaeology. Not only in Greece but around the world, the potential knowledge to be gained from underwater archaeological research was beginning to be appreciated. However, underwater archaeology in Greece was still in its youth and an institution responsible for the preservation and study of the underwater cultural heritage had not yet been established. Consequently, the importance of information given by sport divers or fishermen and provided by less dramatic finds, such as the Point Iria wreck, could not always be evaluated.

Over the ensuing decades progress in Aegean and Cypriot prehistory was to enable a definitive identification of the wreck assemblage, but in the meantime the importance of the Iria shipwreck remained sealed beneath the sand.

It was only in 1974, one year after the foundation of the Hellenic Institute of Marine Archaeology, that the wreck was relocated by a team of its founding members: Nikos Tsouchlos, Peter Throckmorton and Haralambos Kritzas dived at the site and Bruno Vailati filmed and photographed the expedition for the film "The Men of the Sea". The site was then identified by the large pithos fragments and a completely intact pithos, which were photographed in situ by Nicos Tsouchlos (Fig 1 a-b).

Unfortunately, during the long intervening period between 1974 and 1990, when the first comprehensive survey of the site was undertaken by HIMA, this particular pithos was stolen.

A triangular stone anchor with three holes was also located by Kritzas, lying on a sandy shelf at a depth of 8-12 meters very close to the intact pithos.

Photos of the exposed finds and predominantly the intact pithos were taken for examination, but the wreck could not be dated with certainty. A Geometric or Archaic date was then proposed, showing how environmental conditions under water can distort the picture of a prehistoric wreck and make the main characteristics of the pottery, covered with concretions and semi-buried in the sand, indistinguishable. This pithos with its ovoid body, had a plastic relief band around the neck-shoulder junction, but lacked the characteristic multiple relief band on the shoulder. It was not until later that it was recognised as being of Cypriot type.

Indeed it takes great effort, persistence, faith, patience and experience to recognise the importance of a humble cargo, such as the Iria ship was carrying. More so to take the decision that it is worthwhile to engage in a lengthy and expensive full-scale underwater excavation.

The account of the discovery and excavation of such a wreck I think helps us to understand all those parameters important for research and study of underwater finds, particularly the less spectacular prehistoric sites. Additionally, through the story of the discovery and eventual exploration of the wreck site at Point Iria, we may also reflect on the development of the history of underwater archaeological research in Greece, as well as the first 25 years of the Institute's life.

THE SITE

Point Iria is on the north coast of the Gulf of Argolid (see Fig. 1, page 90) near the Mycenaean site of Mases (to the East). A short distance west of the point, at the villages of Iria and Kandia, there are two other Mycenaean sites and further west stand Asine and Tiryns, two very important coastal sites of the Late Bronze Age.

The headland off which the wreck was lying is called Ακρωτήριο Ιρίων or Κάβο Ίρι, which may be identified with the ancient *Στρουθοῦς* (Kyrou 1991, 25-26 and 211-213). The beach northwest of it, is called Παραλία Ιρίων (Iria Beach) and it was known in ancient times as *Ἄγριοι Λιμένες* (literally 'of difficult anchorage').

Iria village dominates a fertile valley, which was irrigated by the river Σελλάς and produces 90% of the artichokes for the Greek market. The bed of the river is now dry, but its fertile nature and the identification of dark alluvial deposits on the wreck site would indicate that the valley had experienced intermittent flooding throughout its period of activity.

The wreck was lying about 10 m. from the rocky shore (Fig. 2) and about 100 m. NW of the tip of the promontory. It was spread over some hundred square meters on a sloping seabed with sandy intervals and patches of concretions and rocks at a depth of 12-27 m (Fig. 2). Its cargo comprised mainly large transport vessels dated ca. 1200 BC from Cyprus, Crete and mainland Greece.

During the exploratory campaigns a total area of 5000 m^2 northeast, southeast of the wreck and even northeast of the tip of the promontory was investigated and many finds of earlier, contemporary and later periods were located (Fig. 3), showing that the site was on a frequented sea route and highly dangerous for shipping due to the prevailing winds and currents.

The pottery of earlier and later periods, including that found on the main wreck site, comes probably from other shipwrecks or chance jettisoning. Interesting finds include at least two sherds dating to the Early Bronze Age, three stone anchors, some rounded volcanic rocks most probably from the ship's ballast, some small pieces of wood and some organic remains. Among later finds are a lead ring and four tiles, which may have come from the cabin roof of a Late Roman or Early Byzantine ship.

THE EXCAVATION

The prehistoric wreck off Point Iria was systematically investigated by the Hellenic Institute of Marine Archaeology from 1990 to 1994 under the direction of Haralambos Pennas and with the generous support of the A.G. Leventis Foundation, the INSTAP and other sponsors of HIMA.

1990

In 1990, a preliminary survey was carried out by a small team of HIMA, during which the wreck was relocated and its extent defined (Pennas 1990, 39). Representative finds on the seabed were also photographed and a rough sketch made of the site, marking the positions of the finds.

1991

In October 1991 an underwater survey was carried out on the wreck at Point Iria (Pennas & Vichos 1993, 8-16 and 1995, 4-9). A team of ten members from the Institute took part, the main aim being to locate the position of the wreck more precisely and delimit the area of the site, to photograph and plot all surface finds and to recover all those in danger of being stolen, as well as any others that might help to determine the nature and date of the wreck.

For the transport of the team to and from the site and as a floating diving base, a traditional trechandiri, 'Kalokyra,' was used, generously loaned for the period of the survey by Adonis Kyrou (Fig. 2).

The wreck was easily identified by an assemblage of pottery which was concentrated in an area of about 105 m^2 at a depth of 20-28 m (Fig. 4). The group consisted of fragments of large and small domestic pottery of commercial types used for transport, including large pithoi, jars, deep basins, a jug and a large trading Mycenaean stirrup jar. All the finds were buried to a greater or lesser extent in the sand, and a considerable number were concreted to the rocks (Fig. 5).

The main concentration of the finds was delimited by a perimeter zone. The perimeter and its reference points were set on the topographic plan of the area.

The finds were labeled and their exact positions and depths plotted. They were photographed in situ, individually and in groups, where possible.

Then work began on detaching the finds concreted to the bottom using a hammer and cold chisel.

Finally, they were raised to the surface, hoisted on board the 'Kalokyra' and immediately wrapped in wet burlap and allotted a catalogue number. They were later measured, given a brief description and transported to the conservation laboratory in the Spetses Archaeological Museum, where the first steps in their conservation began.

A first evaluation of the results of the 1991 survey of the Point Iria wreck, in conjunction with the observations made during the previous surveys of the site in 1974 and 1990, suggested that the group

of the finds were typologically and chronologically related. After careful inspection, Prof. Yannos Lolos dated the finds to ca. 1200 BC and recognised the Cypriot origin of most of the pottery in the assemblage (Lolos 1995, 9-16).

At this stage the scientific team of the Institute became fully aware of the importance of their findings and the contribution such a discovery would make both to the study of shipping in that period and to our knowledge of the transport and movement of goods in the Eastern Mediterranean. Plans for an exploratory excavation then began to be formulated.

1992

After the preliminary inspection of the wreck site in 1990 and the extensive survey of the seabed made in 1991, during which most of the surface finds were recovered, a small team from the Institute carried out a more comprehensive survey of the wreck site in October 1992 (Pennas & Vichos 1995, 12).

The purpose was to collect more information in preparation for the systematic excavation planned for the summer of 1993. Some distinctive pottery sherds were discovered and brought to the surface (Lolos 1996, 4-5).

Test probes in the seabed were made within the main area of the wreck with a bronze core to a depth of about 80 cm, and a trial pit was dug to a depth of 50 cm, which revealed that the stratum of sand was deep.

The months that followed were dedicated to organising and preparing the excavation, as well as raising funds.

1993-1994

The wreck at Point Iria was fully excavated by the Institute for two continuous campaigns in the summer of 1993 (Pennas & Vichos 1996, 6-17) and 1994 (Vichos, Agouridis & Lolos 1998, in press).

In July 1993 technicians, and members of the HIMA team under the direction of Nikos Tsouchlos, Yannis Baltsavias and Petros Vakondios, transported and assembled the land installations for the expedition's base camp on an empty piece of reclaimed land on the edge of the sea, at the settlement of Paralia Irion. The camp consisted of tents, two caravans, a commercial container, a kitchen,

showers and washbasins, toilets and a water and electricity supply system.

Over the next few days the diving boat 'Siomos' arrived, a floating platform was towed into place and anchored over the site of the wreck, close to the tip of Point Iria, with mooring lines attached to rocks on the shore (Fig. 6).

In mid-July the topographical and archaeological work began. Under Koniordos's supervision the ropes delimiting the perimeter of the main cargo concentration were repositioned along with those dividing the perimeter initially into three separate sectors (SI, SII and SIII) (Fig. 7). Later a fourth sector (SIV) was added.

The area inside the main zone and immediately around it yielded some fragments of pottery, chiefly of later periods. Among the more interesting of the finds belonging to the cargo of the Cypro-Mycenaean ship, were the upper part of a stirrup jar A28, which came from just outside sector SIII, part of the Mycenaean deepbowl A26 and, in particular, the complete Mycenaean deepbowl krater A36, which was found some 50 m south of the perimeter zone. Some stones were also found, probably from the ship's ballast.

Among the many fragments of mainly later artifacts that were photographed and plotted, especially important was the rediscovery of the stone anchor A29 (Fig. 8), which was first located by Haralambos Kritzas in 1974. The anchor was found NNE of and just outside the perimeter zone at a depth of 12.50 m. It has three holes, one at the top for the mooring rope and two at the bottom for the wooden teeth. It weighs 25 kg and is made of sandstone (Vichos 1996, 19).

From the surrounding area two more stone anchors were recovered, but only the anchor A29 can with probability be connected with the wreck, for it was found near the main concentration of the cargo.

An extensive and thorough search of the entire area with a metal detector produced only modern objects. The complete absence of any metal prehistoric finds still remains an enigma.

Before starting the main excavation three trial trenches were excavated, until the bed rock was exposed 1.20 m. below the original seabed surface (Fig. 7). The first (T.T. 1), 2 x 2 m, was in the lower central part of sector SI and covered most of the sandy area there,

the second trial trench (T.T.2) in the NE part, and a third trial trench (T.T.3), triangular in plan in sector SIV. Only the second revealed an assemblage of finds, which included primarily small and large pot fragments, most of them from the third Cypriot pithos A7 (groups A33, A34, A49). Additionally, find A37 was also found to the NE, just beyond the perimeter zone, and when cleaned it proved to be a complete stirrup jar with only the spout missing. During the 1994 campaign the perimeter zone was enlarged to include the stirrup jar A37, and a fourth sector SIV was created to the south of the perimeter.

Having formed a fairly accurate picture of the state of the site and the scatter of archaeological finds both on and below the seabed, the excavation team proceeded to a full excavation of the two lower sectors SII and SIII. In SII, where there were smaller patches of sand and more concretions, a number of finds were located, including an intact pithoid amphora concreted with a Mycenaean amphora, with the numeral 1 incised on the handles. In SIII two pithos fragments were found (A50, A71), which probably come from the second Cypriot pithos A5.

Having nearly completed the excavation of the two lower sectors, we continued with the excavation of the upper sector (SI), initially in the part around the first trial trench (T.T. 1). There we had a pleasant surprise. Underneath a large section of a pointed-base amphora, which had evidently rolled there almost a millennium after the sinking of the Cypro-Mycenaean ship, was a stirrup jar (A85) covered with concreted marine organisms, sand and stones (Fig. 9). Two more complete stirrup jars (A86 and A86/1) lacking only their spouts, were uncovered a little to the north (Fig. 10), one of which has painted decoration on the body and false spout. The discovery of these three finds a short distance apart encouraged the team to concentrate their efforts less in the sandy patches in SI and more in the places where there were concretions, using hammers and chisels to break them up and an air lift to remove the sand. In this way numerous groups of finds and important single ones were uncovered. The dark layer of alluvial mud also appeared here just below the surface of the seabed. Finally the rest of sector SIV was excavated and two more pithos fragments were located (A 104 and A104 a).

During the last two days of the 1994 campaign a fourth trial trench was opened, at the lowest part of the wreck, outside the perimeter,

at a depth of 27 m. and where the rocks met the sand. Our aim was to locate any finds that may have rolled down to the lowest part of the rocky cliff. Unfortunately, we did not find any archaeological remains but at least we have excluded the possibility of locating more scattered finds in this area.

The excavation, which reached a depth of between 0.90 and 1.20m, also produced useful evidence for stratigraphy. Under the layer of thick sand, a stratum of dark mud 80 cm deep covered all our finds. It seems that this deposit favours the development of certain sea organisms and it was also responsible for the low visibility under water, especially when it was disturbed during excavation. On the other hand it preserved well all ceramics that were buried.

During one of our excavation campaigns we experienced how rich sea-life is in the area of the wreck, as some finds that were left on the seabed exposed to be photographed, drawn and mapped, were occupied in 48 hours by a colony of shells of the type *murex trunculus*.

It seems thus likely that most of the pottery finds were exposed on the seabed for quite a long time after the ship sank, as they were concreted before they were buried in the thick layer of mud.

All the finds on the surface or just below the sand were photographed in situ and plotted from fixed points by triangulation (axes X, Ψ) before being raised. Their depths (Z) were measured with an accurate depth finder. This traditional method of triangulation was selected as the most appropriate for plotting the wreck, due to the rugged morphology of the seabed, the concentration and the limited number of the finds.

Work under water and many of the finds were recorded on video.

Raising the finds presented no particular problem except for the concretions, which had first to be carefully detached, and the stirrup jars, which required great care when being raised because of their bulk and fragile nature.

In addition to the finds, several concretions were detached from the seabed, raised to the surface, carefully broken and examined for any small finds. After raising the finds initial conservation measures were taken at the excavation camp by the Institute's experienced conservators, who took the first steps in their desalination and cleaning.

The contents of the intact vessels were carefully emptied and examined. They were kept separately in tanks with seawater for further analysis. Unfortunately, their contents proved to be only mud like the deposits of the area. While cleaning the interior of the pithoid amphora A98, a sherd from a decorated Mycenaean skyphos of the LH III B period was discovered. It is probable that it was left from a skyphos carried in the pithoid amphora or brought in, together with two pithos sherds, by an octopus who used the pithoid amphora as shelter.

The scientific team of the Institute inventoried all the finds, entering the details directly into the computer, drew the finds and photographed them. Finally, they were transported to the archaeological Museum of Spetses, where they were stored in the Institute's conservation laboratory, and conservation and desalination were immediately begun.

In the course of all the campaigns 1105 dives were carried out and 550 hours were spent under water. The total cost of the excavation reached in excess of 22 million Drs. Eighty scientists and technicians, all members of the Institute, were voluntarily involved. Here we would like to express our gratitude to them, as nothing would have been accomplished without their contribution.

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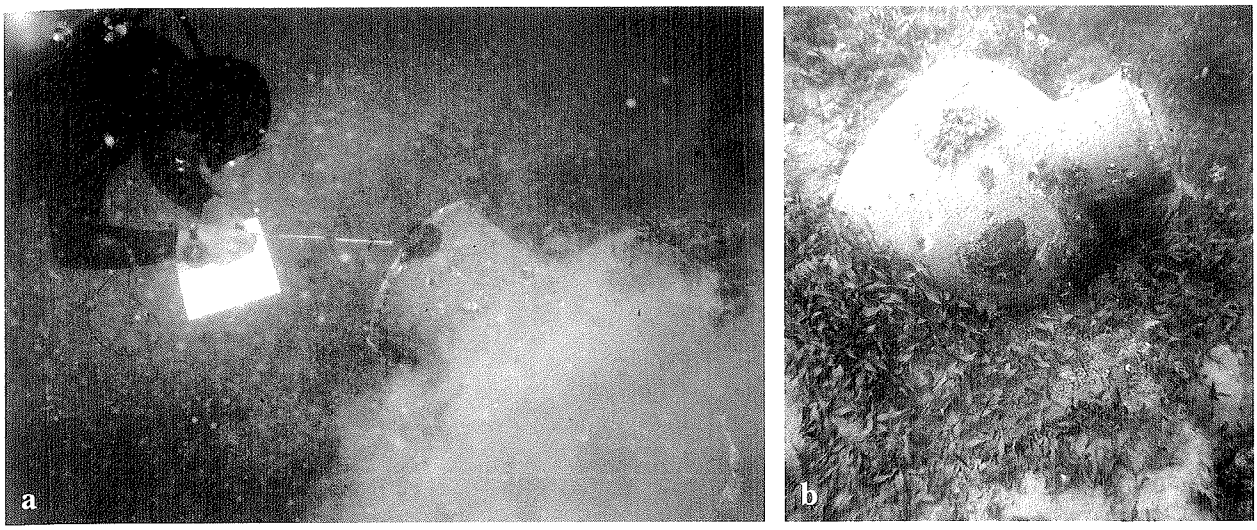


Fig. 1. *The 1974 survey. a. Haralambos Kritzas making a sketch of a large intact pithos. b. The large intact pithos in situ.*

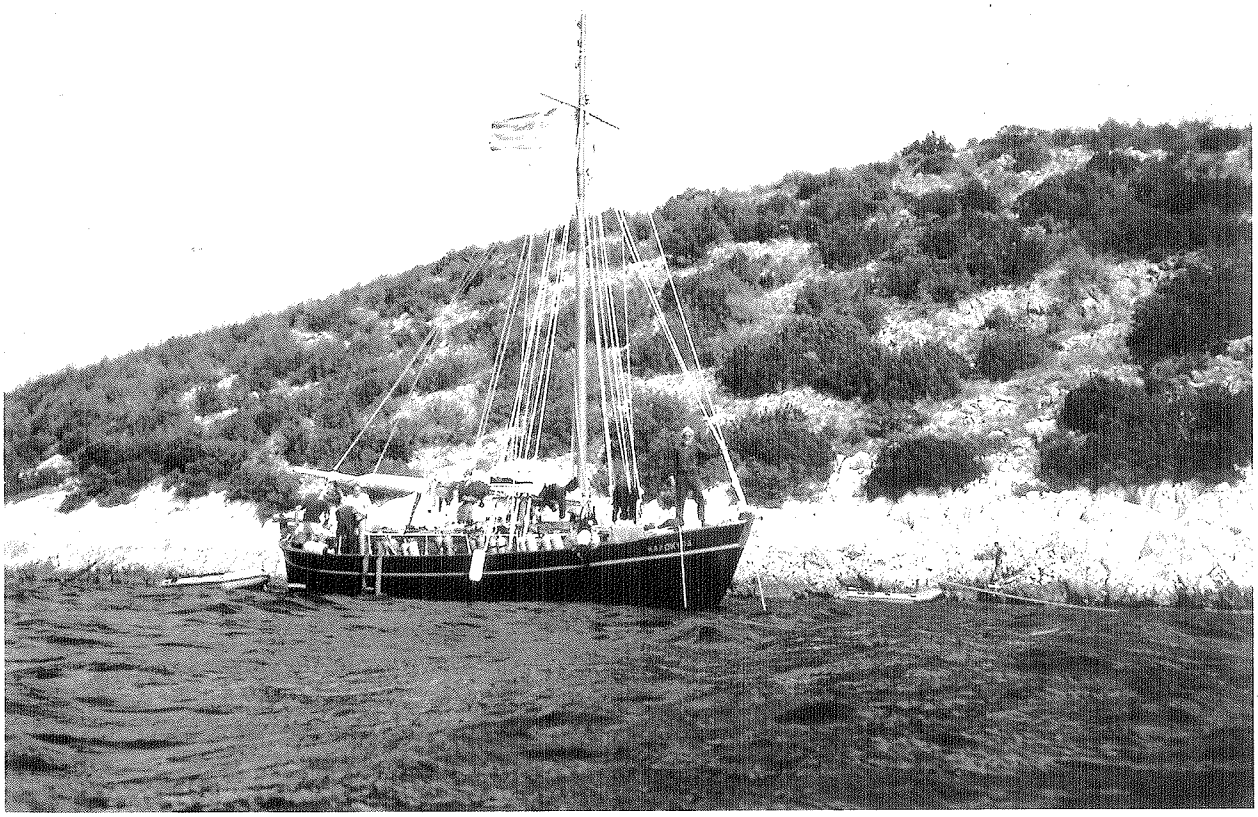


Fig. 2. *The traditional trechantiri "Kalokyra" anchored over the site of the wreck.*

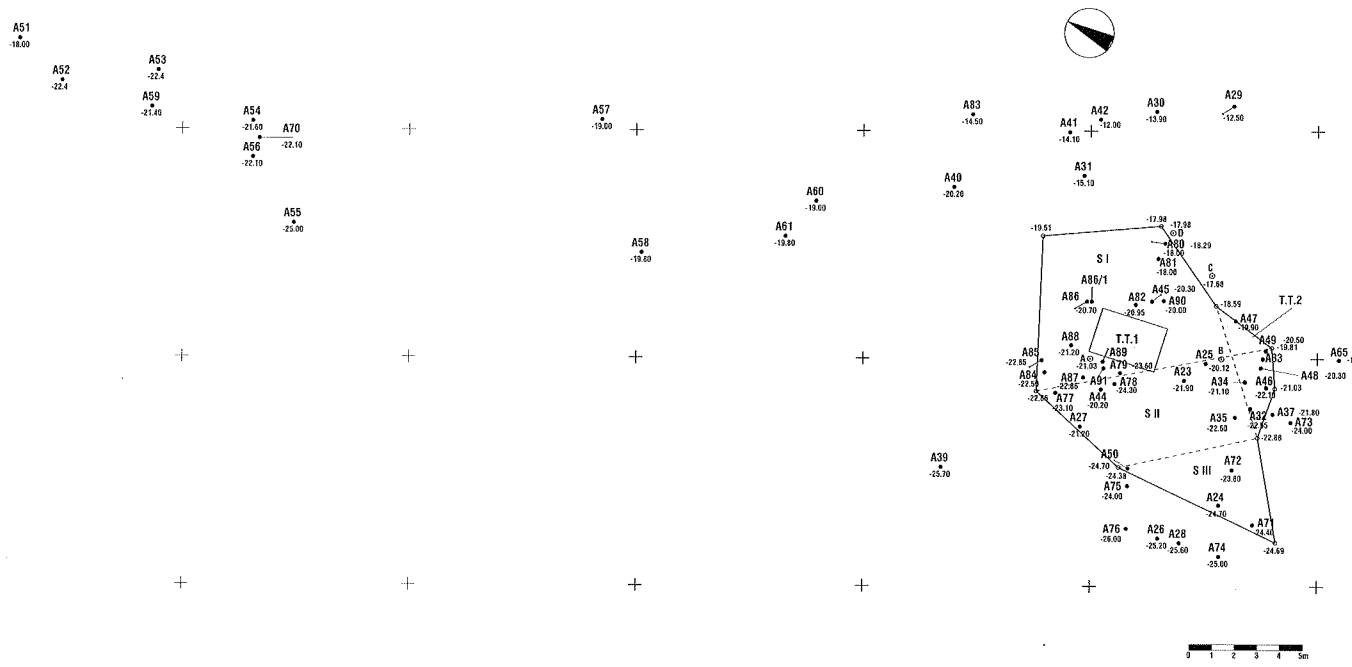
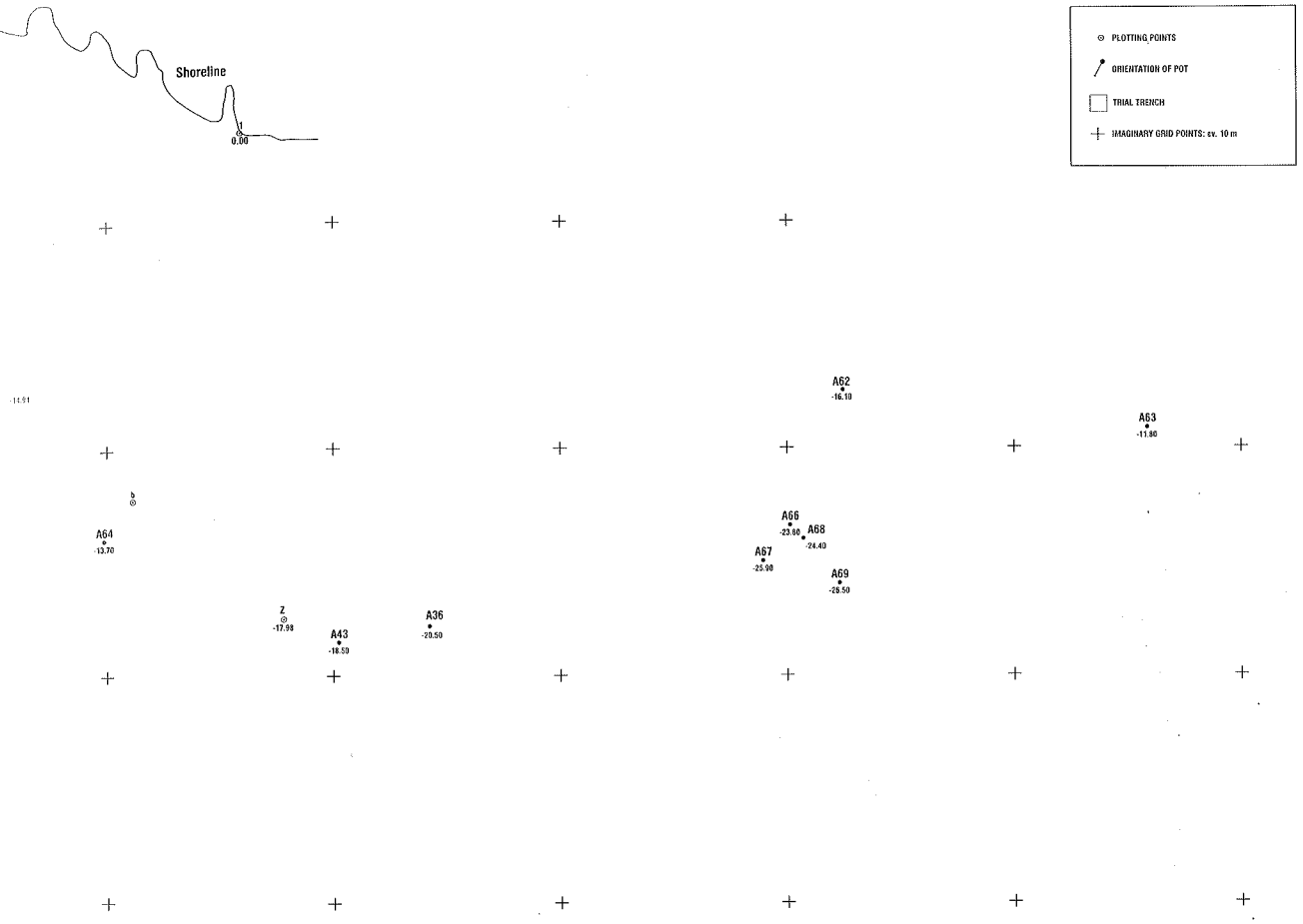


Fig. 3. *Topographic plan of the perimeter zone and surrounding area with the positions of the finds from the 1993 excavation season.*


Shoreline
1
0.00
PLOTTING POINTS
ORIENTATION OF POT
TRIAL TRENCH
IMAGINARY GRID POINTS: ca. 10 m
A62
-16.10
A63
-11.90
A64
-13.70
A66
-23.60
A68
-24.40
A67
-25.90
A69
-26.50
Z
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A43
-18.59
A36
-20.50

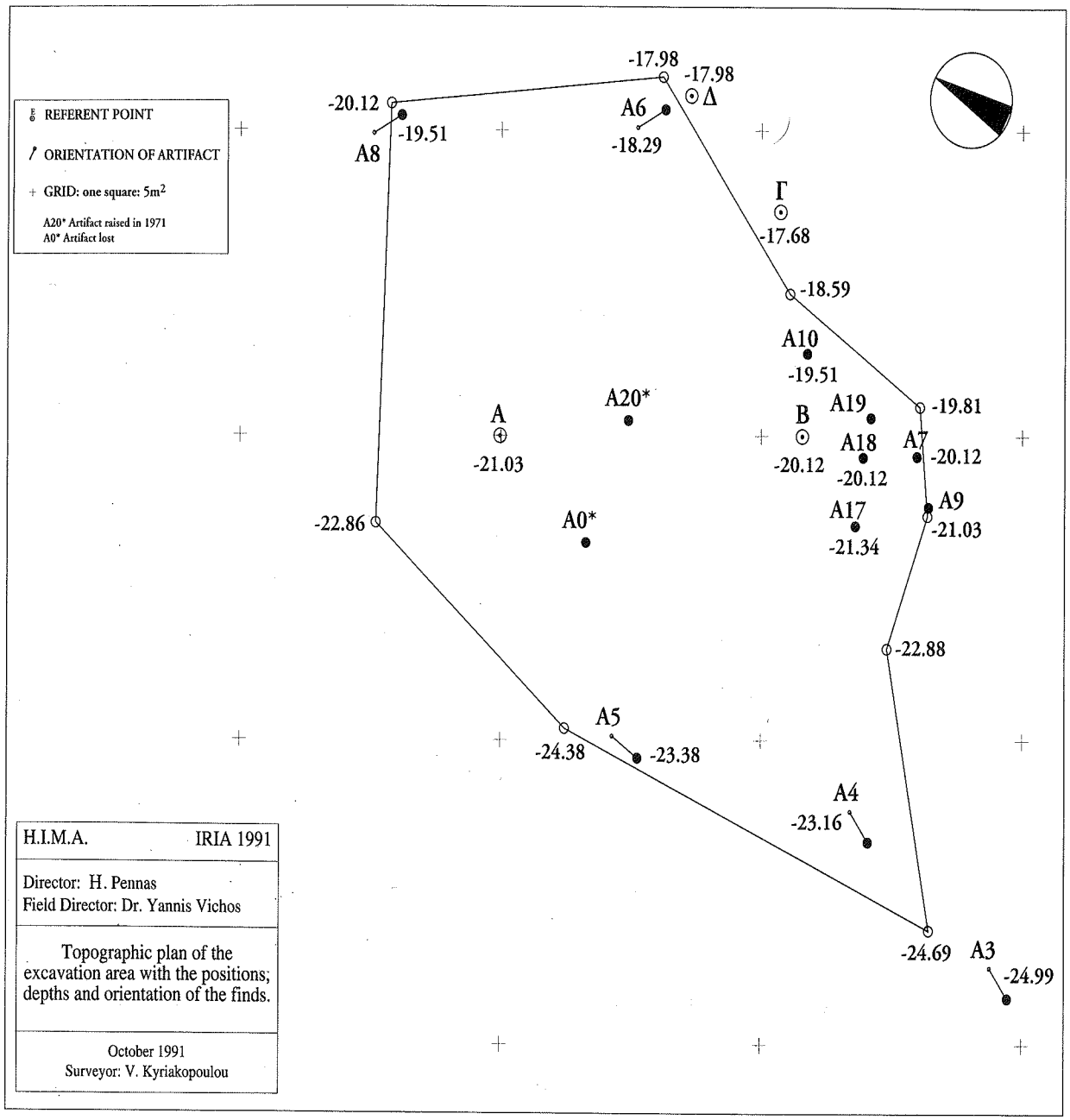


Fig. 4. *Topographic plan of the surveyed area in 1991 with the positions, depths and orientation of the finds.*

Fig. 5. *A large broken pithos semi-buried in the sand and concreted to the rocks.*

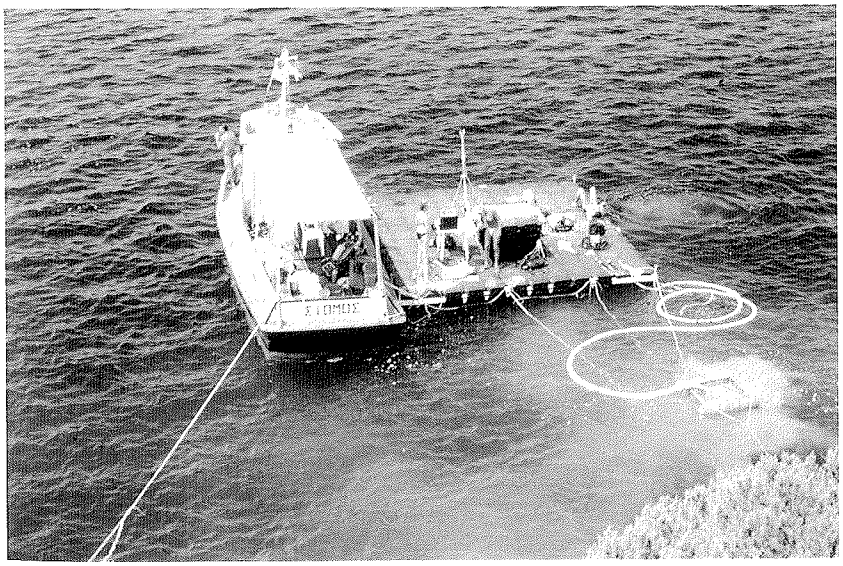


Fig. 6. *The diving boat "Siomos" and the floating platform anchored over the site of the wreck.*

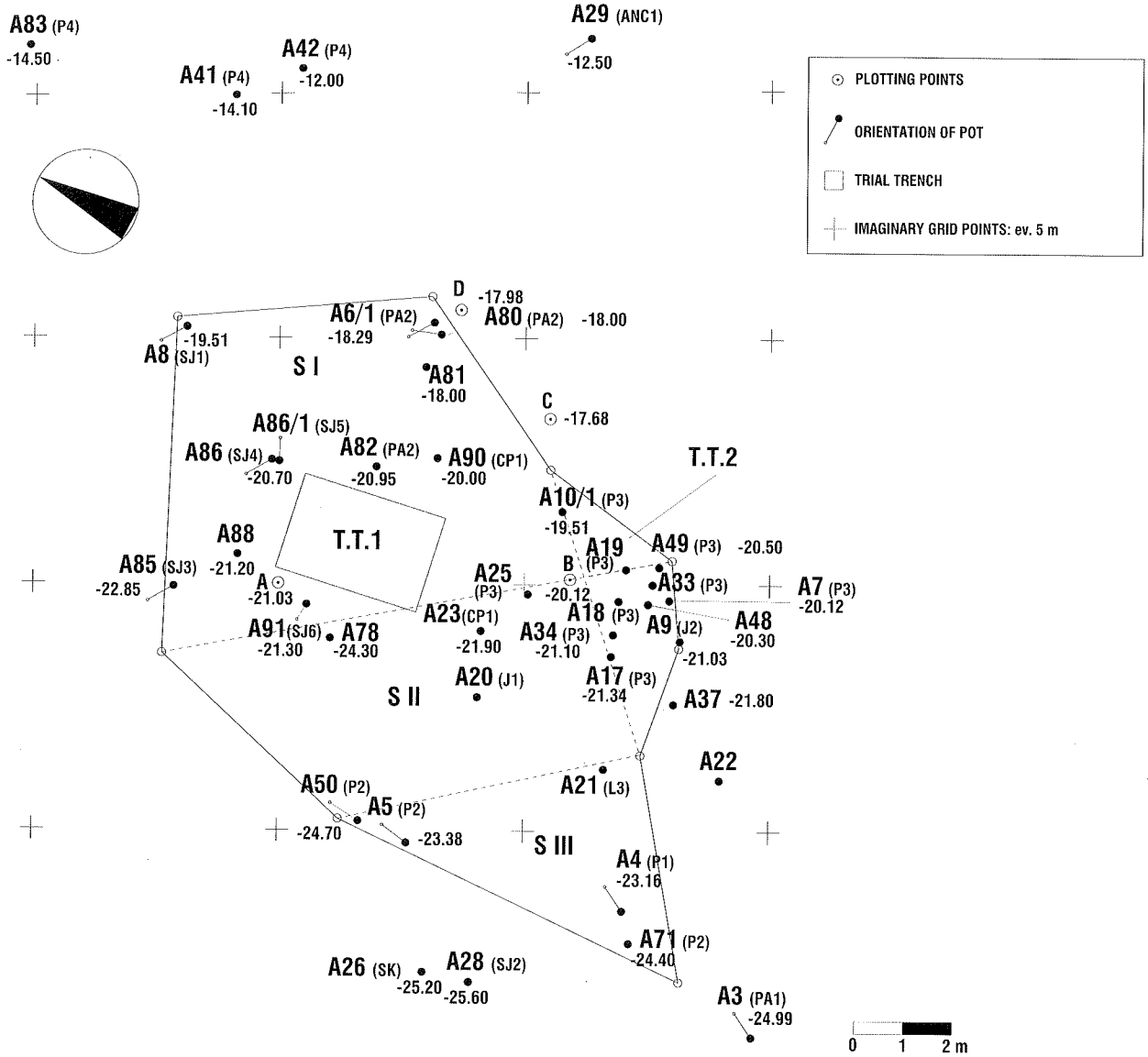


Fig. 7. Topographic plan of the perimeter zone and surrounding area with the positions of the finds from the 1993 and 1994 excavation seasons.

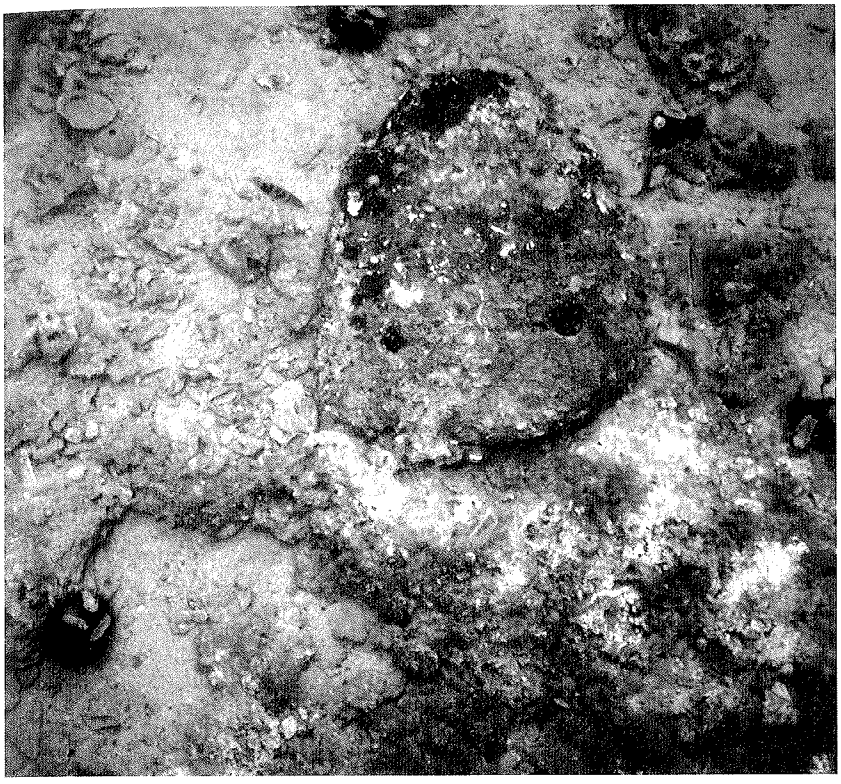
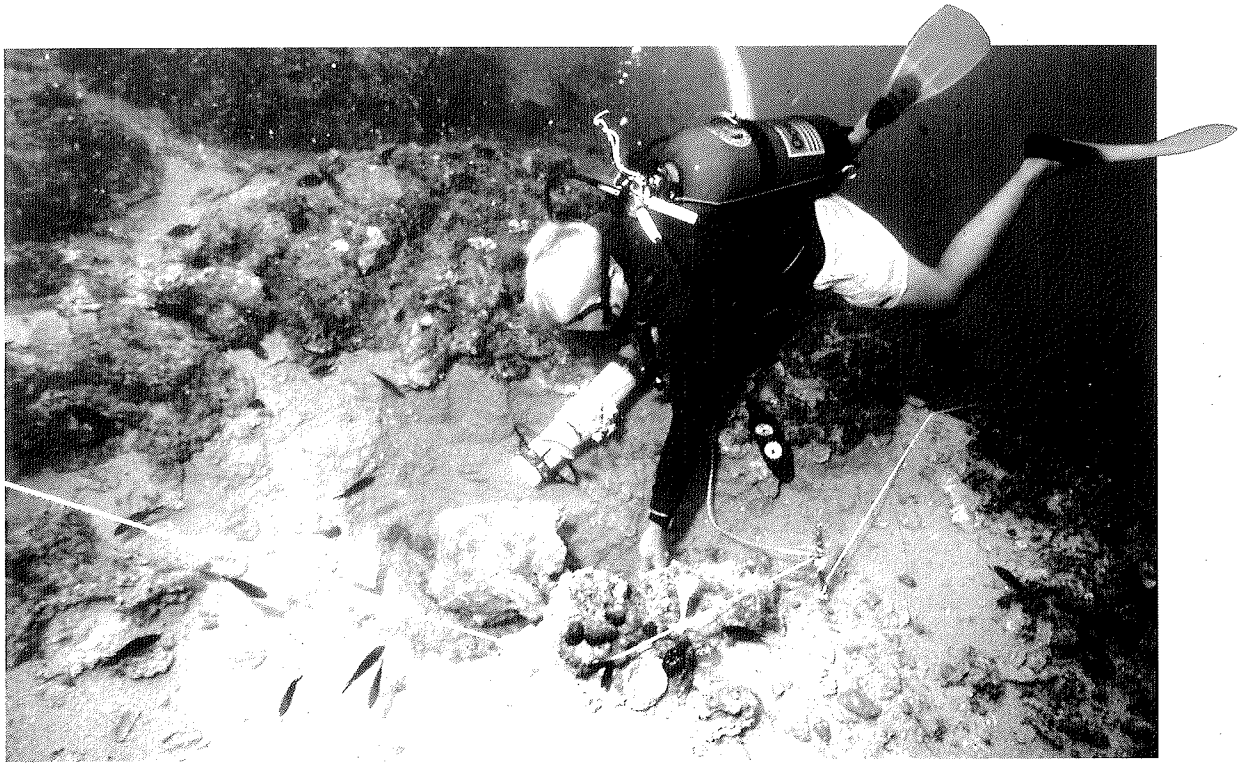


Fig. 8. *Anchor A 29* in situ.

Fig. 9. *Stirrup jar A85* in situ *during excavation.*



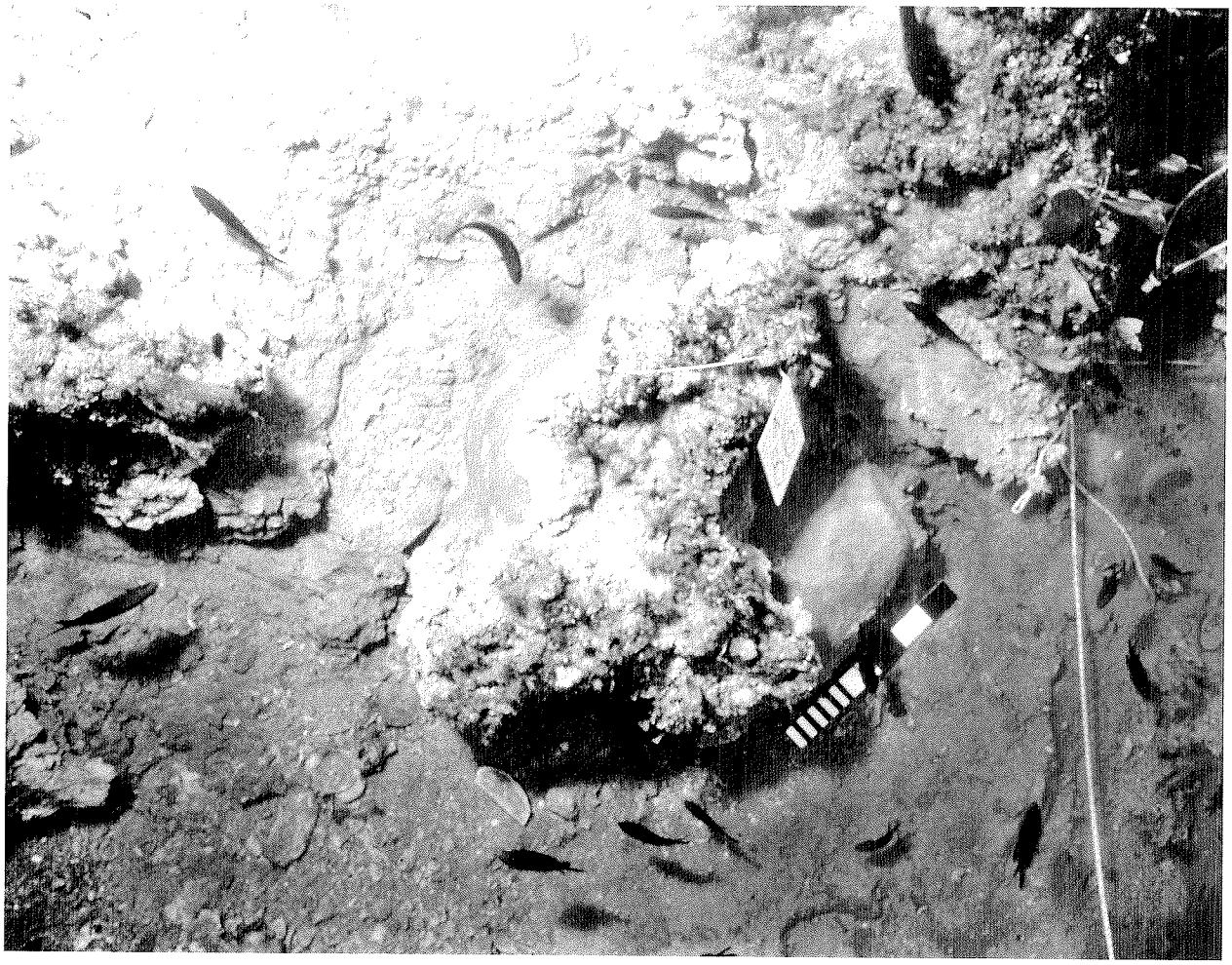


Fig. 10. *Stirrup jars A86 and A86/1* in situ.

The Cargo of Pottery from the Point Iria Wreck: Character and Implications

by Yannos G. Lolos

In this paper we consider the date and character of the cargo of pottery from the Point Iria wreck, excavated by the Hellenic Institute of Marine Archaeology in 1990-1994 (see Pennas 1992; Pennas,Vichos and Lolos 1995; 1996a;1996b; 1999; Lolos 1995; Lolos, Pennas and Vichos 1995; Vichos and Lolos 1997; Karageorghis et al. 1998). Its implications are also examined within the general context of sea trade and contact between the major coastal centres in the Mediterranean towards the end of the 13th and at the beginning of the 12th century BC.

The importance of the cargo of pottery from the seabed off Point Iria in the Argolid is certainly much greater than its limited size might suggest (see colour photograph on p. 2 of this volume). It is one of the very few ceramic assemblages that have so far been recovered from the wreck of a Late Bronze Age merchant ship in the Mediterranean, shedding new light on the character and content of long-distance maritime trade ca. 1200 BC. It contains 24 complete, fully restored or partly preserved pots, in addition to a Cypriot pithos which was located earlier but is now unfortunately lost (Lolos 1995, fig.18; see also cover photo of this volume). In my view, these pots seem to have formed the main bulk or a large part of the cargo of pottery, but probably not the whole of the cargo.

The pottery comprises three main groups: a Cypriot group of Late Cypriot IIC/IIIA date, of 8 vases; a Cretan group of Late Minoan IIIB2 date, of 8 vases; and a Helladic/Mycenaean group of Late Helladic IIIB2 date, of 9 vases.

All three groups are characterized by the presence of large transport vessels. Prominent in the first group are stoutly made Cypriot pithoi which had various functions (Fig. 1). The second is made up of coarse-ware stirrup jars of Cretan origin (Fig. 4). The third is dominated by large two-handled jars of Helladic/Mycenaean appearance (Fig. 5).

Firstly, with regard to the **Cypriot** group in the ship's cargo, this contains well known Late Cypriot IIC/IIIA ceramic types. These include three (3) handleless pithoi with relief decoration on the shoulder (Fig. 1), parts of a fourth pithos, a heavy broad-based jug of the Plain White class (Fig. 2), fragments of another, smaller, jug of similar type and a juglet with a rudimentary trefoil mouth (Fig. 3). Two of these types, the pithos and the juglet, are represented by examples in the Cypriot pottery from the Uluburun wreck (Bass 1987, 711: top left; Pulak 1997, 242, fig. 10).

The Cypriot pithos with a piriform, ovoid or ovoid-conical body, cylindrical neck and multiple relief band or bands on the body is a diagnostic type in the repertoire of Late Cypriot IIC/IIIA pottery. Pithoi of this general shape, with or without handles, often exceeding one metre in height, occur at various sites in Cyprus: Hala Sultan Tekke, Pyla-Kokkinokremos, Kalavassos-Agios Dimitrios, Myrtou-Pigades, Maa-Palaiokastro and others (Vichos and Lolos 1997, 323-324; also P. Åström's paper in this volume).

Like the characteristic Syro-Palestinian or Canaanite amphora, represented by at least 149 examples mostly containing terebinth resin in the cargo of the Uluburun ship (Bass 1987, 709; Pulak 1997, 240-241, fig. 9), the Cypriot pithos belonged to a class of durable transport vessels that travelled great distances across the Mediterranean in the late 14th and the 13th centuries BC. It should be stressed that the circulation of Cypriot pithoi extends from Ugarit and Cyprus to the region of Agrigento in southern Sicily and to Antigori in southern Sardinia (Karageorghis 1993, 584, fig. 3; Ferrarese Ceruti, Vagnetti and Lo Schiavo 1987, 19, 36, fig.2.5), which gives an indication of the commercial ties and connections between the different countries. In this context, special reference should also be made to a fragment of a large jar of "Levantine" type, apparently of earlier date, recently published from Punta d' Alaca on the island of Vivara in the Gulf of Naples (*Missione Archeologica Vivara*, 33).

According to the evidence gained from the Uluburun wreck and from storerooms and other areas in Cypriot settlements, pithoi of this distinctive type were used for storing and transporting olive oil or fruit; as containers for transporting small fine Cypriot vases; and also as "ancient refrigerators", sunk in the ground (see P. Åström's paper in this volume).

As regards the **Cretan** pottery from the Point Iria wreck, it consists exclusively of coarse ware stirrup jars of the tall commercial type (see Fig. 4). They form an important underwater group of 8 vessels almost equivalent in size to that consisting of jars of similar type from the Uluburun wreck. They are made of coarse clay, which according to Dr. Peter Day came from central Crete (see his communication in this volume). All except one lack the vertical tubular spout, and one example (No. A86/1, here Fig. 4: 2) preserves a simple painted decoration of a double band on the body and a spiral on the disk of the false spout, a popular motif used on the disks of many LM/LH III examples of the shape from Crete and the Greek Mainland.

This type of tall stirrup jar, used primarily for storing and transporting olive oil (a basic product of the Mycenaean export trade), is well known from numerous examples, many of them inscribed in Linear B, from the Old Kadmeion at Thebes, Orchomenos, Kreusis, Eleusis, the so-called House of the Oil Merchant and the House of the Wine Merchant at Mycenae, Tiryns, Midea, Pylos; and also from Chania, the Cave of Mameloukos, Knossos and other Cretan sites (e.g. Catling et al. 1980 ; Haskell 1981). It is worth noting that both the name of the jar (ka-ra-re-we, *χλαρεύς*) and its ideogram appear in texts in the Mycenaean (Linear B) Script at Pylos and Knossos.

This specialized ceramic type had a remarkable distribution throughout the Mediterranean in the 14th and 13th centuries BC., covering the whole of the Mycenaean trading world from the Syrian coast and Cyprus in the East to Cannatello near Agrigento in southern Sicily, the island of Filicudi north of Sicily and Antigori in Sardinia in the West (P. Day, personal communication (for the Cannatello examples); Vagnetti 1991, 279, no. 85, fig. 4b, pl. IX: 7; Ferrarese Ceruti, Vagnetti and Lo Schiavo 1987, fig. 2.4: 3).

To turn now to the **Mycenaean** pottery in our cargo, the largest of the pots in this group are three (3) plain, two-handled jars of traditional Helladic type (see Fig. 5), which have close parallels in plain or banded Late Mycenaean jars from major centres in the Peloponnese: Prosymna in the Argolid (Blegen 1937, fig. 430) and the Palace of Nestor at Ano Englianos in western Messenia (Blegen and Rawson 1966, figs. 373: 818, 374: top right, 384: nos. 611, 601).

Of special importance is amphora A99 (Fig. 6 a-b). It exemplifies a common Late Mycenaean ceramic type (Furumark 1941, shape 69, also Blegen 1937, figs. 177: 316, 303, 289, 455: 134, 116, 118), but the two incised marks or symbols on the flattened handles are of interest, since they are the only examples of "writing" on a pot or object from the wrecked cargo. They are not unlikely to be related to the Cypro-Minoan 1 Script and seem to have belonged to a distinctly Cypriot system of marking pots dictated by the needs and conditions of trade and barter at the time, and currently under study by Nicolle Hirschfeld (1993). They are closely matched by incised marks on the handles of two Late Mycenaean pots found in Tomb VI at Minet-el-Beida, the port of Ugarit in Syria (Schaeffer 1949, fig. 59: 1 e, j) and on Cypriot copper ingots from the cargo of the Uluburun wreck (Sibella 1996, 9, 10, fig. 1: 6a).

Examples of fine Mycenaean ware from the site of the Iria wreck are:

- An almost complete spouted deep bowl krater (Fig. 7a-b, H. 21 cm.), which has parallels in finely decorated kraters of LH III B2-LH III C: early date at Tiryns, Athens and Mistros in central Euboea (Kilian 1988, 108, fig. 8, and here Fig. 8; Mountjoy 1995, 45-46, fig. 60; 1997, fig. 14: 90; Tsirivakos 1969, fig. 3 (from Tomb A); Sapouna Sakellaraki 1995, 64). Like other pieces certainly belonging to the ship's cargo (A 58, A 55), the krater (A36) was located at some distance away from the main concentration of pottery finds (see Pennas, Vichos and Lolos 1996, 8-9, 12-13). In view of its Late Mycenaean counterparts and complete state of preservation, it seems safe to assume that it belongs with the ship's cargo (see also my Addendum at the end of this volume, p. 259).

- Also, two fragments of deep bowls of well-known Late Mycenaean types (Figs. 9, 10 a-b), one of which, A100 (Fig. 10), preserves remnants of painted decoration in the form of a characteristic panelled pattern-triglyph (Furumark 1941, motif 75; Mountjoy 1986, 121, 123, figs. 148: 24, 159: 1, 161: 9) and is assignable to the final phase or the end of the Late Helladic III B2 period. Thus, its occurrence in the cargo provides us with useful evidence for the precise dating of the Iria wreck. Like the above mentioned bowls, two fragmentary plain cooking pots (now restored: Karageorghis et al. 1998, p. 34: 28, 31) could

have belonged to members of the ship's crew. Fragments of one of these (cook-pot A 23/A 90) lay in the heart of the main concentration of ceramic finds.

It is worth noting that indirect "external" corroboration of the dating of the wreck at ca. 1200 BC., or in the decade 1200-1190 BC. at the latest, is provided by ceramic evidence found in the destruction level, inside Storerooms 32 and 38, in the palatial complex at Ano Englianos in western Messenia: here, versions of the tall coarse-ware stirrup jar and the large two-handled jar (seen in Figs. 11, 12, 13, 14), i.e. examples of the two Aegean types of transport vessels present in the Point Iria wreck, coexist in the same destruction layer that has been dated by Carl Blegen and his successors at the palace site to the end of the Late Helladic III B2 period or to the transitional LH III B2/LH III C: early phase, at the latest (Blegen and Rawson 1966, 421, figs. 373: no. 818, 374: top right, 384: nos. 611, 601, 389: no. 402, 390: no. 402; 1967, 32; Shelmerdine 1998, 88; Griebel and Nelson 1998, 97; Bennet 1998, 126; Lolos 1998, 18; see also Mountjoy 1997).

The Point Iria wreck is the third Late Bronze Age wreck in the Mediterranean to be systematically excavated, and the first in the Aegean area. It appears to be contemporary with the Cape Gelidonya wreck (Bass 1967; 1996, 25-35) and approximately a century later than the one at Uluburun on the south coast of Turkey (Bass 1987; 1996, 60-78; Pulak 1995; 1997; Fitzgerald 1997). It thus belongs to an advanced phase of the Late Bronze Age, at around 1200 BC.

The geographical location of the pottery cargo off Point Iria is a direct indication of the existence of an important sea trade route along the south coast of the Argolid, clearly forming part of both a local Peloponnesian and a much wider network of "international" sea communications in the Late Mycenaean period. This route is further defined by a series of Late Mycenaean settlements and harbour sites, absolutely or approximately contemporary with the Point Iria wreck, along the south and east coast of the Argolid and on the islands in the area (Lolos 1995, 66, fig. 1; Karageorghis et al. 1998, 28); and also by the find-spots of isolated coarse ware stirrup jar fragments found in the sea off Myti Kommeni in Dokos and in the vicinity of Kosta, opposite Spetses, in addition to a complete example raised from adjacent (?) waters, now on display in a seaside

restaurant at Plaka, the port of Leonidion, on the east coast of Arcadia (Lolos 1995, 77-78, fig. 22). The various find-spots of the complete or fragmentary vases from the sea bottom of this region may be viewed as "fixed points" along the routes of Aegean and foreign ships travelling in the Argolic Gulf and into the crossroads of the Saronic and the Argolic Gulfs in the Late Mycenaean period. Of the underwater finds in the Argolic Gulf, the transport stirrup jars in particular, whether remnants of shipwrecks or occasional jetsam, are safe indicators for maritime trade routes of the period in this part of the Aegean, no less instructive than the evidence for regular east-west sea traffic offered by the five underwater sites with copper oxhide ingots identified along the south and southwest coast of Turkey (for which see Pulak 1997, 234-235).

The cargo from the Point Iria wreck provides further concrete evidence of trading and shipping during the Late Mycenaean period in the Aegean area and beyond. It also sheds some fresh light on one of the most critical periods in Greek and Cypriot Protohistory, in the course, or at the end, of which the collapse began of the great Mycenaean *Koine* in the wider Aegean area.

It is worth emphasizing that the mixed character of the pottery from the Point Iria wreck is a feature that can be identified in the pottery cargoes of nearly every ancient wreck (Parker 1990; Treister 1993; Wriedt Sørensen 1997) and reflects the nature and ways of maritime trade in Antiquity.

The basic proportion of the ceramic cargo of the Point Iria wreck, as is defined by the combined presence of Cypriot and Aegean ceramic types, including established types of transport vessels with an international distribution, has obvious analogies in the large cargo of pottery from the Uluburun wreck, of ca. 1305 BC., and to some extent in that from the Cape Gelidonya wreck, of ca. 1200 BC., comprising two Aegean coarse ware stirrup jars and a fragmentary Cypriot pithos.

An element of differentiation, with reference to the ceramic contents of the other two cargoes, is the complete absence in the extant ceramic material from our wreck, of Syro-Palestinian wares, such as flasks, lamps and other small vessels of everyday use and pointed-based Canaanite jars, whose occurrence in the Argolid-Corinthia is documented from five (5) sites: Nemea-Tsoungiza, Mycenae, Argos, Tiryns and Asine (see Åkerström 1975; Kilian 1988, figs. 24: 7, 25: 12, 13).

Although the cargo from the sea bed off Point Iria, as a "one phase" underwater ceramic group, finds no counterpart within the Aegean context, the co-existence and contemporary circulation of Aegean, Cypriot and even Syro-Palestinian wares is not out of place at major coastal sites in the 14th and 13th centuries BC., like Tiryns, Chania (Kydonia), Poros near Herakleion and Kommos on the south coast of Crete (see Kilian 1978, 452, fig. 7; 1988, 121, figs. 24, 25; Kanta 1998, 41 ff.; Stambolides and Karetsou 1998, 56-58, 60-62, nos. 2, 3, 4, 5, 9, 10, 14, 15; also J.Rutter, in this volume).

Thus, the character of the ceramic content of the Point Iria wreck should be viewed as a reflection of a typical circulation pattern of specific types of transport vessels and products, within the context of long-distance maritime trade in the Eastern Mediterranean around 1200 BC, rather than an element of the "uniqueness" of the specific cargo.

Some indications of the provenance of the ship and the "nationality" of its crew or merchant(s) on board the ship may be gained from the utility wares (i.e. Cypriot jugs and Mycenaean deep bowls and cook-pots), perhaps also from the incised "trade marks" on the handles of amphora A99 (Fig. 6a-b), which can be claimed to be connected to the Cypro-Minoan 1 Script.

These facts, taken with the location of the wreck, point to the coast of Cyprus, as the probable base of the ship, where large naval centres, with a role recently highlighted by Bernard Knapp (1997), flourished at Enkomi, Kition, the site at Hala Sultan Tekke (Alyke), Palaipaphos and Maa-Palaiokastro (Karageorghis et al. 1998, 26); or to the south coast of the Argolid, to important centres of naval power, also known from the Catalogue of Ships in the Iliad (Book II, lines 559-564) and from Hesiod's Catalogue of Women (39, 94.96, b 14-11), to well-fortified Tiryns (*Τίρυνθά τε τειχιόεσσαν*), Mases, and well-harboured Hermione and Asine (*Ἑρμιόνην Ἀσίνην τε, βαθύν κατά κόλπον ἐχούσας*).

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Fig. 1. *Point Iria wreck. Restored Cypriot pithoi.*

Fig. 2. *Point Iria wreck. Cypriot jug A 20.*

Fig. 3. *Point Iria wreck. Cypriot juglet A 97.*

Fig. 4. *Point Iria wreck. Group of Cretan stirrup jars.*

Fig. 5. *Point Iria wreck. Large two-handled jars of Helladic/Mycenaean type.*

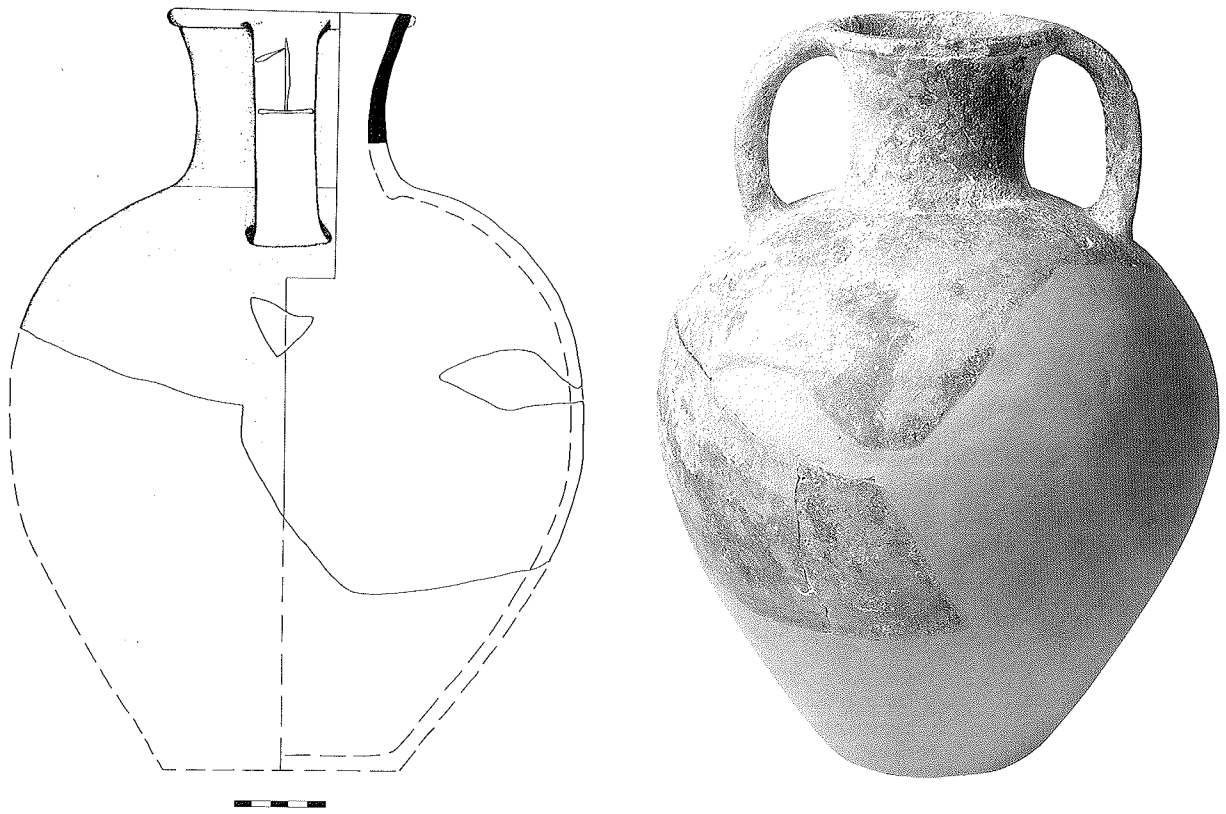

Fig. 6 a-b. *Point Iria wreck. Mycenaean amphora A 99, with pot marks on its handles.*

Fig. 7a-b. *Point Iria wreck. Mycenaean spouted deep bowl krater A 36.*

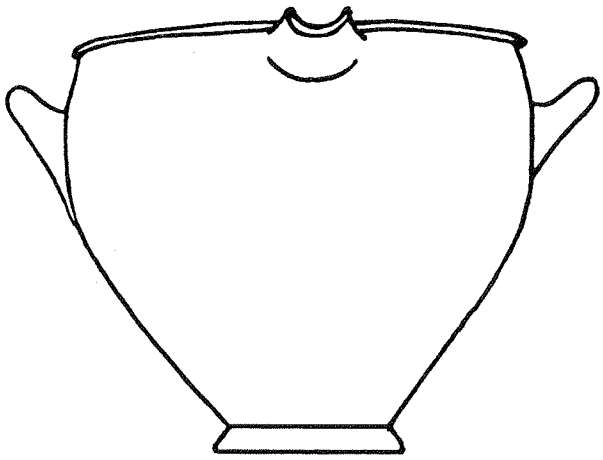

Fig. 8. *Tiryns. Mycenaean spouted deep bowl krater (line drawing, from a photograph in Kilian 1988, 108, fig. 8).*

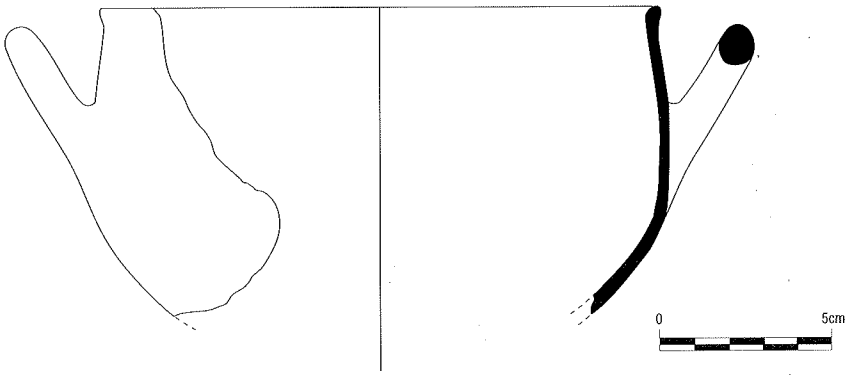

Fig. 9. *Point Iria wreck. Fragmentary Mycenaean stemmed bowl A 26.*

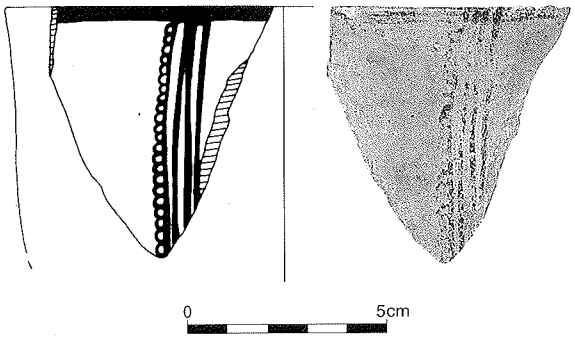

Fig. 10. *Point Iria wreck. Rim and wall fragment of Mycenaean deep bowl A 100 (Pres. H. 6.2 cm.).*

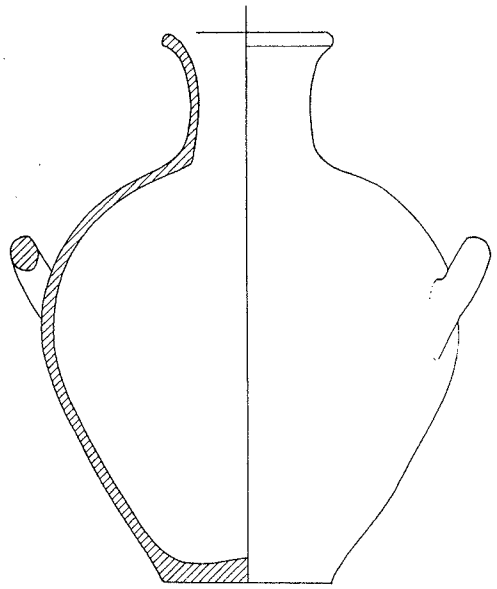

Fig. 11. *Palace of Nestor, Pylos. Banded two-handled jar (H. 38.4 cm.). After Blegen and Rawson 1966, fig. 374: top right.*

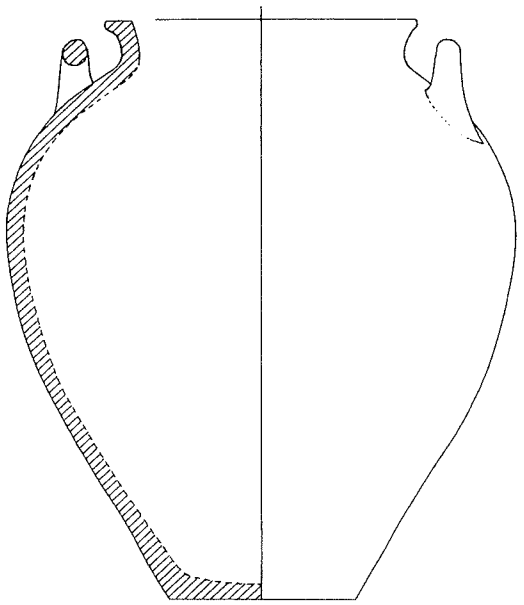

Fig. 12. *Palace of Nestor, Pylos. Plain two-handled jar (H. 76 cm.). After Blegen and Rawson 1966, fig. 384: no. 611.*

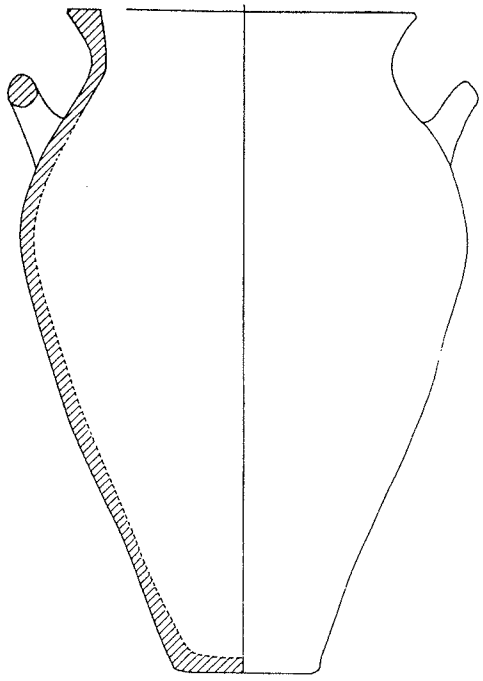

Fig. 13. *Palace of Nestor, Pylos. Plain two-handled jar (H. 88.3 cm.). After Blegen and Rawson 1966, fig. 384: no. 601.*

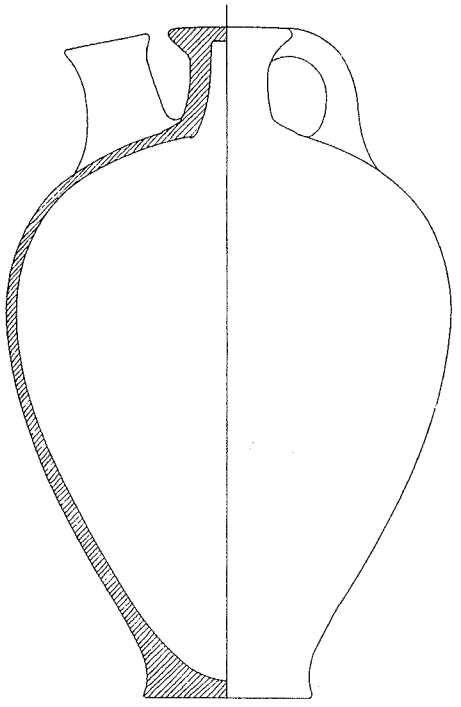

Fig. 14. *Palace of Nestor, Pylos. Coarse ware stirrup jar (H. 43.8 cm.). After Blegen and Rawson 1966, fig. 390: no. 402.*

Petrographic Analysis of Ceramics from the Shipwreck at Point Iria

by Peter M. Day

INTRODUCTION

As a contribution to the colourful picture of seafaring and exchange presented by the Point Iria shipwreck, this paper has a rather straightforward aim: to present in summary some petrographic analyses of ceramics from the excavation. These will be compared with the petrography of pottery from contemporary sites in the Aegean, Cyprus and Italy, including those from the shipwrecks of Uluburun and Cape Gelidonya.

Recent work has revealed a broad distribution of pottery throughout the eastern and central Mediterranean during the Late Bronze Age, testifying to extensive maritime exchange (Jones and Vagnetti 1991; Knapp and Cherry 1994). Chemical and mineralogical analyses of such ceramics have played an important role in this emerging picture, supplementing detailed stylistic study with further evidence of grouping and, in some cases, an indication of origin. The new opportunity to examine the provenance of a range of pottery from individual shipwrecks has important implications for understanding the nature and directionality of exchange in the Late Bronze Age, as it enables the investigation of the composition of ships' cargoes in transit and not just the final depositional context of the ceramic vessel.

This paper will present a selection of analyses from the Iria shipwreck, concentrating on transport vessels, especially coarseware stirrup jars. It is transport vessels which often have comprised the focus of analytical interest, not least because they are the containers of perhaps more perishable products which may not be preserved in the archaeological record (Knapp 1991; Rutter this volume). As a result, there is an increasing amount of comparative analytical data for such vessels from around the Mediterranean, which will be drawn on here.

The occurrence of the same ceramic vessels at a number of important coastal sites around the Mediterranean at this time is striking evidence for the strength, and perhaps frequency, of contacts between widely separated regions. Of course it is in the LBIIIA:2 to IIIB periods (in Aegean terms) that there is the evidence of shipwrecks to emphasise such an intense exchange around the Mediterranean, but the presence of common items of material culture in coastal sites is also evident from much earlier in the Bronze Age, even without direct evidence for their means of transport.

SAMPLING AND PETROGRAPHIC ANALYSIS

The ceramics preserved in the Point Iria wreck have been studied in stylistic terms by Yannos Lolos in preliminary reports (Lolos 1991; this volume). Their shape and decoration provide a rich body of information, with many of their morphological and decorative affinities being used to indicate their 'cultural' links, and to suggest their likely origin. Analytical work can add to this by relating some of the ceramics to well established groups in the Mediterranean and by suggesting their possible areas of production.

The analyses related here involve the examination of ceramic thin sections under the polarising microscope. This technique provides mineralogical and textural information which, in the first instance, may give a strong indication of similarity or dissimilarity of samples to each other. Beyond grouping, such analyses also give evidence of technological practice, especially the types of raw materials used in a ceramic vessel's manufacture, and in some cases may lead to conclusions regarding pottery provenance (Whitbread 1995).

A broad range of pottery from the Point Iria wreck was sampled for petrographic analysis and an account of this work, including full petrographic descriptions and photomicrographic illustrations, forms part of the final publication of the wreck. In the case of some pottery from the shipwreck, notably large bowls and jugs, a dearth of analysed comparative material, combined with a lack of diagnostic mineralogy, precludes confident provenance ascription from petrographic analysis alone. However, in the case of other vessels, the analysis provides more concrete evidence and the pottery discussed here can be linked confidently with samples analysed from other locations and/or with distinctive geology from certain areas.

SUMMARY OF ANALYTICAL RESULTS

Of the range of pottery sampled from the wreck at Point Iria, four groups are presented here: the pithoi; the pithoid amphorae; a cooking vessel and finally the transport stirrup jars.

Pithoi with ovoid body and cylindrical neck

These comprise large pithoi, usually with an ovoid body, cylindrical neck and relief bands of decoration. Examples have been sampled for analysis by the author from Nuraghe Antigori in Sardinia (Ferrarese Ceruti et al. 1987, 17-19, Fig. 2.5), Kommos in southern Crete (Watrous 1992, Cat. No. 846), the Uluburun shipwreck (KW 251: Bass 1986, 274), the Cape Gelidonya shipwreck and Kalavassos, Cyprus. These join the great number of other examples from Cyprus (for references see Lolos 1991, 19-22; Åström this volume), Ugarit (Schaeffer 1949) and even Cannatello, near Agrigento in Sicily (Deorsola 1996, Pl. VI:a), although these have not been analysed.

Of the pithoi of this type found on the Iria wreck, three are homogeneous in terms of the texture and mineralogy of their fabric (Vessels A4, A5, A7). Another pithos is slightly different in its petrographic composition, but nevertheless very closely related to this main group. A4, A5 and A7 have a characteristic fabric, with common, rounded grains of volcanic rock, including altered basalts and other igneous rock fragments rich in plagioclase feldspar and alkali fieldspar. There are frequent calcareous microfossils, including foraminifera and ostracods, some radiolarian chert and red/orange grains which may be chlorite pseudomorphs and serpentine altered by the firing process. The clay matrix itself attests to the mixing of different, clay-rich raw materials prior to tempering with sand.

The other sample of this class of vessel (A58) is similar, in that it comprises a calcareous base clay with frequent, small, rounded sand inclusions. The inclusions are dominated by mudstones, siltstones, quartz and fossiliferous limestone, but it is strongly linked to the main group by the presence of the same altered basalt and ?serpentine and chlorite pseudomorphs.

A number of observations can be made regarding these pithoi. We may suggest that the group of three share a location of production. Though there are slight differences between the main group and

A58, their mineralogy and their general technology of paste recipe would suggest that they are closely linked in terms of provenance. These fabrics seem to have their origin in an area with calcareous marls, cherts and basic igneous rocks. The geological provenance of all these pithoi seems clear, most likely being linked to ophiolitic rocks, but their geographical provenance is harder to pin down without further archaeological comparative material, as there are several ophiolitic massifs within our area of interest (Whitechurch et al. 1984).

The pithoi from Point Iria are similar in composition to the examples from Nuraghe Antigori in Sardinia and Kommos in southern Crete (Jones and Day 1987, 262). The latter have frequent pyroxenes, but are taken to come from a similar geological environment to the Point Iria examples and have the same technology of clay mixing. The chert, basic igneous rocks and ?serpentine suggest a possible compatibility with the geology of the Troodos Massif of Cyprus. Analysis of comparative thin sections of storage jars from Agios Dimitrios, Kalavassos and Maroni, submitted for analysis by Professor Karageorghis, suggests that the marl formations around the foothills of the Troodos comprise the likely origin of at least some of these types of jars. In addition, the Point Iria examples may bear comparison with Jones and Vaughan's Group III in their examination of Canaanite jar fabrics, which are taken to be Cypriot products (1988, 390), although these have not been examined in thin section by the author.

Similar recipes of fine, well sorted, sand tempered calcareous clay bodies have been observed in Canaanite jar fabrics imported to Kommos (work in progress with J.B. Rutter) and we have much to learn from current work by Y. Goren, M. Serpico, M. Sugarman and others, on Late Bronze Age Eastern Mediterranean fabrics. Such studies will further bolster our comparative fabrics to aid future study.

It is clear that these large jars are closely related in source and most likely originate in the south-central area of Cyprus. Their presence in the shipwrecks of Point Iria, Uluburun, and Cape Gelidonya, and also at Kommos in Crete and Nuraghe Antigori in Sardinia –to name only the locations from which samples have been analysed– underlines their role as maritime containers and possibly also as prized products in themselves. Pithos KW 251 on the Uluburun

wreck contained large quantities of Cypriot pottery and a number of tin ingots (Bass 1986, 274). The widespread distribution of storage jars by sea has been remarked upon in archaeological contexts during the Middle and Late Bronze Age in Crete, with pithoi manufactured in the Gournia region occurring in great numbers at coastal settlements around the Siteia peninsula (Day 1997). In addition, the historical record provides us with another, excellent example in the form of the Koroneika jars from Messenia in the Peloponnese. These had a very wide distribution throughout the ports of the Eastern Mediterranean during the mid-late nineteenth and twentieth centuries AD and Blitzer's compelling article (1990) gives examples of the varied historical, social and economic factors which lie behind such a striking distribution of coarse ceramic vessels.

Pithoid Amphorae

Two pithoid amphorae were sampled from the Point Iria wreck (A6/1 and A3) and analysed, initially without knowledge of their typological affinities. These were selected from a total of three of the two-handled jars on the wreck (see Lolos, this volume for parallels and references). Their mineralogical composition reflects an origin in a quite different geological environment to that of the ovoid pithoi. Both vessels examined have a non-calcareous clay body and the optical activity of their groundmass shows them to be low fired. They are coarse, with inclusions which are predominantly from a low to medium grade metamorphic environment.

Although deriving from the same sort of geological environment, the pithoid amphorae are slightly different in fabric from each other. Sample A3 is dominated by low grade metamorphic material: quartz-biotite-muscovite schist, phyllite and metamorphic quartzite. Sample A6/1 has muscovite laths and large inclusions of low to medium grade metamorphic rock fragments, including quartz-feldspar-muscovite schist and quartz-garnet-muscovite schist. It remains difficult to judge what such a small difference might mean in provenance terms, although in this case, it is strongly suspected that they have the same general origin.

Ceramic fabrics containing low grade metamorphic material are quite common in Crete, having been identified in stirrup jar fabrics from west Crete (Day 1995a), in some fabrics from central Crete

(Wilson and Day in press) and in east Crete (Betancourt and Myer 1995; Day 1995b). However, the fabrics of these two pithoid amphorae do not match the many comparative examples of phyllite and schist-based fabrics analysed from Crete. They are, though, compatible in geological terms with an origin in the low grade metamorphic rocks which occur in Attica and especially in the southern Peloponnese. It is suggested that an origin in one of these two areas is likely, although further analysis of comparative material might better enable the detemination of provenance within the regions.

Cooking Vessel A23

This plain cooking vessel was found fragmented amongst the main concentration of ceramic finds on the wreck and has now been restored (Karageorghis et al. 1998, 34, no. 31). Petrographic analysis shows it to have a very distinctive composition, with porphyritic volcanic rock fragments of intermediate composition, probably andesite, along with zoned, fresh plagioclase feldspars. A similar fabric was found in Late Bronze Age cooking pots from Mycenae, Tiryns and Asine by John Riley and re-examination of this material from Mycenae by the author shows it to be the same as the example from the Point Iria wreck. Riley indicated that the nearest possible source for this fabric was the island of Aegina in the Saronic Gulf (Riley 1981b, 141). In fact, in geological terms, another possible source of the non-plastics might be the Methana peninsula, stretching out into the Saronic Gulf from the Argolid. However, the fabric of A23 and its similar vessels has been observed by the author in Middle Helladic pottery from Aegina and is similar to that found in Hellenistic cooking pots originating in Aegina and found at Thorikos in Attica (De Paepe 1979; Jones 1984, 726-27) and this island seems to be the source of the Point Iria cooking vessel.

As A23 was the only example of this vessel type in the wreck, it has been suggested that it might be for the use of the ship's crew (Lolos this volume). Nevertheless, it is clear that in the Late Bronze Age, cooking vessels from the island of Aegina had a wide distribution over the Argolid and surrounding areas, comprising a continuation or a reprise of a striking, broad distribution of both matt painted ware and red cooking pot fabrics from the island in the Middle Helladic period.

Transport Stirrup Jars

These first three categories of ceramic finds from the shipwreck indicate a wide variety of provenances. The picture of a relatively small number of pots from diverse origins is perhaps refined by the next group of vessels to be considered, the transport stirrup jars (TSJs).

The TSJs on the Iria shipwreck give the impression of a tight group of containers (Karageorghis et al. 1998, fig. 14), and presumably contents, and provide a contrast to the typologically diverse TSJs on the Uluburun shipwreck. There are eight TSJs from Point Iria, only one of which has painted decoration, in the form of a spiral on the disk of the false neck and two bands around the upper body (Karageorghis et al. 1998, fig. 14). Both their shape and their fabric is familiar from vessels of this type found on Crete, mainland Greece and elsewhere.

Transport stirrup jars have formed a focus of interest over the relations between the Mycenaean mainland and Crete during the LM/LH IIIA-B periods, being used to illuminate aspects of power, trade, administration and chronology. Much of their importance lies in the painted Linear B inscriptions which are found on a number of TSJs, some of which relate toponyms which are familar from Linear B tablets. That these jars have now been found over most of the eastern and central Mediterranean has only added to the interest in their origins. They have also become something of a cause célèbre of the application of physico-chemical analysis of ceramics in the Aegean area, as work has proceeded over a number of major projects (for reviews see Day and Haskell 1995; Jones 1984, 477-493).

Chemical analysis established that west Crete, probably the area of Chania, was a major source of these jars (Catling et al. 1980). The same work also suggested that TSJs were manufactured in central Crete, as well as in mainland centres such as Mycenae and Thebes. More recent petrographic analysis of TSJs has further refined this work. Building upon the foundation laid by John Riley (1981a) thin section work has been carried out on jars found at Azokeramos, Cannatello, Chania, Dhenia, Enkomi, Gla, Hala Sultan Tekke, Knossos, Kommos, Malia, Mameloukas Cave, Mycenae, Palaikastro and Thebes.

The picture that emerges from these analyses is one of a restricted number of production centres whose products have wide distribution throughout the Aegean, eastern and central Mediterranean. West Cretan fabrics are found, in general, to be homogeneous in their composition wherever they are found, a result which shows good agreement with chemical analyses. However, the major step forward has been the discovery that many of the TSJs found in centres such as Mycenae and Thebes have their origin in central Crete and not in local workshops (Day and Haskell 1995; Day 1995a). The true transport stirrup jar, therefore, seems to be a product of Crete, even when large groups of similar vessels are found together on the mainland, as was the case in the House of the Oil Merchant at Mycenae (Day 1995a). The TSJs found at Mycenae include both west Cretan and central Cretan products, the latter including examples which are definitely the products of the Mesara plain in south central Crete. With the discovery of the Iria shipwreck off the coast of the Argolid, there emerges the possibility of linking these imports in Mycenae, and other sites in the Argolid, with their means of transportation.

In thin section, the composition of the Iria TSJs reflects the slight typological differences noted above: in other words A86/1 stands apart from a homogeneous main group. The main group of TSJs from the Iria wreck are characterised by a microfossiliferous marl groundmass with medium to large rounded sand inclusions. The latter comprise quartz/biotite schist, some phyllite, siltstones (some tuffaceous) and fine to medium grained volcanic rocks, mainly highly altered basalts, grading into dolerites. This fabric is distinctive and has been observed in transport stirrup jars from the Uluburun wreck and from Mycenae.

The single jar A86/1 is very closely related to this fabric, with its well-rounded sand grains in a marl matrix. In fact virtually the only difference between this and the main group at Point Iria is that it does not contain microfossils in the clay matrix. Besides this the inclusions, which best indicate the provenance of the vessels, are the same as the main group. The fabric is the same as that found in some TSJs from Kommos in southern Crete, to others from Mycenae and to a TSJ from the site of Cannatello, near Agrigento in Sicily (Day et al. n.d.; De Miro 1996, 1005:124, plate I:43 and 124). All these vessels appear to share the same place of manufacture.

The latter belong to a range of four related TSJ fabrics, including a group known to be from the Mesara plain in southern Crete, found in large numbers at Kommos and which is also present at Mycenae, Cannatello, Enkomi and on the Uluburun wreck. This fabric shows a combination of rounded sand grains of biotite schist and red, altered basaltic rocks and appears close to that fabric previously described as diagnostic of the western Mesara, Crete ("submarine basalt," Myer and Betancourt 1990, Plate A) and found frequently in pottery of the Kommos and Phaistos region from the Early Bronze Age onwards (Shaw et al. 1997; in press).

Another central Cretan fabric related to these, which has a consistent composition, is the "chert and serpentine fabric," found in analytical work at Knossos, Malia, Kommos, Thebes, and Enkomi. This fabric also occurs in two TSJs from the Uluburun wreck and seems to have its origin in central Crete (Day and Jones 1991; Day and Haskell 1995, 93-94).

In short, the fabrics of TSJs on the Point Iria shipwreck are so similar that they are taken to share the same provenance and to comprise a consistent shipment of vessels. Their fabric is known not only on the nearby mainland, but also in Crete, on the Uluburun shipwreck and in a variety of sites around the eastern and central Mediterranean. They were produced in central Crete and have strong parallels with fabrics which are familar in south central Crete.

TSJs found to be compatible with a central Cretan composition have often been linked with the palace centre of Knossos, but recent work has challenged this. Several TSJ fabrics quite clearly have their origin in the south-central part of the island and it is intriguing to note the similarity in petrography between some TSJs excavated at Knossos and the products of the (earlier) Kommos kiln (Shaw et al. in press). Indeed it has been argued recently that the first coarseware stirrup jars have their origins stylistically in the Mesara (Cucuzza 1997), while it is certain that a substantial number of TSJs sampled from the Mesara have their origin in that area and not in north central Crete (Haskell et al. forthcoming). Such a conclusion fits well with the Linear B toponym evidence which links most of the vessels which are not west Cretan with the Mesara plain area (the "Inner Group" of Palaima 1984).

COMMENT

The Transport Stirrup Jars on the Point Iria Wreck and Uluburun

The TSJs on the Iria wreck seem to share an origin in central Crete, with all but one forming a homogeneous group. Setting aside for a moment the other vessel types considered above, the nature of the Iria TSJ fabrics, viewed together with the imported groups of TSJs in the House of the Oil Merchant at Mycenae, might suggest shipments involved in directional exchange. In this case a specific cargo might be taken on board intended for a centre such as Mycenae, Tiryns or Asine. This indeed may be the case for the TSJs in the ship which foundered off Point Iria. However, if we turn to another shipwreck, that of Uluburun, the same vessel types testify to a rather different story.

Of the ten TSJs sampled from the Uluburun wreck, three are of the well known west Cretan fabric which has been identified in many locations. Another vessel is of a chert-rich fabric whose only parallel is in one jar from Mycenae, whilst perhaps the most interesting find from analysis was a fabric which contains fresh, intermediate volcanic rocks, most likely not of Aegean origin. The six remaining samples are in three different fabrics from central Crete, similar to those found at Knossos, Kommos, Malia, Thebes, Mycenae, Enkomi, Cannatello and the Point Iria wreck. Indeed one of these central Cretan vessels on the Uluburun wreck (KW 1198) is of the same fabric as the majority of the central Cretan jars analysed from the House of the Oil Merchant at Mycenae (Day 1995a), a fact which agrees with the typological parallels between them (Bass et al. 1989, 11).

So, in contrast to the Point Iria ship, that which foundered off Uluburun contained TSJs which had their ultimate origin in a variety of different production locations, at least one of which does not seem even to be Aegean. A non-Aegean origin is certainly suggested by the shape of two TSJs from the wreck. Furthermore four of the TSJs, both Aegean and non-Aegean types, have signs incised after firing on their handles, directly adjacent to the disk capping the false neck (such as KW 1977 in Hirschfeld 1990, p. 195). These signs in Cypro-Minoan script are made on vessels which have different origins and thus it is clear that they indicate the re-use of these transport vessels, possibly in Cyprus. It seems that new con-

tents were put in the TSJs and they were then sent out as a newly-composed shipment.

Shipments, stirrup jars and central Crete in LMIIIB

Whether the TSJs from Iria were a group picked up en route, like others in the range of pottery found on board, or whether they comprise a shipment sent from one location to another, the similarity of these vessels with those familiar from the western Mesara port of Kommos and other sites on Crete is striking. This turns our attention to the undoubted importance of south-central Crete in the movement of ceramic containers and their contents which were transported around the Mediterranean. Palaima (1984) has pointed to two geographical concentrations reflected in the Linear B toponyms inscribed on TSJs. One group matches known place-names in the Chania area, whilst the Inner Group reflects place names which are known or suspected to be associated with the south-central part of the island. It is assumed that the TSJs contained liquid agricultural produce such as olive oil, or some "value-added" product based on oil. Linear B texts suggest that the Mesara plain comprised a major agricultural area which seems likely from its natural topography and fertility. Therefore it might be expected that it exported agricultural produce and derivatives, specifically from the port of Kommos.

The range of foreign imports found at Kommos testify to its important role in maritime trade (Watrous 1992, 149-183; Knapp and Cherry 1994, 138-141). The occurrence of Cypriot-style ovoid pithoi and TSJs in the same fabrics at Kommos and Nuraghe Antigori in Sardinia is balanced by the presence of Sardinian imports to Kommos in LMIIIA:2-B levels (Watrous et al. 1998). The presence of Cypriot pithoi and central Cretan TSJs on both the Iria and Uluburun wrecks gives us an idea of these repeated sets of goods which were travelling around the Mediterranean at this time.

However, Kommos may not be alone in such a role. Although it is of interest to point to the importance in maritime exchange of the Mesara and Kommos at this time, we might suggest that further excavations of, for example, the LMIII levels at Poros Katsambas would show how important that port was in this regular movement of commodities throughout the Aegean and beyond, as it was in the Early and Middle Minoan periods (Dimopoulou 1987).

Material culture sets and interaction in the East and Central Mediterranean

From the analyses, we can see that the Point Iria ship was carrying pottery from a variety of locations, including Cyprus, Aegina, central Crete and the Mycenaean mainland. In having ceramics from these varied sources, it is similar not only to the shipwreck of Uluburun, but also to several key coastal towns around the eastern and central Mediterranean at the end of the 13th century BC. Such varied cargoes might tend to favour 'tramping' as a mechanism in maritime exchange, but it seems likely that such activities were multifaceted and that the variety of exchange patterns outlined by Knapp and Cherry (1994, 123-155) may all have been present in some form.

It is clear that the ovoid pithoi may have been present on most of these trading vessels during this period of the Late Bronze Age, perhaps as ship's containers. But the contrast in the TSJ cargoes of the wrecks at Point Iria and Uluburun serves to remind us that the same sort of vessel may indicate different forms of commodity movement in different cases.

As more ceramics are published from these sites, we are increasingly aware of the repeated occurrence of the same vessel types throughout the eastern and central Mediterranean. When, for example, TSJs found in Cannatello and the Iria wreck are found by petrographic analysis to have been manufactured in the same location, the questions concerning production, exchange and consumption of these commodities becomes all the more detailed.

Even if we trace the origins of the ceramics both at the coastal sites and on the wrecked vessels that once carried them, there remains a major question. Regardless of the origin of the vessels, reflected in the labels that we ascribe to them –'Mycenaean', 'Minoan', 'Cypriot'– we are faced with a material culture shared not only by the crew of the vessels that travelled across the Mediterranean Sea, but also by a number of harbours which formed their ports of call. This shared pottery may represent only a part of the range of material culture at any one of these coastal sites, but it is a sharing which indicates not only a passive reception of such goods, but an involvement and an input into negotiations and transactions, both social and economic, which formed part of the regular contact between widely dispersed geographical areas.

Yet many settlements inland from these harbour sites seem to have fewer examples of these vessel types (for example Canaanite jars), a pattern not unlike that seen in the Early Bronze Aegean of Renfrew's 'International Spirit' or even by certain aspects of Middle Helladic ceramic distribution. Such contrasts in the material culture of proximate sites on the coast and inland require us to investigate both the basis for choices and the patterns of consumption, but also emphasise the importance of understanding further the nature of maritime contact in societies around the eastern and central Mediterranean at this time.

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Point Iria Wreck: Stirrup jar A86/1 (Photo K. Xenikakis, 1998)

The Point Iria Wreck: The Nautical Dimension

by Yannis Vichos

THE EVIDENCE

Point Iria is on the northeast coast of the Gulf of Argolid at the end of a long stretch of coast starting from the acropolis of Asine in the west (Fig.1). The shoreline is sandy, with fields, behind which there are mountain ranges. The nearest Late Bronze Age sites are at Kandia and on a hill in the modern village of Iria (Lolos 1995, 11, 14, figs. 6-7).

Further east is the site of Mases, which is mentioned in the Iliad in the Catalogue of the Mycenaean cities that sent ships to take part in the Trojan War.

The Iria wreck lies some 15 metres from the rocky shore and roughly 100 metres before the tip of the headland. It is a place where strong northern and western winds are frequent. Together with the powerful easterly sea currents they create dangerous conditions for ships. The air masses rushing down the valley between the two mountain masses are deflected by the small mountainous island of Ipsili opposite the headland. At times during the summer months a turbulent wind (the pounentis) blows, and the sea becomes very rough. Some such swirl of winds and currents must have caught the Iria ship as it tried to weather the headland, probably sailing on an easterly course.

The ship was carrying a mixed cargo of pottery consisting of large transport vessels and some smaller utility wares (see photograph in p. 2 in this volume). There are two classes of transport vessels: those that were probably traded together with their contents (the 8 stirrup jars), and those containing products that were to be traded (the 5 pithoi).

The 3 pithoid jars could have belonged to either class (see Fig. 1, p. 54 in this volume).

The utility pots also fall into two classes: those that were themselves for exchange (the 2 deep bowls and the deep bowl krater) and those that probably belonged to members of the crew (e.g. the jugs and the cooking pots). The juglet could have belonged to either (see Fig. 3, p. 54 in this volume).

Combining these classes of pottery from the cargo with the provenance of the objects, one can suggest various scenarios for the provenance and route of the ship and the nationality of the crew members.

A small stone anchor (Fig. 2) was found at a depth of 13 metres just above the main pottery concentration (Vichos 1996, 15-17). It weighs some 25 kgs and is made from sandstone (most probably from a river). It is of the "composite type", in Frost's typology, with three holes of a maximum diameter of 2.3 cm: one on top for the rope and two at its base for the wooden arms. The biconical holes were probably made with a wooden drill.

Its position a little higher up than the main body of the cargo (see A29 at the top of Fig. 7, p. 40 in this volume), despite its relatively small weight, is a possible indication that it belonged to the Iria ship, but it cannot be dated with certainty by its type and shape since this type was in use from the Bronze Age to the Middle Ages.

We found different sized stones and river stones that may have formed part of the ship's ballast. Of the 6 stones we recovered as samples, 5 must have been ballast (Fig. 3). Three of them, in fact, were found close to the stone anchor just above the main pottery concentration (see A30, A31, A40 in Fig. 3, p. 36-37 in this volume). From a preliminary examination, they appear to be of igneous rock, which does not exist in the area, and are probably reused stone artifacts (querns and rubbers). They could therefore very possibly have belonged to the ballast of the Iria ship. In the wider area around the cargo there are hundreds of scattered stones of various sizes, many of which may also have belonged to the ship's ballast. The others have fallen from the limestone cliffs of the headland. But since they were all covered with marine growths we could not tell which were limestone and which were volcanic.

The few small pieces of wood recovered may have come from the ship, but the hull itself has not survived. There is a semicircular hole in the largest fragment, possibly made for a wooden peg

Its diameter is 6 mm, which corresponds to the diameter of some holes for wooden pegs found in the Cape Gelidonya wreck (Figs. 4, 5; also Bass 1967, 48, figs. 46, 51 (wd2).

Three organic fragments are of interest; when they were found buried in the sand they had a cylindrical form, but they lost their shape when brought to the surface (Fig. 6). They were probably pieces of rope like those found in the Cape Gelidonya wreck (du Plat Taylor 1967, 160-62, BM 5, 6, 7; Haldane 1991, 11; Sibella 1993, 86-87). The small size and bad preservation of the few organic samples from the wreck made reliable archaeometric analyses uncertain.

The complete absence of metal objects, in spite of careful excavation and a search of the whole wreck area with a metal detector, still remains an enigma.

THE LAST VOYAGE

If we cannot be certain of the final destination of the Point Iria ship, the starting point of its voyage must surely have been one of the sites on the south or west coast of Cyprus. This seems to be indicated by the comparatively large amount of Cypriot pottery it was carrying. It is equally probable that one of its subsequent ports of call was in Crete.

Although it might appear at first sight that the shortest passage from Cyprus to Crete would have been the direct one, it is more likely that the ship at first sailed in a northwesterly direction along the south coast of Turkey and then headed southwest, passing between Rhodes and Karpathos (Fig. 7). The prevailing currents and winds in the eastern Mediterranean, combined with the seagoing capabilities of the ships at that time, made such a route almost a necessity. On its arrival in Crete (at Knossos on the central north coast or at Kommos on the central south coast) it would have loaded the other large part of its cargo, the eight stirrup jars, which were probably full of olive oil.

It is harder to determine the last part of the voyage. The most likely scenario is that after waiting for a favourable wind to make the northerly crossing to the Greek mainland, it set a course for Kythera, rounded Cape Malea and sailed up the southeast coast of the Peloponnese before traversing the Gulf of Argos, where it foundered off Point Iria (Fig. 8).

The possibility that it may have sailed directly from Crete or via the Cyclades to the Gulf of Argos can be ruled out, because of the long distance of these routes across the open sea and because of the northerly winds that made such a route very difficult. The absence of any Cycladic pottery in the cargo further supports the theory of a direct sailing from Crete to the southeast Peloponnese, following a route which was usual all through antiquity.

During the last leg of the voyage it may have put in at some of the many Mycenaean harbours along the way in order to unload part of its cargo and take on some of the Mycenaean wares which formed the third large section of its cargo at the time it went down. Such a voyage by a seagoing vessel engaged in international commerce and at the same time serving the needs of a local trading network accords with the facts as we know them at this period.

The above is the most probable scenario for the final voyage of the Iria ship, but not the only one. Others could be suggested, one being that the Cypriot and Cretan pottery was not taken on board at their places of origin, but was transshipped at sites in Argolis as part of the local commercial trade. Also, when the ship was abreast of modern Leonidio or Astros, it might have set a course for Spetses and then proceeded along the northeast coast of the Peloponnese (Fig. 8). In this case, it could have first put in at Mases and then, continuing on its voyage to Asine and Tiryns, have foundered as soon as it had rounded Point Iria sailing from east to west.

In any case the finds recovered from the Point Iria wreck did not necessarily constitute the whole of the cargo carried by the ship on its last voyage. The different goods in the cargo might have changed in every harbour where it called, new ones being added and others being exchanged. This would partly explain the lack of artifacts one would expect to find in the wreck of a ship at this period sailing out of Cyprus, such as copper ingots, tin and other raw materials, as well as probable objects of Syro-Palestinian origin, of the sort that have been found on numbers of Mycenaean sites in Argolis: Mycenae, Argos, Tyrins and Asine, (see Lolos in this volume) and at Kommos in Crete (Pulak 1997, 251; Rutter in this volume) as well as in the two other known contemporary wrecks (Cape Gelidonya, Bass 1967; 1988; 1989; and Uluburun, Bass 1987, 1997; Pulak, 1997).

POSSIBLE CAUSES OF THE SHIPWRECK

The Iria ship must have been wrecked by a sudden onset of bad weather which drove it onto the rocky shore before it was able to weather Point Iria (Fig. 1). This may be deduced from the fact that the wreck lies some 15 metres from the shore and that the cargo was scattered about at random. Our own personal experience during the four months we worked on the wreck, in the course of which we experienced heavy seas and high winds that twice snapped the cables holding our floating platform, as well as the information supplied by local fishermen, confirmed that the locality of the wreck is a dangerous hazard for shipping, especially for vessels approaching from the west. The force with which the ship struck the rocks as it was driven by the west wind is perhaps indicated by the position of the deep bowl krater some 50 metres to the south of the main concentration of the cargo (see A36 in Fig. 3, p. 36-37 in this volume). The deep bowl krater, an open, relatively light vase, must have been carried some distance away before it slowly filled and sank to the bottom.

The crew and captain may have drowned or survived, if they were able to swim the few metres to the rocky shore. In the latter event, they might also have been able to rescue some of the more valuable objects they had with them, such as seal stones, jewelry, amulets, daggers, etc. This would explain the absence of such finds in the wreck.

TYPE OF SHIP

The two basic types of vessel that predominated throughout antiquity, and which were the product of function and sailing methods, had already appeared by this period. These were the long warship and the round-hulled merchantman (Fig. 9). A long fighting ship is depicted above and a round merchant ship below. The round ship has two turrets, one forward and one aft, and a curving hull. The rig is not shown. It has far fewer frames than the long ship, perhaps because the planking is stronger and the construction generally stouter. The Iria ship undoubtedly belonged to the latter class. As regards the particular morphological features of the merchantmen, the existing evidence, chiefly iconographic, shows that although there were different types, the principal type and its variations had a symmetrical hull.

Iconographical evidence

Please let me remind you of some known iconographical examples of Mycenaean ships:

A clay ship model from a tomb at Mycenae, ca. 1300 BC. (Fig. 10). National Archaeological Museum, Athens. It is symmetrical with a raised prow and stern. It had two benches or frames, and because of its crescentic shape may belong to the Minoan tradition.

A clay ship model from Asine, 12th century BC (Fig. 11). As restored, it has a symmetrical shape. Three of the six or seven frames are indicated by paint on the inside, and a small cavity at the center of the hull may indicate the mast step. On the outside is the gunwale, a wale and the keel.

A painted representation of a ship on a small stirrup-jar from Skyros (Fig. 12), early 12th century BC. The hull is round and the prow ends in a bird's head. It has a central mast with a masthead and fore- and backstays. There may have been bulwarks on the side.

A clay ship model from Argos (Fig. 13), LH IIIA 2-IIIB2. The ends are more or less symmetrical. The prow is more pointed. Two frames are shown on either side of the mast step. There is also part of a structure for a steering-oar.

A painted representation showing two ships on a LH IIIB krater from Enkomi in Cyprus (Fig. 14), 13th century BC. They are both round ships seen from the side. Two levels can be distinguished: the deck and the hold. The martial activity of the ship shows that at least in the Eastern Mediterranean round ships could be used for military purposes.

A clay ship model from the sea of Amathous (Fig. 15), LC III or CG I. It has a rounded hull with pointed ends, two cross-beams on both bow and prow. The mast step is shown in the middle of the hull.

Archaeological evidence

According to the archaeological evidence of the Uluburun and Gelidonya wrecks and ancient literary sources it appears that by the end of the 14th c. BC the chief building method was by the shell-first technique (Fitzgerald 1996, 8; Pulak 1997, 248-49), whose basic features are known from later Greek and Roman wrecks. In this method the planking of the vessel is first fitted together, joined by

mortises and tenons secured with wooden pegs, and the frames and other members of the skeleton were inserted afterwards. Although the wooden hull of the Iria ship did not survive, one of the small wood fragments recovered had a worked semicircular hole in it, which would be consistent with a shell-first construction (Fig. 6).

The pottery recovered from the wreck, including the 5th pithos (which was stolen), has a total weight of about 476 kilos (see photo at p. 2 of this volume). Out of this, the Cypriot pots weigh 370 kilos, the Cretan 38 kilos and the Helladic 68 kilos. The anchor and ballast stones weigh 67 kilos. This gives a total weight for all the finds of about 543 kilos. The volume of the pottery was about 2.910 cubic centimeters, which together with that of the other finds comes to 3.200 cubic centimeters. If to the weight of the pottery we add the weight of their contents, if they were full of liquid, we have a total of 3 tons. This was the minimum weight of the cargo on board at the time the ship went down. If then we add the weight of the all the ballast, the crew members, the mast, sail and oars and other equipment, we have a ship that must have been at least 7 metres long. Since, however, it would have been difficult for a 7 metre ship to have made the voyage from Cyprus to Argolis[1], we must conclude that either all the cargo has not been found (perhaps part of it was stolen from the sea bed), or that at the time the ship sank it had already unloaded part of its original cargo.

The little evidence we possess obliges us to resort to speculation and to imagine a small vessel, no more than nine metres long (Fig. 16), built by the shell-first method, and having a rudimentary keel and sparsely spaced frames, if any at all (Pulak 1997, 248-249). It would not have been decked over, but we cannot rule out the possibility that the stem and stern were covered and that it may have had bulwarks. It was probably propelled mainly by a square sail, with oars being used only as auxiliaries. It would have been steered by one or two steering oars mounted at the stern.

THE PROVENANCE OF THE SHIP

The available evidence for the Iria wreck, as for the other known LBA wrecks in the eastern Mediterranean, is insufficient to determine their "nationality"—if indeed the term is not anachronistic in this context (Bass 1996, 75; 1997,168-70; Pulak 1997, 250-56). It might have been built in one place with timber imported from another and by shipwrights of different origin. The captain, the crew and the merchant may all have had different origins. Although Cypriot, Mycenaean and Creto-Mycenaean pottery in the cargo point to different provenances, and the few utility wares (Cypriot jugs and Mycenaean deep bowls and cooking pots) suggest a Mycenaean or Cypriot origin for the ship and crew, we still cannot know where it was actually built or whether the crew were Mycenaean, Cypriot or both.

If we want to resort to speculation and try to imagine the ship's home port we can consider the following:

The case for a Cretan home port is perhaps the least probable. Why would a ship have left Crete to transport olive oil to Mycenaean Greece and have first gone to Cyprus? Unless of course the Cypriot pithoi and jugs had been previously brought from Cyprus to Crete by another ship.

A scenario with Crete as a stopping place on the way is more probable: Crete would have been an intermediate port of call on the Cyprus-Argolis route, less because its geographical position made it necessary for seagoing vessels to take that route, than for reasons of trade and barter, in view of the close relations between what was by then Mycenaean Crete and Argolis, and because of the time-honoured links between the Eastern Mediterranean (especially Cyprus and the Near East) and Crete, which were very close in this period (Pulak 1997, 251).

The case for a ship setting out from a Mycenaean harbour on the Greek mainland and sailing to Cyprus, perhaps with a cargo of fine painted Mycenaean pottery and oil, and then returning to Greece via Crete, is much more probable. This would explain the presence of the fine Mycenaean vases and the cooking pots, either as the remains of a cargo that had not been all disposed of, or as pots belonging to the crew. The cooking pots might have been used for cooking during the voyage.

It is equally likely that the ship was Cypriot. The relatively poor cargo may be more understandable if we imagine a ship setting sail from Cyprus, loaded, in addition to the pithoi, with some of the organic products, either contained in the pithoi or separately, and not traceable today, that we know from Linear B sources were exported from Cyprus to mainland Greece at that time: these included wool, cloth, spices, sesame, cumin, clothing, alum and purple dye (Palaima 1991, 276-84; Bass 1997). The pithoi could also have contained fine Cypriot wares, like those found in the pithoi from Uluburun, which could be unloaded at ports en route. The juglet found in the Point Iria wreck may be the only one of these wares that was not unloaded from the ship.

The ship would have had two destinations: first, Crete, where it may have unloaded a part of its cargo, perhaps raw copper in the form of ingots. There it took on a cargo of stirrup jars and possibly pithoid jars which, along with the Cypriot pottery, it would try to sell in some of the many Mycenaean harbours along the way on its voyage to the Gulf of Argos. A Cypriot origin would also explain the presence of the two jugs, which could have held drinking water for the crew.

CONCLUSION

However that may be, the importance of the wreck lies in the nature of its cargo and the fact that at the end of the 13th c. BC a ship which foundered in Mycenaean Argolis was carrying a mixed cargo of Cypriot, Cretan and Helladic origin. This now provides concrete evidence of the existence and kind of the maritime trade between Cyprus and Argolis at this period. Such trading transactions must have been frequent and regular, since by its nature it is unlikely that the cargo was a special shipment commissioned by some central authority. It represented, rather, an ordinary everyday kind of traffic.

The composition of the cargo of pottery is little different from that found in the other two known wrecks which have been excavated on the coast of Asia Minor. We could in fact say that the Iria ship also fits into the pattern of a two way maritime trade between the Eastern Mediterranean and the Aegean, regardless of the "nationality" of the ships and crews. It is therefore not unreasonable to say that the chief difference between it and the Uluburun wreck is that

its voyage took place about a century later, just before the collapse of the Late Bronze Age culture in the Aegean and the Eastern Mediterranean, and that it was wrecked at a point in its voyage when it had already unloaded a large part of its original cargo.

In this we were less fortunate than the excavators of the Uluburun wreck, which would appear to have sunk at the beginning of its voyage instead of the end.

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NOTES

1 The length of the contemporary ship wrecked at Cape Gelidonya, which also appears to have been carrying a relatively small cargo, is estimated to have been over 10 metres (see Bass 1996, 29). The length of the Uluburun ship was between 15 and 18 metres (see Fitzgerald 1996 and Pulak 1997, 248-249).

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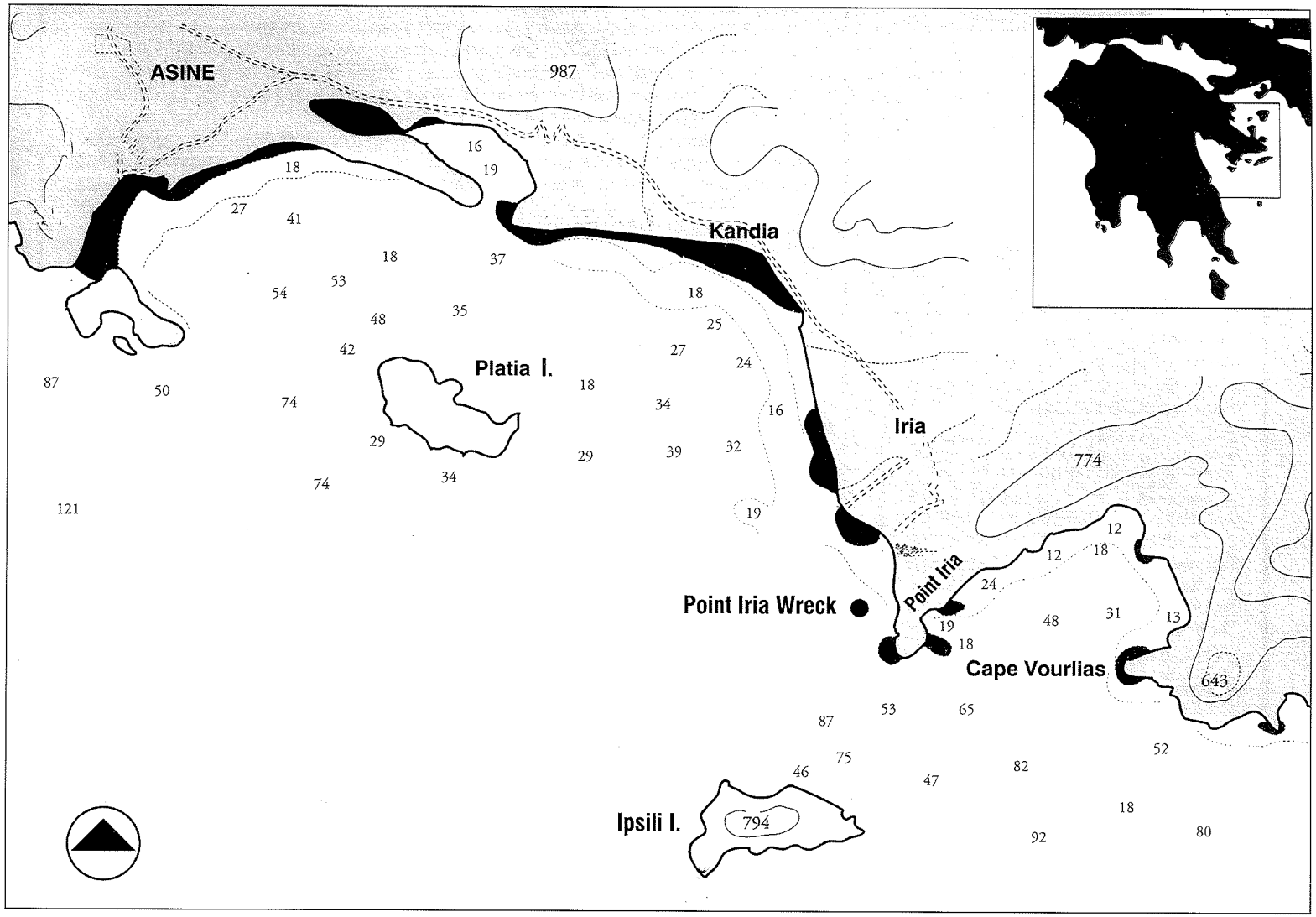


Fig. 1. *Map of the Gulf of Argos with Pont Iria and the main LH sites on the coast.*

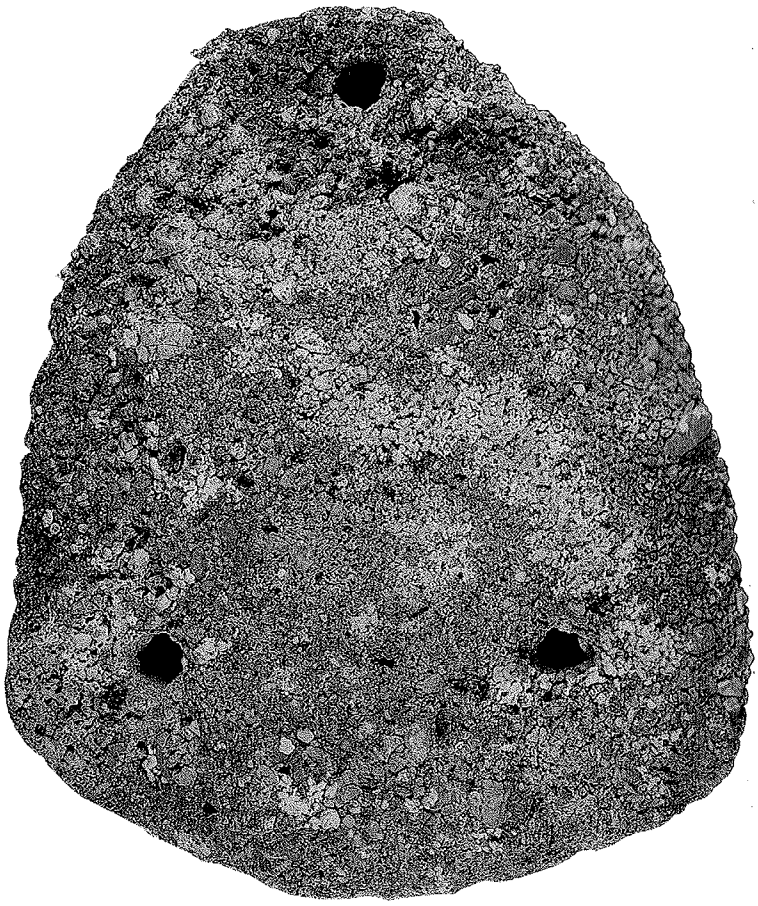


Fig. 2. *Stone anchor A29*

Fig. 3. *Ballast stones from the site.*

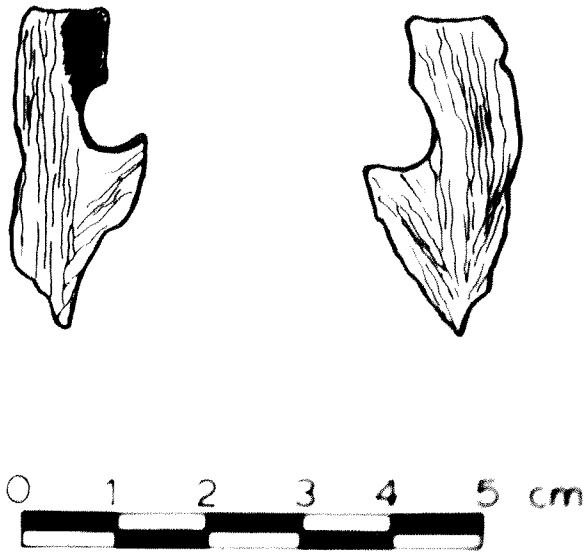


Fig. 4. *The wooden piece with a semicircular hole (drawing A. Mari).*

Fig. 5. *Samples of wood from the Cape Gelidonya wreck.*

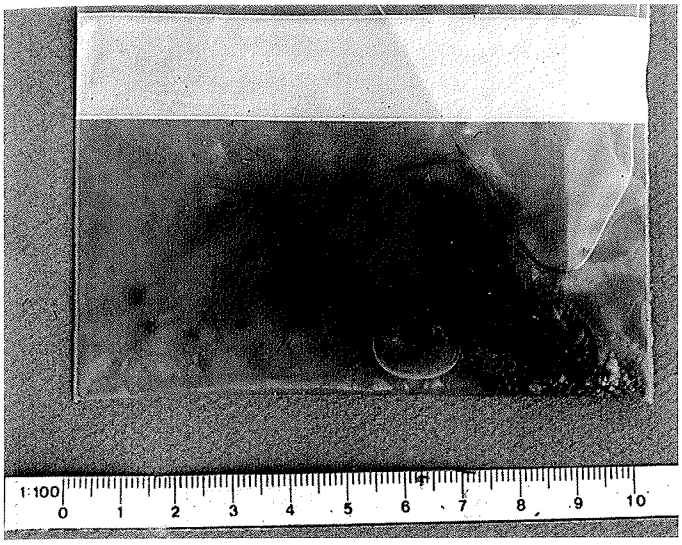
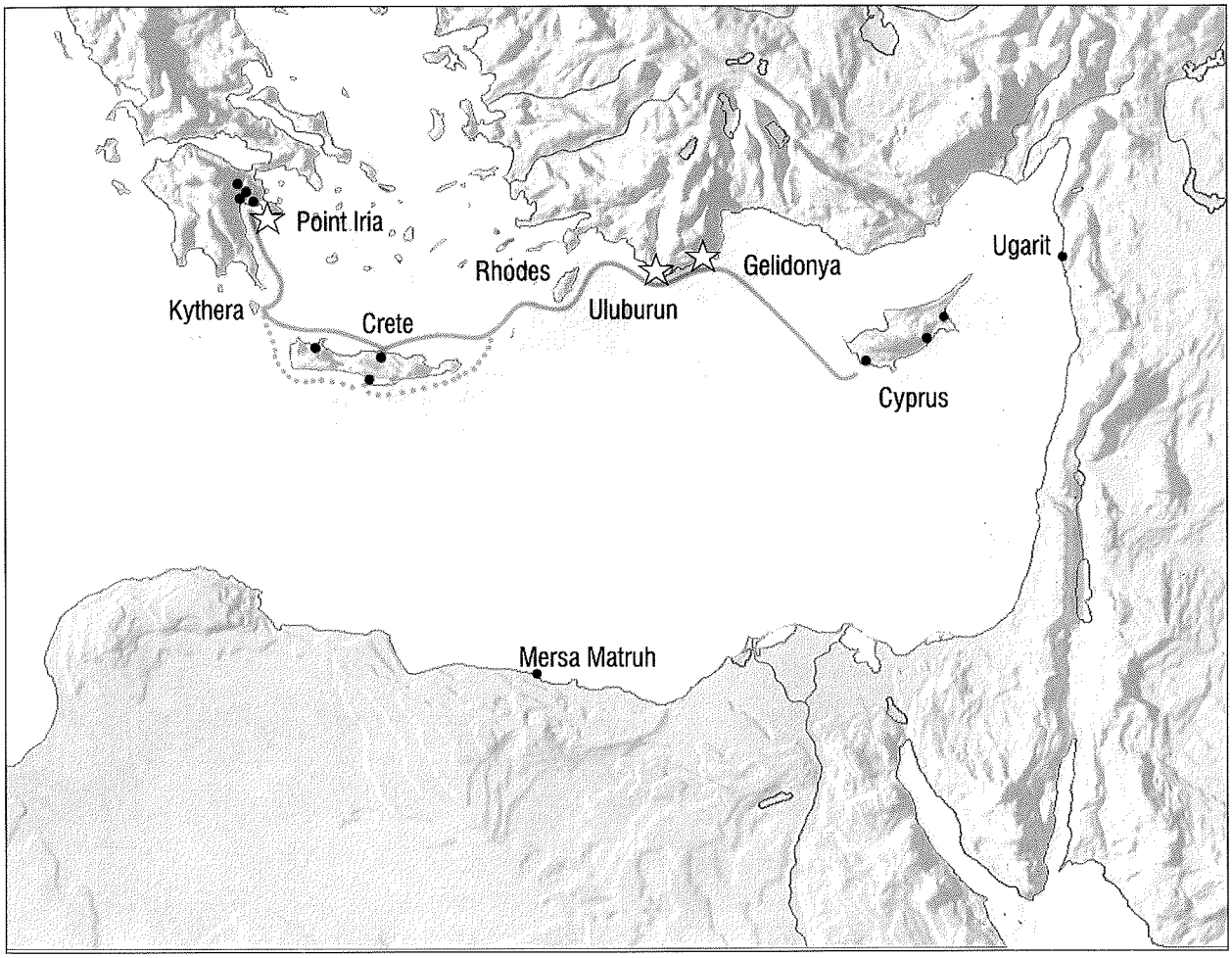


Fig. 6. *Organic sample (probably rope) from the Point Iria Wreck.*

Fig. 7. *Hypothetical route of the last voyage of the Point Iria ship (map: T. Bellas).*



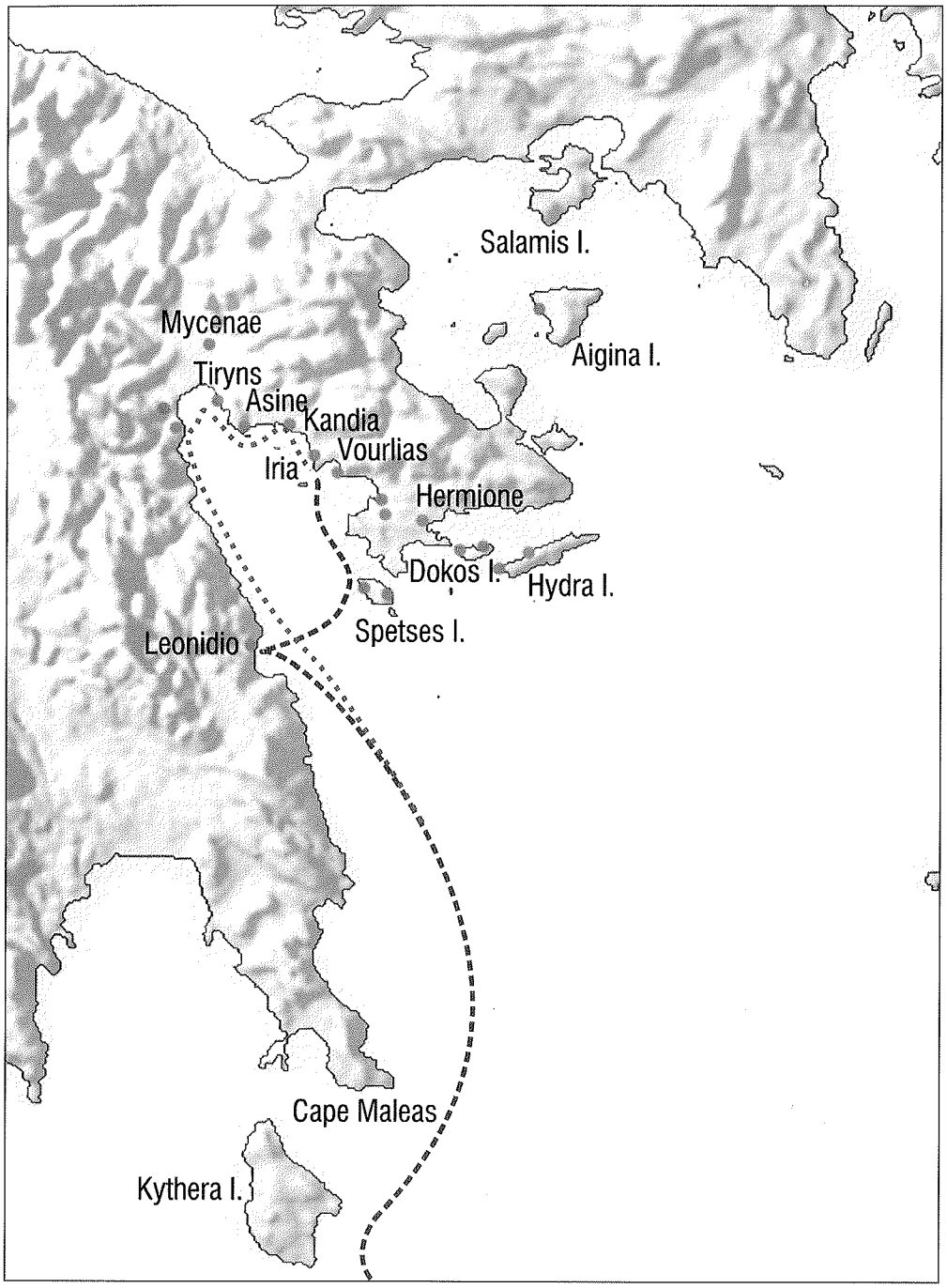


Fig. 8. *Last part of the voyage with the two alternative scenarios (map: T. Bellas).*

Fig. 9. *Rock carvings from Dramesi, Boeotia,* ca. *1200 BC.*
Schimatari Archaeological Museum
(from L. Basch, Le musée imaginaire de la marine antique, Athènes 1987).

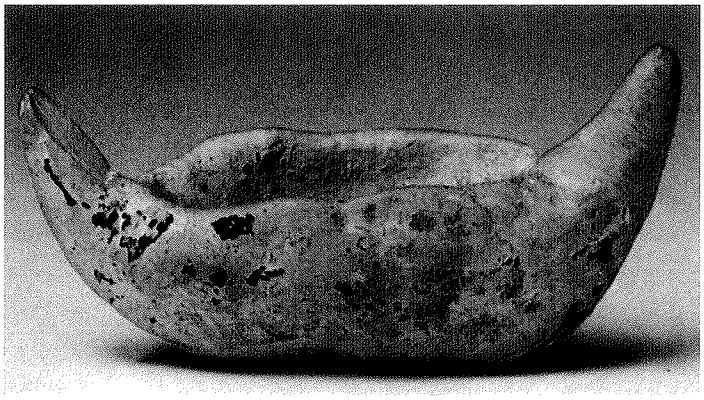


Fig. 10. *Clay ship model from a tomb at Mycenae,* ca. *1300 BC. National Archaeological Museum, Athens (from L. Basch 1987).*

Fig. 11. *Clay ship model from Asine, 12th century BC. Nauplion Archaeological Museum (drawing: A. Mari).*

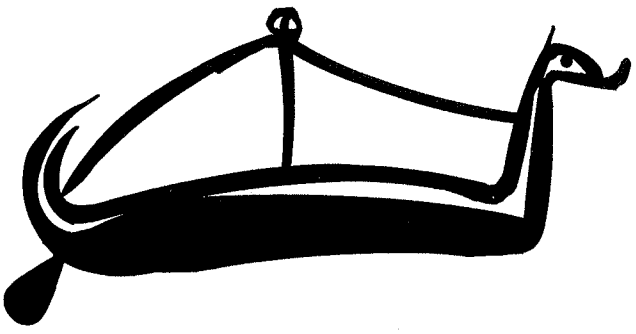


Fig. 12. *Painted representation of a ship on a small stirrup-jar from Skyros. Skyros Archaeological Museum.*

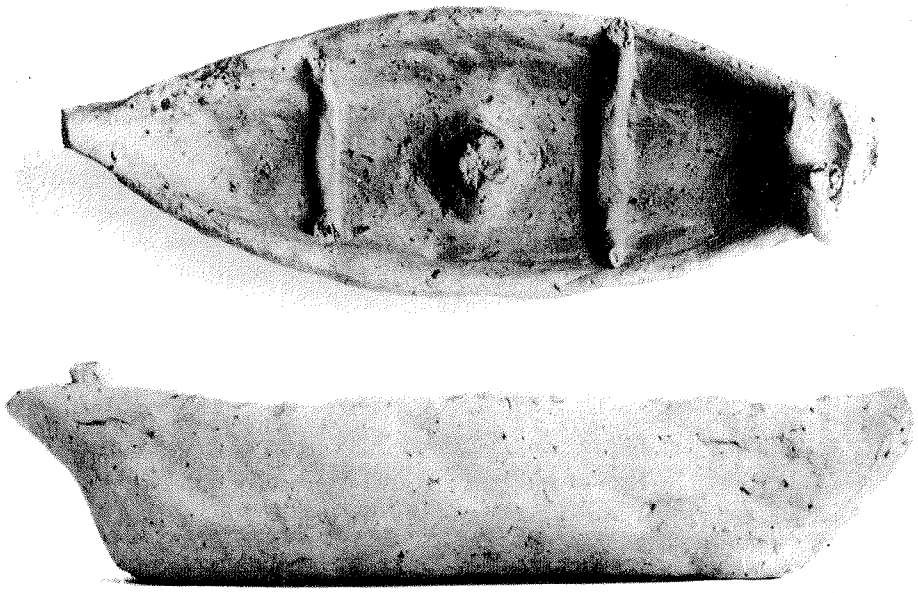


Fig. 13. *Clay ship model from Argos, LH IIIA 2-IIIB 2. Argos Archaeological Museum (from E. Palaiologou, Tropis I, Piraeus 1985).*

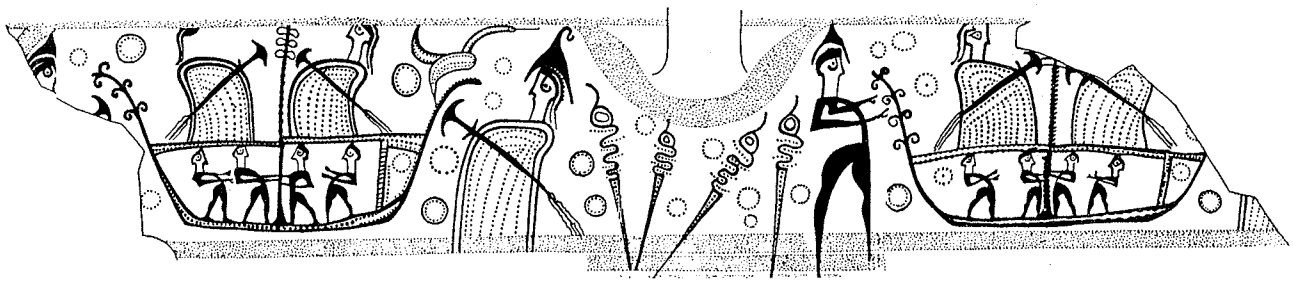


Fig. 14. *Painted representation showing two ships on a LH IIIB krater from Enkomi, Cyprus. Medelhavsmuseet, Stockholm (from L. Basch 1987).*

Fig. 15. *Clay ship model from the sea of Amathous.*

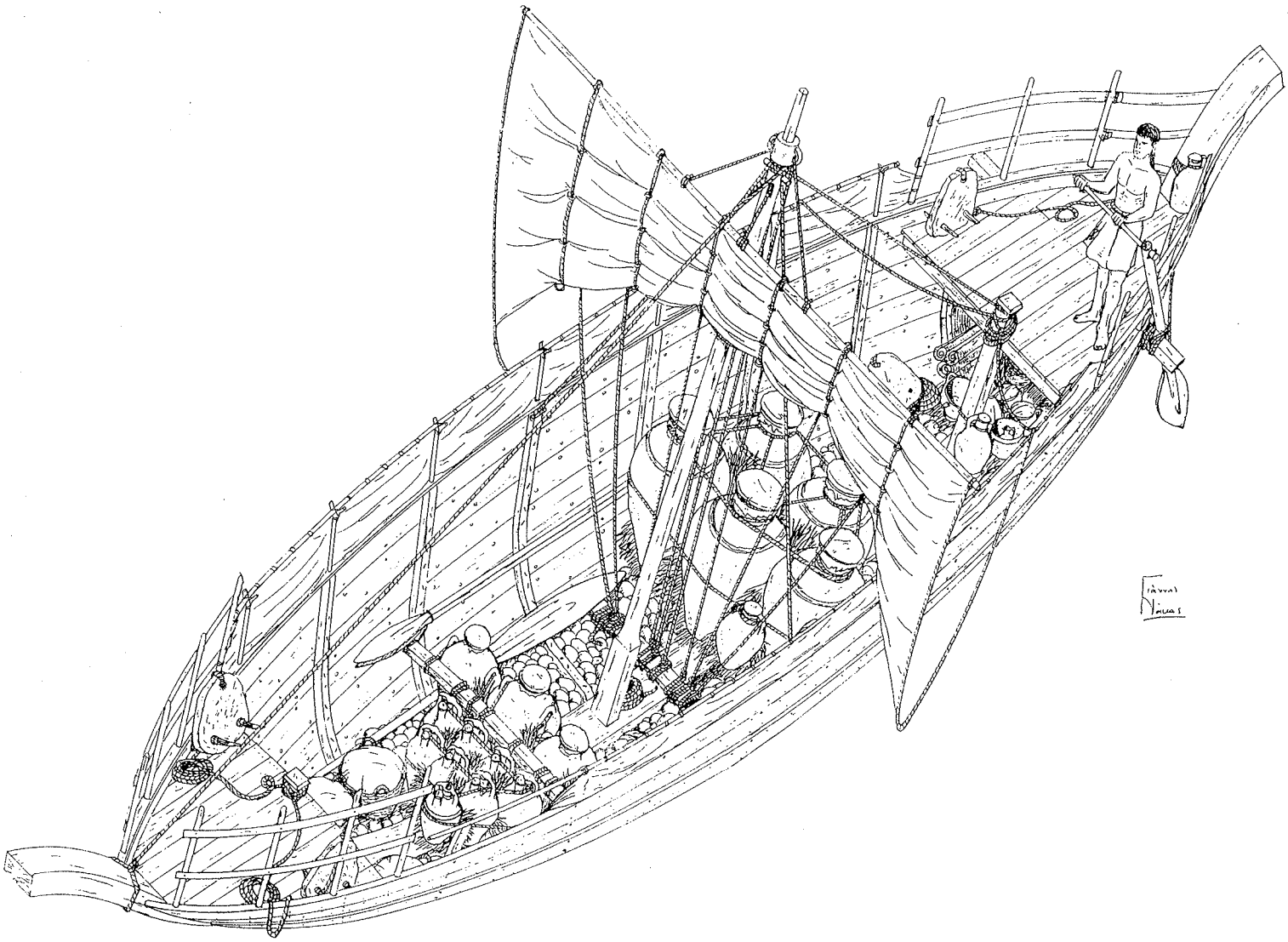


Fig. 16. *Hypothetical reconstruction of the Point Iria ship (drawing: Y. Nakas, 1998).*

Topographical and Historical Context of the Iria Wreck

by Adonis Kyrou

The sea, which clasped within its stormy embrace at Point Iria the little merchantman sailing through the Gulf of Argos 3,200 years ago, has jealously guarded the secret of the wreck until our day. Now that scholars and scientists are studying the finds brought up by the divers of the Hellenic Institute of Marine Archaeology, this humble Late Helladic III trading vessel has opened up new horizons in the study of this last phase of the Mycenaean world and the condition of insecurity and turmoil prevailing in the region of the Argosaronic Gulf at the beginning of the 12th c. BC (end of LH IIIB 2).

No actual remains of the ship have so far been found. The small ship capsized some tens of metres from the precipitous northwest side of the promontory in a sudden tumultuous sea whipped up by the strong west or northwest wind so feared in the region, and known to modern sailors as the *ponente* or *maïstro*. Except for a large part of the cargo of utilitarian pots and pithoi for transporting agricultural products, one or two stone anchors and some ballast stones, it left no other indications that might reveal its identity and the circumstances surrounding its final voyage. We must therefore turn to the historical and archaeological evidence about the region of the wreck.

Point Iria, the Strouthous of antiquity (Pausanias 2. 36. 3-4), is a nautical landmark for mariners sailing in the Gulf of Argos (Fig. 1). In the days of the Mycenaean state it formed the boundary between the territory of Asine and those of Hermione and Mases, and marked the western coastal limit of the district of Didymia (Papachatzis 1976, 283. Kyrou 1990, 19-23). The locality that interests us in the case of the Iria wreck is the wide bay stretching to the east of the promontory and called Agrioi Limenes in antiquity —in the plural in Greek, because a rocky ridge of hills at right angles to the flat shore divides it into two parts, which are protected from northerly and westerly winds at the west end by the islet of Ipsili (Fig. 2).

Agrioi Limenes, whose name means "wild havens", and by extension a bleak place, precipitous and inaccessible by land (Liddell & Scott 1901, 30), as indeed it is, was the only outlet to the Gulf of Argos and the sea for the mountainous district of Didymia, which was famous in antiquity for its large olive production and its dairy products from the large herds of sheep and goats that browsed there (Fig. 3). This area was also disputed in the late Hellenistic period (2nd c. BC) by both the Epidaurians and the Hermioneans (Jameson *et al.* 1994, 596-599). Today Agrioi Limenes has the names Megali and Mikri Vourlia, and it is interesting to recall that it was from this bay, sheltered from the winds, that sections of the British expeditionary force were evacuated in April 1941 after the collapse of the battle front.

The purpose of these remarks is to show that the site of the wreck off Point Iria was not simply a fortuitous point in the sea, where the ship was driven and sunk by high winds and heavy seas, but resulted from the action of the heavy seas breaking against the cliffs of this natural arm of land covering the entrance to a harbour which was well known to sailors of the period, and which may well have been the destination of a ship approaching from the northwest—presumably Asine or Nauplia. A Late Mycenaean fortified site on the summit of the precipitous hill overlooking the shore of Vourlia (Agrioi Limenes) dominates the narrow coastal strip, where other Late Bronze Age remains are visible, chiefly around wells, now dried up, or on mountain passes (Figs. 4, 5, 6).

The crew of the little merchantman would have been trying to fetch this windless bay in the midst of the stormy sea. Serious damage to the mast or steering oar, however, may have left the boat unmanoeuvrable, and it got caught in the backwash of the waves and overturned before it was able to weather the point to the safety of the harbour.

That is the topographical background of the wreck. But what is the historical basis for this nautical calamity? The date of the finds at the end of Late Helladic IIIB brings us close to 1200 BC, the probable time of the end of the Trojan War. It must also be remembered that according to mythology and history the whole of the southeastern end of the Argolid, from Nauplia and Asine to Hermione, Troezen and Eiones (on the eastern edge of Troezen), known by the general name of Acte (Polybius 5. 91. 8. Pausanias 2.8.5), had been settled

since the end of the 14th c. BC by rugged newcomers, chiefly farming and herding populations of Dryopes or Dolopes, who had descended from the mountainous regions of NE Thessaly and arrived as far as Aigina and Attica (Pausanias 4. 34. 9. Herodotus VIII, 43. Diodorus Siculus 437, 2. Kyrou 1990, 82-87). This Dryopian state, at the soft underbelly of the Mycenaean Argolid, quite naturally came into open conflict with the Mycenaean power at a moment when the Mycenaeans were most vulnerable. This must have been at a time when the political and military leadership together with a large part of the army and priesthood were away at the Trojan War. And indeed the archaeological record suggests that a large earthquake, which overwhelmed Mycenae and other Mycenaean centres in the Argolid towards the end of the 13th c. (LH IIIB 2), followed shortly after the occurrence of some kind of internal conflict that left clear indications—conflagrations and destruction—in some of the principal buildings of Mycenae at the end of LH IIIB 2 (around 1200 BC). This was then followed by a period of reconstruction and a new flowering, at the beginning of the 12th c. (Wace 1955, 187. French 1963, 50. Mylonas 1983, 247-252. Iakovidis 1986, 259).

This intertribal confrontation in the Mycenaean realm finds an echo in the mythological cycle of the "Curse of the Atreides", which is connected with the atmosphere of internal warfare prevailing in the Argosaronic region at the beginning of the 12th c. BC, resulted in an exodus by many groups of Dryopes from the Argolid, Aigina and Attica to the Cyclades and further afield as far as copper-bearing Cyprus, with which the Dryopes of pre-Dorian descent maintained close colonial and commercial ties.

During this period of intertribal strife in the waning Mycenaean kingdom (very end of LH IIIB 2), which came in the first two decades of the 12th c. BC, the Dryopian towns in the NE Argolid, E Laconia (Thyreatis) and Aigina, as well as those in Boeotia and Attica, which had been isolated by the severing of their land communications by the Mycenaeans, formed a joint defensive political and commercial league in order to defend their sea links against the threat of the powerful Mycenaean fleet from Crete, and also to ensure the maintenance of supplies to the Dryopian coastal centres. Later on, in the middle of the 7th c. BC (Strabo VIII 374), under threat from Pheidon, the well-known tyrant of Argos, seven major Dryopean towns, including Athens, Aigina, Epidaurus, Hermione,

Nauplia, Brasiae (or Prasiae: modern Leonidio) and Minyan Orchomenos, formed the defensive Amphictiony of Calauria, with the sanctuary of Poseidon at Calauria (modern Poros) as its religious centre (Fig. 7).

This putative league—as a precursor to the subsequent amphictiony—of the Dryopes of southern Greece in the late Mycenaean period, during the troubled times prevailing at the beginning of the 12th c. BC (end of LH IIIB 2), looked chiefly towards the sea. It is therefore reasonable to suppose, given the farming and herding occupations of the Dryopes, that to handle its maritime needs it attracted ships coming not only from the regions it controlled, but also from more distant places which maintained ties with the warring Dryopes of the Peloponnesian region as a whole. It should also be noted that the decline of Mycenaean maritime power left the Dryopian centres of the Argosaronic region a free field of action, although the threat of the appearance of the Mycenaean fleet from Crete made it necessary to establish defensive posts at points on the coasts and islands along the routes followed by the ships serving the main Dryopian harbours. Well-fortified harbour stations on the islands and islets controlled the sea routes from the Gulf of Argos to the Saronic Gulf and the Cyclades, for example the island of Dokos (ancient Aperopia) and the islet of Modi or Liontari (Eiones?) off the east coast of Poros, for vessels sailing to Aigina and Attica. And for voyages across the open sea to the Cyclades there was Hydra (ancient Hydrea), with its many springs. They testify to the defensive cover of the sea routes and the safeguarding of supplies for the ships of the Dryopian league during the troubled first decade of the 12th c. BC. By contrast, on the more southerly sailing route the islet of Parapola or Velopoula (Fig. 8), on which remains have been found of an important Early Bronze Age (Early Helladic II, *ca.* 2300 BC) settlement with evidence of considerable copper-working activity—the copper probably came from the neighbouring islet of Falkonera—does not seem to have played much of a role in the Mycenaean shipping trade to the Cyclades and Crete, since no remains of this period have been discovered there (Kyrou 1990, 75-76).

In searching for conclusions it must be recognised that on present evidence it cannot be said with any certainty that the Point Iria wreck was a ship of Cypriot origin, beyond the fact that part of the cargo recovered consists of pithoi and utilitarian pottery made in

Cyprus. It is, however, sure that at this time the maritime contacts of the Dryopes of southern Greece extended as far as Cyprus. In this particular instance, leaving aside speculations about its origin, it seems very probable that this small merchant ship, whose length could not have exceeded 10 metres, was on a short voyage, coming from one of the northwestern harbours in the Gulf of Argos, like Nauplia and Asine, with the purpose of taking on a cargo of agricultural products in Agrioi Limenes or nearby Mases.

The ship's final destination is unknown, whether it would have returned to the harbour it had sailed from, or whether it would have continued on towards the Saronic Gulf or the Cyclades. In the latter case, if it were making for Aigina and Attica, it would have sailed through the Vouporthmos (modern Mouzaki) channel between Hermione and Dokos (Fig. 9), probably putting in for supplies at the fortified harbours of Myti Kommeni on Dokos (Fig. 10) and the islet of Modi, where there are also the remains of a sizable Late Helladic III settlement, possibly the Homeric town of Eiones (Fig. 11). If, again, its destination was the Cyclades, the last stop for taking on supplies on its way out of the Gulf of Argos would have been Hydra. There are imposing remains of constructions for the collection and discharge of spring water at either end of the island: at Cape Zourva to the northeast on the rocky coast of Zoodochos Piyi and at Cape Bisti on the flat coast of Ayios Nikolaos to the southwest (Fig. 12). It was to the existence of these springs that this island at the furthest edge of Agamemnon's kingdom, which had passed into the hands of the rebellious Dryopes, clearly owed its ancient name of Hydrea. They, indeed, may also have been responsible for the fortification of the Ayios Nikolaos coast adjacent to the water supply system on the hill of Bisti, which was built in the manner characteristic of Dryopean fortifications in the Argosaronic region for the protection of the place against sea raids by the Mycenaeans.

As a final comment it must be said that it is premature, on the present evidence of the Point Iria wreck, to speak of the identity of the ship and the course of its final voyage. Further investigations to locate the possible remains of the sunken vessel are necessary, using modern technological equipment both to locate any possible metal objects —which are so far completely absent—and to continue the excavation down to a greater depth, since it is very probable that this little ship was overturned by the strong wind and backwash of the rebounding waves, without breaking up on the rocks. Had that

happened, the cargo would have been smashed and piled up very close to the northwest shore of the point. Only after the whole area of the bottom in the vicinity of Point Iria has been fully explored may we learn more about the wreck and about one of the last dramatic phases in the history of the kingdom of Mycenae, once "rich in gold".

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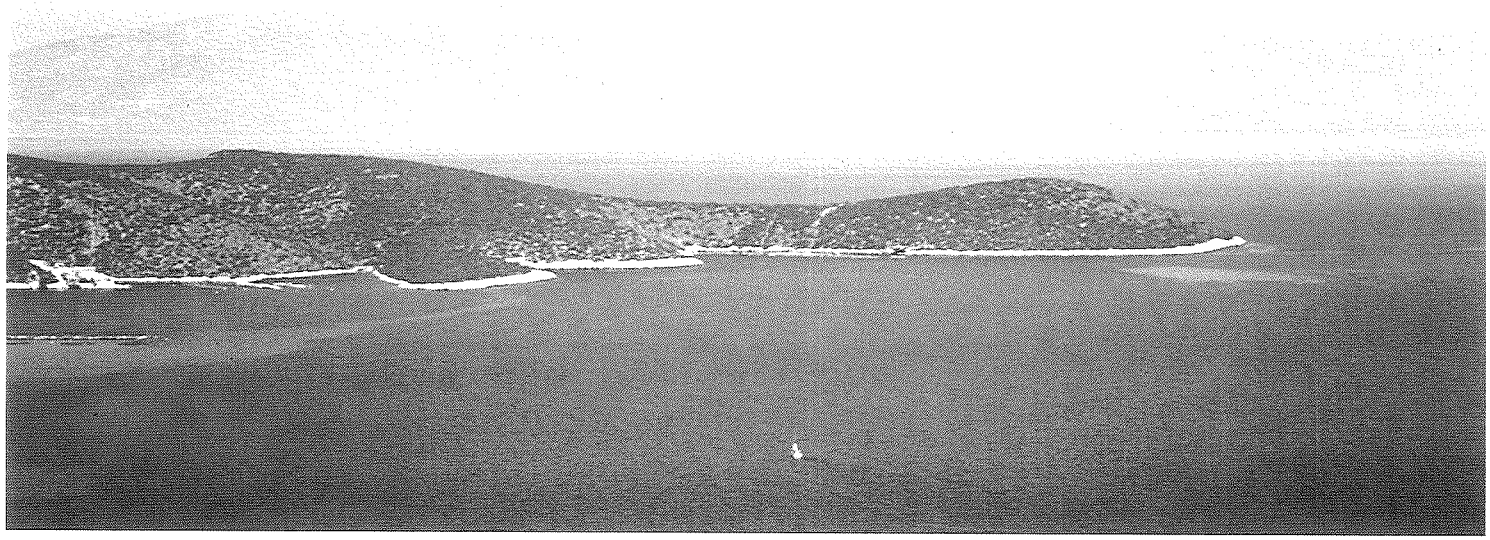


Fig. 1. *Point Iria, the Strouthous of antiquity, was a nautical landmark in the Gulf of Argos, forming the coastal boundary between the Mycenaean centres of Asine and Mases. The ship capsized near the northwest side of the promontory.*

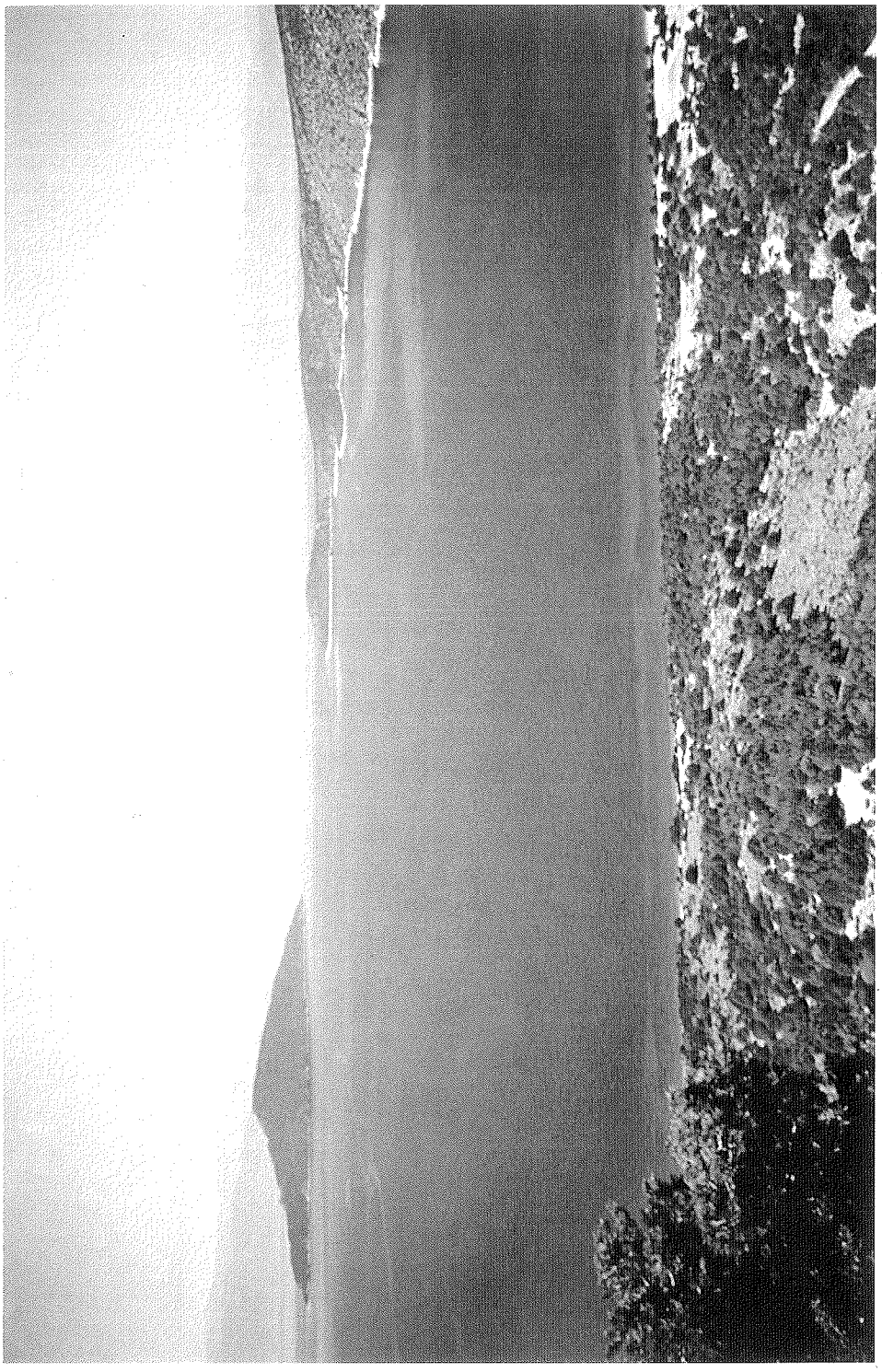


Fig. 2. *The Iria promontory encloses on the west the bay of Vourlia, where the ancient port of Agrioi Limenes was situated, the outlet to the sea of the mountainous district of Didymia.*

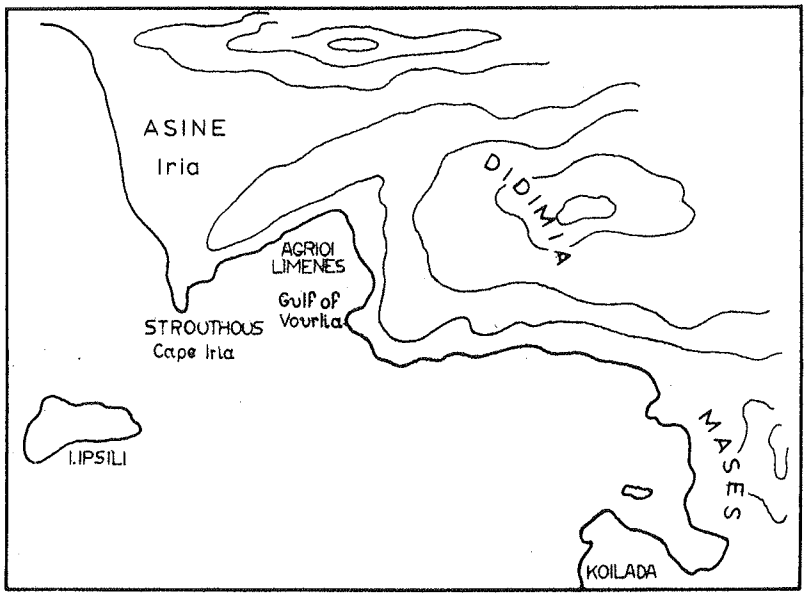
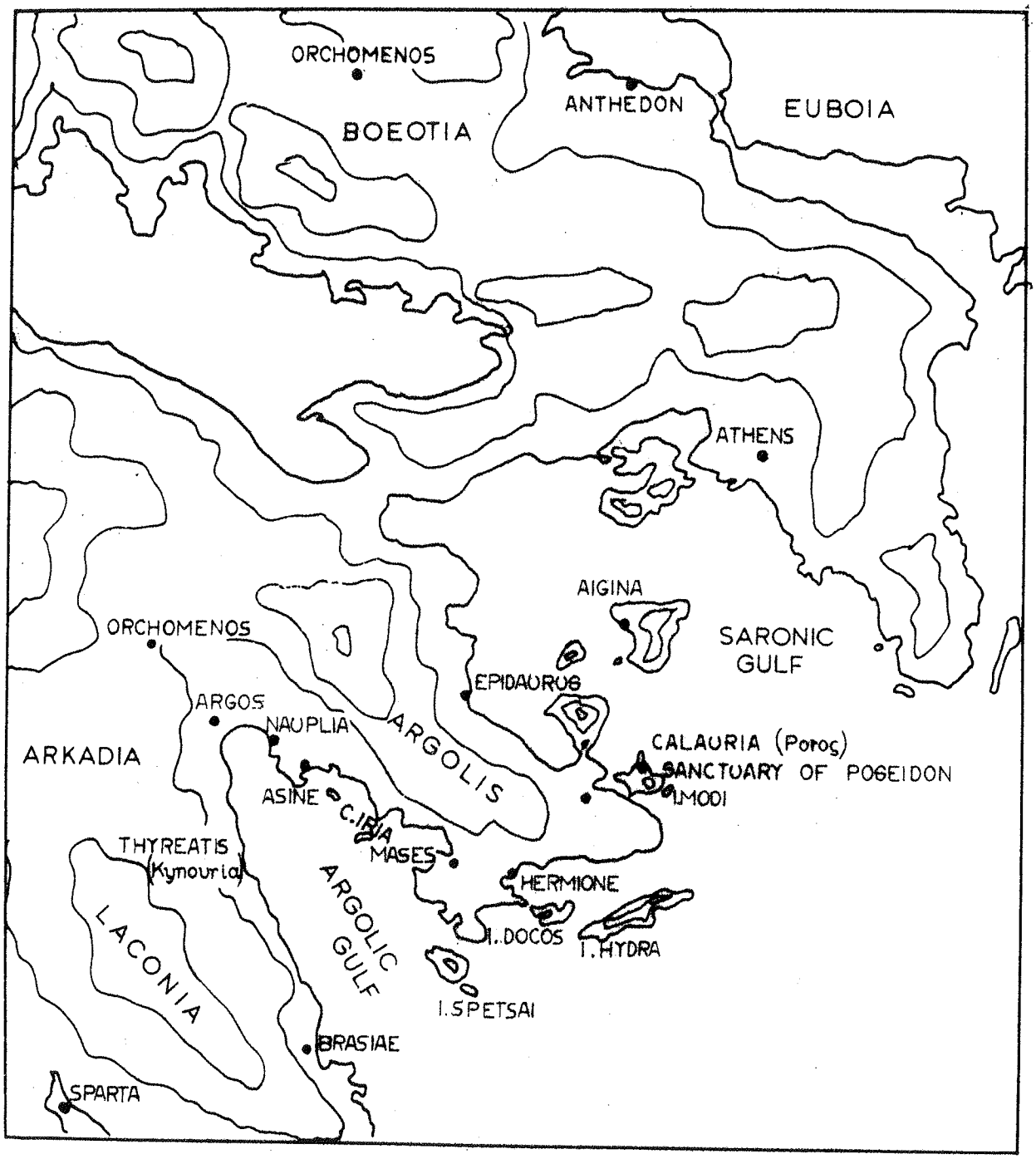


Fig. 3. *Plan of the area of Agrioi Limenes (modern Vourlia), east of Point Iria. The ship was trying to reach this port when it was capsized by the strong west wind near the tip of the point.*

Fig. 4. *The fortified Mycenaean site on the hill dominating Vourlia bay (Agrioi Limenes) can be dated to the time of the wreck at Point Iria (end of 13th-beginning of 12th c. BC).*

Fig. 5. *The ruins of the acropolis and the rest of the settlement on the hill in Vourlia bay mark a LH IIIB site hitherto unknown in Mycenaean Argolid.*

Fig. 6. *The ruins of the Mycenaean site on the hill of Vourlia in the mountainous area of Didymia near the boundary with Asine can be identified as the Voleoi Lithoi (mound of stones) mentioned by Pausanias (2. 36. 3-4).*



Fig, 7. *The Calaurian Amphictiony in the 7th c. BC, formed by the Dryopian cities of Orchomenos, Athens, Aigina, Epidaurus, Hermione, Nauplia and Brasiae.*
The plan also shows the expansion of the Dryopian league in the 12th c. BC.

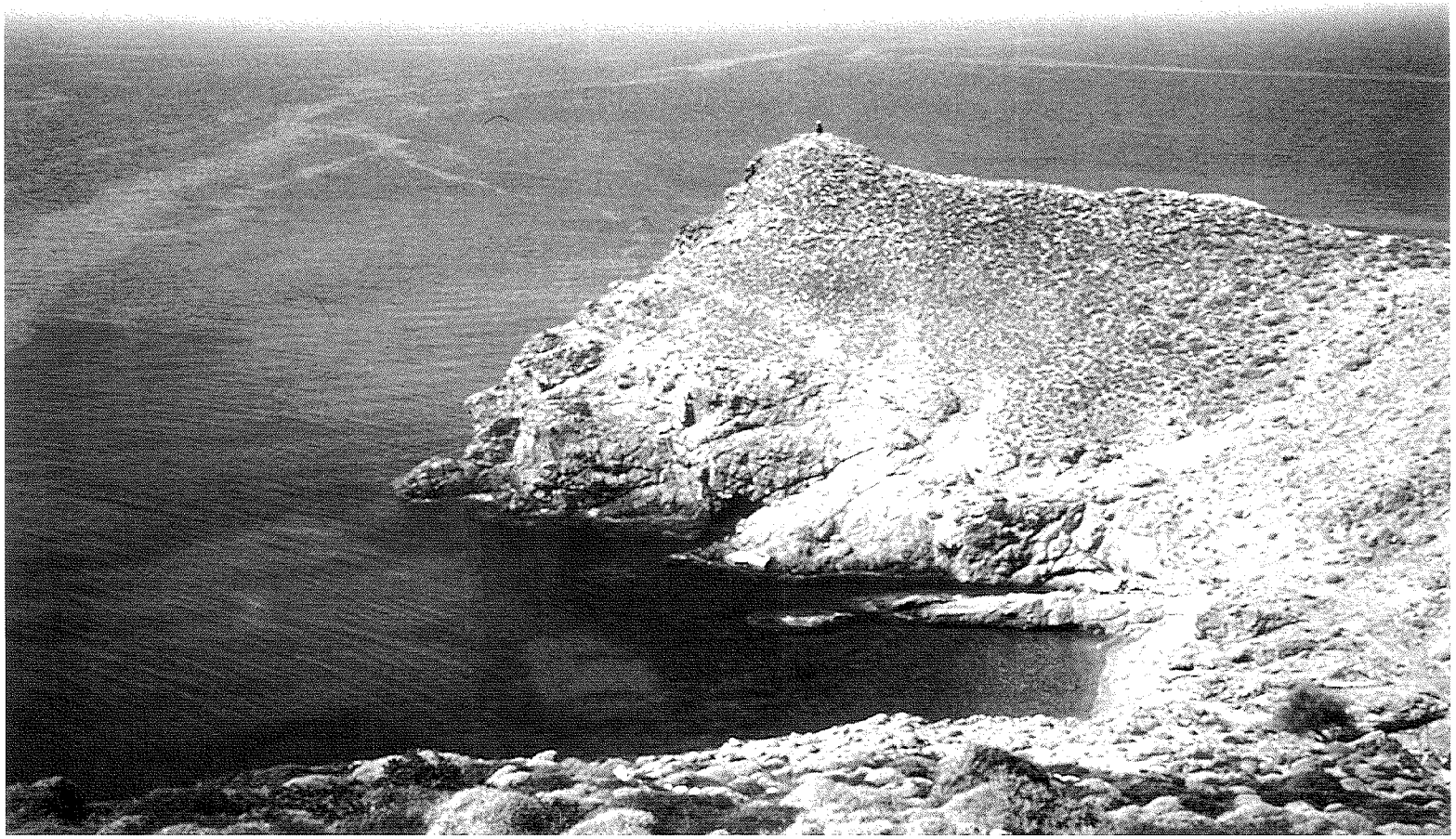


Fig. 8. *The islet of Parapola (Velopoula) in the open Myrtoon Sea, although it lies at a nerve centre for seafaring between the Argolid and the Cyclades, does not have any traces of Mycenaean presence in the little harbour, where there are remains of an Early Helladic II settlement (ca. 2300 BC).*

Fig. 9. *The Mouzaki (ancient Vouporthmos) channel separates the island of Dokos (left) from the coast of Hermione. It has always been a key for seafaring from the Gulf of Argos to the Saronic Gulf.*

Fig. 10. *On the Myti Kommeni promontory on the north coast of Dokos, a fortified harbour of the Dryopes belongs to the same period as the Point Iria wreck (LH IIIB 2).*

Fig. 11. *Also contemporary with the wreck is an important Late Helladic IIIB settlement on the islet of Modi, east of Poros (ancient Calauria), where a sacred enclosure was cut into the rock.*

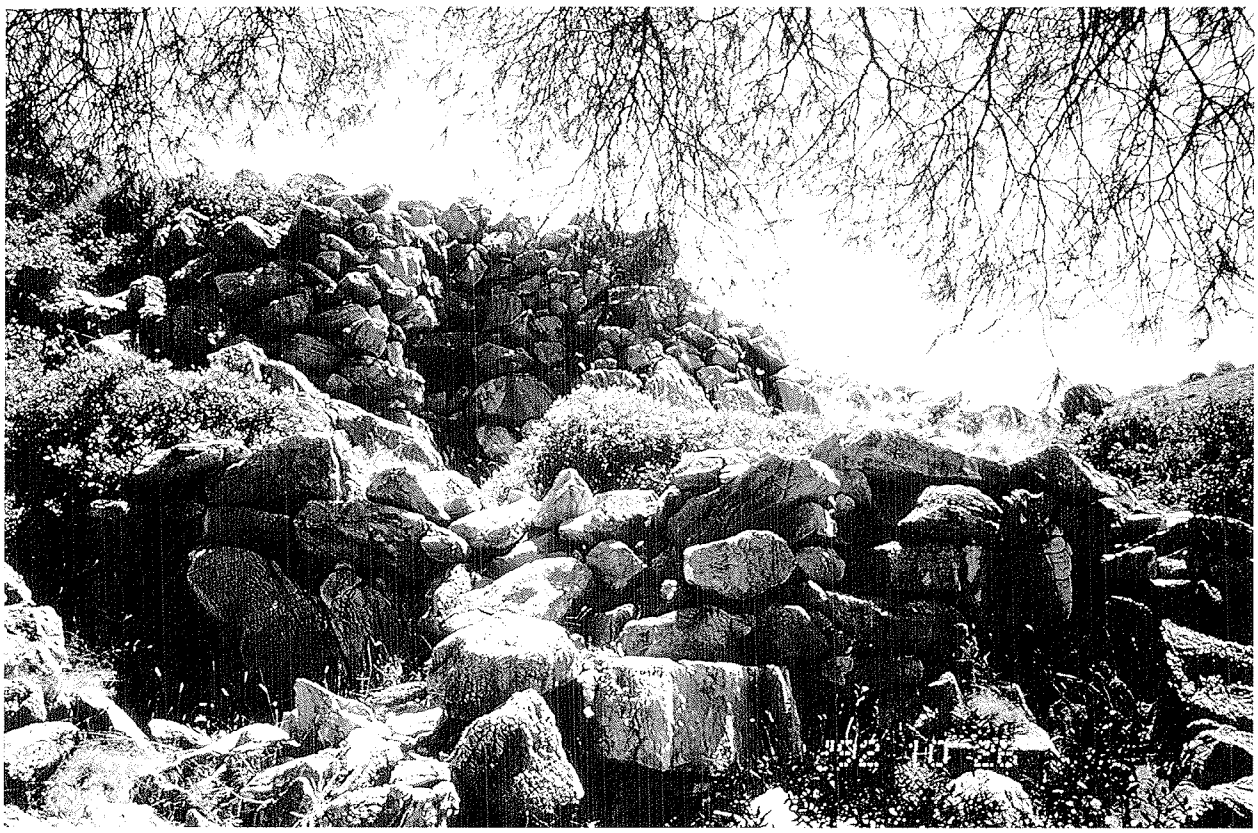


Fig. 12. *The island of Hydra (ancient Hydrea) played a major role in seafaring from the Gulf of Argos to the Cyclades due to its many springs. An imposing LH IIIB structure on the south coast at Ayios Nikolaos-Bisti ensured the collection and discharge of water.*

Morning Session Discussion

Chairman: Vassos Karageorghis

CHAIRMAN: Are there any questions for Mr. Agouridis? If not, I have one myself: Is the excavation finished or are there any further remains deeper under the sand?

AGOURIDIS: We would like to leave this matter open for the future. There could be further investigation of the deepest areas using modern methods (sub-bottom profiler) which can show much deeper than the present area which, as I said, is covered with a thick layer of mud. The excavation can't be extended under the mud, but a further investigation using modern technology remains a possibility.

KOTSAKIS: I would like to ask, how is the extent of the area defined or limited? How do you know the excavation only covers 50 m^2 as you said?

AGOURIDIS: The area is defined by the main collection of finds as shown on the plan. The superficial excavation of the wider area revealed the other finds. But the main collection defined the perimeter of the excavation.

CHAIRMAN: We move on to Mr Lolos' talk.

IACOVOU: Could you please confirm for us if there is a single vessel in your cargo that could be dated to Late Helladic IIIC?

LOLOS: No.

IACOVOU: And another question: Is there a single sherd that could be attributed to the Syro-Palestinian coast? Anything at all?

LOLOS: Well I can refer only to the ceramic finds. The answer is no. There is nothing in the cargo of pottery that can be attributed to the Syro-Palestinian coast.

IACOVOU: Well in that case, I will reserve further comment for the afternoon session.

DEMAKOPOULOU: I would like to comment on the papers given by Professor Lolos and Dr. Day. My remarks concern the pottery of the Iria wreck which we saw so well displayed at the museum this morning. I think it would be useful to

draw some comparisons between this pottery and the fine pottery from the recent Greek-Swedish excavation at Midea. Midea was one of the most important Mycenaean centres in the Argolid and of course joined in the commerce between Mainland Greece, Crete, Cyprus and the East. We have not yet any Cypriot pottery from Midea, even though we noticed today that there are many similarities between the large Cypriot pithoi and the pithoi from Midea. However, closer similarities exist with the Cretan finds at Iria, namely the storage stirrup jars. I want to emphasize that a large number of such stirrup jars were found at Midea, which added to our knowledge of this class of pottery, and which really do seem to be Cretan imports to Midea. Three of these storage stirrup jars from Midea bear inscriptions in Linear B; most important is the one bearing the Cretan name *wi-na-jo*, which was undoubtedly sent to Midea from Crete, probably from Chania, on the basis of the exchange trade between the Argolid and Crete.

I come now to the group of pots from the mainland. I understand that Dr. Day attributes the pithoid jars from the wreck to this category. At Midea we have in fact many coarse amphoras and pithoid jars that strongly resemble the ones we saw today in the museum. Some of them have incised signs on the handles, on the shoulder and very often on the upper part of the belly. There are also similarities in the cooking pots; we too have many cooking pots, some of them three-legged, which look like the one in the museum with the collar neck. I think that – according to the examples from Midea – this one in the exhibition must have a flat and not a ring base, as restored. I should just like to add in conclusion that the dating of the Iria wreck is confirmed by the sherd of the deep bowl which preserves its decoration. We have a great number of similar bowls from Midea. The Iria sherd must belong to the late LH IIIB 2 period. In the same showcase a restored bowl is also on display which I think must be a stemmed bowl, as the rounded lip indicates. To conclude, the similarities between the Helladic pottery from the Iria wreck and the pottery from Midea are indeed impressive.

KARAGEORGHIS: I would like to express my doubts about the engraved sign on the handle of the amphora, having examined it carefully this morning. I believe it is not a Cypro-Minoan sign, but simply one vertical and one horizontal sign and, most important, it is not engraved after firing, but before. Anyway, we'll look at it afterwards together.

KANTA: This is just a comment about the stirrup jars. I would just like to say, from the one that preserves the spout, that a date just before or around 1200 is very good in Cretan terms, because as you can see, the spout has

started going near the false neck and this is a late feature, and in full IIIC sometimes they touch. So around 1200 is very good.

LOLOS: I want to thank Dr. Demakopoulou for her information regarding the excavation at Midea, which will be very useful to us in the future final publication of the pottery cargo.

Mr. Chairman, I do not agree with what you said about the incised sign, that there is only a vertical and a horizontal line. There is also a slanting line, which meets the top of the vertical one; this in fact appeared more clearly on the accurate drawing of the incised sign we made using thin paper and a lead pencil. It can be seen with the naked eye on both handles; in other words the sign was used on both handles, that is, the same incised sign which has the particular parallels that I mentioned in my talk.

KARAGEORGHIS: I don't doubt that. I only wanted to say that it is such a simple symbol that it might not be Cypro-Minoan, but a symbol indicating the capacity. Much more important is the fact that, in my opinion, the incision was made before the firing and not after.

[Editor's note: Prof. Iakovidis agreed with Prof. Karageorghis. On the other hand, Dr. Day and Prof. Kotsakis were sure that the incision was made after firing, which was also the opinion of Dr. Lolos]

IAKOVIDIS: We continue with Peter Day's communication.

ANDREOU: I'm not going to ask questions about interpretations, but I would first like to clear up a couple of matters. I don't know if I understood rightly, but was more than one fabric distinguished in the stirrup jars from both Iria and from Uluburun? Is there evidence that these fabric groups are from the same region, for example from central Crete, or is one from western Crete and another from central Crete?

DAY: Of the six stirrup jars that I have analysed from Iria, five belong to one group and are almost identical to each other. They are central Cretan, probably south central Cretan. I should point out that the groups are formed from all the stirrup jars analysed from approximately 15 sites. In the overall stirrup jar study, the sixth sample (A86/1) from Iria has been placed in a slightly separate petrographic group. But that is one of at least four main central Cretan groups and is very similar to the main group at Iria, the only difference being that A86/1 does not have microfossils in its matrix. The most important factor for provenance is the non-plastic inclusions which are identical to the other five jars from Iria. So in terms of provenance you can almost take them together and they

are from central Crete. There are no west Cretan jars from Point Iria. Uluburun shows a very different picture. Perhaps the most strange stirrup jar fabric from Uluburun, present in just one vessel, also occurs in the Cape Gelidonya shipwreck. It contains volcanic inclusions which do not match with volcanic fabrics that we know from the Aegean. I am not, at present, sure of its provenance. It is clearly not Cretan or from the mainland and I would very much doubt that it is Aegean. Another fabric from Uluburun, with chert inclusions, has a parallel in a stirrup jar from Mycenae. Again I am uncertain where that fabric comes from, but I have no definite parallels for it in Crete. In addition there are west Cretan transport stirrup jars on the Uluburun wreck and finally, there are a number of different types of fabrics from central Crete. So you may have about 6 or 7 quite different fabrics on the Uluburun wreck. They clearly come from a variety of sources and have in some location, perhaps in Cyprus, been re-filled and sent out again, as the Cypro-Minoan inscribed signs on some handles suggest.

CHAIRMAN: Any more questions? Any questions for Mr. Vichos?

DOUMAS: I wanted to ask, what was the relation between the length of the Iria ship, which was calculated at less than 9 metres, compared to the length of the other two known wrecks? From the size of the ship and its contents, that is the cargo, I have the impression that it was not a vessel that traded over very long distances. It was probably Cypriot because of the large pithoi in it, and I imagine that these pitharia must have been in the part of the hold that held the loose cargo. I think that to make journeys from Cyprus to Crete, and the Argolid, with stirrup jars to transport goods in such small quantities would have been unlikely. In other words, it might have been a fishing boat carrying such goods because of an opportunity, but not making this particular journey on purpose for such a restricted selection and amount of goods.

VICHOS: Of course that's one of the problems we faced when we considered the size of the ship and the actual route it took on its final journey. I'll try to answer the first part of your question. I think that in the last publication of Dr. Pulak about the size of the Uluburun ship, it was about l5 m — between 15 and 16 m. Of course the Uluburun cargo is enormous in bulk and weight due to the10 tons of copper oxhide ingots. As I said in my talk, I am convinced that a large part of the cargo had already been off-loaded at some of the ports visited before sinking. However, the cargo found wasn't as small as it seems in the photo we showed. According to the calculations we made with the help of Mr. Dimitris Papadas, who is an officer in the Greek Navy and a member of the

Research Programmes for *Kyreneia II* and the trireme *Olympias,* and has great experience in this field, he believes that we aren't talking about a ship of less than 7- 8 m. If we reckon that we only have a small part of the goods, we must be talking about a ship of at least 9 m. A boat of this size was quite capable of making this journey. We are talking about a small commercial ship 100 years later than Uluburun, and we can imagine it had a poorer cargo, because the time was at the end of the Mycenaean period. As regards the Gelidonya wreck, I think that was also a small vessel. Do we have any estimate of the size of the Cape Gelidonya ship? About 10 m. And it was a wreck contemporary with that of Iria. So I think it's comparable, and anyway the plan is based on those measurements.

CHAIRMAN: Very brief questions for very brief answers.

KANTA: I would like to know, since no small items were found, not even in the jars or between them, if it was just a wreck, or if they had deliberately jettisoned some of the cargo and the ship had sailed off.

VICHOS: This possibility is always investigated by underwater archaeologists at every excavation, and particularly when the hull of the ship is not found. But I think we can rule out this possibility here, because the disposition of the cargo, although scattered over an area of about 150 m^2, has a uniformity about it. The total number of stirrup jars was homogenous; it was scattered but homogenous.

KOTSAKIS: I wanted to ask if this ship was from Cyprus, but had been bought in this area. I know ships are bought and used in different places. Couldn't this have happened in this case?

DAY: I don't think that the ultimate origin of the stirrup jars and other pottery affects any estimation of where the ship was from and where it was going. Even pottery found commonly in sites in northern Crete has an extensive distribution. For example, stirrup jars from Mallia are of the same type as some on the shipwrecks, so are some jars from Knossos. Yet some of pottery at Knossos is from the south of Crete. So I don't think that pottery necessarily tells you where the ship was from and where it is going. It could have picked up south Cretan jars anywhere, on the north coast of Crete or from further afield. I would take it a step further and say that if you look at the stirrup jars from the House of the Oil Merchant at Mycenae, it's not at all sure what we are to understand from that substantial group of pottery. Is it stored as an incoming or outgoing group of jars? Much of the pottery that we analysed and published in Iphigenia Tournavitou's book was actually central Cretan

found together with some western Cretan stirrup jars. Yet these vessels in the House of the Oil Merchant seem all to have been stoppered with the same clay. It gives the impression that central Cretan vessels had been shipped to western Crete, been stoppered with west Cretan clay and then gone to Mycenae. Or perhaps all the jars of different provenance went to Mycenae and then were stoppered there as a new shipment waiting to go out. What I'm saying is that some of these groups which are homogeneous, typologically and in terms of their provenance, are difficult to interpret because they may appear anywhere and were likely to have been re-used.

CHAIRMAN: Any questions for Mr. Kyrou ?

IAKOVIDIS: I am afraid I have my doubts about his historical conclusions. The facts from Mycenae, Tiryns and Midea suggest a destruction or destructions due to natural causes, namely one or more earthquakes, and an uninterrupted continuation of habitation. There is no indication whatsoever of a break or a change in occupation in these and the other sites in the area.

End of Morning Session Discussion

Aspects of Trade Between Cyprus and the West During the 14th-13th Centuries BC

by Vassos Karageorghis

Maritime trade relations between Cyprus and the Aegean had already started by the 15th and 14th centuries BC, first with Crete and then with the Mycenaean world. Although there is no evidence that the Cypriots exported copper to Crete as early as the 15th century BC, discoveries at Kommos, Kydonia and elsewhere on the island, support the theory that there was a 'balance of trade' between the islands of Cyprus and Crete during the Late Bronze Age, which continued during later periods. There is still quite a lot to be defined in these trade relations, for example the extent of trade in agricultural and other perishable goods, reference to which is to be found in Late Minoan written documents, but for which there is hardly any evidence in the archaeological record. The conditions under which the Minoan Cretans transmitted the Linear A script to the Cypriots ca. 1500 BC still have to be defined. It will not be surprising if we find out one day that the relations between Cyprus and Crete during the early part of the Late Bronze Age were much closer than we have hitherto been prepared to accept. Now that the role of the Minoans in Egypt and the Levant is better known as a result of recent excavations at sites such as Tel el-Daba and Kabri as well as at Alalakh and Ugarit we may learn, one day, that the Cretans had important interests in the Eastern Mediterranean and that Cyprus may have served as a commercial base for them, and that coastal towns in Cyprus, such as Morphou-Toumba tou Skourou, served as emporia or 'refuelling' posts. Archaeological discoveries support this suggestion.

Trade on a larger scale, probably in favour of Cyprus this time, started early in the 14th century BC with the Mycenaean Greeks, who replaced the Minoans as the dominant power in the Aegean and who were particularly interested in the copper resources of the island. Underwater excavations during the last several decades have demonstrated how rapidly and how radically our knowledge about interconnections in the Mediterranean may change, with discover-

ies such as those of Uluburun, Cape Gelidonya and Iria. The correspondence between the King of Alasia (Cyprus) and the Pharaoh of Egypt as preserved on clay tablets, is quite eloquent about the nature and extent of this trade, even if we accept that part of it was in the guise of exchange of 'royal gifts'. The ten tons of copper and other metals on the Uluburun ship cannot possibly be regarded as 'royal gifts'. They represent royal trade, with the oxhide ingot becoming the 'internationally' accepted commodity in trade and economic transactions, like the American dollar today.

The Mycenaeans and the rest of the peoples of the Mediterranean needed copper for their weapons, their tools and vessels, and Cyprus could provide it in large quantities. This demand for copper enhanced the position of Cyprus as an important economic factor in the Mediterranean, and this was further strengthened by the geographical position of the island, situated between the Orient and the Aegean and, we may now add, the central Mediterranean. I would not be surprised if one day Cypriote copper ingots were to be found even beyond the central Mediterranean. If we compare the pattern of trade established later by the Phoenicians, who reached the Atlantic coast of Spain and Portugal, we will be struck by the similarities with the Late Bronze Age trade. There is a greater chance that this information will be provided by underwater archaeology rather than by conventional land archaeology, unless written documents one day reveal details of inter-Mediterranean exchanges during the Late Bronze Age.

What did Cyprus receive in exchange for its copper in the 14th century BC? Mycenaean pottery is, perhaps, the main commodity in this exchange. The extraordinary number of Mycenaean vases, many of them large kraters decorated in the pictorial style, which have been found in the tombs of rich Cypriots provide corroborating evidence. Recent research suggests that Cypriots may have been involved in the diffusion of this pottery not only to Cyprus but also to the rest of the Levant, mainly the cosmopolitan town of Ugarit. The evidence is provided by the engraved painted signs of the Cypro-Minoan script found on many of the Mycenaean vases which have been found in the eastern Mediterranean. Whether some of the Mycenaean pottery was produced during the 13th century BC in regional centres like Miletus and Cyprus, by immigrant potters using clay from the Peloponnese, is a matter which I will discuss elsewhere.

A careful study of the Cypriote items found not only in shipwrecks but also on land, in the Aegean and the central Mediterranean during the 14th and 13th centuries BC may be instructive and may reveal an interesting pattern. The oxhide ingots are, of course, the primary commodity of the trade. They are also the main commodity in the exchanges between the King of Alasia and the Pharaoh of Egypt during the first half of the 14th century BC. We know very little about luxury goods and about organic goods, like spices, perfumed oils, wool, textiles and other commodities which may have formed part of these exchanges.

The Cypriot potters were skilled manufacturers of storage jars (pithoi), not only for storage in official residences but also for transport in the course of trade. This skill survived down to the first part of the 20th century in the same way as it did on the island of Crete. Enkomi and Hala Sultan Tekke provide some evidence for such pithoi during the 14th century BC, but their fairly recent discovery in large numbers and in restorable condition in the spacious storerooms of the 'administrative' Building X at Kalavassos is quite instructive. These pithoi, of a more or less standard type, with or without handles, are ovoid in shape, with a high, fairly narrow neck. According to information kindly supplied by Alison South, at Kalavassos the height of some of the larger pithoi is 1.2-1.5 m., while the largest are 1.5-2.0 m. in height, with walls 2.5-4.5 cm. thick on the upper body and up to 6 cm. thick on the lower body. Rim diameters are up to 68 cm. They are well fired and their clay is usually mixed with grit to make the fabric more durable. Although most of the pithoi in the Pithos Hall in Building X have not been restored, they must have been of fairly standardized size, probably about 1.65m. high. Some pithoi were sunk up to their necks in the ground for reasons which are not yet well defined. These sunken vessels include some of the largest with a height of 1.8 m.-1.95 m. The capacity of one restored pithos with a height of 1.65 m. has been calculated by a computer programme at 561 litres (when filled to just below the rim). Their weights are as yet unknown, but 200 kg would not be unreasonable for the larger vessels. Gas chromatography analyses have shown that some of the Ayios Dhimitrios vessels contained olive oil; the sunken vessels may have contained water.

But what is of greater interest here is the use of pithoi in maritime trade as containers for goods other than liquids. The large pithoi of the shipwreck of Uluburun are eloquent examples of this practice.

Some of them contained fine Cypriote pottery, to which I shall refer later. Considering conditions of shipping in the Late Bronze Age it is unlikely that such pithoi were used for the conveyance of liquids. But other perishable goods, including pottery and agricultural goods, could easily be packed inside them for safe transport.

I am grateful to my friend Cemal Pulak for the following information regarding the Uluburun pithoi. There are six complete or relatively complete pithoi at Uluburun, with fragments of probably three more, bringing the total number of pithoi on the wreck to nine. There are three sizes, of which the largest contained 18 pieces of Cypriot ceramics. This jar is fragmentary, and the pieces have yet to be assembled to provide accurate dimensions, but it is about 1.4 m. in height. There is also a single example of a small pithos of about 1 m. in height. The remaining four pithoi are of the same size (1.3 m. high). The size of the three fragmentary jars is not absolutely certain, but they appear to be of medium size, 1.3 m. high. In addition to the nine pithoi, there is a two-handled, wide-mouthed pithos which is the smallest of the vessels. This jar also contained several Cypriot ceramics when excavated.

Unfortunately all of the Uluburun pithoi are still being desalinated in order to remove the seasalts that have permeated their porous fabric. Consequently they have yet to be dried, cleaned of encrustation, assembled and eventually weighed. Their weight cannot be guessed accurately at present, but it takes two people to lift them and they may be in excess of 100 kg. each.

Pithoi of the size which have been found in the Uluburun and Iria shipwrecks, as well as on land in Sardinia, Kommos (Crete) and recently at Agrigento (Sicily), could not possibly have been exported from Cyprus for their own sake; they must have contained other goods. Such pithoi, of a standardized shape and decoration, were manufactured in Cyprus from the 14th century BC down to the beginning of the 12th century BC, as the excavations at Maa-Palaeokastro and Alassa have shown. It is interesting to note that the pithos fragment from Sardinia corresponds chemically to the pithoi of Kalavassos-Ayios Dhimitrios, which may have been a centre of production of such pithoi.

The popularity of Cypriote fine ware, mainly White Slip and Base-ring, is already well known. Such pottery is mainly found on Rhodes and Crete, but it also occurs in the rest of the Aegean. In a

communication which I will present next month during the White Slip Conference which will be held in Nicosia, I propose to suggest that the White Slip ware bowls, which were popular in Cyprus, the Aegean and the rest of the eastern Mediterranean for more than 400 years, owe their popularity to their particular qualities as table ware for liquids or hot food, qualities which derive from their hard clay and impermeable slip. Similar qualities may be attributed to Base-ring ware bowls. The Base-ring ware juglets, known as bilbils, which are found in Egypt and the Levant from the 16th century BC onwards and in the Aegean from the 14th century BC, may have been used for the transport of perfumed oils or opium, a suggestion which was made in the 1960s by Robert Merrillees and which has gained wide support. These fabrics were also exported to the central Mediterranean. On the island of Thapsos, on the east coast of Sicily, where Cypriots and perhaps Mycenaeans probably established an emporium as early as the 14th century BC, Base-ring ware juglets were not only imported from Cyprus but they were also imitated in local clay, probably to contain a liquid comparable to that contained in the genuine Cypriote juglets. The same phenomenon appears seven centuries later on the island of Kos in the Dodecanese, where the Phoenicians, who had probably established a factory for the production of perfumes in the Dodecanese, produced locally made juglets of a Cypriot type with local clay, to bottle perfume.

Another peculiar type of Cypriote vessel, which often appears together with the Base-ring and White Slip pottery in the Levant, further west in the Aegean, for instance at Kommos, and in the central Mediterranean (as at Thapsos), is the White Shaved ware juglet, which is also found on the Uluburun shipwreck. Neither its fabric, which is quite poor and porous, nor its appearance, which is rather crude, assist in understanding the popularity of this Cypriote juglet during the 14th and 13th centuries BC at a number of sites in the Mediterranean region.

The wall-bracket is a particularly Cypriote product of the Late Bronze Age. There are some bronze examples, but the vast majority are in Plain White ware. Their form is standard and they may have been used as lamp-holders or supports for incense-burners. They are usually found in sanctuaries in Cyprus. On the mainland they are found in the Levant, but also in the Uluburun shipwreck and at Tiryns. I have no doubt that an expert eye would recognize

fragments at other sites in the Aegean and elsewhere. The reason for their export outside Cyprus is unknown.

I have already referred to the pithoi of the Uluburun and Iria shipwrecks and the possibility that they may have been used as containers. Perhaps I may add a word about the large Plain White ware jug of the Iria shipwreck. Its size is larger than usual. It is heavy, rather crude, and it may well have been used to hold fresh water. It could remain stable on a ship due to its weight and large flat base and its porous walls would keep the water cool.

Finally I should mention stone anchors. There is a Late Bronze Age Cypriote type of which a fairly large number of examples has been found in Cyprus, particularly near coastal towns like Kition and Hala Sultan Tekke. Such anchors have also been found on the Uluburun ship, at Kommos, at Iria and as far west as Sardinia. Were they actually exported for their own sake or were they used as ballast on ships? Whatever the case, it is interesting that they appear at places with which Cyprus had trade connections.

Brisk trade relations between Cyprus and the West continued right down to the very end of the 13th century BC, even the very beginning of the 12th century BC At Pyla-Kokkinokremos was found one of the latest Mycenaean IIIB bell kraters decorated with chariot groups, the chariot being of the rail type which replaced the heavy Mycenaean chariot box. At Maa-Palaeokastro there is an example of imported Handmade Burnished ware, and at Enkomi a Late Helladic IIIB2 skyphos and also bronze greaves and bronze Naue II type swords. The clouds of turmoil and instability were starting to gather over Cyprus. At Kalavassos-Ayios Dhimitrios, in the large palatial Building X, the Mycenaean IIIB pottery used just before its destruction and abandonment is mixed with local imitations. Shipping no doubt continued in the Mediterranean, but the new type of small swift ships, usually associated with the "Sea Peoples", did not have much space for commercial goods. They devoted their space to carrying people, refugees who fled with only some of their valuables. The movement of refugees from the Aegean to the eastern Mediterranean may have started at the very end of the 13th century BC, if the dating of Pyla-Kokkinokremos and the destruction and abandonment of Building X at Kalavassos-Ayios Dhimitrios to ca. 1200 BC is correct. But the bulk of the refugees reached the coasts of Cyprus slightly later, at the beginning of the

12th century BC. At the same time they also reached the Levantine coast. By the early 12th century BC the brisk trade between Cyprus and the Aegean and the central Mediterranean must have come to an end, to be resumed, no doubt, after less turbulent conditions were established in the region. We should, therefore, consider the Iria ship, with its Cypriote and Cretan cargo, as one of the last which sailed to the Argolic Gulf and which, on her way back, met an untimely fate. The date of the cargo, as has been established from the study of the ceramic material, agrees perfectly with the events and the atmosphere of the years around 1200 BC.

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Fig. 1. *Pithos (height 1.62 m) from Building X at Kalavasos-Ayios Dhimitrios (photo courtesy of Alison South).*

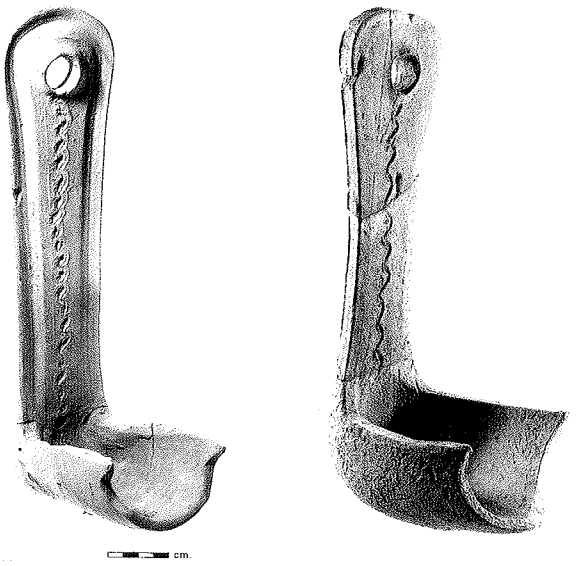

Fig. 3. *Wall brackets from Kition (left) and Pyla-Kokkinokremos (right) (photo courtesy of the Cyprus Museum, Nicosia).*

Fig. 2. *White Shaved juglets from Enkomi, Tomb 2 (photo courtesy of the Cyprus Museum, Nicosia).*

The Cypriote Pottery From the Iria Shipwreck

by Paul Åström

Cypriote pottery has been found in a wide area from Umm el-Marra (East of Aleppo) (Curvers & Schwartz 1997: 220, 223. Fig. 20: 5-8) and Mubaqat (East of the Euphrates) (Orthmann & Kóhne 1974: 93, Fig. 39) in the East to Antigori in Sardinia in the West (Jones & Day 1987; Ceruti et al. 1987,17-19; Vagnetti 1992, 633-634; Åström 1991, 13; Stos Gale & Gale 1992, 322). The hand-made White Slip and Base-ring vases were popular exports in the eastern Mediterranean. Domestic plain pots were less attractive for exports. We find, however, plain Cypriote jugs on the shipwreck from Cape Gelidonya, where they were probably used as kitchen ware by the crew (Bass 1967, 123, Fig. 132: 14-16).

Cypriote plain ware was also present on the shipwreck from Iria, probably used in the daily household. A large jug with a solid, stable, flat base and thick walls, numbered A 20, was particularly suitable for a voyage on the sea and was perhaps made precisely to be used on board a ship. A base of a similar jug but smaller, A 9, has also been found. The upper part of another jug, A 97, is also preserved. The ship carried also a number of Cypriote pithoi and a stone anchor, possibly of Cypriote origin.

The Cypriote pottery on board has been dated to Late Cypriote IIC/Late Cypriote IIIA1, thus around 1200/1190 BC. It seems difficult to narrow down the absolute chronology more precisely than that by pottery alone, but let us try at least to arrive at a relative chronology.

When I wrote this communication I had at my disposal the published articles about the shipwreck (Pennas 1991; Lolos 1995; Lolos et al. 1995). Dr. Lolos had also kindly sent me a drawing of the upper part of a juglet with trefoil mouth. Dr. Lolos and Dr. Vichos had kindly shown me the finds some years ago. I cannot find an exact parallel for the fragmentary juglet in Cyprus, where however the general type is known (cf. Åström 1972, 245-246). There are other vessels which may be Cypriote which are unpublished. I can-

not find any exact parallels for the wide bowls or bathtubs, although similar vessels with different profiles are known from Cyprus (Maier & Karageorghis 1984, Fig.78; Karageorghis in Lolos 1995), so I shall concentrate on the date of the Cypriote pithoi and the flat-based jug from the shipwreck.

The borderline between Late Cypriote IIC and IIIA1 is in some ways floating, but guiding lines begin to crystallize. Let us first look at Late Cypriote IIC parallels for the Iria finds.

The finds from excavations at Kalavasos, Ayios Dhimitrios, directed by Ian A. Todd and Alison K. South, give us a picture of the material culture characterizing LCIIC and its end. Earlier finds have also been found at that site, but they are not relevant in this case. The site was apparently abandoned at the end of the period, so it provides an important terminus ante quem. Material from the site is not later than Late Cypriote IIC and antedates the catastrophes which befell Cyprus at the transition from Late Cypriote IIC to IIIA1.

It is only in the last decades that a sufficient number of Cypriote pithoi have been found in well-dated contexts to enable a thorough typological study to be made. Priscilla Keswani has made a beginning by classifying the pithoi from Kalavasos according to size. A complete pithos which has been published is not a close parallel for the Iria pithoi, but a similar neck profile is present among the fragments (Keswani 1989, Fig. 17:24). A comparable jug like the Iria one is also present among the finds from Kalavasos and thus dates from Late Cypriote IIC (Keswani 1989, 18, Fig. 19:6). Other jugs and wide bowls from this site resembling the Iria vessels may also be pointed out (Keswani 1989, Fig. 19 and 20).

The finds from the first period of the sanctuary at Ayia Irini are probably all Late Cypriote IIC (Åström & Åström 1972, 694-695) comprising e.g. Base-ring II Ware and a Mycenaean IIIB kylix. Several pithoi were found there. One of them has been restored and it is of the same slender shape as one of the Iria pithoi. The sanctuary also contained a Plain jug of a type similar to the Iria jug with a flat base.

The finds from Karageorghis' excavations at Pyla, Kokinnokremos, have been attributed to the end of Late Cypriote IIC, when the first Mycenaean IIIC1 sign appears. I am now inclined to agree with

that opinion (earlier view in Åström 1983, 13). There are good parallels for the flat-based jug and the pithoi at Pyla, Kokinnokremos (Karageorghis & Demas 1984, PL. XX and XXII, XXXVIII and XLI).

The lowest burial layer of Enkomi Tomb 6 contained a number of similar jugs (Gjerstad et al. 1934, 494-495, Nos. 11 and 69, Pl. LXXIX:2, second row; Åström 1972, 247, Type VIIID1a1-2). The layer was sealed at the very end of Late Cypriote IIC. It also contained one of the few exported Mycenaean IIIB2 deep bowls of Type B with a broad band (Gjerstad et al. 1934, Pl. LXXIX:2, row 6: 6).

A comparable jug was also found in Dikaios' Tomb 11 at Enkomi. This tomb was closed before Late Cypriote III (Dikaios 1969, 395, Pl. 213:19/2).

The pithoi and Plain jugs from the Iria shipwreck may also be compared with finds from Late Cypriote IIC to IIIA1 contexts.

Floor II in the excavations at Maa, Palaeokastro, is attributed to Late Cypriote II but continues into Late Cypriote IIIA1. There are parallels for the pithos and for the flat-based jug from Floor II at Maa (particularly Karageorghis & Demas 1988, Pls. CLXXXIV:462, CXCV:615, CXCVI:432, 377).

Another site is Myrtou-Pigadhes, where jugs and pithoi similar to the Iria ones occur in strata V-VII, from Late Cypriote IIC to IIIA (Catling 1957, 52, 56-59, Forms 306-307, 361; Åström 1972, 689, 693).

A jar and a jug from Apliki are similar to the Iria specimens (du Plat Taylor 1952, 143, Fig. 8:1 and 4). They were found in a house which was constructed in Late Cypriote IIC and destroyed at the beginning of Late Cypriote IIIA.

At Hala Sultan Tekke, a Late Bronze Age harbour town on Cyprus, similar pithoi were buried in the ground to function as ancient refrigerators and there are good parallels for the plain jug, particularly from the contents of well F 7001 (Åström 1998, Figs. 11, 128, 129, 133, 135, 137 and 138). The jugs had been dropped near or at the bottom of the well. It is possible that they date from Late Cypriote IIC but the well was in use into Late Cypriote IIIA1.

However, if the types occur already in Late Cypriote IIC, we may also reckon with some time for the actual use of the pots after they were made, that is with survivals in Late Cypriote IIIA1.

A corpus of Late Bronze Age pithoi found on Cyprus comprising about a hundred sites was given in *The Swedish Cyprus Expedition* vol. IV:1C (1972, 259-264). The sites which I have already mentioned should be added to the list as well as new finds from e.g. Athienou (Dothan & Ben-Tor 1983, 113-115, Fig. 52, Pl. 35), Maroni (Cadogan 1983), Toumba tou Skourou (Vermeule & Wolsky 1990) and Paphos (Maier & Karageorghis 1984, 95, Fig. 79).

Cypriote pithoi have been found abroad at Minet el-Beida, Ras Shamra (Schaeffer 1949, Fig. 86:22, 23, 27, Pl. XXXI:2), Kommos (Watrous 1992, 157,158, Fig.70, Pl. 52), Agrigento (Karageorghis 1993, 584), Antigori (see above) and on the Kaş shipwreck (Bass 1987, 710; Bass et al. 1989, Fig.2), where some of them contained Cypriote pots. Generally, the pithoi contained oil, water, seeds etc. and were used as containers. They may have been exported for their own sake or as containers which were later on recycled for use as storage jars. I do not know if the pithoi from Iria were empty or if analyses could give us an idea of their contents. Cypriote pithoi were made at Toumba tou Skourou, where masses of pithoi were found (Vermeule & Wolsky 199, 378-381), and analyses of the clays have also shown that they were made in the Larnaca and the Limassol Area (Jones & Day 1987; Jones & Vagnetti 1991, 134; Bryan et al. 1997).

Summarizing, I consider the Cypriote pottery from the Iria shipwreck (Fig.1) most likely to have been made in Late Cypriote IIC. This does not exclude the possibility that the pithoi and jugs were still in use after that period. The absence both of Plain White Wheel-made II Ware and Bucchero Ware provides an argument against a Late Cypriote IIIA date, although fine Bucchero occurs earlier, eg. on the Kaş shipwreck. That there were contacts between the Argolid and Cyprus is proved by the fact that Mycenaean IIIB2 deep bowls have been found at Enkomi in Tomb 6 as already mentioned and at Hala Sultan Tekke (Åström 1998, 84, Figs. 150 and 152).

Did the ship sail outside the coast of the Argolid before, during or after the catastrophes at the end of Mycenaean IIIB2? Can we answer that question? Is dating based on pottery sensitive enough

to decide? In view of the circumstance that several sites in this area - Tiryns, Midea, probably also Mycenae, Iria and the island of Dokos - were struck by seismic activities at that time, one might hypothesize that the ship capsized and was driven to the shore by waves caused by a violent earthquake. Waves caused by earthquakes tend to be very high near the beaches. The writer was on board a ship outside Paphos on 10th September 1953, when an earthquake and subsequent tremors caused damage to the buildings on land and the huge ship was lifted up by the waves at sea. I end with a question: was the earthquake in the Argolid at the end of Mycenaean IIIB2 the cause of the fatal destiny of the ship that sank near the coast of Iria? Did the pottery fall out from the ship, if it was turned upside down? Did it float away somewhere else, since there are no traces of it in the area of the finds?

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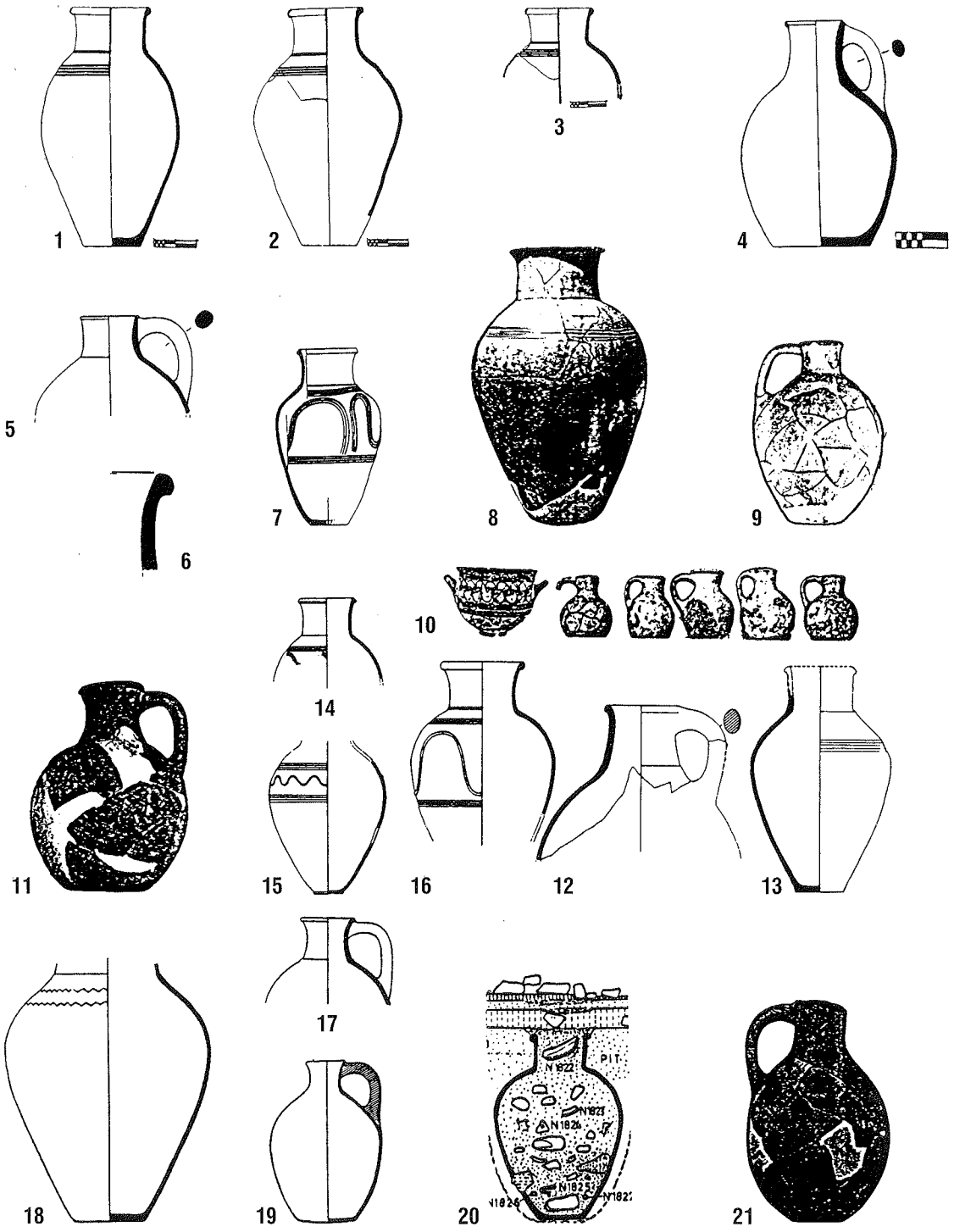

***Fig. 1. 1-4**: Iria; **5-6**: Kalavasos,* Ayios Dhimitrios*; **7**: Ayia Irini; **8-9**: Pyla,* Kokkinokremos*; **10**: Enkomi Swedish Tomb 6; **11**: Enkomi Cypriote Tomb 11; **12-13**: Maa,* Palaeokastro*; **14-17**: Myrtou,* Pigadhes*; **18-19**: Apliki; **20-21**: Hala Sultan Tekke.*

Cretan External Relations During Late Minoan IIIA2-B (*ca.* 1370 - 1200 BC): A View From the Mesara

by Jeremy B. Rutter

The great destruction of the palace at Knossos that occurred roughly halfway through the first half of the fourteenth century BC appears to mark a dramatic turning point in the history of the Bronze Age Aegean, one which Bennet and Hallager have aptly recognized as separating a "Mono-Palatial" from a "Final Palatial" phase on Crete.[1] This destruction marks the end of a period some two to three generations long - the Late Minoan II and IIIA1 ceramic phases - during which Knossian supremacy in the center and west of the island was absolute.[2] This Knossian dominance is most clearly visible in the wealth of the graves of a Mycenaeanizing population element resident at Knossos, a group that is conventionally considered to have been principally responsible for Knossos' preeminent position on the island. But Knossos' leading role is equally clear from the standardization of LM IIIA1 ceramics following Knossian models, and also from the simple fact that no complexes of monumental settlement architecture replacing or rivalling the court-centered buildings of the Neopalatial era that we ordinarily refer to as "palaces" existed anywhere on the island except at Knossos itself.[3]

All of this changed abruptly in the immediate aftermath of Knossos' destruction by fire early in the LM IIIA2 ceramic phase.[4] The richly furnished tombs at Knossos known collectively as the "Warrior Graves" (or, somewhat more accurately, "Burials with Bronzes", inasmuch as they include numerous female burials[5]) cease to be used, and equally rich burials at nearby sites such as Katsambas on the coast to the north and Archanes just to the south likewise come to an abrupt halt.[6] Regional distinctions in ceramic style are far more characteristic of the LM IIIA2 period than of the preceding LM IIIA1 phase and these become progressively more pronounced with time.[7] And major building programs involving large-scale and often architecturally innovative structures are launched at sites such as Tylissos, Ayia Triadha, and Kommos.[8] It is the external contacts

of this later phase, which I will follow Hallager in terming "Final Palatial", that I should like to explore in summary fashion in what follows.

In spatial terms, I shall focus on the western Mesara, and in particular on the sites of Kommos and Ayia Triadha, for two reasons: first, this is simply the area of Crete that I know best, thanks to eight years of work on the Neoapalatial, Monopalatial, and Final Palatial pottery from Kommos and to the hospitality of my Italian colleagues working at Ayia Triadha;[9] and secondly, the numerous recent surveys of Aegean external contacts during this period[10] have made abundantly clear that the site of Kommos has produced far more evidence for interregional contacts during the Final Palatial era than has any other single site on land in the Aegean, whether these be great palatial centers such as Mycenae, Thebes, and Knossos or, like Kommos, merely ports of entry such as Palaikastro, Poros/Katsambas, Mallia, or Asine.[11] The only sites in the Aegean that, on present evidence, can begin to rival Kommos in terms of the number and range of imports from outside this region's boundaries are Tiryns on the Greek Mainland and Chania on Crete, at both of which the functions of palatial center and port are combined.[12]

In striking contrast, Kommos was seemingly not a political center in the Final Palatial era, but merely a harbor town. It served the nearby center of Ayia Triadha, the site not merely of two major complexes of settlement architecture constructed during this period but also of the surely royal tomb that contained the famous Ayia Triadha sarcophagus.[13] During the period ca. 1370 - 1250/1225 BC, between the establishment of an independent polity (in all likelihood, a kingdom[14]) in the western Mesara with its capital at Ayia Triadha and its principal port at Kommos on the one hand and the virtual abandonment of both sites midway through the LM IIIB ceramic phase on the other, these two sites, along with the other preeminent site in the region, Phaistos, provide an invaluable, and as of this writing unique, archaeological laboratory for the study of how materials imported from outside the Aegean were dispersed after their arrival at a Minoan port of entry.[15]

So what sorts of extra-Aegean imports show up at Kommos during this period? Among the most important economically, but as a rule very difficult to verify through excavations of major sites on land, is metal, especially copper.[16] Six fragments of copper ingots have been

found at Kommos, only one of which certainly dates from the Final Palatial era but all of which could and probably do.[17] All were sampled for analysis and have been shown to be consistent with production from Cypriot ores.[18]

Of much lesser economic importance to the receiving society but of perhaps equal value to the archaeologist are two three-holed anchors of Cypro-Levantine type found re-used as bases for posts in a LM IIIA2 context south of the original two galleries of the ship-storage facility christened Building P.[19] Not only is the type of anchor non-Aegean, but analysis of the foraminifera embedded in the limestone of which the anchors are made indicates that the stone is most likely to come from Cyprus or coastal Syria. Aside from an example without provenience on display in the Mykonos Museum and a much smaller example produced from a different stone (sandstone) that is associated with the Iria wreck,[20] these Kommian anchors are the only specimens thus far known from the Aegean of a type that is extremely popular in the Late Bronze Age Levant and Cyprus at sites such as Ugarit, Athlit, Kition, Hala Sultan Tekke, and Maroni Tsarroukas.[21] Their use at Kommos as bases for a makeshift colonnade is striking, inasmuch as anchors of this sort are often found re-used as building material both in Syria and on Cyprus.[22] They imply, although certainly do not prove, the presence of either Cypriot or Syrian ships at Kommos in the 14th century BC Their use as architectural members may conceivably even reflect Levantine collaboration in the construction of some of the harbor facilities there.[23]

Kommos has not produced any of the Mitannian "Common Style" seals in faïence or frit, North Syrian or Cypriot faïence vessels, Old as well as New Kingdom Egyptian stone vases, or North Syrian and Egyptian ivories that have been recovered from LM III contexts at both coastal (Nea Alikarnassos, Amnisos, Poros/Katsamba, Chania) and inland (Armenoi, Ayia Triadha, Kalyvia, Knossos) sites on Crete, and only one possible fragment of an Egyptian 18th Dynasty glass vessel has so far been recovered at the site.[24] But this is hardly surprising, since the vast majority of such finds come from tombs and the LM III cemetery at Kommos has yet to be located.[25] What is significant about these categories of foreign imports is that they show clearly how commonly exotic objects from abroad were forwarded inland from their points of entry at the coast and how frequently such items were deposited as grave goods. By contrast, the

large quantities of imported ceramics so far identified at Kommos do not appear to have represented a class of object that was valued enough to be transported inland, much less deposited in tombs. The handsomely decorated tablewares from Cyprus found in substantial numbers at Kommos (Table 1) are not attested at either Ayia Triadha or Phaistos, nor are the numerous Cypriot pithoi in which such fragile tablewares were probably shipped.[26] This pattern may be true in other regions of Crete as well, though the numbers of examples so far known are small. For example, White Slip II milk-bowls have been found in LM III contexts at Poros/Katsambas and Chania, but have yet to be published from settlements further inland.[27] No imported Cypriot tablewares have to my knowledge been reported from LM III tombs. How different this situation is from the dispersal of Mycenaean and Minoan tablewares on Cyprus, where huge quantities of such imports are transported inland and deposited in large numbers in tombs.[28] Nor have undecorated Cypriot utilitarian vessels in the form of fragments of ordinary Plain White jugs and kraters been identified at any Minoan site other than Kommos.[29]

Fragments of over fifty Canaanite (Table 2) and almost three dozen Egyptian (Table 3) jars have been found at Kommos, but once again not one fragment of such a vessel has been discovered at either Ayia Triadha or Phaistos.[30] As in the case of the Cypriot tablewares, these Levantine vessels used for the transport of liquid and other produce in bulk[31] turn up at Minoan coastal emporia such as Chania and Poros/Katsambas, but are not dispersed from there to inland centers.[32] How different the situation is on the Greek Mainland, where Canaanite jars are found at sites on the interior (e.g. Athens, Menidi, Tsoungiza) from the LH IIB phase onward and where vessels of this type are much more commonly deposited in tombs, presumably as prestige objects.[33] The chronological distribution of these Near Eastern jars at Kommos is a bit surprising. The earliest round-bodied jars of Egyptian type may appear as early as the beginning of the LM IB period, and are certainly common from the LM II period onwards. The more angular Canaanite jars seemingly made their debut in the Mesara no earlier than the LM IIIA1 period, although examples of Neopalatial date are known from Akrotiri on Thera, as well as from a chamber tomb at Poros, the palace at Kato Zakro, and probably also the settlement on the islet of Pseira.[34] The apparent opening up of the Mesara initially to Egyptian rather than

Levantine imports in bulk is presumably simply a consequence of that region's geographic position on Crete and the location of its major port in the middle of the south coast. But this circumstance does suggest that Kommos' principal trading partners may have been somewhat different from those who were carrying goods to the ports of eastern and northeastern Crete.

Aside from these two varieties, a third important class of transport vessel commonly found at Kommos, particularly in deposits of the Mono-Palatial era but also in the Final Palatial period, consists of reddish-brown burnished wheelmade jars (Table 4). Although we as yet have no idea where in the Mediterranean such vases may be at home between the later 15th and the 13th centuries BC, we have been able to use the fragments from no less than sixteen different examples to produce reconstructions of what we think the largest and smallest examples probably looked like (Figs. 1-2).[35] The absence to date of any handle fragments that can be associated with these jars suggests to us that these vases may simply not have had handles.

In contrast to the numerous terracotta vessels from Cyprus, Syria-Palestine, and Egypt, almost no Anatolian ceramic imports have been identified at Kommos. Apart from one bowl and one flask from Neopalatial contexts, pottery fragments suspected of being Anatolian consist of just two pieces of very hard-fired, slipped-and-burnished bowls from 13th century BC contexts (Table 4).[36] Though few in number, these pieces are nevertheless of considerable interest. First of all, they are the only presently recognized ceramic imports from Anatolia to have been found anywhere in the Aegean west of the Dodecanese and the other eastern Aegean islands lying immediately off the west coast of modern Turkey.[37] And secondly, in their physical appearance they strongly resemble Hittite pottery - that is, they belong not to the gray and tan wares characteristic of the western Anatolian coastal regions during the Late Bronze Age, but rather to the red-slipped wares typical of the Anatolian interior.[38]

Not all of the imports to Kommos from outside the Aegean come from the east. As Watrous has made clear, imports from Italy fall into two typologically and chronologically discrete groups: first, a series of thin-walled, black-surfaced, and very highly burnished open vessels which have distinctively shaped boss-like bases

["omphalos bases"]; and second, a somewhat broader range of vessel types comprising two kinds of jars (collar-necked and swollen-lipped) and two kinds of bowls (lipless and sloping-lipped) that Watrous is surely correct in interpreting as lids for the jars (Table 5).[39] The first group dates from the end of the 15th century, lacks any particularly close parallels, and consequently cannot yet be assigned to any more narrowly defined source than "Italy."[40] The omphalos-based cups or bowls of this group are much too early in date to merit further discussion here. But the second group of jars and bowls appears to date exclusively from LM IIIB. Indeed, the majority of examples come, as noted by Watrous, from contexts that represent the final large-scale occupation of the site during the Bronze Age.[41] Watrous justifiably saw in these combinations of jars and lids another approach to long-distance transport using ceramic containers and he made a very solid case for their identification as Sardinian.[42] But his suggestion that ceramic vessels such as these were used to ship scrap metal seems inherently improbable, since it is unclear why lids would have been desirable for this purpose, and in any case organic containers like baskets would surely have been better suited for the long-distance transport of irregularly shaped and often heavy pieces of metal.[43] It is more likely that these lidded Sardinian jars, like their functional analogues from Egypt and Syria-Palestine,[44] not to mention the reddish-brown burnished jars I mentioned earlier whose home is still unknown to us, contained organic produce of some kind.

Two last categories of non-Minoan ceramic imports into Kommos are worth mentioning briefly, not so much for their exotic nature as for the interesting comparisons and contrasts they offer with the various groups of foreign containers already surveyed. The first consists of Mycenaean pottery, all of which takes the form of finely decorated tablewares that dribbled into the site in modest amounts and without any significant breaks from the final phase of the LM IA period onwards (Table 6). The later 14th and 13th century BC Mycenaean imports consist of both open and closed shapes, including a small fragment of an amphoroid krater decorated with a chariot scene, a very rare find on Crete.[45] There is no evidence from Kommos for the importing during any stage of the Late Bronze Age of either more utilitarian unpainted wares or cooking pottery from the Mycenaean Mainland. From the contemporary Cyclades, on the other hand, come several dark-surfaced, highly micaceous pithoi

(Table 7), seemingly all datable to the 13th century.[46] Large closed vases with micaceous fabrics that may come from the Cyclades, whether linear or patterned, appear to be a phenomenon of the Mono-Palatial era at Kommos, as are at least two Cycladic White jars (Table 7). Occasional heavily micaceous cooking vessels that likewise may originate in the islands turn up in Kommian contexts throughout the Late Bronze Age (Table 7).[47]

As thus far revealed by excavation, the Bronze Age town of Kommos in the Final Palatial period may be neatly subdivided into two functionally distinct zones.[48] The northern and higher areas of the site, known as the Hilltop and the Central Hillside, are residential districts that were occupied by what may reasonably be described as "ordinary" rather than "affluent" inhabitants. The southernmost and lowest part of the site, to the south of a handsomely paved east-west road that may have led from the harbor town all the way to the capital of Ayia Triadha, was home to two monumental structures that represent rebuildings of two large segments of the underlying court-centered complex of Neopalatial date known as Building T. Over T's east wing were built the six great galleries of the ship-storage facility known as Building P; and over parts of T's north and west wings were constructed the various rooms of Building N, possibly the administrative headquarters from which Kommos' port facilities were supervised.[49] It is therefore possible to break down the imports into Final Palatial Kommos according to whether they come from private domestic contexts on the hill as opposed to findspots in the monumental, presumably either royal or public buildings south of the road. Moreover, within the royal or public sector one can distinguish between an administrative but nevertheless residential structure (Building N), the shipsheds (Building P), and the very large court open to the south and west which lay in the angle between them.[50]

Space considerations preclude a detailed review of the evidence here, but a few quick implications of the data are worth noting.[51] First, half of the known copper ingot fragments come from the Central Hillside, half from Building N. That is, access to this imported metal does not appear to have been restricted, and metalworking was an activity that could take place in a residential context and was not confined to specialized industrial establishments.[52] Second, imported tablewares in Final Palatial contexts, whether Cypriot or Mycenaean, and imported pithoi, whether Cypriot or Cycladic, are

quite evenly distributed from one end of the site to the other (Tables 1, 6-7). Egyptian, Canaanite, and reddish-brown burnished jars, on the other hand, are distinctly more common in the southern sector, closer to where they would have been offloaded (Tables 2-4).[53] They are also far more common in strata of the Mono-Palatial period than in Final Palatial contexts, thus implying that the importation of bulk organic produce in such vessels was brisker when Knossos ruled unchallenged over most of the island than in the subsequent poly-palatial era.[54] Third, the Sardinian dark-burnished jars and lids were evidently introduced only well after the Final Palatial period had begun.[55] Unlike the other transport vessels which are richly, albeit very fragmentarily, represented in and around the shipsheds, the Sardinian jars occur only in residential contexts, whether on the Hilltop and Central Hillside or in Building N south of the road (Table 5).[56] In other words, this western form of imported transport vessel differs from the eastern varieties both in terms of when it was popular and where within the settlement it was distributed. Finally, although their numbers are tiny, the few Anatolian imports resemble the Sardinian jars in being restricted to Final Palatial and ordinary residential contexts (Table 4).

Given the amount of foreign material pouring into Kommos in the Mono-Palatial and Final Palatial eras, one may reasonably inquire as to what was being shipped out of the site. There is unfortunately not much relevant evidence from Kommos for the Mono-Palatial period of LM II-IIIA2 Early, although some Linear B tablets from Knossos make clear that very impressive quantities of grain were produced and stored in the Mesara at this time, possibly to be exported.[57] During the Final Palatial period of LM IIIA2 through mid-LM IIIB, a novel form of transport container, known as the short-necked amphora (or SNA), was produced in huge quantities either at or in the immediate vicinity of Kommos (Figs. 3-4). I have argued elsewhere that this distinctive shape was purposefully designed to rival the Canaanite jar of Cyprus and the Levant and the transport stirrup jar of north-central and western Crete as a reusable container in the intense interregional commerce of the later 14th and 13th centuries BC in the eastern Mediterranean.[58] Its shape was intended to recall that of the oval-mouthed amphora, which had been the principal transport vessel of the Protopalatial and earlier Neopalatial Mesara. But like much of the monumental architecture of the Final Palatial Mesara, the short-necked ampho-

ra was also designed, at least initially, to be both a morphological and decorative hybrid: just as the monumental buildings of Final Palatial date at Ayia Triadha represent an unprecedented blending of Minoan and Mycenaean elements, so is the short-necked amphora of Kommos a novel combination of the oval-mouthed amphora, the Canaanite jar, and the transport stirrup jar decorated with an octopus or simply with stylized tentacles, Thanks to their wide necks, the Kommian amphoras could have carried either liquids or solids. Oil and wine were probably shipped in most, but the only commodity we can presently be sure that was transported in them is haematite, or red ocher, because this substance has left clear stains on many amphora interiors. These two instances of the creative fusion of once discrete forms of material culture, one from the domain of architecture and one from that of ceramics, speak eloquently across the centuries of how the Mesara reacted to the independence restored to it by the destruction of Knossos ca. 1375 BC.[59]

Who were the principal carriers of tradegoods brought into and shipped out of Kommos in the Final Palatial period? Certainty on this point in the present state of our knowledge is, of course, impossible, but a fairly strong case can, I believe, be made that most of the ships conducting interregional trade in and out of Kommos were Cypriot.[60] Cypriot imports have a longer history in the Kommian material record than do imports from any other region, including the Greek Mainland and perhaps even the Aegean islands: certainly attested as early as Middle Minoan IIB, they may begin even earlier.[61] In addition, Cypriot imports span a wider range of functions (from tablewares to bulk containers to simple utilitarian pottery) and materials (copper ingots and possibly stone anchors as well as ceramic containers). Cypriot traders are likely to have been present in every region beyond the Aegean from which Kommos received imports, from Egypt through the Levant to Cilicia, then through the central Aegean to Sardinia in the far west; they alone could therefore have been responsible for delivering Kommos' unusually wide range of imports to this single location. The Late Bronze Age shipwrecks so far excavated in and immediately adjacent to the Aegean – Iria, Ulu Burun, and Gelidonya – all contained large amounts of cargo originating in Cyprus and could well all have been Cypriot. Finally, essentially no foreign imports except for Mycenaean containers of perfumed oil and Near Eastern luxury items like cylinder seals, carved ivories, and vessels made of exotic

stones, faïence, and glass percolate from Minoan ports of entry into the interior, in dramatic contrast with the situation on contemporary Cyprus. If the traffic in foreign staples and basic manufactured goods had been in the hands of the Minoans, wouldn't more foreign tableware and containers have ended up at sites on the interior of Crete?

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NOTES

1 The groundbreaking work of L. V. Watrous on foreign ceramic imports into Kommos (1985; 1989; 1992, 149-183) has set the stage for all of my own work on this material over the past five years, as a glance at Tables 1-7 will make abundantly clear. Our occasional disagreements over the identifications of individual fragments [e.g. as noted in Tables 1, 5, 6, and 7] do not significantly alter the principal patterns in Kommos' external relations to which Watrous has drawn attention (1992, 173-183).

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Special thanks are due to E. H. Cline for sharing the contents of his paper entitled "The Nature of the Economic Relations of Crete with Egypt and the Near East during the Late Bronze Age" prior to its publication. Since I first saw his paper only after my own had already been presented orally and was almost on the point of being submitted in written form for publication, the two may be viewed as largely independent assessments of the data currently available. The numerous points of agreement are thus all the more striking, while the occasional areas of disagreement indicate clearly enough which problems require additonal data or merit further research.

For recent discussions of the Late Minoan (LM) IIIA2 destruction at Knossos and its impact, see Niemeier 1985; Doxey 1987; Bennet 1987b, esp. 311; Hallager 1988a, esp. 15-17 and table 1; Haskell 1989; Shelmerdine 1992; Haskell 1997a; Popham 1997; Rethemiotakis 1997. In their recent review of the Neopalatial, Final Palatial, and Postpalatial eras on Crete, Rehak and Younger embrace the term "Final Palatial," the equivalent to what Dickinson [1994, 13, fig. 1.2] terms "Third Palace Period." Both of these latter appraoches fail to make the important distinction between LM II-IIIA1 (when Knossos appears to have been the only functioning palatial center on Crete) and the ensuing LM IIIA2 through mid-IIIB phase (during which most scholars are confident that the island was divided into several smaller but seemingly independent political entities with their capitals at sites such

as Ayia Triadha, Chania, and Tylissos [e.g. Hallager 1987; Shelmerdine 1992]). Shelmerdine has argued persuasively that the Knossian destruction marks a major turning point in patterns of settlement throughout the island (1992, 572-577, 585-590). Note that the latest fieldwork and analysis of the finds at Kommos has demonstrated that a major period of building activity at this site during LM IIIA2 (and *not* LM IIIA1) now conforms in date with those observed at Chania, Ayia Triadha, Tylissos, Knossos, and Malia, so that Kommos no longer appears to be as out of step with developments elsewhere, as Shelmerdine thought might be the case (1992, 574, 576-577).

2 Bennet 1985; 1990, 208-211. Eastern Crete appears to have lain outside of Knossos' sphere of interest and control during this period, to judge both from the Linear B texts found at Knossos and from the material culture of the eastern part of the island (Bennet 1987b; MacGillivray 1997a; 1997b). Shelmerdine has nevertheless presented some interesting arguments in favor of identifying a major change in settlement organization at Palaikastro at the time of Knossos' destruction early in LM IIIA2 (1992, 575).

3 Bennet 1987a, 311; Hallager 1988a, 15-16. As J. W. Shaw has kindly reminded me, one should in this context keep in mind that no significant portions of the palace at Knossos were actually constructed in LM III times. That is, the Knossian palace of the later 15th and early 14th centuries BC is a Neopalatial facility that was, in effect, being re-used during this Mono-Palatial era. We are often less well-informed about the nature of this re-use than we are about how the original structure functioned in Neopalatial times. Moreover, no thorough investigation of how the workings of this enormous architectural complex varied from Neopalatial to Mono-Palatial to Final Palatial times has to my knowledge yet been published.

4 The ceramic date for this destruction was presented in detail by Popham almost three decades ago (1970) and has been recently reaffirmed (1997). A contemporary destruction horizon has been reported in Knossos' harbor-town of Poros (Rethemiotakis 1997, 52 and note 102). Cline (1994, 10-11; n.d.) has drawn attention to the significance of this destruction horizon for the history of Crete's external contacts.

5 As has been made abundantly clear by Kilian-Dirlmeier 1985. I am very grateful to L. Preston for stimulating discussion on this as well as other aspects of LM burial customs.

6 For the Warrior Graves as a phenomenon, see the treatments in Pini 1968, esp. 41-46; Popham, Catling, and Catling 1974 [to whom credit is due for the alternative label of "Burials with Bronzes"]; Matthäus 1983; Driessen and MacDonald 1984; Kilian-Dirlmeier 1985; Kallitsaki 1997. A helpful recent review is provided by Löwe (1996, 52-60) who, however, includes all Neopalatial, Mono-Palatial, Final Palatial, and Post-Palatial graves with weapons under the single heading of "Warrior Graves."

7 Kanta 1980, 288-290. For a recent sampling of opinions on the growing regionalism that characterizes Final Palatial as well as Post-Palatial Minoan ceramics, see the papers in Hallager and Hallager 1997.

8 Hayden 1981, 1984, 1987; Shelmerdine 1992, 573-577, 585-587; Shaw and Shaw 1993; La Rosa 1992, 1997; Cucuzza 1997.

9 I should like to acknowledge the great debt I owe to the directors of the Kommos Excavations, Professors Maria and Joseph Shaw, as well as to my collaborator in the study of the prehistoric pottery from the site, Dr. Aleydis Van de Moortel, for past and continuing instruction on virtually all aspects of Minoan culture. It is a pleasure to acknowledge also the easy-going collegiality of the Minoanists working at Ayia Triadha and Phaistos over the past decade. Professors Vincenzo La Rosa and

Fillipo Carinci, and Drs. Nicola Cucuzza, Anna Lucia D'Agata, Pietro Militello, and Orazio Palio have been extremely kind and generous in sharing knowledge not only about their most recent finds but also concerning all aspects of the extremely complex sites at which they work.

10 Lambrou-Philippson 1990; Cline 1994; Knapp and Cherry 1994. An indication of how quickly the basic data base on which we all rely can change is the fact that Yannai 1983, written in the earlier 1980's, makes no mention whatsoever of Kommos.

11 Cline 1994, 276-277 table 70. For the significance of Kommos as a port, see Knapp and Cherry (1994, 138-141) who conclude their review of the site as follows: "Kommos must be recognized as a significant seaport in Bronze Age Mediterranean trade, one that should take its place alongside Ugarit, Enkomi, Marsa Matruh, Termitito, Thapsos, or Nuraghe Antigori. Like those ports, it is suggested here that Kommos enjoyed an independent existence, at least from LM I onwards." Insofar as the Final Palatial period is concerned, it is inconceivable to me that Kommos could have acted independently of nearby Ayia Triadha. I am inclined to see in Ayia Triadha and Kommos a pairing of interior capital and nearby coastal emporion comparable to Ras Shamra and Minet el-Beida in Syria, Pylos and its port in the southwestern Peloponnese, or for that matter Knossos and Poros/Katsamba on Crete's north coast. For Kommos and Tiryns as Aegean "gateway communities" which exhibit distinctly different arrays of Near Eastern imports from those typical of inland centers such as Knossos and Mycenae, see Cline 1994, 87; n.d.

12 See Pålsson Hallager 1983, 1985, 1993 for imports from Chania, Kilian 1988, 122-123 fig. 4, 127 on imports to Tiryns. Cline's recent list of imports by site makes the task of evaluating which sites in the Aegean played leading roles in interregional exchanges far simpler than heretofore (1994, 276-277 table 70).

13 For the sarcophagus itself, the standard work is still Long 1974, to be supplemented by Immerwahr 1990, 100-103, 180-181, Löwe 1996, 23-41, and Rehak and Younger 1998, 155 with notes 441-442. The tomb (Pini 1968, 51, fig. 112; Löwe 1996, 172 Cat. No. 362) was re-exposed in 1997 by V. La Rosa and his team, and its date of construction has now been pinpointed thanks to the discovery of mendable pottery found in a previously unexcavated foundation trench along the structure's east side. I am very grateful to V. La Rosa for guiding me around his excavations at Ayia Triadha during the summer of 1997.

14 For the argument that the states of LM IIIB Crete must have included at least one kingdom because of the use of the word *wa-na-ka-te-ro* on the inscribed stirrup jars, see Hallager 1987, 182-183, 185. Note that an independent LM III kingdom in the western Mesara appears to have been established either at the same time as or very shortly after the great destruction of Knossos by fire early in LM IIIA2.

15 For the issue of how imports were dispersed from ports of entry to their hinterlands, see most recently Manning and De Mita 1997. Other major coastal sites on Crete either lack a nearby excavated center on the interior to which they might have forwarded the foreign goods offloaded at them (e.g. Palaikastro, Gournia, Malia, Chania) or else have been heavily eroded and therefore have preserved only outlying districts to be excavated (the case of Poros-Katsamba: Dimopoulou 1997). For discussion of gateway communities with particular reference to Crete, see Cline 1994, 87.

16 For literature of the past decade on the Late Bronze Age traffic in metal ingots in the eastern Mediterranean, see Muhly, Maddin, and Stech 1988; Stos-Gale 1988; 1989; Knapp 1990; Gale 1991b; Borgna 1995; Budd, Pollard, Scaife, and Thomas 1995; Stos-Gale, Maliotis, Gale, and Annetts 1997. For a fairly recent

review of the literature on provenience analyses of metals, see Knapp and Cherry 1994, 96-121.

17 Blitzer 1995, 500-501 M1-M6, 527-530. The pieces M1, M4, and M5 comes from three LM IIIA2 deposits on the Central Hillside [Watrous 1992, Deposits 43, 47, and 44 respectively]. The remaining three (M2, M3, and M6) were found in advanced LM IIIB contexts in and around the eastern room of Building N [contemporary with Watrous 1992, 76-78, Deposit 77].

18 Muhly, Maddin, and Stech 1988, 291-292. See now Stos-Gale, Maliotis, Gale, and Annetts 1997. For assistance with how the source of the copper represented by the Kommian ingots is most accurately described, I am beholden to A. B. Knapp (cf. 1993, 335, with respect to the source of the ingots found at Cape Gelidonya and Uluburun). Half an ingot found in a LM IIIC to Subminoan context during the excavation of the Piazzale dei Sacelli at Ayia Triada in 1903 is now unfortunately lost (D'Agata n.d.). Its precise metallic composition is therefore uncertain, as, of course, is the date of its arrival at the site where it was found. Despite its late context, it could well have been imported contemporarily with the Kommian fragments during the Final Palatial era. I am very grateful to A. L. D'Agata for drawing my attention to this piece and for allowing me to mention it here in advance of the fuller presentation of it in her forthcoming monograph.

19 Shaw, J. W. 1995. Detailed study during 1998 of the context pottery associated with these anchors has led to a slight lowering of the date initially assigned to them, from LM IIIA1 to LM IIIA2. For other anchors at Kommos, see Shaw and Blitzer 1983. For anchors as indicators of other cultural groups in the Eastern Mediterranean, see Galili, Sharvit, and Artzy 1994 (for which reference I am grateful to A. Van de Moortel).

20 Pennas, Vichos, and Lolos 1996, 15-17, figs. 1, 3a.

21 Shaw, J. W. 1995, 284-286; Manning and De Mita 1997, 128-129, figs. 26-27.

22 Shaw, J. W. 1995, 285-286; Manning and DeMita 1997, 129.

23 The Kommian three-holed anchors could, of course, easily enough have been acquired by Minoan ships in Cypriot or Levantine ports. If is not so much their presence at Kommos as their particular usage as architectural members in Building P that suggests, at least to me, that they should be taken as indicative of some sort of actual Cypro-Levantine presence at the site. If the re-use of foreign anchors for such a purpose is so unexceptional, then why have such anchors not been found at other Aegean harbor sites, expecially those with close Cypriot or Levantine connections (e.g. Chania, Tiryns, Palaikastro, Poros/Katsambas)?

24 For a listing of such items, see the following catalogue entries in Cline 1994, no. 556 [Amnisos]; nos. 168-169 [Armenoi]; nos. 142, 743 [Ayia Triadha]; nos. 260-261, 557, 650 [Kalyvia]; nos. 491, 496-497, 742 [Katsambas]; no. 125 [Chania]; nos. 128, 153, 170, 398, 283-287, 506, 522, 561, 683, 703, 745 [Knossos]; no. 487 [Nea Alikarnassos]; no. 127 [Poros]. A number of the pieces from Knossos and Katsambas listed above come from "Burials with Bronzes" of the Mono-Palatial phase rather than from Final Palatial contexts. See also Kanta 1980, 315-316; Phillips 1991. Compare the corresponding range of items of this sort imported into Late Bronze Age Cyprus recently collected by Jacobsson (1994). The possible vessel fragment of Egyptian glass from Kommos comes from Room 4 in House X (Shaw and Shaw 1993, pl. 27c; Cline 1994, no. 784); I thank J. W. Shaw for reminding me of its existence.

25 Cline (n.d.) has independently made precisely this point.

26 Cypriot tablewares make their initial appearance at Kommos in the last of the three sub-phases of LM IA identified at the site (see Table 1; for the tripartite sub-

division of LM IA at Kommos, see Van de Moortel 1997, 25-28, 235-267) and continue to be imported throughout the remainder of the Neopalatial period as well as during the Mono-Palatial and Final Palatial eras. Prior to LM IA Final, Cypriot imports are thus far attested in some numbers in the form of medium coarse vessels from Protopalatial contexts, but as yet not in contemporary tablewares (Watrous 1985, 7; Van de Moortel, pers. comm.). For the transport of Cypriot tablewares during the 14th century BC in Cypriot pithoi, in much the same fashion that Oriental porcelain was packed in china barrels between the 18th and 20th centuries AD, see the evidence of the Ulu Burun wreck (most recently Pulak 1997, 242-243), which was carrying Base Ring II bowls, White Slip II milkbowls, White-shaved juglets, and Bucchero juglets, and plain trefoil-mouthed jugs, lamps, and wall brackets, in addition to the pithoi, as part of its cargo. Cypriot pithoi that have been found in the central Mediterranean on both Sardinia (at Nuraghe Antigori: Ferrarese Ceruti, Vagnetti, and Lo Schiavo 1987, 17-19, fig. 2.5) and Sicily (at Cannatello: De Miro 1996, 999; Deorsola 1996, 1037, pl. VI, a; D'Agata 1997, 456) may have functioned in the same way; my thanks go to A. L. D'Agata for the references to the Cannatello example.

27 Kanta 1980, 316; Banou 1995, 649-654, fig. 1; Stambolidis and Karetsou 1998, 62-63 nos. 14-15.

28 For some recent discussions of the importing of Aegean tablewares into Cyprus, see South 1995 and Manning and De Mita 1997. For the importation of Mycenaean tablewares to Crete, see Kanta 1980, 314-315; Pålsson Hallager 1993; and the discussion below of Mycenaean imports to Kommos, together with Table 6.

29 On the other hand, no examples of the Cypriot wall brackets abundantly represented on the Ulu Burun wreck (Cline 1994, nos. 797-804) and at Tiryns (*ibid.*, nos. 788-796) nor any Cypriot lamps of the sort found in quantity on the Ulu Burun wreck (Pulak 1997, 243; Cline 1994, nos. 662-677) have been identified at Kommos. A single example of a similar wall bracket was found at Mycenae over seventy years ago (Cline 1994, no. 787).

30 A handful of Egyptian flask fragments have also been found at Kommos (Watrous 1992, 162-163 nos. 1541, 1961, fig. 73, pls. 54-55), the largest single example of which has recently been published by Banou (1995a, 657, fig. 4).

31 For the original contents of such jars, the information derived from the Ulu Burun wreck has been extraordinarily informative. According to the latest report (Pulak 1997, 240-241), the Canaanite jars on this ship contained olives, terebinth resin, orpiment, and glass beads. No doubt they also contained wine (Leonard 1995) and oil, and possibly also grains (Cline 1994, 95-97, 99 table 60). See also Haider 1988; 1989; Mills and White 1989; Knapp 1991; Haldane 1993.

32 For Canaanite jars from LM III contexts on Crete other than at Kommos, see Stambolidis and Karetsou 1998, 57-58 nos. 4 [= Cline 1994, 179 no. 388] and 5 (Chania). For the notion that the predominantly coastal distribution of Canaanite jars in Crete is due to the fact that their contents were decanted or otherwise repackaged at ports of entry such as Kommos prior to being dispersed to the interior, see Cline 1994, 96; n.d. The altogether different pattern of distribution of these jars on the contemporary Greek Mainland (see following note), though striking, does not necessarily invalidate Cline's explanation of their distribution on Crete.

33 Cline 1994, 95-96 and nos. 294-295 [Athens], 296 [Argos], 297 [Asine], 298-301 [Menidi], 302-310 [Mycenae], 311-321 [Tiryns]. 322 [Tsoungiza], 323 [Pylos], and 324 [Thebes]. Cline, following Amiran, initially downplays the value of such jars in and by themselves (1994, 95), but clearly in Mainland Greek contexts they served

as a potent symbol of status, as he himself goes on to point out (ibid., 96). At least two Canaanite jars recently published from Crete were parts of funerary assemblages, one from a Neopalatial tomb at Poros and the other from a LM IIIA tomb at Chania (Stambolidis and Karetsou 1998, 56 no.2 and 57-58 no.5), but the vast majority of such jars from Minoan sites have been found in settlement contexts. The reason for the prestige seemingly conferred by Canaanite jars on the Greek Mainland may possibly be connected with their having contained an alcoholic beverage, a substance to which greater value may have been attributed by the individualistic warrior ideology that seemingly prevailed in early Mycenaean culture than by the more communal orientation of Minoan palatial culture. The value of such a beverage may have been further enhanced if it was an imported, hence exotic alternative to a locally produced form of alcohol. The latter may have been of considerable value in the first instance, owing to the substance from which it was made (e.g. honey, in the case of mead). For an extended discussion of the role of alcoholic beverages in European prehistory, see Sherratt 1987 = Sherratt 1997, 376-402.

34 Akrotiri: Cline 1994, 172 no.325; Poros tomb: Stambolidis and Karetsou 1998, 56 no.2 (found with LM IB and LM II pottery); Kato Zakro: Cline 1994, 178 nos. 385-386; Pseira: Cline 1994, 179 no. 387 = Banou 1995b, 115 ADC-65, 152-153, fig. 50, pl. 29c. The predominance and priority of Egyptian over Levantine contacts with Crete in the LM I and II periods has been commented on previously by Cline (1994, xvii; n.d.).

35 The closest external parallels for the body profile and size of these reddish-brown burnished jars that I have yet seen are those of late Middle Bronze and Late Bronze I shoulder-handled jugs from Megiddo (Amiran 1970, pls. 34:6, 46:1) and both handleless jars and shoulder-handled amphoras from Tarsus (Goldman 1956, nos. 882, 887-889, 1044), but the fabric and surface treatment of these pieces all appear to be quite different. I am extremely grateful to J. Balensi, P. Bikai, and M-H. Gates for their assistance in tracking down Near Eastern comparanda for this newly identified class of imported jars.

36 Watrous 1992, 156, 168 nos 1058 and 1292, pls. 25, 48, 53, 57; Cline 1994, 183 no. 427 and 218-219 no. 761.

37 Cline 1994, 68, 271 table 67.

38 For west Anatolian gray and tan wares, see Blegen, Caskey and Rawson 1953, 35-38; Blegen, Boulter, Caskey, and Rawson 1958, 21-23. For the distribution of imported Trojan gray wares throughout the eastern Mediterranean, see Allen 1990 and Schachner 1997. For a brief introduction to Hittite pottery and how it is to be distinguished from Late Bronze Age pottery in both northwest and southwest Anatolia, with references to more detailed studies, see Macqueen 1986, 102-107. I would like to express my sincere appreciation to H. Erkanal, M. Mellink, and A. Schachner for serving as consultants on the issue of the identity of these sherds.

39 Watrous 1989; Watrous 1992, 163-168, 175, 182; Cline 1994, 79, 272-273 table 68. The only additional shape aside from jars and bowls that belongs to the second group is the round-mouthed jug, represented by a single example (Watrous 1992, 167 no. 1971, pl. 58, fig. 75). Watrous uses the Italian term *dolio* for the shape here described as a swollen-lipped jar.

40 The clay of the vessels to which the omphalos bases belong is readily distinguishable petrologically from that used for the later jars and bowls from Sardinia (Watrous, Day, and Jones n.d.). It is therefore quite likely that these two groups of "Italian" material from Kommos were produced in altogether different locations.

41 Watrous 1992, 182. In his original presentation of the Italian material from Kommos, Watrous assigned a substantial number of pieces to LM IIIA2 (4) and

LM IIIA2-B (23) contexts. As Table 5 makes clear, there is no good reason to assign a LM IIIA2 date to any piece of Italian material yet recovered from Kommos, and particularly not to any examples of the later group identified on typological and petrographic grounds as Sardinian. The data presented in Cline's charts (1994, 82-84 tables 49-54, fig. 17 and 272-273 table 68 should be adjusted accordingly.

The pieces of wheelmade gray ware from Kommos which Watrous lists under the heading of imports from Italy are in my opinion unlikely to have anything to do with Italy (contra Kilian 1988, 133). They are best viewed as imitations in ceramic of stone (most likely serpentine) vessels, a tradition which has a long history on Crete (e.g. Rutter 1979; Tsipopoulou and Vagnetti 1994) for both small open shapes (shallow cups and bowls) and diminutive closed ones (juglets, piriform jars, alabastra). Half-a-dozen examples of such vases have now been inventoried at Kommos, from contexts of several different dates, although most examples may be assigned with some confidence to LM IIIA (Table 5).

42 Watrous 1992, 163, 182. A Sardinian provenience is supported by the petrological work done by P. M. Day on the fabrics of these jars and bowls. This Sardinian material from Kommos thus appears to be substantially different in functional terms from the Italian ceramic material recovered at Chania, which B. Pålsson Hallager has interpreted as evidence for a resident Italian population group at the site (1983, 1985; note the cautionary remarks of Vagnetti 1985 on this subject).

43 Watrous 1992, 182, followed by Cline 1994, 79. I am grateful to J. W. Shaw for useful discussion of this issue. That such jars may have been used as storage containers for scrap metal in stationary contexts does not by any means prove that they were equally well suited to serve as shipping containers for such materiel.

44 It is worth noting, in passing, that the mouths of these Near Eastern jars would also have been covered, but the mode of doing so was quite different (see, for Egyptian jars, Wood 1987), as was the mode of covering the spouts of transport stirrup jars in the Aegean (for which see Tournavitou 1995, 79-81, pls. 11b-d, 12a).

45 The most detailed treatment of this ceramic type is Morris 1989, which I have unfortunately not been able to consult. For the rarity of Mycenaean pictorial kraters on Crete, see Vermeule and Karageorghis 1982, 41. The only other example dating from the Final Palatial era known to me comes from a tomb of uncertain type near Souda Bay (Kanta 1980, 236; Vermeule and Karageorghis 1982, 201 V.19) and, though decorated with a chariot scene like the piece from Kommos, is a LH IIIB bell krater (FS 281) rather than an amphoroid krater; it has been on permanent display for many years now in the Chania Museum (Inv. No. 812).

46 A fully restorable example of such a pithos comes from Archives Room 7 in the palace at Pylos (Blegen and Rawson 1966, 394 shape 55, fig. 381), a context now persuasively dated to the very beginning of the LH IIIC period (Mountjoy 1997). A. L. D'Agata kindly informs me that several fragments of similar pithoi have been found in LM IIIA2 contexts at Ayia Triadha.

47 Fragments of markedly micaceous cooking dishes or pans also occur in Protopalatial contexts in the building fills associated with Building AA (Van de Moortel pers. comm.), the monumental predecessor of the court-centered Neopalatial Building T that appears to have had much the same plan (see Shaw and Shaw 1993, 168-170, 178, 185, fig. 10a-b for the early stages of its exposure).

48 For a detailed analysis of the town of Kommos in the Bronze Age, see Shaw, J. W. 1996a, 1-8; 1996b, 392-398; Shaw M. C. 1996, 360-363. For a report on the most recent fieldwork at the site through the end of the 1992 season, see Shaw and Shaw 1993. For a review composed in 1991 of Kommos during the Mono-Palatial era, see Shaw and Shaw 1997.

49 In between the northern and southern sectors of the site as so far excavated and lying just north of the east-west road, immediately northwest of where that road intersects a paved north-south road, is the building named House X. Constructed in early Neopalatial times as a well-to-do residence, this building appears to have been largely, perhaps even entirely, converted into a town shrine during the Mono-Palatial era (LM II - IIIA2 Early), after which it appears to have undergone yet another major remodelling. Its terminal period of use, during the Final Palatial era, is poorly documented, since the uppermost prehistoric levels here were to a large extent re-used in the seventh century BC. The foreign imports from House X (Tables 1-4, 6) thus belong almost exclusively to the Neopalatial and Mono-Palatial periods, and for this reason this portion of the site is omitted from further discussion in this paper. For a detailed preliminary report on House X, see M. C. Shaw in Shaw and Shaw 1993, 131-161.

50 In the Neopalatial period, and possibly even in Mono-Palatial times, the court would have been bounded on the west and south by the respective wings of the palatial Building T. But after the construction of Building P at the beginning of the Final Palatial era, the west wing had certainly been either destroyed by the sea or purposefully demolished in order to provide ready access from the beach to P's galleries. The original south wall of Building T had by this time been dismantled down to just above its original foundations.

51 In a paper delivered in May 1997, a little more than a year before the data presented here in Tables 1-7 was most recently updated, J. W. Shaw (n.d.) has a number of interesting observations to make with regard to the spatial distributions of imported pottery found at Kommos.

52 For a diachronic study of metallurgy at Kommos, with special emphasis on the decentralization of this activity in the later Neopalatial period, see Blitzer 1995, 500-520 and especially 526-532.

53 This intrasite distribution of foreign transport jars might be viewed as supporting Cline's theory that the contents of such jars were decanted prior to being distributed inland (see note 32 above). On the other hand, the only complete Canaanite or Egyptian jars so far recovered at Kommos were found in storerroms [Rooms X4 and X5] adjacent to the shrine (Room X7] in House X (Table 2) rather than in the shipshed-*cum*-warehouse that is Building P.

54 Watrous 1992, 175, 181-182; Cline 1994, 11, 96; n.d. It is, however, something of an exaggeration to describe either Canaanite or Cypriot vases as "rare" during Final Palatial times (Watrous 1992, 182; cf. Tables 1-3 here). No reddish-brown burnished jars whatsoever appear to have been recognized in contexts on the Hilltop or Central Hillside. The three more or less fully preserved Canaanite jars found at the site all come from the LM IIIA2 Early abandonment horizon of the public shrine in House X and presumably contained perishables that were either used or at least stored in that facility; two of these have already been published (Watrous 1992, no. 1951, pl. 53, fig. 72 = Banou 1995a, 654 no. 7061, fig. 2 = Stambolidis and Karetsou 1998, 57 no. 3; Banou 1995a, 655 no. 8069, fig. 3).

55 The point worth noting here is that a significant amount of time appears to have elapsed between the decline in the numbers of Near Eastern jars arriving at Kommos and the appearance of Sardinian jars. Thus to connect the two in some kind of cause-and-effect relationship (e.g. Watrous 1992, 182; Cline 1994, xvii, 11, 79-80; n.d.) may be to oversimplify what is a far more complex situation. In addition, previous authorities have tended to view the Levantine, Egyptian, and Sardinian imports to Kommos as the result of Minoan maritime enterprise, whereas it seems equally possible that non-Minoan carriers (e.g. Cypriots; see text below) may have been responsible for the actual overseas transport of the vessels in question.

56 The numbers of bowls correspond remarkably closely to the numbers of jars in individual contexts, further supporting Watrous' identification of the bowls as lids.

57 Over 10,000 units of grain (estimated to have weighed more than 800 tons, or enough to feed over 4000 persons for a year) are recorded on tablet KN F 852 next to the site of *da-wo*, considered by most authorities to have been a site within the Mesara (Chadwick 1976, 117-118; Bennet 1985, 247; 1990, 210). Bennet (1985, 247) suggests that this enormous quantity of grain, if not redistributed within Crete, might well have been traded overseas. For the names of the sites of Phaistos, Ayia Triadha, and Kommos in the "age of Linear B," see Bennet 1985, 247; Shelmerdine 1992, 580-581; McArthur 1993; Cucuzza n.d.

58 Rutter n.d. A program of petrological and chemical analysis incorporating samples from a substantial number of these jars was launched in 1998 by P. M. Day, V. Kilikoglou, and J. B. Rutter in an effort to establish on physico-chemical as well as stylistic grounds that they were produced in the western Mesara.

59 Other examples of such creative fusion at this time include the Ayia Triadha sarcophagus, long recognized as an amalgam of formerly discrete Minoan and Mycenaean traditions in funerary ideology and representational art, and also the wallpainting style represented by the surviving LM III frescoes from Ayia Triadha, soon to be published by P. Militello. A rather different interpretation of the significance of the hybridization process, as this is manifested in the large megaroid Building ABCD at Ayia Triadha, is provided by Hayden 1987, 213-218.

60 The issues being addressed in this paragraph are essentially twofold: first, should we imagine that the carriers responsible for the presence of non-Minoan goods at Kommos were as heterogeneous as the range of the imports themselves? and second, to what degree do we wish to credit Minoan maritime enterprise for the quantity and range of these foreign imports? To say that most of the ships that brought foreign goods to Kommos were Cypriot is most decidedly *not* the same thing as claiming that eastern Mediterranean trade in general was dominated by Cypriot carriers. Moreover, even with respect to Kommos in particular, a substantial amount of the cargoes both entering and leaving the harbor must have travelled in Minoan bottoms, for otherwise Building P, on the assumption that it is correctly identified as a ship-storage facility, would hardly have been necessary.

The surveys by Knapp (1993) and Cline (1994), and more fully by Knapp and Cherry (1994, 123-155), of the various theories concerning the nature of eastern Mediterranean interregional trade and who, if anyone, was the dominant ethnic group in this activity makes abundantly clear how little agreement there has been among the principal authorities on this subject. Significantly, although the Cypriots have often been identified as important participants in the trade in metals, and particularly during the 13th century BC when various modes of physico-chemical analysis have identified ingots for the first time consistent with Cypriot ore compositions (e.g. Muhly, Madden, and Stech 1988, 291-292), Cypriots have rarely been argued to have been the major carriers in the traffic in raw materials and manufactured goods (e.g. Knapp and Cherry 1994, 128-134; the viewpoint expressed in Muhly, Madden, and Stech 1988 is an exception in this respect). For Cypriot interaction with the Aegean specifically, see most recently Graziadio 1995.

61 Such imports of Protopalatial date from outside the Aegean that had been identified at Kommos prior to May 1997 are briefly reviewed and assessed in Shaw J. W. n.d.

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TABLE 1
CYPRIOT IMPORTS TO NEOPALATIAL AND FINAL PALATIAL MINOAN KOMMOS
[last updated: 10/98]

KOMMOS: HILLTOP

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C335	13A	10	WS II milkbowl	#1946, pl.51, fig. 70	#406	LM III
C344	13A	10	WS IIA milkbowl	#1947, pl.54	#405	LM III
C1262	19B	21	WS II milkbowl	#985, pl.52	#430	LM IIIB
C2141	27A1	25	WS II milkbowl	#1698, pls.52, 54	#428	LM IIIB
C3156	21B	18	WS II milkbowl	#873, pl.52	#424	LM IIIA2
C4143	19B1	43	Plain White pithos	#1099, pl.50	#688	LM IIIB
C4249	27A	6	WS II milkbowl	#1932, pl.51	#413	LM IIIA1
C4651	39B	6	White-shaved juglet	#951, pl.52, fig. 70	#635	LM IIIA2
C5596	5A	9	WS II milkbowl	#1942, pl.52	#410	LM IIIA

KOMMOS: CENTRAL HILLSIDE

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C340	9A	18	WS II milkbowl	#570	#419	LM IIIA1
C665	9A2	59	WS II milkbowl	#1938, pl.52 [mislabelled "1954"], fig.70	#408	LM IIIA
C993	19A	20	WS II milkbowl	#1936, pls. 51, 52	#422	LM I mixed with some LM IIIA2
C1052	19A	31	BR I shallow bowl	#1937, pl.52	#425	LM I mixed with some LM IIIA2
C1981	9A2	59	WS II milkbowl	#1939, pl.52	#411	LM IIIA
C1982	9A2	59	WS II milkbowl	#1940, pl.52	#409	LM IIIA
C2046	9A	7	WS II milkbowl	#1935, pls.52, 53	#416	LM IIIA1
C3171	35A1	61	Plain White Wheelmade pithos	#846, pl.52, fig.70	#690	LM IIIA2
C3249	9A2	59	WS II milkbowl	#1941, pl.52	#407	LM IIIA
C3681	40A	2	WS II milkbowl	#1944, pl.51	#431	LM IIIA2 - B
C3729	41A	10	WS II milkbowl	#808, pl.51	#418	LM IIIA
C3947	40A	44	WS II milkbowl	#935, pl.51	#421	LM IIIA2 - B
C4432	40A	57	WS II milkbowl	#1933, pl.52	#412	LM IIIA1
C4658	35A1	71	BR I jug/tankard	-	—	<tbd>
C4773	6A	12	WS II milkbowl	#1934, pl.53	#414	LM IIIA1
C5122	35A1	62	WS II milkbowl	#847, pl.52	#420	LM IIIA2
C5731	41A	10, 16	BR II jug (?)	-	—	LM IIIA
C5770	41A1	12	Plain White Wheelmade pithos	#807	#689	LM IIIA

Table 1 (continued)

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C6112	48A	65	WP IV juglet	*Kommos* II, #1835, fig.63	–	MM III

KOMMOS: SOUTHERN AREA, CIVIC BUILDINGS

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C2753	36A	9	RLW spindle bottle	#278, pl.51, fig.70	#717	LM IB Early <disturbed in LM IIIB>
C2977	36A	22	medium coarse unpainted tuyère	–	–	LM IA Final
C3218	37A	43	WS II milkbowl	#1931, pl.51	#417	LM IIIA2 Early
C3560	36A	1	Plain White Wheelmade I jug	–	#753	LM II
	100C	17, 19, 20, 23, 25				
C4127	43A	63	WS IIA milkbowl	#1340, pl.52	#432	LM IIIB
C4577	43A	91	Monochrome bowl	#1930, pl.51	#404	LM IIIA2 Early
C6743	51A1	65	WS II milkbowl	#1945	#429	LM IIIB
C7073	58A	17	Plain White Wheelmade pithos	–	#341	LM IIIA2 Early
C7407	57A	40	BR II carinated bowl	–	#423	<tbd>
C7422	57A1	42	Plain White closed shape	–	#338	LM IIIA2
C7639	56A1	100	Plain White Handmade pithos	–	#329	LM IIIA2 Early
C8154	63A	63	Bucchero juglet,	–	#610	<tbd>
C8202	63A	70	Plain White Wheelmade pithos	–	#376	<tbd>
C8727	67A1	50	Plain White ? Handmade pithos	–	#345	<tbd>
C9196	95A	37	Plain White krater	–	–	<tbd>
C9266	75A/B	43A	Base Ring I tankard	–	–	LM IIIA2 Early
C9990	86F	95	WS II Late milkbowl	–	–	<tbd>
C10034	95A	85	WS II milkbowl	–	–	<tbd>
C10035	95A	80	Plain White Wheelmade closed shape	–	–	<tbd>
C10111	95A	128	WS IImilkbowl	–	–	<tbd>
C10260	95C	209	WS Wheelmade I (?) jug	–	–	<tbd>

Table 1 (continued)

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C10298	95A	189	BR I juglet/ tankard	–	–	<tbd>
C10365	97E	30, 35, 37, 38	BR II jug	–	–	LM IIIB
C10463	97E	47, 49	BR II carinated bowl	–	–	LM IIIA2
C10649	76C	53B	Monochrome jug	–	–	LM IIIB
C10669	50A	78	WS II milkbowl	–	–	LM IIIA2 Early
C10730	100D	34	Plain White Handmade krater	–	–	LM IB Late
C10732	50A	70	WS II milkbowl	–	–	LM IIIA2 Early
C10744	50A	74	Plain White closed shape	–	–	LM IIIA2 Early
C10754	42A	54	Proto–Base Ring closed shape	–	–	LM IB Early
C10766	58A	50	Monochrome closed shape	–	–	LM IA Final
C10777	52A	43	Proto–Base Ring jug/tankard	–	–	LM IA Final
C10778	56A1	92	Proto–Base Ring jug/tankard	–	–	LM IA Final
C10779	56A1	92	Proto–Base Ring jug/tankard	–	–	LM IA Final
C10833	36A	4	Proto–Base Ring jug/tankard	–	–	LM IB Early [disturbed in LM IIIB]
C11078	36A	30	Proto–Base Ring jug/tankard	–	–	LM IB Early [disturbed in LM IIIB]
C11122	57A1	47	Base Ring jug	–	–	LM IIIA2 Early
C11133	56A1	75	Monochrome (?) bowl	–	–	LM IIIA2 Early
C11215	90A	17	BR I jug/tankard	–	–	LM IA Final
C11240	90A	55	Plain White pithos	–	–	LM IIIB
I53			jug/amphora with potmark on handle	–	#608	<tbd>

KOMMOS: SOUTHERN AREA, HOUSE X

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C5645	11A	17	WS II milkbowl	#1943, pl.51	#415	LM IIIA
C9013	73A	55, 59, 60, 60A, 63A	complete Plain White partially Wheelmade pithos	—	—	LM IIIA2 Early
C9382	73B	98	BR II carinated bowl	—	—	LM IIIA2
C9567	81C	31	WS II milkbowl	—	—	LM IIIA
C9612	81C	44	WS II milkbowl	—	—	LM IIIA
C9859	87A	69	Monochrome bowl	—	—	LM II
C10209	93E	89	WP Wheelmade I tankard	—	—	LM IIIA2 Early (?)
C10366	93E	95, 98	WP Wheelmade I tankard	—	—	LM IB Late
C10555	72B	9	Monochrome bowl (?)	—	—	Mixed Minoan and Historic

Abbreviations for Cypriot Ceramic Wares
BR = Base Ring
RLW = Red Lustrous Wheelmade
WP = White Painted
WS = White Slip

Originally Published as Cypriot but Subsequently Identified as Something Else

C3391 Published in LVW (#1544) as a fragment of a Base Ring juglet, this fragment instead appears to belong to a fine gray wheelmade vase of LM IIIB date.

C4734 Published in LVW (#803) as a fragment of a Base Ring juglet, this fragment instead appears to belong to a fine gray wheelmade vase of LM IIIA1 date.

C6626 Published in LVW (#1344) as a fragment of a Plain White Wheelmade amphora, this handle and rim fragment belongs instead to a locally made medium coarse ladle.

DATE RANGE OF CYPRIOT IMPORTS: MM IIB - III; LM IA Final - LM IIIB

ABBREVIATIONS:
LVW = L.V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992).
EHC = E.H. Cline, *Sailing the Wine-dark Sea: International Trade and the Late Bronze Age Aegean* (Oxford 1994).
<tbd> = to be determined

TABLE 2
CANAANITE AND SYRIAN IMPORTS TO MINOAN KOMMOS
[last updated: 10/98]

KOMMOS: HILLTOP

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C1172	21A1	41	jar	#750, pl.53, fig.71	#370	LM IIIA2
C1564	19B2	42	jar	#1097, pl.54 [mislabelled "1640"]	#378	LM IIIB
C2646	1B	2	jar	#945, pl.54, fig.71	#379	LM IIIA2
C2764	1B1	4A	jar	#946, pl.54, fig.71	#381	LM IIIA2
C5591	5A	10	jar	#1950, pl.53	#358	LM IIIA1
C5984	1B1	4B	jar	#588, pl.14, fig.71	#355	LM IIIA2

KOMMOS: CENTRAL HILLSIDE

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C1053	19A	31	jar	#1954, pl.54, fig.71	#375	LM IIIA2
C1780	9A	18	jar	#571, pl.54, fig.71	#360	LM IIIA1
C2924	33B	28	jar	#809, pl.53, fig.71	#362	LM IIIA1
C4527	40A	82	jar	#1949, pl.55, fig.71	#361	LM IIIA1
C4771	9A1	3	jar	#1948	#330	LM IB [??]
C5733	41A	10	jar	#810, pl.50	#364	LM IIIA1

KOMMOS: SOUTHERN AREA, CIVIC BUILDINGS

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C3351	36B	29	jar	#1952	#363	LM IIIA2
C4064	42A	46	jar	#1957	#383	Mixed Minoan and Historic
C4125	43A	61	jar	#1958	#380	Mixed Minoan and Historic
C5140	43A	63	jar	#1341	#382	LM IIIB
C6839	51A1	72	jar	#1959, fig.71	#333	LM IIIB with some Historic
C6840	52B	67	jar	—	—	Mixed Minoan and Historic
C7069	60A	17	jar	—	#343	LM IIIA2 Early
C7074	58A	17	jar	—	#336	LM IIIA2 Early
C7105	58A	17	jar	—	—	LM IIIA2 Early
C7115	59A	53	jar	—	#327	LM IIIA2 Early
	60A	20				

Table 2 (continued)

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C7336	57A1	45	jar	–	#339	LM IIIA2 Early
	60A	33				
C7428	57A1	45	jar	–	#334	LM IIIA2 Early
C7440	56A1	71	jar	–	#340	LM IIIA2 Early
C7638	56A1	94	jar	–	#337	LM IIIA2 Early
C8053	62D	55	jar	–	#328	LM IIIA2 Early
C8144	63A	61	jar	–	#346	LM IIIA2 Early
C8216	67A1	48, 50	jar	–	#352	LM IIIA2 Early
C8244	67A1	48	jar	–	#371	LM IIIA2 Early
C8245			jar	–	#373	<tbd>
C8728	67A1	46	jar	–	#356	LM IIIA2 Early
C8729	67A1	48	jar	–	#347	LM IIIA2 Early
C8730	63A	75	jar	–	#372	LM IIIA2 Early
C9100	95A	37	jar	–	–	LM IIIA2
C9398	76C	56B	jar	–	–	LM IIIB
C9865	88A	21	jar	–	–	<tbd>
C9941	89C	123	jar	–	–	LM IIIB
	90C	97				
C10360	89C	113	jar	–	–	LM IIIB
C10362	89C	125	jar	–	–	LM IIIB
C10656	83C	77	jar	–	–	LM IIIA2
C11141	84A	28	jar	–	–	LM IIIB
C11232	90A	57, 58	jar	–	–	LM IIIA2
I43	60B	60	jar with potmark	–	–	Mixed Minoan and Historic
I47	63A	63	jar with potmark	–	#344	LM IIIA2 Early
I50			jar with potmark	–	#369	<tbd>
I51			jar with potmark	–	#359	<tbd>

KOMMOS: SOUTHERN AREA, HOUSE X

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C6990	59A	5	jar	–	#326	LM IIIA2 Early
C7061	59A	25	complete jar	#1951, pl.53, fig.72	#354	LM IIIA2 Early
C8058	66A	32	jar	–	#366	LM IIIA2 Early
C8069	66A	29	complete jar	–	#368	LM IIIA2 Early
C9152	73A	54	jar	–	–	LM IIIA2 Early
C9167	73A	55, 60	complete jar	–	#377	LM IIIA2 Early
C9624	81C	42	jar	–	–	LM II-IIIA1 with some Historic

COMMENT: Note the dramatic difference in the distribution of Canaanite material between the residential parts of the site (Hilltop, Central Hillside) and the area of the public (and commerecial?) buildings in the south: roughly five times as many Canaanite fragments come from the latter area as from either of the former. Note also that all three complete" Canaanite jars were found in House X.

DATE RANGE OF CANAANITE IMPORTS: LM IIIA1 - LM IIIB
[the dating of C4771 to LM IB must be considered dubious]

ABBREVIATIONS:
LVW = L.V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992).
EHC = E.H. Cline, *Sailing the Wine-dark Sea: International Trade and the Late Bronze Age Aegean* (Oxford 1994).
<tbd> = To be determined

TABLE 3
EGYPTIAN IMPORTS TO MINOAN KOMMOS
[last updated: 10/98]

KOMMOS: HILLTOP

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C3392	12A1	2	flask	#1541, pl.54, fig.73	#533	LM IIIB
C4646	39B	2	jar	#1956	#367	LM IIIA
C5960	1B	23	jar	#955	#573	LM IIIA2 - B
C5977	1B	28	jar	#587, pl.14	#569	LM IIIA2

KOMMOS: CENTRAL HILLSIDE

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C287	9A	16	jar	#1960, pl.55, fig.73	#570	LM IIIA1
C288	9A	16	flask	#1961, pl.55, fig.73	#535	LM IIIIA1
C894	19A	7	jar			
C1474	2A1	2	jar	#1291, pl.54	#572	LM IIIB
C1649	23B	8	jar	#1963, pl.55	#751	LM IIIA
C1845	9A2	56	jar	#1294, pl.55	#584	LM IIIB
C2556	19A	9	jar	#1953, pl.54	#357	LM IIIA1
C3802	9A	17	jar	#294, pls. 7, 51	#609	LM II
C4107	40A	53	jar	#1955	#374	LM IIIA

KOMMOS: SOUTHERN AREA, CIVIC BUILDINGS

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C2763	36A	9	jar	#277, pl.55	#563	LM IB Early <disturbed in LM IIIB>
C3350	36B	29	jar	#1962, pl.54	#754	LM IIIA2
C3559	36A	12	jar	#488	#568	LM II
C4203	44A	42	jar	#1020	#566	LM IIIB
C4574	43A	87	jar	#1964, fig.73	#565	LM IIIA
C6392	50A	25	jar	#1965, pl.54, fig.73	#564	Mixed LM IIIB to Historic
C6949	44A	42	flask	#1021, pl.54	#567	LM IIIB
C7070	60A	17	jar	-	#574	LM IIIA2 Early
C7072	58A	17	jar	-	#331	LM IIIA2 Early
C7448	57A1	49	jar	-	#365	LM IIIA2 Early
C7476	56A1	76	jar	-	#350	LM IIIA2 Early
C8336	65A4	75	jar	-	#342	LM IIIB
C8726	67A1	58	jar		#353	LM IIIA2 Early
C9489	89A	11	jar	-	-	LM IIIA2
C9504	89A	36	jar	-	-	LM IIIA2
C9837	88A	17	jar	-	-	<to be deter mined>
C10065	94A	52	jar	-	-	LM IIIA2
C10218	94B	114	jar	-	-	LM IIIA2
C10331	91B	44	jar	-	-	<to be deter mined>
C10655	89A	2	jar	-	-	LM IIIB
C10723	100C	19, 21, 23, 25, 26, 28	jar	-	-	LM II
C10765	27B	35	jar	-	-	LM II
C11047	43A	91	jar	-	-	LM IIIA2 Early

KOMMOS: SOUTHERN AREA, HOUSE X

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C7550	59A1	65	flask (?)	-	#536	<tbd>
C8006	66A	27	flask	-	#534	LM IIIA1
C8837	66A	21	jar	-	#351	LM IB
C9625	81C	42	jar	-	-	<tbd>

COMMENT: The Egyptian material from Kommos includes small closed vessels in the form of flasks in addition to large transport vessels in the form of jars. Almost all of the flask fragments thus far identified come from the residential area of the site (Hilltop, Hillside, House X). Several different kinds of jars can be identified on the basis of different neck heights and diameters and different lower handle attachment locations (i.e. shoulder-handled amphoras, belly-handled amphoras, handleless piriform jars, etc.). The above identifications were confirmed as Egyptian by Linda Hulin during a two-day visit to Pitsidia on July 23-24, 1997.

DATE RANGE OF EGYPTIAN IMPORTS: LM IB (or just possibly LM II) - LM IIIB

ABBREVIATIONS:
LVW = L.V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992).
EHC = E.H. Cline, *Sailing the Wine-dark Sea: International Trade and the Late Bronze Age Aegean* (Oxford 1994).
<tbd> = To be determined.

TABLE 4
KOMMOS: MISCELLANEOUS NON-MINOAN IIMPORTS
[last updated: 10/98]

REDDISH-BROWN BURNISHED WHEELMADE JARS
AREA OF CIVIC BUILDINGS:

INV. NO.	TR.	PAIL	PORTION PRESERVED	CONTEXT DATE
C8933	89C	128	grooved shoulder fragment	LM IIIB
C9848	88A	26	raised base	LM IIIA
C9863	88A	25 #2	raised base	LM IIIA
C9880	88A	23	raised base	LM IIIA
C10361	89C	116	body sherd	LM IIIB
C10685	50A	74	grooved lower neck and shoulder fragment	LM IIIA2 Early

Table 4 (continued)

INV. NO.	TR.	PAIL	PORTION PRESERVED	CONTEXT DATE
C10743	50A	73	shoulder and lower body fragments	LM IIIA2 Early
C11066	44A	41	lower neck, shoulder, and mid-body fragments	LM IIIA2 Early
C11153	57A1	41	lower body fragment	LM IIIA2
C11216	90A	20	rim and neck	Mixed LM IA Final and LM IIIA2
C11350	93E	58	body sherd	LM II
C11363	57A1	42	lower body fragment	LM IIIA2

HOUSE X:

INV. NO.	TR.	PAIL	PORTION PRESERVED	CONTEXT DATE
C10850	11A	19	shoulder and neck fragment	LM II
C10975	66A	31	lower and mid-body fragment	LM IIIA1
C10978	66A	31	faintly grooved neck and shoulder fragment	LM IIIA1
C10988	66A	31	rim and neck	LM IIIA1

COMMENT: As of 1 August 1998, a fair number of visiting scholars have been shown this material (among them, F. Carinci, J. Coleman, N. Cucuzza, W. Gauss, E. Hallager, L. Hulin, V. Karageorghis, V. La Rosa, W-D. Niemeier), but as yet no one has recognized it. Its floruit appears to span the period from LM II through LM IIIA2 - the pieces from LM IIIB contexts in Gallery P5 could well be earlier cast-ups.

SUSPECTED ANATOLIAN IMPORTS

HILLTOP:

INV. NO.	TR.	PAIL	IDENTIFICATION	LVW	EHC	CONTEXT DATE
C3082	25A	25	brown-slipped-and-burnished bowl	#1058, pls.25, 53, 57	#427	LM IIIB
C3523			flask	#1929, pl.51, fig.69	#532	LM IB
C4091	41A	27	red-slipped-and-burnished conical bowl	Kommos II #586, pl.30, fig.27	-	MM III

CENTRAL HILLSIDE:

INV. NO.	TR.	PAIL	IDENTIFICATION	LVW	EHC	CONTEXT DATE
C1620	2A1	3	red-slipped-and-burnished bowl	#1292, pls.48, 53	#761	LM IIIB

ABBREVIATIONS:
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EHC = E.H. Cline, *Sailing the Wine-dark Sea: International Trade and the Late Bronze Age Aegean* (Oxford 1994).

TABLE 5
ITALIAN IMPORTS TO MINOAN KOMMOS
[last updated: 10/98]

KOMMOS: HILLTOP

INV. NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C157	5B	20	collar-necked jar	#1540, pl.57, fig.73	#576	LM IIIB
C731	11B1	16, 21	lipless bowl (small)	#1561, pl.58, fig.75	#521	LM IIIB
C847	21A	3	collar-necked jar	#1423, pl. 53, fig. 75	#585	LM IIIB
C863	5B		sloping-lipped bowl	#1424, pl.57, fig.74	#440	LM IIIB
C1147	19B	8, 14	collar-necked jar (small)	#1377, pl.57, fig.75	#586	LM IIIB
C1520	21B	23	sloping-lipped bowl	#1037, pl.53, fig.75	#426	LM IIIB
C1573	21B1	32	closed. shape	#1167, pl.57	#577	LM IIIB
C2137	27A1	25	jar	#1696, pl.56	#588	LM IIIB
C2189	27A1	73	closed shape	#1721, pl.57	#763	LM IIIB
C3310	12A1	64	swollen-lipped jar	#1542, fig.74	#527	LM IIIB
C3311	5B	16, 17	collar-necked jar	#1543	#583	LM IIIB
C3494	12A1	64	sloping-lipped bowl	#1545, pl.57	#434	LM IIIB
C3953	11B1	15	jar	#1597, pl.56	#530	LM IIIB
C4325	27A1	33	closed shape (small)	#1722, pl.44	#764	LM IIIB
C4411	27A1	25, 30	jar	#1697, pl.57, fig.75	#648	LM IIIB
C4625	4A1	32, 66, 67	closed shape	#1307, pl.57	#758	LM IIIB
C4699	27A1	25	open shape	#1638	#528	LM IIIB
C5268	16A	20	lipless bowl (?)	#672, pl.56	#517	LM IIIB [?]
C5348	5B	16	collar-necked jar	#1426, pl.57, fig.76	#589	LM IIIB
	12A	80				
	21A	5				
C5349	12A1	21	swollen-lipped jar	#1427, pl.57	#531	LM IIIB
C5464	5B	3	collar-necked jar	#1428, pl.57, fig.75	#590	LM IIIB

Table 5 (continued)

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	EHC	CONTEXT DATE
C5465	5B	3	lipless bowl	#1429, pl.57	#591	LM IIIB
C5592	5A		collar-necked jar	#1970, pl.56	#592	LM IIIB

KOMMOS: CENTRAL HILLSIDE

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C469	9A1	2	sloping-lipped bowl	#1968, pl.58, fig.73	#433	LM IIIB
C1699	2A		closed shape	#1293, pl.56	#587	LM IIIB
C1769	22A2	74	jar (?)	#1018, pl.56	#578	LM IIIB
C1854	2A	6	jar (?)	#1295, pl.57, fig.73	#762	LM IIIB
C1900	2A1	23, 34	bowl	#1296, pl.56	#441	LM IIIB
C2103			open shape	#811, pl.56	#757	LM IIIA1
C2923	33B	28	omphalos bowl	#813, pl.56	#523	LM IIIA1
C4270	22A1	17	open shape	#1672, pl.56	#436	LM IIIB
C4470	41A1	6	omphalos bowl	#1966, fig.73	#524	LM IIIA1
C4580	41A1	8	omphalos bowl	#812, pl.56	#525	LM IIIA1
C4936	41A1	26	omphalos bowl	#522, pls.53, 56, fig.73	#526	LM IIIA1
C5123	35A1	66	open shape	#1967, pls.53, 58	#759	LM IIIB (?)

COMMENT: The shallow, thin-walled bowls (or cups) with omphalos bases from Kommos (i.e. LVW #522, 812, 813, 1966) are all from early (i.e. LM IIIA1) contexts. The only other piece of "Italian" material to which LVW assigns such an early date is his #814 (C5731), a misidentified piece of Cypriot Base Ring ware. All the omphalos bases come from just south of the House of the Snake Tube, in effect from a single context.

KOMMOS: SOUTHERN AREA, CIVIC BUILDINGS

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C3199	37A	41	lipless bowl	#1339, pl.56, fig.73	#518	LM IIIB
C4126	43A	63	jug/jar	-	-	LM IIIB
C4130	44A	37	sloping-lipped bowl	#1969, pl.58	#435	LM IIIB
C6444	50A	22, 27	collar-necked jar	#1343, pl.56, fig.75	#593	LM IIIB
C6552	27B	29 (or 21 or 22)	jar	#1363	#579	LM IIIB
C6553	27B	26	lipless bowl	#1364, pl.56	#519	LM IIIB
C6694	50A	52, 56, 58	sloping-lipped bowl	#1753, pl.58, fig.74	#437	LM IIIB
C6695	50A	52	collar-necked jar	#1754, pl.58	#580	LM IIIB
C6696	50A	52	collar-necked jar	#1755, pl.58	#581	LM IIIB
C6698	50A	53	lipless bowl	#1756, pl.58, fig.73	#520	LM IIIB
C6702	50A	54	sloping-lipped bowl	#1757, pl.58	#438	LM IIIB

Table 5 (continued)

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C6710	50A 51A	55, 56, 57 75	lipless bowl	#1761, pl.58, fig.74	#439	LM IIIB
C6715	50A	56	collar-necked jar	#1759, pl.58	#582	LM IIIB
C6717	50A	56	swollen-lipped jar	#1760, pl.58, fig.73	#529	LM IIIB
C6718	50A	57	round-mouthed jug	#1971, pl.58, fig.75	#612	LM IIIB
C6738	50A	59	bowl	#1758, pl.58	#614	LM IIIB
C6904	51A1	75	lipless bowl	#1973, pl.58, fig.74	#442	LM IIIB
C7663	62A	1	lipless bowl	—	—	LM IIIA2 Early <disturbed in LM IIIB>
C8173	50A	"47-65"	collar-necked jar	—	—	Mixed LM IIIB to Historic
C10742	100D	38	lipless bowl	—	—	LM IB Late <disturbed in LM IIIB>
C10832	36A	4	lipless bowl	—	—	LM IB Early <disturbed in LM IIIB>
C11145	84C	48	lipless bowl	—	—	LM IIIB

COMMENT: Note the absence of Italian imports from House X. The simplest explanation for this is that occupation levels dating from the LM IIIB period are not preserved here, yet it is only in contexts of this date that Italian imports may be considered common.

KOMMOS: PIECES CLAIMED AS ITALIAN IMPORTS BY LVW BUT NOT ACCEPTED AS SUCH BY JBR

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C864	21A	5	EM I chalice [Pyrgos Ware]	#1425, pl.56, fig.76	#443	
C5731	41A	10, 16	closed shape [Cypriot Base Ring]	#814, pls.53, 56	#611	
C6673			cooking jug [7th cent. BC]	#1752, pl.58, fig.74	#384	Mixed Minoan through early Archaic
C6723	50A	28	thickened vertical strap handle	#1972, pl.58 [mislabelled as #1758]	#613	

KOMMOS: FINE WHEELMADE GRAY WARE

INV.NO.	TR.	PAIL	SHAPE	LVW	EHC	CONTEXT DATE
C2818	36A	14	alabastron	#270, pl.6, fig.18	—	LM IB Early <disturbed in LM IIIB>
C3391	12A1	21	juglet	#1544, fig.76, pl.58	—	LM IIIB
C4734	41A1	19	juglet	#803, fig.76, pl.53	—	LM IIIA1
C4937	41A1	2b	teacup	#514, fig.23, pls.53, 56	—	LM IIIA1
C5268	16A		teacup	#672 [misdescribed], pl.56	—	LM IIIA2
C7691	62A	9	teacup	—	—	LM IIIA2 Early

COMMENT: These dark-gray-burnished cups and juglets appear to belong to the earlier LM IIIA period (Tsipopoulou and Vagnetti 1994) and may represent a LM IIIA continuation on the part of Minoan potters to imitate stone vessels in fired clay (Rutter1979). Unlike the rest of the dark-burnished material published as Italian by LVW, these fragments come from wheelmade vessels, and their fractures and surfaces are distinctly gray rather than black or mottled.

ABBREVIATIONS:
LVW = L.V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992).
EHC = E.H. Cline, *Sailing the Wine-dark Sea: International Trade and the Late Bronze Age Aegean* (Oxford 1994).
JBR = J. Rutter

TABLE 6
MYCENAEAN IMPORTS TO KOMMOS
[last updated: 10/98]

KOMMOS: HILLTOP

INV. NO.	TR.	PAIL	SHAPE	LVW	CONTEXT DATE
C2140	27A1	25, 30	stemmed bowl, patterned [LH IIIB]	#1117, pl.51, fig.69	LM IIIB
C2146	27A1		deep bowl, patterned [LH IIIB?]	#1695, pl.44, fig.69	LM IIIB
C3896	4A2	64	stirrup jar, patterned [LH IIIB?]	#1621, pl.41	LM IIIB
C3897	4A2	64	stirrup jar, patterned [LH IIIB]	#1628, pl.41	LM IIIB
C5425	4A2	59	piriform jar, linear [LH IIIA]	#1133	LM IIIA2

KOMMOS: CENTRAL HILLSIDE

INV. NO.	TR.	PAIL	SHAPE	LVW	CONTEXT DATE
C1473	2A1	2	stirrup jar. patterned [LH IIIA2 - B]	#1264, pl.29, fig.46	LM IIIA2-B
C1771	22A2	74	stirrup jar (FS 183), patterned [LH IIIB]	#1017, pls.24, 50,	LM IIIB
C2058	2A2	27	goblet, patterned [LH IIIA1]	#789, pl.18	LM IIIA1
C4271	22A1	131	bowl, linear (handle only) [LH III]	#1671, pl.51	LM IIIA2-B
C5819	41A	40	goblet, patterned [LH IIB]	#1926, pl.51, fig.69	LM IIIA1

KOMMOS: SOUTHERN AREA, CIVIC BUILDINGS

INV. NO.	TR.	PAIL	SHAPE	LVW	CONTEXT DATE
C2424	27B	13	stirrup jar, patterned [LH IIIC Early]	#1881, pl.47	LM IIIB Late
C2816	27B	33, 38	pithoid jar, Palace Style [LH IIA]	#308, #309, #313;	LM IIIA2 Early
	36A	12, 32		pls. 7, 8	
	37A	23			
	44A	43			
	50A	68, 70, 73, 76			
C2949	37A	24	stirrup jar, linear as preserved [LH IIIA2]	#1927, pl.51	LM IIIA2 Early
C3346	37A	57, 59	Vapheio cup, patterned [LH I]	#338, pls.46, 50	LM IB Early
C4693	43A	96	kylix, patterned [LH IIIA2]	#1928, pl.51	LM IIIA2-B
C6709	50A	55, 56,	deep bowl, patterned [LH IIIB]	#1739, pl.44	LM IIIB
C6912	53A1	70	Vapheio cup, patterned [LH I]	–	LM IA Final
C6919	50A	79	alabastron, patterned [LH IIA]	–	LM IB Late
C7116	60A	20	alabastron, patterned [LH IIA]	–	LM IIIA2 Early
C7643	57A2	79	alabastron, patterned [LH IIA]	–	LM IIIA2 Early

Table 6 (continued)

INV.NO.	TR.	PAIL	WARE AND SHAPE	LVW	CONTEXT DATE
C7876	50A	55	stemmed bowl, patterned [LH IIIB]	#1737, pl.44	LM IIIB
C8335	65A4	75	stirrup jar, linear as preserved [LH IIIA2/B]	–	LM IIIB
C8344	65A4	78	kylix, patterned, Zygouries type [LH IIIB1]	–	LM IIIB
C10734	50A	79	teacup, patterned [LH IIA]	–	LM IB Late
C11033	37A	26	goblet, linear as preserved [LH IIB]	–	LM II
C11045	43A	91	alabastron, patterned [LH IIA]	–	LM IIIA2 Early
C11085	100D	39	alabastron, patterned [LH IIA]	–	LM IB Late
C11092	89B	57A, 57A1	alabastron, patterned [LH II(A?)]	–	LM IIIA2

KOMMOS: SOUTHERN AREA, HOUSE X

INV. NO.	TR.	PAIL	SHAPE	LVW	CONTEXT DATE
C7636	59A	88	angular alabastron, patterned [LH IIIA2]	–	LM IIIA2 Early
C8129	66A	34	Vapheio cup, patterned [LH I]	–	LM IIIA1
C9126	74A	13	amphoroid krater, patterned with chariot scene [LH IIIA2 - B]	–	Mixed Minoan and Historic
C11000	66A	26	stirrup jar, patterned [LH IIIA2]	–	LM IIIA1
C11309	93E	60	goblet, patterned [LH IIB]	–	LM II

COMMENT: Note the presence of no less than three LH IIB goblet fragments, of which two have been found in solid LM II contexts. Note also the discovery of two LH I Vapheio cup fragments in LM IA Final and LM IB Early contexts. The number of LH IIA alabastron fragments is striking.

The importation of Palace Style jars from the Greek Mainland, exemplified by C2816 (see the comparanda for both decoration and shape in Niemeier 1985: figs. 2:8-12, 23:3, 6, 25:2; the best parallels are the jars from Kakovatos) comes as something of a surprise and was only recognized in September 1998.

Original Identification as Helladic or Mycenaean Reconsidered

C611 Published in LVW (#1422, pl.51, fig.69) as "probably Lakonian or Messenian", this oddly shaped and decorated but almost fully preserved example of a patterned FS 176 stirrup jar from LVW's LM IIIB Deposit 82 does

not have exclusively Mainland parallels. Why could it not equally well be an imported Cycladic, Dodecanesian, or even Minoan piece?

C4090 Published in *Kommos* I (#585, fig.27, pl.30) as "probably Middle Helladic"., this red-slipped-and-burnished bowl rim from a MM III context is now considered to be possibly Anatolian.

C5384 Published in LVW (#1925, pl.50) as "Helladic (Euboia or Boeotia?)" on the grounds of fabric and handle type, this piece from a MM-LM I context in Hilltop, Court 2 is now considered to be an unidentified import.

DATE RANGE OF MYCENAEAN IMPORTS: LM IA Final - LM IIIB Late (LH I - LH IIIC Early).

ABBREVIATIONS

LVW = L.V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992).

TABLE 7
CYCLADIC IMPORTS FROM WELL-DATED CONTEXTS IN THE SOUTHERN AREA AT KOMMOS
[last updated: 10/98]

KOMMOS: SOUTHERN AREA, CIVIC BUILDINGS

INV. NO.	TRENCH	PAIL	IDENTIFICATION	LVW	CONTEXT DATE
C10725	100C	23, 27	medium coarse matt-painted closed vase	-	LM II
C4576	36A	5	plain Cycladic White jar	#1923, pl.50 (bottom three); #276, pl.50; #1924, pl.50 (right sherd)	LM II
	43A	91			
	50A	73			
C7477	56A1	77	medium fine linear closed shape, micaceous fabric		LM IIIA2 Early
C2928	27B	22	dark-surfaced micaceous pithos	#1338, pl.51	LM IIIB Advanced
	37A	21, 22, 41			
C4134	34A2	48	dark-surfaced micaceous pithos	#1342	LM IIIB Advanced
	44A	40			
	44B	7			
	50A	27, 42, 50, 52. 54, 58, 59			
	51A	28			
	51A1	75			
	65A4	80			
	84A	6			
	84D	59			
	86F	83, 85, 85A			
	87B	88			

Table 7 (continued)

INV. NO.	TRENCH	PAIL	IDENTIFICATION	LVW	CONTEXT DATE
	89C	104			
	90A	53			
	91B	32, 42			
	95A	6, 7, 8, 10, 18, 29, 33, 91			
C10454	43A	91	plain Cycladic White jar (top three sherds)	#1923, pl.50	Mixed LM IA to LM IIIA1
C11056	89A	29, 29A	patterned jug or jar, Cycladic White fabric	—	LM IIIA2

KOMMOS: SOUTHERN AREA, HOUSE X

INV. NO.	TRENCH	PAIL	IDENTIFICATION	LVW	CONTEXT DATE
C8020	66A	27	fine linear closed shape, micaceous fabric		LM IIIA1

COMMENT: LVW publishes a fragment of a dark-surfaced pithos of the same sort as C4134 from an advanced LM IIIB context in Room 6 on the Hilltop (#1629 =C4077, from his LM IIIB Deposit 86) and another similar bit from Room O15 on the Hilltop (#1912 = C4515). A patterned jar fragment (#157 = C2547, from Deposit 3) is comparable in its fabric to C11056 above and may be of comparable date, since LVW's Deposit 3, though mostly LM I, also contains some LM IIIA2 material. The LM IIIA2 - B fragment #1140 = C4871 appears to be a piece of micaceous cooking pottery (cf. the separate listing of such pieces below. The claim that #806 = C5843 is Cycladic seems rather doubtful. In the cases of three pieces published by LVW (#276 = C2762, #1923 = C4576, and #1924 = C6834), note from the table above that the sherds of these as published in LVW have been reassigned.

The most fully preserved pithos, C4134, has an exact, though appreciably larger, parallel in the plastically decorated pithos no.1147 of shape 55(b) from the Archives Room 7 of the Palace of Nestor at Pylos (Blegen et al. 1966: 95, 394, fig. 381), a piece dated to the very end of the LH IIIB period and thus probably only slightly later, if later at all, than the Kommian example.

MICACEOUS COOKING POTTERY
KOMMOS: SOUTHERN AREA, AREA OF CIVIC BUILDINGS:

INV. NO.	TR.	PAIL	PORTION PRESERVED	CONTEXT DATE
C6507	53A	34	body sherd	LM I
C9906	88A	25	rim	LM IIIA
C10455	95C	196	body sherd	LM IIIB

KOMMOS: SOUTHERN AREA, HOUSE X:

INV. NO.	TR.	PAIL	PORTION PRESERVED	CONTEXT DATE
C8019	66A	27		LM IIIA1
C8127	66A	31, 34		LM IIIA1
C10264	93E	107	rim	LM IA Final
C10405	93E	59	base	Mixed MM III to LM IB

COMMENT: There is a good chance that these highly micaceous cooking pots (mostly shallow dishes, but also including at least one wide-mouthed jar) come from the Cyclades.

ABBREVIATIONS:
LVW = L.V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992).

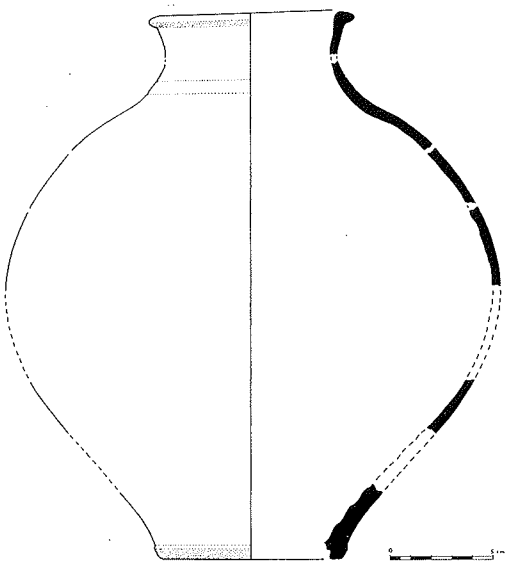

Fig. 1. *Composite drawing of imported Reddish-brown Burnished Jar, small size.*

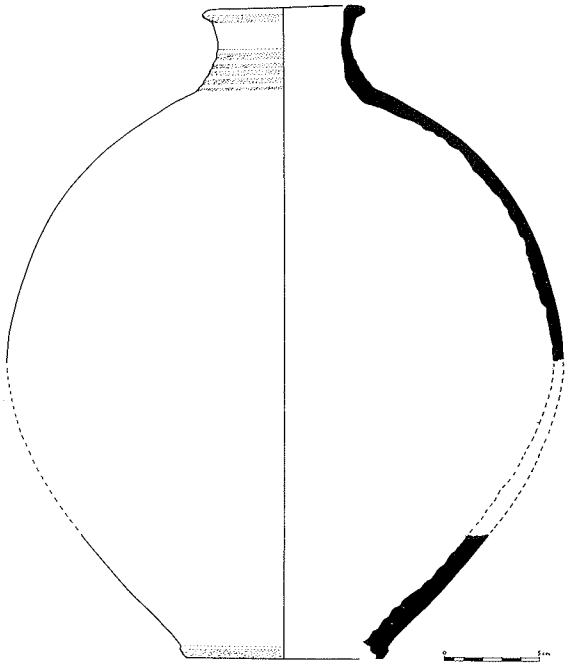

Fig. 2. *Composite drawing of imported Reddish-brown Burnished Jar, large size.*

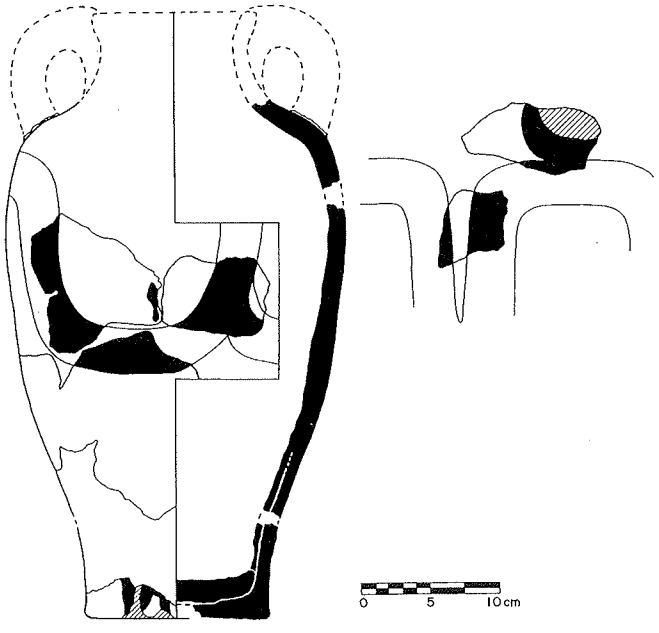

Fig. 3. *Kommos C9063: LM IIIA2 decorated short-necked amphora.*

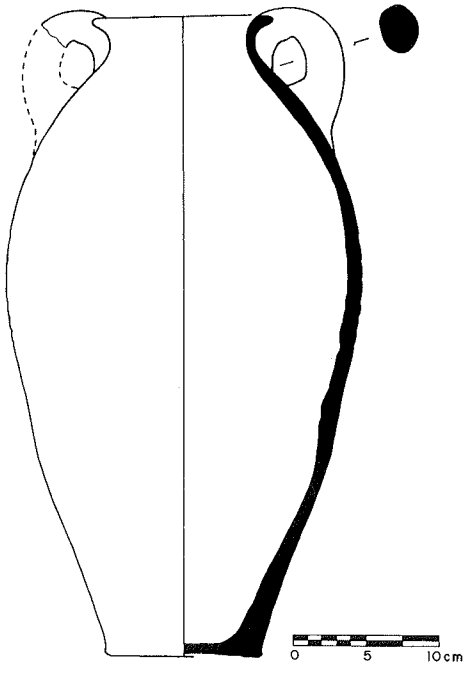

Fig. 4. *Kommos C10348: LM IIIB plain short-necked amphora.*

Mycenaeans and Cypriots in the Central Mediterranean before and after 1200 BC*

by Lucia Vagnetti

The three LBA shipwrecks known up to now in the Mediterranean – Uluburun, Cape Gelidonya and Point Iria – offer an unprecedented vivid image of what could be called "the archeology of trade" in a time span that roughly encompasses one hundred years, from the late 14th century to ca. 1200 BC.

Although the three groups are located in the eastern Mediterranean and in the Aegean, they undoubtedly offer some hints for a better understanding of the evidence for long-distance Mediterranean trade that also extends to the central Mediterranean, i.e. southern Italy, Sicily and Sardinia, with possible occasional voyages further West.

The direct evidence is limited: the Uluburun cargo contains a sword that the present speaker has compared with well-known examples, of the so-called Thapsos-Pertosa type (Fig. 1), which are ubiquitous in Sicily and in southern Italy (Vagnetti & Lo Schiavo 1989, 222, Fig. 28.2). Amber beads also have a western origin, specifically in the Baltic, possibly distributed through the Adriatic and, ultimately, along Mediterranean sea-routes, calling at Apulian ports (Harding & Hughes-Brock 1974).

As is well known, the interconnections of southern Italy, Sicily and Sardinia with the Aegean go back to the transition between the Middle Helladic and Late Helladic period (Vagnetti 1982; 1991; 1993; Re forthcoming). The related archaeological evidence is well known through primary publications and interpretations at various levels and there is no need to enter into details.

Here I would like rather to focus on some aspects of the evidence specifically related to the 13th and 12th centuries, a period when Mycenaean and Cypriot material is often found together in central Mediterranean contexts, as in the cargoes of the three wrecks just mentioned. In particular, I am going to discuss some classes of finds that match the range of objects and goods carried aboard the sunken vessels.

ANCHORS

Twenty-four stone anchors are surely associated with the Uluburun shipwreck (Pulak 1997, fig. 20), only two with that of Point Iria (Vichos 1996, figs. 1-3; Vichos & Lolos 1997, fig. 17; Iria Exhibition 1998, fig. 33), while a pierced stone found near the Cape Gelidonya cargo has eventually been disregarded by the excavator (Bass 1967, 45; contra McCaslin 1980, 31, fig. 18).

The typology of stone anchors was first elaborated by Honor Frost (1970; 1973) on whose work other more recent contributions have been built (McCaslin 1980; Wachsman, Haldane 1997; Wachsmann 1998, 255-294 and forthcoming). The contrasting evidence of a large number of items from the eastern Mediterranean (especially Cyprus, Israel, Byblos and Ugarit) and the limited finds from the Aegean has been stressed, giving rise to the suggestion that the Aegeans, rather than using the single-hole weight anchor or the three-hole composite anchor, very common in Cyprus and in the Levant, were probably more familiar with a type of device,called a "killik", in which an unworked stone of the appropriate weight was added to a sort of wooden cage whose remains (i. e. the stone) would go unnoticed in archaeological contexts (Wachsmann 1998).

In view of this, the items found in the central Mediterranean —if they are really attributable to the Bronze Age— seem to point towards a connection with Cyprus and the Levant, rather than with the Aegean. The evidence was first summarized by Quilici (1971) who published a stone anchor of the composite type found in the Tyrrhenian sea, *ca.* 10 km south of the mouth of the Tiber (Fig. 2:a). The anchor is of local stone (tufa) and has no association with wreck material or with archeological coastal sites of the Bronze Age. Quilici also lists several other stone anchors (all stray finds from the sea) from the Gulf of Naples, Sicily and the southern Adriatic coast.

Some very welcome additions to Quilici's list come from Sardinia where both types —with one or three holes— have been found. Some of the items from northern Sardinia were collected and illustrated by Fulvia Lo Schiavo (1995a; 1995b; 1997), who also lists some pieces from the south of the island. The only vague association available refers to a large anchor with a single hole, more than 70 kilos in weight (Fig. 2b); it was found on the sea-bed in a small cove under a promontory where remains of a nuraghe are still visible.

The lack of real archeological association for all the items and the long-lived shape (see recently Grossmann & Kingsley 1996) call for great caution in accepting the stone anchors as evidence per se of Bronze Age connections with the eastern Mediterranean; however, when looked at in the context of other archaeological evidence, they may acquire some relevance to the discussion.

INGOTS

According to the most recent estimation the Uluburun shipwreck contained *ca.* 10 tons of copper and one ton of tin (Pulak 1997, 235). Copper was shipped in two main forms: oxhide ingots and plano-convex or bun ingots, both of which are known in large number in the central Mediterranean.

Fragments of oxhide ingots are known from Sicily (Cannatello and Thapsos), the Aeolian islands (Lipari) and twenty-six sites in Sardinia. Four items, three from Serra Ilixi and one from S. Antioco di Bisarcio, are complete and also carry incised marks similar to Aegean and Cypriot scripts (fig. 3). In most cases, however, they were found in fragmentary condition and in hoards also containing bun ingots as well as complete and fragmentary tools and weapons (Lo Schiavo 1998 and forthcoming).

One should stress the fact that the distribution of oxhide ingots is centred in certain specific points in the Mediterranean and that the highest concentration of find spots on land is in Cyprus and Sardinia.

A recent thorough study of the Nuragic pottery containers inside which the metal hoards were found and of the associated metal items has allowed a better chronological attribution of the deposits which, in most cases, should be referred to the Nuragic Late and Final Bronze Age, i.e. the 13th, 12th and 11th centuries BC (Lo Schiavo 1998 and forthcoming; Campus-Leonelli forthcoming).

PITHOI

Thanks again to the Uluburun wreck we have also acquired a better understanding of the use of pithoi as large transport containers, not only for water or food, but also for manufactured objects such as pottery (Bass 1986; Pulak 1997). A number of pithoi of Cypriot type and manufacture was also found in the Iria wreck (Lolos 1995;

1996; Iria Exhibition 1998, figs. 13, 21); a large neck fragment of a similar pithos comes from Kommos (Watrous 1992, fig. 70). In the central Mediterranean we know of two fragmentary examples of the same origin: the sherds of a Cypriot pithos from Antigori in southern Sardinia (Fig.4) have been known for long time and their Cypriot origin has also been confirmed by archaeometric analyses (Ferrarese Ceruti, Vagnetti & Lo Schiavo 1987, fig. 2.5; Jones & Day 1987, 262, sample 62); the recent find of a similar pithos at Cannatello, in Sicily has been illustrated and discussed in preliminary publications (Karageorghis 1993, 584, fig. 3; Deorsola 1996, 1037, pl. VI,a).

Lolos (1996, 19) emphasises the very good quality of the Cypriot pithoi in comparison with the average quality of Creto-Mycenaean pithoi of the Late Bronze Age. One wonders if Cypriot potters had developed a high technological level for the production of these containers, which may have become a sort of "quality item", particularly suitable for long distance transport of goods. A situation that can to some extent be compared —on an ethnographic basis— with the fortune and distribution of the very strong pithoi produced in the 19th and early 20th century AD at Koroni in Messenia —the well known "Koroneika"— thoroughly studied by Harriet Blitzer (1990).

An interesting evaluation of the use of big containers in trade also emerges from some recent studies of collared-rim jars in the Late Bronze Age Levant (Artzy 1994; 1997; Wengrow 1996), where they are linked with areas such as Tel Nami, where sea-borne trade converged with land communication routes, along which dromedaries seem to have been already in use in the Late Bronze Age (Artzy 1994). This specific point cannot be extended to the Aegean or to the central Mediterranean, but could have encouraged technological improvement in the production of large containers in Cyprus, from where some items found at Ugarit and elsewhere in the Levant originated (Åström 1972, 259-64, Fig. LXXII:6; Yon, Lombard & Renisio 1987, fig. 27:79/955).

OTHER CYPRIOT POTTERY

Cypriot pottery other than pithoi, although not particularly frequent, has been recognized in various Italian Late Bronze Age contexts, always associated with Mycenaean pottery of late LH IIIA or IIIB (Lo Schiavo, Macnamara & Vagnetti 1985).

Complete examples of White Shaved flasks have been found at Thapsos in Sicily, together with juglets of Base-Ring shape, but of as yet unidentified fabric (Lo Schiavo, Macnamara & Vagnetti 1985, fig. 2:1-3; Karageorghis 1995). Recent excavations at Cannatello have brought to light sherds of a White Slip bowl. A Rude Style sherd was found in Campania at Eboli (Vagnetti & Lo Schiavo 1989, 219, fig. 28.1c).

In comparison with Cypriot pottery, Mycenaean and LM III pottery was definitely favoured by the central Mediterranean groups, as the very wide distribution of the finds immediately shows.

There are specific types of Mycenaean and LM pottery, such as the coarse ware stirrup jars of Cretan manufacture, associated with trade and specifically with Cyprus, that have also been found in Italy. There are examples from the sea near Filicudi in the Aeolian Islands (Vagnetti 1991, pl. IX:7) and from Antigori in Sardinia (Ferrarese Ceruti, Vagnetti & Lo Schiavo 1987, 2.4:3). Part of a handle belonging to an imported plain stirrup jar is also among the Broglio di Trebisacce finds (Vagnetti & Panichelli 1994, pls. 75:11; 80:3c).

Three handles of stirrup jars from Cannatello in Sicily display incised potter's marks which seem to be close to the Cypriot repertoire (De Miro 1996, 1004, pl. VII, lower row). I have not personally inspected the pieces and I cannot say if the marks are incised after firing as is customary, according to N. Hirschfeld (1992; 1993; 1996), who is studying the corpus of this kind of marks, in examples found in Cyprus and in the Aegean. In any case it is interesting to point out that the distribution of these marks outside Cyprus is always related to contexts where other evidence of Cypriot connections has been found, as in the case of Cannatello.

IVORY

Semi-worked elephant and hippopotamus ivory found at Uluburun has shed new light on the mode of circulation of this precious raw material.

Late Bronze Age ivory objects are rare in the central Mediterranean, but one should also stress that no thorough research on this subject has yet been attempted. A fragment of an imported Mycenaean warrior head with a boar-tusk helmet comes from

southern Sardinia (Ferrarese Ceruti, Vagnetti & Lo Schiavo 1987, 2.3:2, a-c), but from sites in peninsular Italy there is also evidence for local working of the material.

The case of Frattesina, where waste material and finished objects (mostly combs) were found together, is already known (Bietti Sestieri 1981; 1997). One comb of Frattesina type was also found at Enkomi, indicating an interesting pattern of circulation of raw material from East to West and of finished products in the opposite direction (Vagnetti 1986).

This type of comb, in horn or bone and more rarely in ivory, is also known from several other sites in peninsular Italy (Cassola Guida, forthcoming). An example in elephant ivory from Torre Mordillo in southern Italy (Fig. 5), is a recent addition to the corpus. At the same site, where Mycenaean pottery is also well represented, a second fragment of elephant ivory, most likely a waste piece, was also found, showing that ivory working was practiced there also (Arancio, Buffa, Damiani, Tagliacozzo, Trucco & Vagnetti 1995, fig. 1:7).3

GLASS

The presence of glass ingots in the Uluburun shipwreck also sheds new light on the circulation of this material. In fact the ingots represent a sort of semi-worked state of the material, which could have been remelted at any site with sufficient pyrotechnological skill, in order to produce small objects on the spot (Rehren & Pusch 1997; Nicholson, Jackson & Trott 1997). Frattesina in northern Italy, where evidence for such a production is represented by a large number of glass beads as well as by crucibles with remains of glass, is again a candidate for such an activity (Bietti Sestieri 1997).

METALWORK

Fulvia Lo Schiavo, Ellen Macnamara and the present speaker have tried, jointly and individually, to collect the evidence for Cypriot metalwork imported to the central Mediterranean and for its impact on local craftmanship, especially on Sardinia (Macnamara, Ridgway & Ridgway 1984; Lo Schiavo, Macnamara & Vagnetti 1985; Vagnetti 1986; Vagnetti & Lo Schiavo 1989). Several connections have been identified, in most cases related to the sphere of tools used for metalwork, such as heavy double axes and hammers, tongs and charcoal shovels. Tripods of Cypriot type are both

imported and locally imitated in Sardinia, as well as some type of metal vessels found in Sicily (Vagnetti 1968; La Rosa, forthcoming).

FINAL REMARKS

This brief survey shows clearly how the central Mediterranean finds match many classes and specific types of objects of Cypriot and Mycenaean origin included in the cargoes that we have been discussing. The evidence is supplemented by what has been found at some harbour sites in Cyprus and in the Aegean, in particular at Kommos, where some sherds of hand-made burnished pottery which in preliminary publications (Watrous 1989; 1992) went under the general label of "Italian", are typologically and —as far as has been said in anticipation— also archaeometrically characterised as Nuragic (Jones & Vagnetti 1991, 134).

But what was the impact of such a trade on the central Mediterranean terminals?

Without analysing in detail the various aspects of the Aegean and Cypriot connections with local societies, we may emphasise a few points.

Traded objects found in the central Mediterranean are always inserted in local contexts, in sites already established, that in several cases survived the end of the systematic trade, which had its climax in LH IIIA and IIIB; imported LH IIIC material exists, but is very scanty (Vagnetti & Panichelli 1994).

What emerges from the data is that the circulation of finished products, such as pottery and metalwork, and of semi-worked raw materials, such as ivory, glass and possibly oxhide ingots, gave an impetus to the establishment of local workshops producing a variety of artefacts of specialised technology.

To the already mentioned ivory and glass working, particularly flourishing at Frattesina in the Po valley, but also known elsewhere, one should of course add the numerous local workshops producing wheel-made pottery of levigated clay in LH and LM IIIB style, with a continuity until IIIC, located at various sites in southern Italy and Sardinia and identified thanks to the combined effort of archaeology and archaeometry (Jones 1986; 1993, forthcoming; Jones & Day 1987; Jones & Vagnetti 1991; 1992; Jones, Lazzarini, Mariottini & Orvini 1994; Vagnetti & Jones 1988; Vagnetti 1994).

The Cypriot pithoi that arrived at Italian coastal sites in the 13th century may have stimulated the production of similar containers, decorated with raised bands and group of grooves on the shoulder and body (Fig. 6), known at several sites in southern Italy, with a high concentration in the Sibaritide area in northern Calabria (Bergonzi 1985; Tenaglia 1994; Levi 1995; Bianco & Orlando 1995; Levi, Jones, Lazzarini, Sonnino & Vagnetti 1998; Guglielmino, forthcoming).

While pottery, with the exception of big storage jars, seems to be under the predominant influence of the Mycenaean tradition, metalwork, especially in Sardinia, owes much more to Cypriot influence.

In both cases the working hypothesis, on which one may try to build up a convincing pattern, is that potters from the Aegean and bronzesmiths from Cyprus regularly visited the central Mediterranean, possibly on a seasonal basis and following, at least at the beginning, the main stream of long-distance trade (Lo Schiavo, Macnamara & Vagnetti 1985; Vagnetti & Lo Schiavo 1989; Jones & Vagnetti 1991; Vagnetti 1999). The fall of the Mycenaean palace system and the consequent disruption of a well-established trade network, may even have encouraged some of them to migrate and give birth to stable workshops operating in a new environment and in a different economic reality.

However, the circulation of craftsmen does not seem to have been exclusively from East to West; the well-known mould for a winged axe of a type common in LBA peninsular Italy, found in the House of the Oil Merchant at Mycenae, is just one of the many indications of feedback, which represent another fascinating chapter of Mediterranean interconnections and which we are not going to discuss here (Matthäus 1980; Bettelli 1995 and forthcoming).

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NOTES

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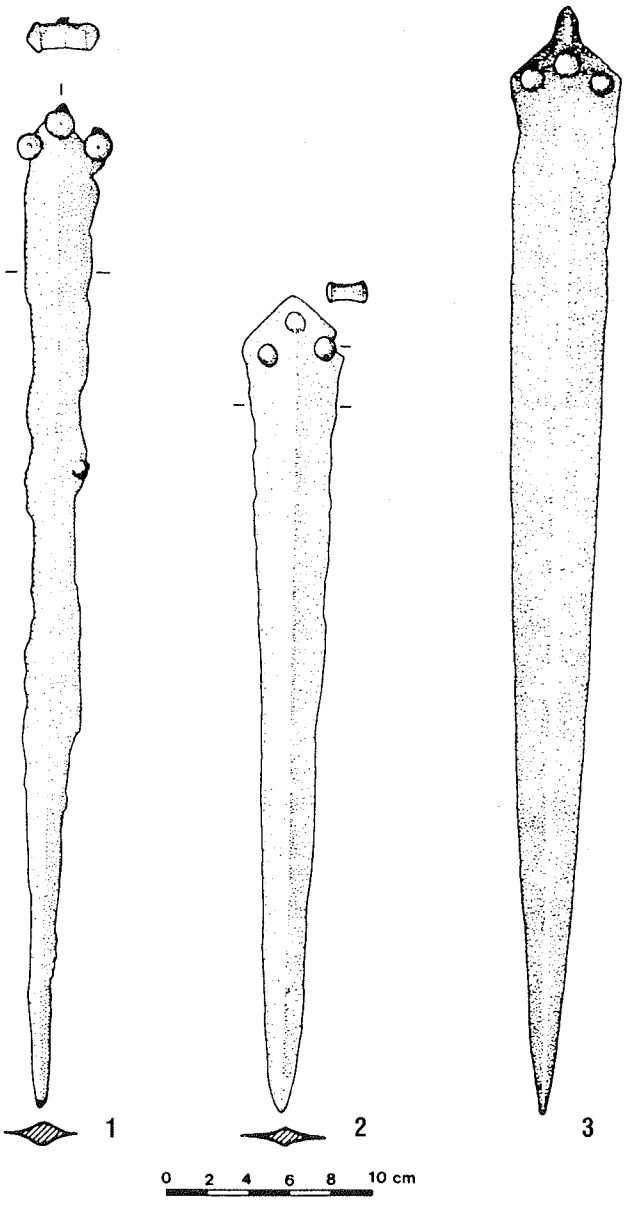

Fig. 1. *Daggers of Thapsos-Pertosa type.* ***1****: Ulubarun, Turkey;* ***2****: Venosa, Southern Italy;* ***3****: Matrensa, Sicily (after Vagnetti & Lo Schiavo 1989).*

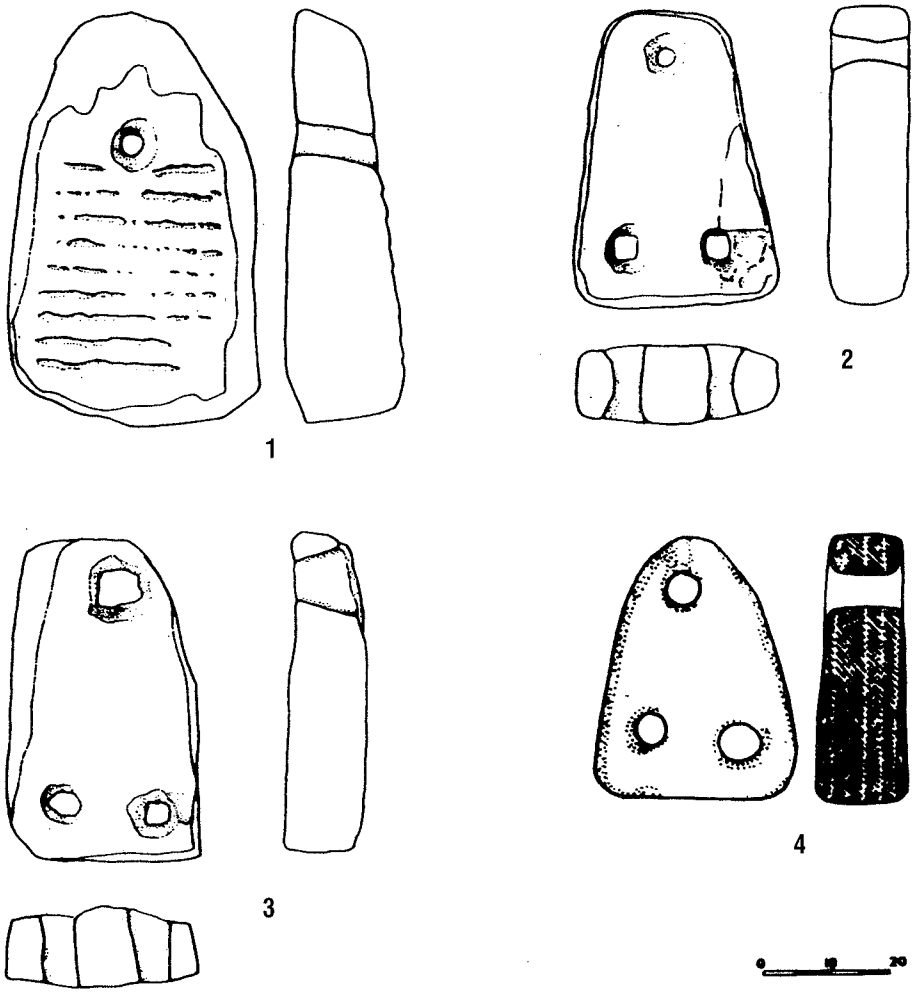

Fig. 2. *Stone anchors from the Tyrrhenian sea.* ***1-3:*** *from Sardinia (after Lo Schiavo 1995b);* ***4:*** *from the sea, south of the Tiber mouth, central Italy (after Quilici 1971).*

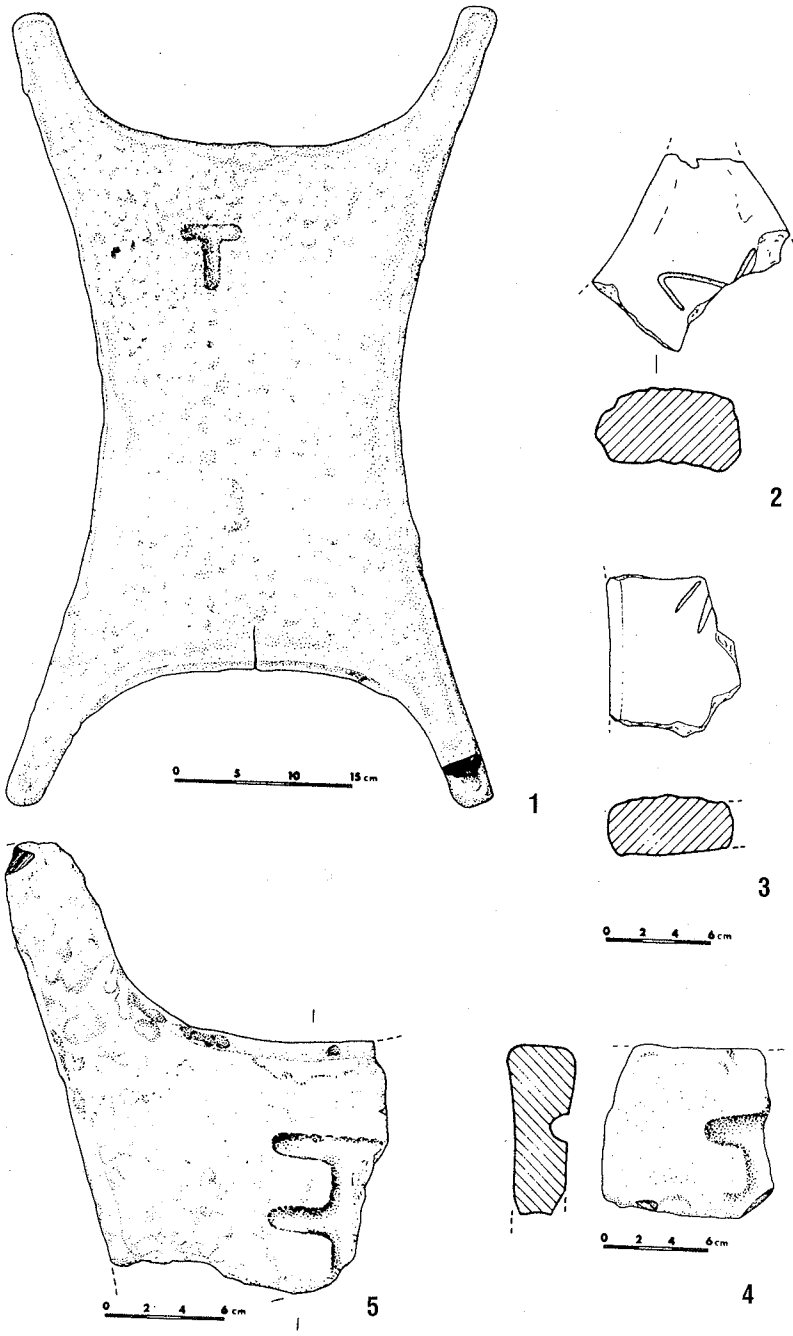

Fig. 3. *Oxhide ingots bearing impressed marks from Sardinia.*
1*: Ozieri;*
2-3*: Sardara;*
4*: Teti;*
5*: Capoterra (after Vagnetti & Lo Schiavo 1989).*

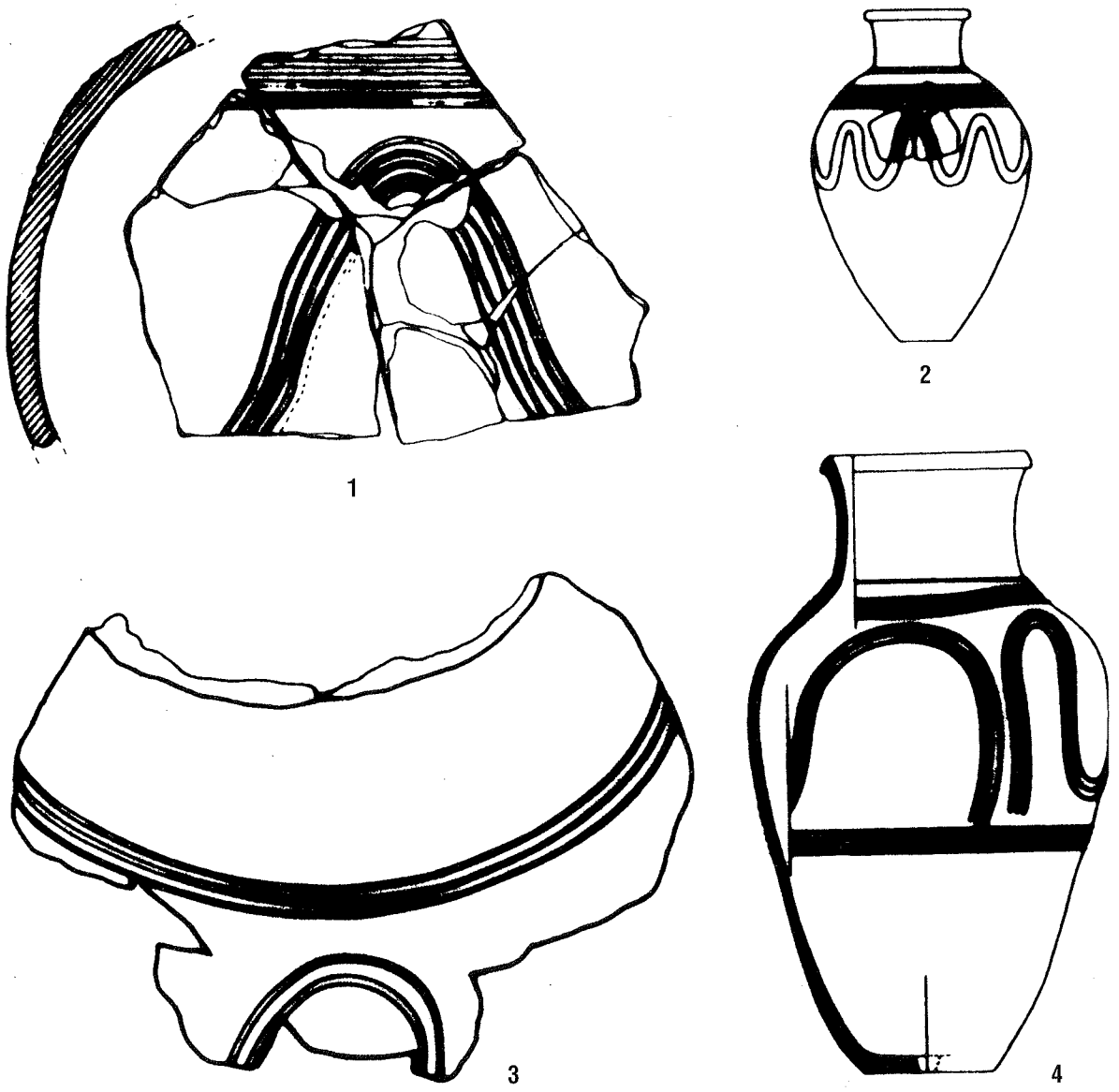

Fig. 4. *Cypriot pithoi decorated with wavy bands.*
1-2*: Sherds and possible reconstruction*
of the complete pithos from Antigori, Sardinia;
3*: Fragmentary pithos from Cannatello, Sicily;*
4*: Pithos from Ayia Irini, Cyprus*
(after Åström 1972). Not to scale.

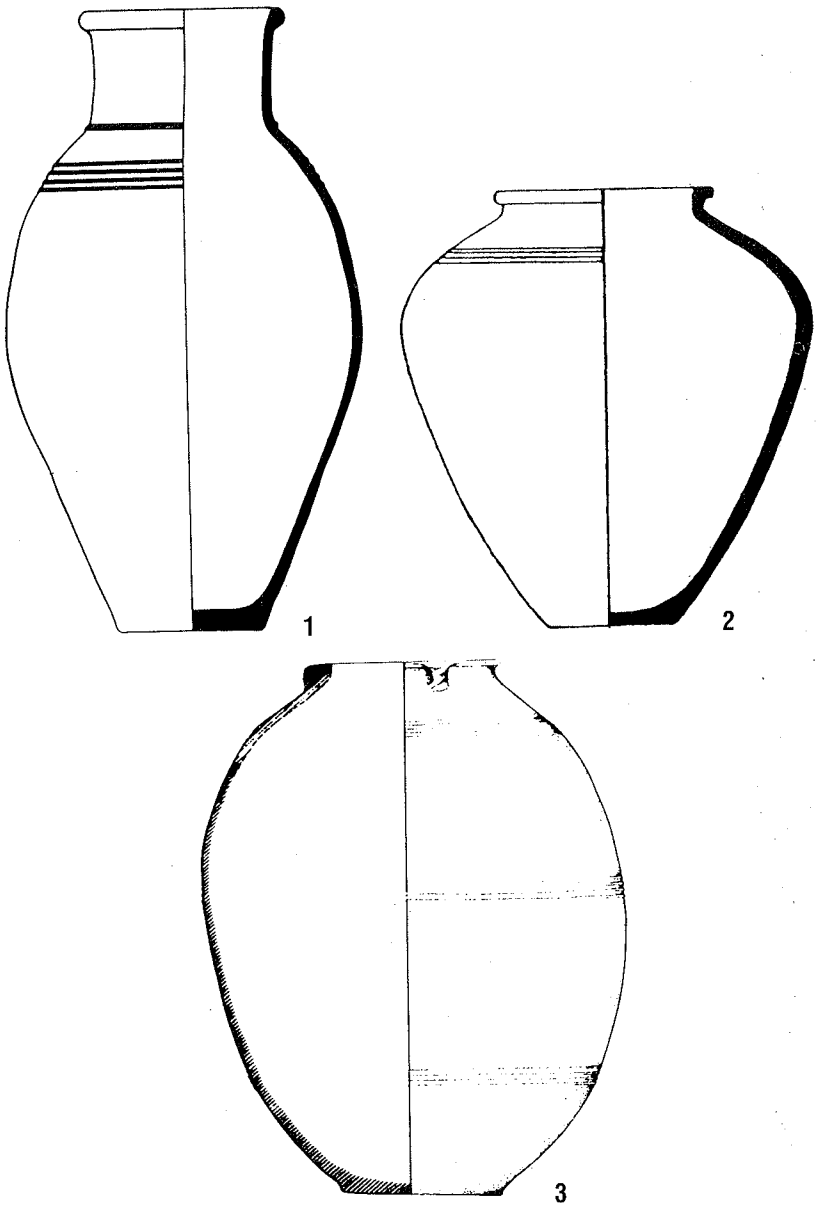

Fig. 5. *Cypriot and Italian pithoi decorated with horizontal groovings.*
1*: From Cape Iria, Argolid (after Lolos 1995);*
2*: From Myrtou Pigadhes, Cyprus (after Catling 1957);*
3*: From Timmari, southern Italy (after Bianco & Orlando 1995).*
Scale 1:33.3 (1-2) 1:20 (3).

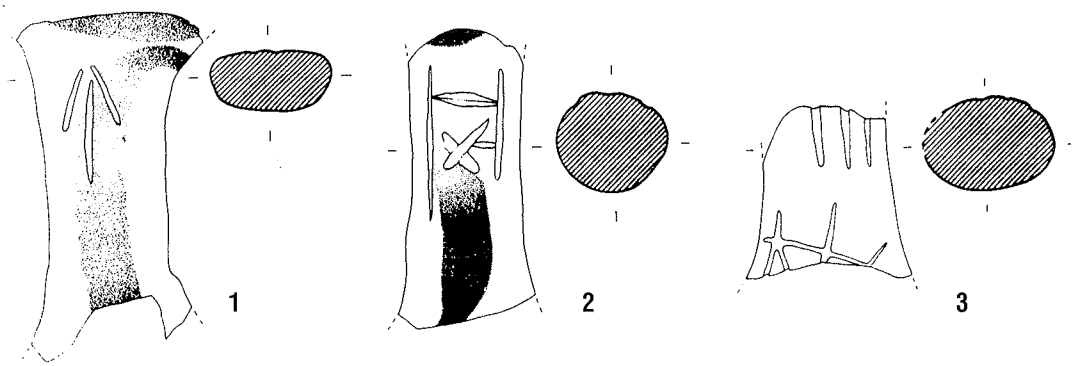

Fig. 6. *Stirrup jars' handles with potter's marks from Cannatello, Sicily (after De Miro 1996). Scale 1:3.*

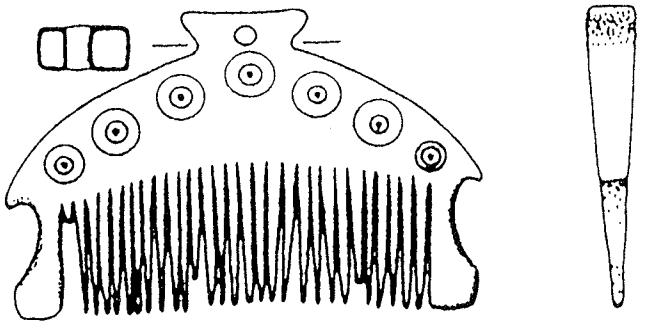

Fig. 7. *Ivory comb from Torre Mordillo, southern Italy. Scale 1:1.*

The Late Bronze Age Shipwreck at Uluburun: Aspects of Hull Construction

by Cemal Pulak

The Institute of Nautical Archaeology's (INA) shipwreck excavation between 1984 and 1994 at Uluburun, near Kaş, a small cape on the southwestern coast of Turkey, brought to light one of the wealthiest and largest known assemblages of Late Bronze Age trade goods yet discovered in the Mediterranean.[1] Dendrochronological dating of a piece of presumably fresh-cut dunnage or firewood suggests that the ship sank some time around 1300 BC.[2]

The ship's primary cargo comprised approximately ten tons of Cypriot copper ingots and nearly a ton of tin ingots of unknown origin, both cast predominantly in the typical oxhide shape (Stos-Gale *et al.*, 1998). Other raw materials included glass ingots, ebony logs, hippopotamus and elephant ivory, ostrich eggshells, terebinth resin carried in Canaanite jars, and various foodstuffs. Manufactured goods included ten large storage jars (pithoi), some of which contained Cypriot wares for export. Also found were metal and faience vessels, ivory containers, a jeweler's hoard of gold and silver, and tools and weapons of bronze. Study of the cargo and personal effects of those on board suggests that the ship was a Canaanite or a Cypriot vessel sailing from the Syro-Palestinian coast or Cyprus to the Aegean. The finds further suggest that there were at least two Mycenaeans of rank traveling on the ship, probably as envoys.

The distribution of the copper oxhide ingots and other objects on the site showed that the shipwreck was oriented approximately east to west, its western extremity being uppermost on the sloping seabed, with the rows of ingots running athwartships. The dispersion of some of the cargo to the south indicated that the ship had settled on the slope with a list to starboard, which excavation of the ship's keel suggested was approximately 15 degrees. The stern of

the ship rested at the shallower end of the site, at approximately 44 meters, and its bow at about 52 meters, with additional cargo scattered down the steep slope to a depth of 60 meters or more. The distribution of the artifacts on the seabed suggests a length of about 15 meters for the ship; a total capacity of at least 20 tons is an approximation based on the total weight of the cargo, anchors, and ballast stones recovered during excavation. It is not known, however, how much of the ship's original cargo perished. Any estimates regarding the hull's basic dimensions and capacity, therefore, must remain speculative.

The ship's cargo of copper oxhide ingots was originally stowed in four neat rows, each of multiple layers and running from one side of the hold to the other. Many ingots either slipped down the slope after the ship sank or were displaced as the hull settled under the tremendous weight of the cargo, but the basic arrangements of the rows survived. This displacement of ingots, evident in all four rows, but particularly pronounced in the first row (highest on the slope, nearest the stern) and the fourth (lowest on the slope), makes it impossible to ascertain any ingot's original position. Those still in place, however, revealed that the ingots in any given layer overlapped one another like roof shingles, with the direction of overlap alternating from layer to layer (Pulak 1998, 197, fig. 12).

On the ship were 24 stone anchors, all of the single-hole type (Fig. 1). Extensive surveys carried out by the excavation team around the site and in the area between the shipwreck and the terminus of the cape, from shore to a depth of 50-55 meters, did not reveal additional anchors that could have been deployed as a last measure to prevent the ship from being driven against Uluburun's jagged rocks. It is possible, however, that such anchors were simply missed by the surveyors or that they lay in inaccessible depths. Two of the anchors are much smaller (21.9 and 25. 9 kilograms) than the others and may have been for use on the ship's boat, or perhaps served another purpose entirely. Although only about 25 percent have been cleaned and weighed to date, it does seem that the remaining 22 anchors can be loosely grouped into three basic weight categories: the heaviest at about 210 kilograms, the mid range at 164-182 kilograms, and the lightest at about 120 kilograms. Eight were found between the first and second rows of copper oxhide ingots and were probably stored amidships in the

hold, on their sides as pairs, one on top of the other. Another 16 anchors were uncovered at the deep end of the site in the area corresponding to the ship's bow. Of these, 12 appeared to have been stowed downslope of the fourth row of copper ingots, in an area probably corresponding to the forward extremity of the ship's hold. These anchors, and the eight stored amidships, must have been spares for replacing any that were lost during the voyage; judging by their number, losses must have been frequent. As such, these anchors would have been kept low in the hold to maximize the ship's stability, but readily accessible when needed. On the other hand, 4 anchors, 2 per side, may have been kept on the foredeck for use in routine anchoring of the ship. How the ancient mariners managed these heavy anchors is not known, but some lever-type device may have been used in their recovery. What this device looked like and how it functioned is still unknown to us, but it may have taken the form of a simple derrick fixed to the mast (Frost 1995, 168, fig. 3), or the boom or yard of the square sail may have been rigged in a special way.

The Uluburun anchors are of a type and size virtually unknown in the Aegean,[3] but often found in the sea off the coast of Israel (Wachsmann 1998, 265-70, 272-73, 285-86; Galili, Sharvit & Artzy 1994); in the walls of temples and tombs at Ugarit and its port at Minet el-Beida (Schaeffer 1978; Frost 1969a, 1991) and at Byblos (Frost 1969b; Wachsmann 1998, 271-73), on the Syro-Palestinian coast, and at Kition on Cyprus (Karageorghis 1976a, 875-78; 1976b, 60, 69, 72, 78, 169; Frost 1985; Wachsmann 1998, 273-74). Such anchors seem to have been manufactured at Tell Abu Hawam and Tell Nami (Bass 1991, 74). A similar type of anchor is also known from the Late Bronze Age shipwreck at Cape Gelidonya (Pulak & Rogers 1994, 20-21; Wachsmann 1998, 283, 285).

In addition to the cargo and anchors, a unique aspect of this Late Bronze Age shipwreck is the preserved parts of its hull. Due to the steep, rocky nature of the seabed at Uluburun, somewhat reminiscent of that at Point Iria, what little of the hull that was preserved is extremely scanty and fragmented. Nonetheless, these remains may be easily grouped into three distinct sections, with a fourth consisting of only a few completely disarticulated and damaged bits of planking (Fig. 2). The largest section of hull was located in the only relatively flat and sandy area of the site, near the

eight stone anchors high up on the slope between the first and second rows of copper ingots. This section owed its preservation, in part, to the weight of the stone anchors, which forced the keel and planking into the sand that had accumulated on a relatively flat ledge. The second and third hull sections, on the other hand, were preserved under the second and third rows of copper ingots, respectively. Although much of the planking from these last two sections is stained green and severely distorted from the immense weight of the copper oxhide ingots that had been placed on them, they nevertheless were preserved by these ingots. The toxic environment created by the copper evidently discouraged marine borers and other organisms detrimental to the preservation of hull timbers. Results of wood species analyses revealed that the hull was built of cedar (*Cedrus* sp.),[4] instead of fir (*Abies* sp.), as previously identified and published (Bass 1989, 25). This new identification is not at all surprising when one considers that Bronze Age sources often mention cedar as the timber most preferred for building ships. The physical and mechanical attributes of cedar are well suited for shipbuilding: shrinkage is minimal, seasoning is achieved without significant distortion, it is easily worked and has little dulling effect on tools, and it is more resistant to decay in salt water than most other woods (Steffy 1994, 27, 256; Rival 1991, 36).

In addition to the hull itself, remains of a bulwark fencing have also been tentatively identified (Fig. 3). A row of five well-rounded stakes, the only nearly fully preserved example of which is 1.7 meters long and nearly 7 centimeters in diameter, was excavated several meters north (starboard) of the hull remains. One end of each stake had been sharpened to a point with four or five strokes of an axe or adze; the sharpened ends of all the stakes pointed toward the keel. Lying on and somewhat perpendicular to the stakes were closely-spaced parallel withies. There is no surviving evidence to suggest that the withies were in fact fastened to the stakes, but this assemblage almost certainly represents the type of wickerwork weather fencing visible in all Syrian ships depicted in nearly contemporary Egyptian tomb paintings (Davies & Faulkner 1947, pl. 8; Davies 1963, pl. 15; Säve-Söderbergh 1957, pl. 23; Basch 1978, 102, figs. 4-6; 1987, 63-65, with figs.), and it reminds us also of the wicker fencing assembled by Odysseus to keep the waves out of the boat he built to leave Calypso's island (Odyssey 5.256-257).

Since 1984, when the first hull section was exposed during the initial excavation campaign, we had known that the ship's planking was assembled with mortise-and-tenon joinery similar to that found on Greek and Roman ships of more than a millennium later. In contrast to the present-day "skeleton-based" construction technique, whereby a ship's planking is shaped around and fastened to a pre-erected skeleton of the vessel, the ancients used the "shell-based" method, which entailed edge-joining the planks with mortise-and-tenon joints that were then locked in place with wooden pegs driven through the tenons. Mortise-and-tenon joints had, of course, been used in Bronze Age ships in Egypt, as attested in Khufu's funerary boat at Giza (ca. 2600 BC) and Senusret III's boats (ca. 1850 BC) at Dashur (Lipke 1984, 64; Steffy 1994, 25-27, 32-36; Patch & Haldane 1990, 34-35, fig. 19). These early Egyptian examples of mortise-and-tenon joints, however, were freestanding and not pegged to lock adjacent planks to one another. As such, they offered considerably less longitudinal support for the planking than did their pegged counterparts. Their primary function during construction was to align the planks, which were then fastened to each other with ligatures.

This tradition of shipbuilding appears to have persisted at least as late as the 5th century BC, when Herodotus observed nearly identical construction methods in use in Egypt. In his oft cited and much discussed passage, Herodotus noted that short planks were joined to each other with long, close-set tenons, which were then caulked from the inside using papyrus fibers (Casson 1973, 14-15). If Herodotus was, indeed, describing the caulking of the hull from inside with papyrus fibers [as argued by Casson (1992), but see Haldane and Shelmerdine (1990) for another view], this then, almost certainly implies that the planks were fastened to each other with ligatures, as the caulking material would have to have been kept in place by the ligatures used in lacing seams of adjoining planks (see also, Wachsmann 1998, 228-29). Herodotus makes no mention of locking the tenons with pegs, but the Egyptians were fully aware of pegged mortise-and-tenon joints as least as early as Dynasty III (ca. 2700-2600 BC) and used them in woodwork requiring this type of fastening (Lucas & Harris 1962, 451). As far as we can determine, however, they were not utilized in shipbuilding, unless they were restricted to seagoing ships only, for which we have no surviving Egyptian examples.

Exactly when and where pegged mortise-and-tenon joints were first used to build seagoing ships is not known. The earliest documented use of this type of joint in the Near East, however, is much later than in Egypt, and is seen in woodwork (Ricketts 1960, 530, fig. 229.1) dating to the Middle Bronze IIB period (*ca.* 1800/1750-1650 BC). It is possible that pegging mortise-and-tenon joints in shipbuilding may have developed on the Levantine littoral and spread westward from there (Basch 1981; Wachsmann 1998, 239-41), and that this type of joint, termed "Phoenician" by the Romans (Sleeswyk 1980), may have been more than mere coincidence. It is of interest, therefore, that their earliest archaeologically documented use in shipbuilding occurs in the remains of the Uluburun ship, which almost certainly was built somewhere along the Syro-Palestinian coast or on Cyprus. Moreover, reexamination of published hull wood drawings (Bass 1967, 50-51) and unpublished photographs from the Cape Gelidonya shipwreck (ca. 1200 B.C.), another Syro-Palestinian or Cypriot ship, indicates that pegged mortise-and-tenon joints were also used in its construction–more will be said on this below. Nevertheless, it is impossible to offer a convincing answer to this query until more Bronze Age shipwrecks are discovered and excavated.

Before discovery of the Uluburun hull, the earliest conclusive use of the shell-based method of shipbuilding using locked mortise-and-tenon joints was revealed through the excavation and detailed study of a late-4th-century BC merchantman found near Kyrenia, Cyprus (Steffy 1985; 1994, 42-59). While the Kyrenia ship still remains the only well-documented and published example of an early ship built in this ancient fashion, recent discoveries have shown that the method dates at least several centuries earlier. At present, the earliest archaeologically attested use of locked mortise-and-tenon joinery in post-Bronze Age ships is seen in the 7th-century BC shipwreck at Mazarrón, Spain (Negueruela *et al.* 1995, 195-96), but this site is still under investigation and preliminary reports do not allow for full evaluation of the hull's constructional details. More complete documentation exists for the late-6th-century B.C. Jules Verne 7 ship at Marseilles (Pomey 1995, 475-80) and the late-5th-century BC Ma'agan Michael shipwreck near Haifa (Steffy 1994, 40-42). Although archaeological evidence for it is extremely limited, it seems highly likely that the late-5th- or early-4th-century Porticello ship was also built in the same tech-

nique (Eiseman & Ridgway 1987, 10-13; for a more recent date of the shipwreck, see Lawall 1998). Although nothing of this ship's hull has survived, that pegged mortise-and-tenon joints were used in its construction is strongly suggested by the discovery of several loose tenons and a sliver of wood with a pair of mortises presumably representing a plank fragment. Of these five ships, three also employed lashing or lacing in the fastening of some timbers, specifically, frames to strakes in the case of the Mazarrón ship, and the ends of the lower strakes to stem and sternpost on the Jules Verne 7 and Ma'agan Michael ships.

The Uluburun hull remnants in this first section to be discovered were found to be fairly well preserved on their inboard surfaces over an area measuring some 1.8 meters by 1 meter in width (Fig. 2). These remains comprised a 1.7-meter section of the ship's keel, port garboard (the plank or strake adjoining the keel) and second strake, both of which preserved their complete widths, and fragments of the third strake. Only a fragmented portion of the garboard survived on the starboard side. This contiguous hull section, which lay on the only flat area of the seabed at the site, was protected by a blanket of sand that had accumulated over it, but was poorly preserved on its outboard surface, that is, the surface corresponding to the exterior of the hull. An unusual aspect was the lack of any evidence for framing. At this time we reason that perhaps the preserved hull section is not sufficiently wide or perhaps long enough to include frames or bulkheads or evidence for securing such structural elements to the planking, especially if they were not affixed to the first few strakes on either side of the keel.

Another unusual feature was the overall appearance of the ship's keel. When first uncovered, the flat top surface (the interior sided surface) of the keel was 10 centimeters higher than the interior surface of the garboard strakes, instead of being at the same level with them, as is usually the case in ancient Mediterranean hulls (Fig. 4). For this reason, it was thought that all mortise-and-tenon joints between the keel and garboard had sheared away completely and that the bottom planking had eventually settled at a level below its original position on the hull. Examination of the upper portion of the keel's sides (molded surfaces) above the level of the garboards, however, did not reveal any evidence to suggest that the garboards had been fastened to the keel in this area, nor

was there any beveling or a rabbet on either side of the keel to accommodate the garboards, all of which indicated that the strakes were indeed found in or near their original positions –below the interior sided surface of the keel.

It had been assumed initially that the keel projected well below the exterior surface of the planking, as do most traditional keels. Raising the keel clearly disproved this notion, revealing that the garboards had been fastened to the keel with mortise-and-tenon joints near its bottom surface, such that the keel had protruded only slightly below the outboard surface of the garboards. Equally remarkably, it was determined that the keel was originally wider (sided 28 centimeters) than it was high (molded 22 centimeters). It should be noted, however, that the latter dimension has been reconstructed with information from a small, well-preserved knot in the keel's exterior, which otherwise had been completely destroyed by teredo worms. Therefore, this value may not correspond precisely to the original molded dimension of the keel, but it is sufficiently close to give an accurate impression of the keel's size and, thus, its position relative to the level of the garboards. It should be noted also that a 50-centimeter length of the keel (Fig. 2), which was slightly askew (to the south) of direct alignment with the larger keel piece, was preserved in the third hull section, located approximately 1.3 meters farther down the slope (Fig. 2). As with the larger keel section, the original outboard surface of this keel piece is nonexistent, but its extensively encrusted inboard face suggests a sided dimension of only 21-22 centimeters. If this is the case, then, it seems that the keel narrowed by about a quarter of its maximum width toward the bow and, presumably, also the stern, though exactly how narrow it originally was at either extremity cannot be determined from the surviving parts of the hull.

Nonetheless, it is clear that the keel's sided dimension was greater than its molded dimension. It also seems safe to conclude that the bottom of the keel originally projected only about 2 centimeters beneath the outboard surface of the garboards. Such a robust longitudinal stiffener, then, would have effectively served as a spine or backbone for the hull, provided protection to the bottom planking, and supported the weight of the vessel when beached or hauled ashore. Unlike keels of later sailing ships, however, it would have helped the ship little to hold course or point nearer the wind when sailing against contrary winds. The keel plank or

proto-keel of the Mazarrón ship is of a somewhat similar configuration, with its sided dimension (17 centimeters) greater than its molded dimension (10 centimeters), but it differs from the Uluburun keel and garboards in that its inboard surface is at the level of the garboards (Azipurua & Méndez 1996, 219).

It appears, therefore, that we have on the Uluburun ship a rudimentary or proto-keel that is significantly more massive than a simple keel plank —which offers little or no longitudinal stiffening to a hull— but one unlike a true keel in the traditional sense. Not only does this unusual keel configuration allow for a better understanding of the development of ancient shipbuilding concepts, but it also helps reveal the technological and sailing limitations of Bronze Age seagoing ships and the implications of such constraints on maritime trade routes utilized during the Bronze Age.

The two remaining sections of hull preserved under the copper ingots correspond to the starboard side of the ship's hold. Both sections are somewhat disarticulated, crushed, and distorted, making the identification and association of some of the poorly preserved planking in these areas difficult and arbitrary. Unlike the remains of the third section, however, much of the wood in the second section is extensively eroded and had shifted a little after settling on the seabed. Therefore, the identification of strake numbers and their specific association with the other hull timbers is somewhat problematic. The force of dispersal appears to have been more violent here than at the upper or lower hull areas. This probably was due to the steep gradient of the seabed in this area, which, compounded by the weight of the copper ingots, caused the keel to snap off at this point and leave the forwardmost (third) section of the preserved hull remains to settle on the seabed with less distortion. The planks appear to have slid a little to the south, becoming slightly misaligned with the third section just downslope. Strake four (the fourth from the keel) overlapped strake five, while strakes six and seven met at an angle; fragments of planking were wedged or forced under the upper end of strake seven.

Although only partially preserved and in poor condition, this second section of hull includes an important construction feature not preserved elsewhere on the wreck. As the hull remains have yet to be studied in detail, the purpose of this feature is not fully understood, but it is possible that we have here either a flat scarf (a join-

ing of two planks whose diagonal ends were cut off perpendicular to their lengths) or, more likely, a drop strake, indicating that we are approaching the bow. As runs of planks curve in toward the stem and stern and diminish in width, those that become impractically narrow are discontinued (dropped) and their ends cut square to prevent splitting. Support for this second possibility comes partly from the first hull section, where there is noticeable tapering of the garboard toward the bow. That this tapering becomes even more pronounced closer to the bow is revealed by the garboard fragment preserved in the third hull section. There is one well-preserved mortise-and-tenon joint at the scarf of the drop strake, and a vestige of a second. A preserved patch of thorny burnet (*Sarcopoterium spinosum*) dunnage, a type of brushwood placed under the ingots to provide a cushion for the cargo placed on the planking, indicated that ingots had been placed so as to bear directly on the scarf, suggesting either that the scarf location had been obscured by the dunnage and so was not avoided during lading, or that Bronze Age seafarers were not particularly concerned about the assumed weakness of such scarfs. Additional dunnage under the layer of thorny burnet is represented by only a single large branch at the lower (east) edge of this second section of the hull remains.

Each garboard tapers in thickness from about 10 centimeters at the edge adjoining the keel to about 6-6.5 centimeters at the opposite edge, where it adjoins the second strake. They were fastened to the keel with typical mortise-and-tenon joints locked in place with pegs of oak driven from the under surface of the keel. Pegs in the garboards, as well as in all other mortise-and-tenon joints in the preserved hull remains, were driven from the interior of the hull and passed through the plank completely. The oak pegs, averaging 2.2 centimeters in diameter at their inboard face, are tapered and multi-faceted, with one well-preserved peg displaying about twelve facets. After being driven in place, a peg's excess length was sawn even with the surface of the plank rather than trimmed with an adze (Bass 1989, 31, fig. 2). Not all peg pairs on adjoining planks could be located due to the poor state of preservation in some areas. Examination of the hull remains has further revealed that the Uluburun ship was assembled without the use of metal fasteners, nor were there any treenails or holes for fastening with ligatures found in the surviving portions of the hull.

It had been clear from the beginning of the excavation that the Uluburun ship's mortise-and-tenon joints were more widely spaced and more robust than those found in Greek and Roman hulls of similar size (Table 1). Unlike most Greco-Roman mortise-and-tenon joints, however, those of the Uluburun ship were found to be extraordinarily deep, extending from one plank edge to sometimes within 1.5 to 2 centimeters of the opposite plank edge. In fact, mortise-and-tenon joints in the Uluburun hull are about twice as long as those in planks of Greco-Roman ships of comparable length and, as such, are considerably longer than the optimal size needed to resist the shear stresses exerted on the joints. Clearly, these longer-than-necessary tenons were much more than simple plank fasteners and acted as small internal frames, offering considerable stiffness and integrity to the shell of outer planking (Steffy 1985, 90; 1994, 46). The tenons were carefully crafted of oak, a much harder wood than the cedar of the planks. The use of oak for tenons in both the Uluburun and Cape Gelidonya hulls clearly suggests that Late Bronze Age shipwrights already knew the value of using tenons that were harder than the wood surrounding them. It seems, then, that the Uluburun ship relied heavily on the mechanical strength provided by long hardwood tenons, and that the practice of using such tenons was aimed specifically at supplementing the hull's lateral rigidity with an internal framework to compensate for the scarcity or lack of proper frames. Such construction may partly explain how heavy cargos could be carried directly on hull planking without resorting to visible lateral support in the form of frames or bulkheads. After the Bronze Age, shipbuilders began relying more heavily on a sturdier framework to maintain lateral rigidity of a hull, and the use of long tenons and thick planks was no longer as crucial for this purpose. Consequently, tenons could now be made shorter and plank thicknesses decreased (Table 1). Decreasing a plank's thickness, however, increased its flexibility, which, in turn, required the placement of mortise-and-tenon joints at closer intervals than that needed with thicker planks to insure watertightness of a hull. Nevertheless, the use of thinner planking and greater reliance on framing simplified the construction process and permitted greater control over the building of more complex and efficient hull forms.

One-half of a preserved tenon is approximately 15 centimeters long and 6.2 centimeters wide, suggesting a length of about 30 centimeters for the complete tenon (Fig. 5). When compared with

the only surviving tenon from the Cape Gelidonya ship (Fig. 6), a relatively constant ratio of about 1.2-1.3 is observed between the lengths, widths, thicknesses, and peg hole diameters (Bass 1967, 50-51, fig. 51, Wd 2) of the two tenons; dimensions of both tenons are given in Table 1. These two tenons are remarkably similar in shape, featuring the same taper in both width and thickness, and beveling at the narrower extremities, but the Cape Gelidonya tenon is approximately 17-23 percent smaller than those from Uluburun. If a linear relationship existed between tenon dimensions and hull size for Late Bronze Age seagoing ships, and if our estimation for the length of the Uluburun ship as 15 meters is reasonable, it would appear that the Cape Gelidonya ship was some 11.5-12.5 meters in length. This is larger than the estimated length of about 10 meters for that ship, but it should be kept in mind that Bass's assessment was based on the quantity and the distribution of finds on the seabed, as hull remains were minimal and did not offer additional information for estimating the ship's size. Recent surveys at Cape Gelidonya, however, have revealed more artifacts, including the base of a large pithos and a stone anchor weighing nearly 220 kilograms. This single-holed anchor was located some 70 meters from the shipwreck site itself, with additional objects scattered between the anchor and the site. This suggests that the vessel's bottom had been torn open and objects had spilled from the ship before it sank some 70 meters down current of where it first struck a submerged reef, and may indicate that the Cape Gelidonya ship carried a heavier cargo and was therefore somewhat larger than originally envisioned.

In the Uluburun hull, rather than staggering the joints in one edge of a plank from those in the opposite edge, each mortise cut into one plank edge was positioned immediately adjacent to the nearest joint cut into the opposite edge of the same plank, such that mortises often infringed on one another. Occasionally, the edge of a tenon nearest the adjacent joint was cut or damaged when the mortise from the opposite plank edge was cut. It is difficult to determine whether this consistency of placement was simply a convenient way of uniformly spacing the joints or if it represents a specifically executed structural practice, but the latter seems more likely. Indeed, it suggests a conscious attempt to form a network of internal paired frames of tenons extending continuously up the sides of the hull planking.

The removal of a substantial volume of wood for adjacent tenon pairs throughout a plank would seem to have significantly compromised its structural integrity and thus that of the hull. To minimize this undesirable effect, then, spacing joints at equal distances from one another, rather than pairing them immediately next to each other, would seem more desirable. This is precisely the reason why mortise-and-tenon joints are spaced evenly on later ancient ships. Why, then, do those of the Uluburun hull appear to contradict common sense? It will be argued here that immediately adjacent or adjoining deep mortises (of the type used in the Uluburun hull) cut in opposing plank edges made for a stronger plank than did those spaced farther apart. The reason for this has to do with the depth of the mortises. When hull planks are subjected to moment forces, these forces are resisted by the tenons, which, in turn, impart tensile stresses to the plank. These tensile stresses are opposed by the uncut wood between the tenons, and the plank is thus prevented from splitting tangentially. In traditional mortise-and-tenon joints, mortises are usually not much deeper than one-half the width of a plank. Mortises cut in one edge of a plank, therefore, do not intrude into the area between mortises cut in the opposing edge of the same plank. Since the resistance of a plank to tangential or lateral splitting is mostly a function of the amount of uncut wood between the two joints, which is proportional to and increases with the distance between the joints, a mortise cut in the plank's opposite edge does not compromise the effective area of wood that resist splitting between joints. However, in the case of the Uluburun hull, where mortises are cut deeply to within a few centimeters of a plank's opposite edge, wood resisting lateral splitting is determined by the distance between joints in opposing edges of a plank. Staggering of joints in opposite edges of a plank, therefore, would nearly halve the effective wood area and considerably weaken a plank's resistance to lateral splitting.

That compromising plank integrity was a genuine concern of the builders of the Uluburun ship is also demonstrated by the fact that the spacing of these joints varies with changing plank width. This spacing increases from about 20 to 25 centimeters, center to center, toward the bow, where the planks generally became narrower. The spacing of mortise-and-tenon joints in Greco-Roman ships, on the other hand, appear mostly to be constant throughout the length of a plank.[5] By placing the

joints farther apart, the volume of uncut wood between adjacent joints in a narrow section of a plank more closely approaches the level found between joints in the wide section of the same plank. This, then, is clearly a conscious effort by the boatbuilder to preserve the structural integrity of a plank of varying width as it spans some portion of the length of the hull.

As noted above, the Uluburun shipwreck has not produced any evidence of lateral stiffening of the hull. One large timber, which lacks any evidence indicating how, or even if, it was fastened to the ship, was discovered near the first hull section. This heavy timber, of oval section and angled at one end, may be part of a standing beam or through-beam (see below), but it is so poorly preserved that its placement on the ship and its ultimate function is completely lost. In contrast to the ship's longitudinal strengthening provided by the keel, this lack of lateral support for the hull is perplexing, especially when one considers that the ship was carrying more than eleven tons of metal ingots when it sank. How could the ship accommodate a cargo of such concentrated weight placed directly on planking some 6 centimeters in thickness? This difficulty was partly overcome by placing branches of 5 centimeters in diameter or more, but usually less, athwartships from either side of the hull toward the keel (Fig. 7). The ingots were then placed directly on top of these cushioning branches or, sometimes, on thorny burnet layered over the branches so that cargo damage to the planking would be minimized. It seems, then, that the popular notion of placing heavy cargo directly on hull planking was detrimental to a vessel's water tightness is not necessarily valid.

The Uluburun evidence also appears to challenge the use of the inverted-arch analogy to describe the behavior of frameless or sparsely framed hulls. According to this analogy, such a hull had to carry cargo on deck so that its weight could be distributed evenly throughout the hull in much the same way an architectural arch bears the load of a building. The load on deck, counteracted by the hydrostatic and buoyancy forces of water, would thus push together the hull planks, thereby facilitating watertightness and hull integrity. If, on the other hand, heavy cargo were placed directly on hull planking, the sheer weight of the cargo would force apart the planks and compromise the watertightness of seams. Yet, not only was the Uluburun ship probably only par-

tially decked, but surviving portions of its hull clearly demonstrate that at least part of its cargo of heavy metal ingots was placed directly on hull planking with only minor cushioning.

What we have thus far learned from surviving remnants of the Uluburun hull permits us to reevaluate and better interpret some ship representations and ship models from Late Bronze Age contexts in the eastern Mediterranean. A detailed depiction of Egyptian seagoing ships on an expedition to Punt is portrayed on Queen Hatshepsut's (ca. 1460 BC) mortuary temple at Deir el Bahri (Naville 1898, pls. 72-75; see also Wachsmann 1998, 17, fig. 2.11; 20-21, figs. 2.15-2.18). These ships are shown in profile and appear to be long and slender. A line delineates the seam between the planked part of the hull and the flat spine or central timber terminating in a projecting stem and sternpost. This line, although incomplete on some of the ships, is similar to a rabbet line and gradually approaches the line representing the exterior limit of the hull as it progresses downward, but becomes parallel to it before merging with the waterline of the ship. The impression appears to be that of a keel projecting below the planking at hull extremities that possibly diminishes considerably or disappears entirely amidships.

Hatshepsut's Punt ships bear a strong resemblance to carved boat models from the tombs of Amenhotep II (ca. 1400 BC) and Tutankhamun (ca. 1330 BC), all of which appear to conform to a particular hull form that appears in the New Kingdom (Reisner 1913, figs. 348-49; Jones 1990, 28-37, pls. 16-22, 33; Landström 1970, 106-107, figs. 328, 331-33; also in Wachsmann 1998, 22-24, figs. 2.20-2.23). Like the Punt ships, these boat models also feature a spine or backbone timber that protrudes below the planking near the ends of the hull, but which gradually disappears amidships. As the hulls of these wooden models are solid and not hollowed out, internal structural features are not rendered. Consequently, construction features must be gleaned and deduced from details shown on the exteriors of the models.

A hollow terra cotta boat model from Byblos, on the other hand, is modeled with a molded internal centerline representing a massive longitudinal member running the full length of the hull that projects outward horizontally at bow and stern (Dunand 1937, pl. 140, no. 3306; Basch 1987, 67, fig. 122). On the exterior surface

of the model, this longitudinal element becomes flush with the hull amidships in the manner observed on the models from the tombs of Amenhotep II and Tutankhamun. Also shown in relief on the model are the protruding ends of four through-beams on either side of the hull. Two of these protrusions correspond to ends of through-beams that cross uninterrupted from one side of the hull to the other, while the other two represent ends of beams that are concealed beneath the partial decks placed fore and aft; there is no indication of framing. The model is thought to represent a Bronze Age, Syro-Canaanite ship, but Wachsmann (1998, 52-53), correctly in my view, identifies it as a somewhat foreshortened version of Egyptian hulls of the type represented by the models from the tombs of Amenhotep II and Tutankamun. The evidence strongly suggests, then, the use of through-beams and of a keel-like member or a proto-keel in certain Late Bronze Age Egyptian ships (Wachsmann 1998, 241-242; Hocker 1998).

Other Late Bronze Age models suggest that a similar internal keel configuration was used on ships elsewhere in the eastern Mediterranean. A molded strip running along the inboard centerline of a late Late Cypriot I-II (ca. 1450-1225 BC) terra cotta ship model from a tomb may represent the internal projection of such a keel (Westerberg 1983, 11-12, 80, fig. 5; also in Basch 1987, 70, 72, figs. 138-41; and Wachsmann 1998, 63, 65, fig. 4.5). There is, however, no indication of a keel on the model's exterior. A Late Helladic IIIB (13th century BC) model fragment from Tiryns, Greece, features a similar molded strip in its interior that may represent an inward-projecting keel (Kilian 1988, 140, fig. 37.5; also in Wachsmann 1998, 151, fig. 7.46), whereas the keel and frames--or other lateral timbers such as beams or through-beams--of two small Late Helladic IIIB models from Tanagra, Greece, are delineated with dark paint on their interiors (Wachsmann 1998, 148-49, figs. 7.39, 7.41).

The pegged mortise-and-tenon construction of the Uluburun hull appears to be the earliest known use of this joinery technique in the history of ship construction. Therefore, not only can we push back by more than half a millennium its employment in seagoing ship construction, but we also have before us the unprecedented opportunity to compare details of this shipbuilding method with those of Greco-Roman ships of comparable size. There was no conspicuous employment of framing in the traditional sense, at

least not in the parts of the hull that were preserved, but the use of very widely spaced frames, several heavy bulkheads, or through-beams on the ship cannot be ruled out.

Pictorial representations, models, and archaeological evidence strongly suggest that during the Late Bronze Age at least some seagoing ships were equipped with robust centerline timbers or spines similar in function to those of later keels, but which amidships protruded into the hull rather than outward, as did most later keels. Our first and only direct archaeological evidence for the existence of such a keel comes from the Uluburun ship.

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NOTES

[1] Bass 1986; Bass, Pulak, Collon and Weinstein 1989; Pulak 1988; Pulak 1990; Pulak 1997; Pulak 1998; Pulak and Bass 1992; Gates 1994, 258-260; Gates 1995, 223-25; Gates 1996, 304-306. Additionally, yearly progress reports have appeared in the INA Quarterly (INA Newsletter prior to 1992) and in Proceedings of the International Symposium of Excavations vols. 7-17 (Ankara, Turkey), vols. 10-17, in Turkish.

[2] Reexamination of a small piece of cedar from the shipwreck, has revealed an additional faint ring, which now places the last observable ring at 1305 B.C. As there is no bark preserved on this piece, there is no way of knowing whether the latest observable ring on the piece represents the original exterior of the tree, but because the timber is not in any way modified by human agency, any missing rings would have resulted from attrition by sand and water during the course of 3,300 years. As this timber was probably intended for use as dunnage or firewood, its deliberate seasoning for an extended period would have been meaningless. For this reason, it would not be unreasonable to suppose that the Uluburun ship sank sometime shortly after 1305 B.C., perhaps around 1300 B.C.

[3] A small number of stone anchors have been found in the Aegean and in the western Mediterranean, but they are usually much smaller than those from Uluburun or are of the composite type with three holes, rather than the single-holed weight type like those recovered from the Uluburun ship. Stone anchors from the Aegean are conveniently cataloged in Wachsmann 1998, 279-83; for Italy and Sardinia, see Lo Schiavo 1995. Petrographic studies of two anchors from Kommos, Crete, indicate that they were probably made of stone originating in either Cyprus or Syria (Shaw 1995).

[4] Peter I. Kuniholm, of the Malcolm Wiener Laboratory for Aegean and Near Eastern Dendrochronology at Cornell University, made the wood identifications, which were subsequently confirmed by Werner Schoch at the Swiss Federal Forestry Research Institute in Zürich.

[5] Such observations are not usually recorded in shipwreck reports, but the table of mortise-and-tenon joints for the strakes of the Kyrenia ship indicates no appreciable variation in the spacing of these joints (Steffy 1985, 81-82, table 3). Moreover, the Kyrenia ship's fully illustrated port strake 6 shows these joints to be spaced uniformly in spite of considerable narrowing of the strake toward the stern (Steffy 1985, 78, ill. 5).

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Table 1

Dimensions of mortise-and-tenon joints of Bronze Age and Greco-Roman ships of ca. 15 meters in length. The values listed below were compiled from published references indicated with each entry and from non-cited sources. Where a range of dimensions were given, they have been averaged expressly for the purpose of simplifying comparisons and are not intended as definitive values representing the specifics of each shipwreck. All dimensions are in centimeters unless noted otherwise.

Shipwreck	Date (B.C.)	Length	Plank Thickness	Tenon Spacing	Tenon Dimensions (L x W x Th)	Peg Diameter
Uluburun[a]	ca. 1300	15 m	6	20	30 x 6.2 x 1.6	2.2
Cape Gelidonya[b]	ca. 1200	10 m	?	?	ca. 22 x 5.3 x 1.3	1.8
Ma'agan Michael[c]	ca. 400	13.4 m	4	12	14 x 4.5 x 1	0.9
Kyrenia[d]	ca. 300	15 m	3.6	12	15-20 x 4.3 x 0.6	1.0
Cheritienne C[e]	ca. 175-150	15-16 m	3-3.5	12	8-16 x 3-5.5 x 0.65	0.8
Apollonia I[f]	ca. 150-100	15 m	3	?	16 x 6 x 1	1.1
Cavalière[g]	ca. 100	13 m	3	11	12-13 x 6 x 0.6	0.9
Miladou[h]	ca. 100-50	15 m	2.5	9-13	12-15 x 6-7 x 0.65	?
Lourans 2[i]	ca. A.D. 100	15 m	2.5	12	12-13 x 6 x 0.4	0.9

[a] Bass 1985, 25; Steffy 1994, 37.

[b] Bass 1967, 50-51.

[c] Linder 1992, 34; Steffy 1994, 40-41.

[d] Steffy 1994, 43-48.

[e] Joncheray 1975, 58-59, 68.

[f] Long 1992, 73-74.

[g] Charlin, Gassend & Lequément 1979, 67.

[h] Dumontier & Joncheray 1992, 131-37.

[i] Gassend, Liou & Ximénès 1985, 91.

Greco-Roman sites also in Fitzgerald 1994, 182-183; 1995, 125-127.

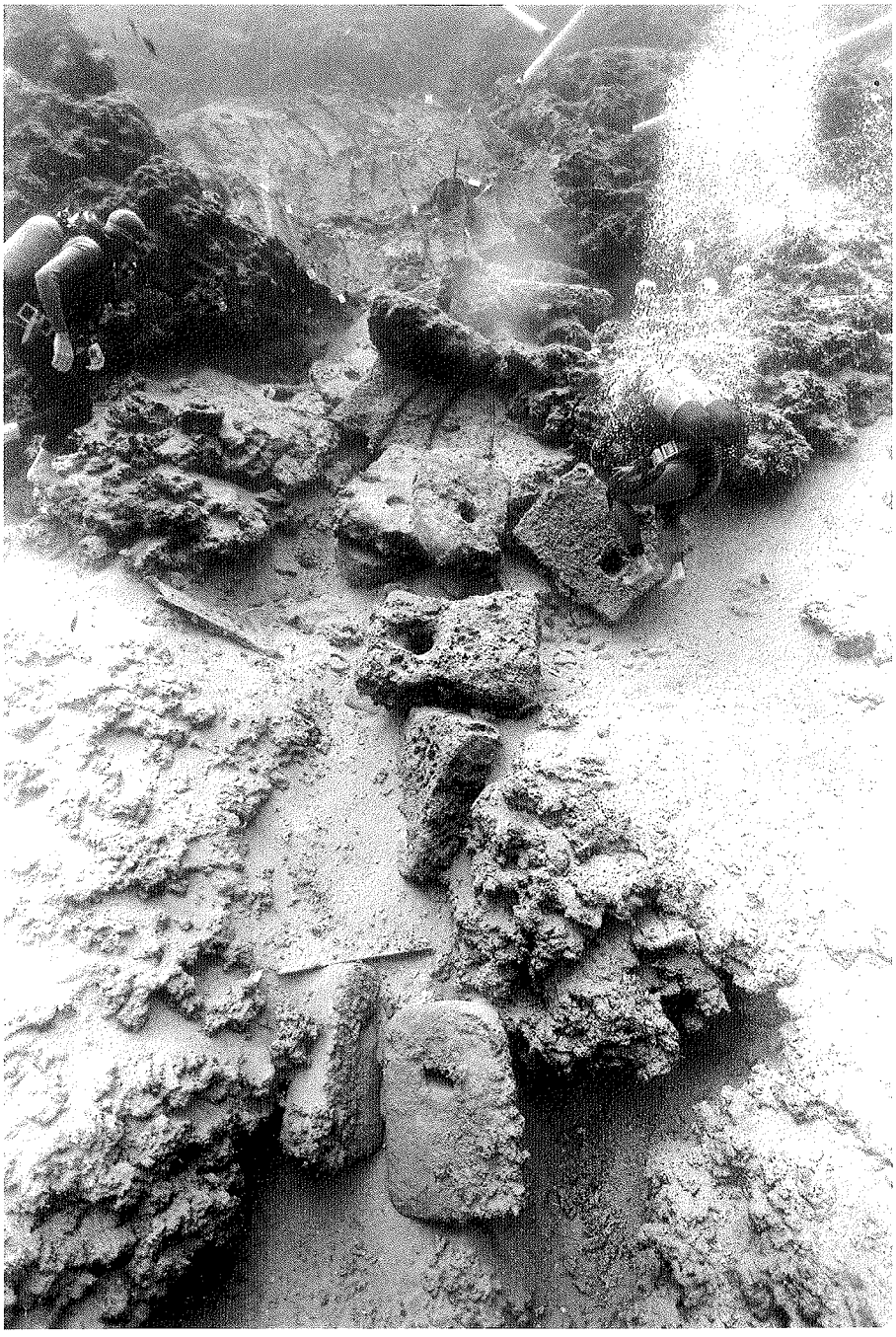


Fig. 1. *The Uluburun shipwreck site, as seen from east looking upslope (west). The pair of stone anchors in the foreground were probably stowed on the ship's foredeck for everyday use, while those lying farther up the slope would have been stored in the forward part of the hold as spares. Visible in the background (top) are the second, third, and fourth rows of copper ingots with their typical overlapping lading arrangement.*

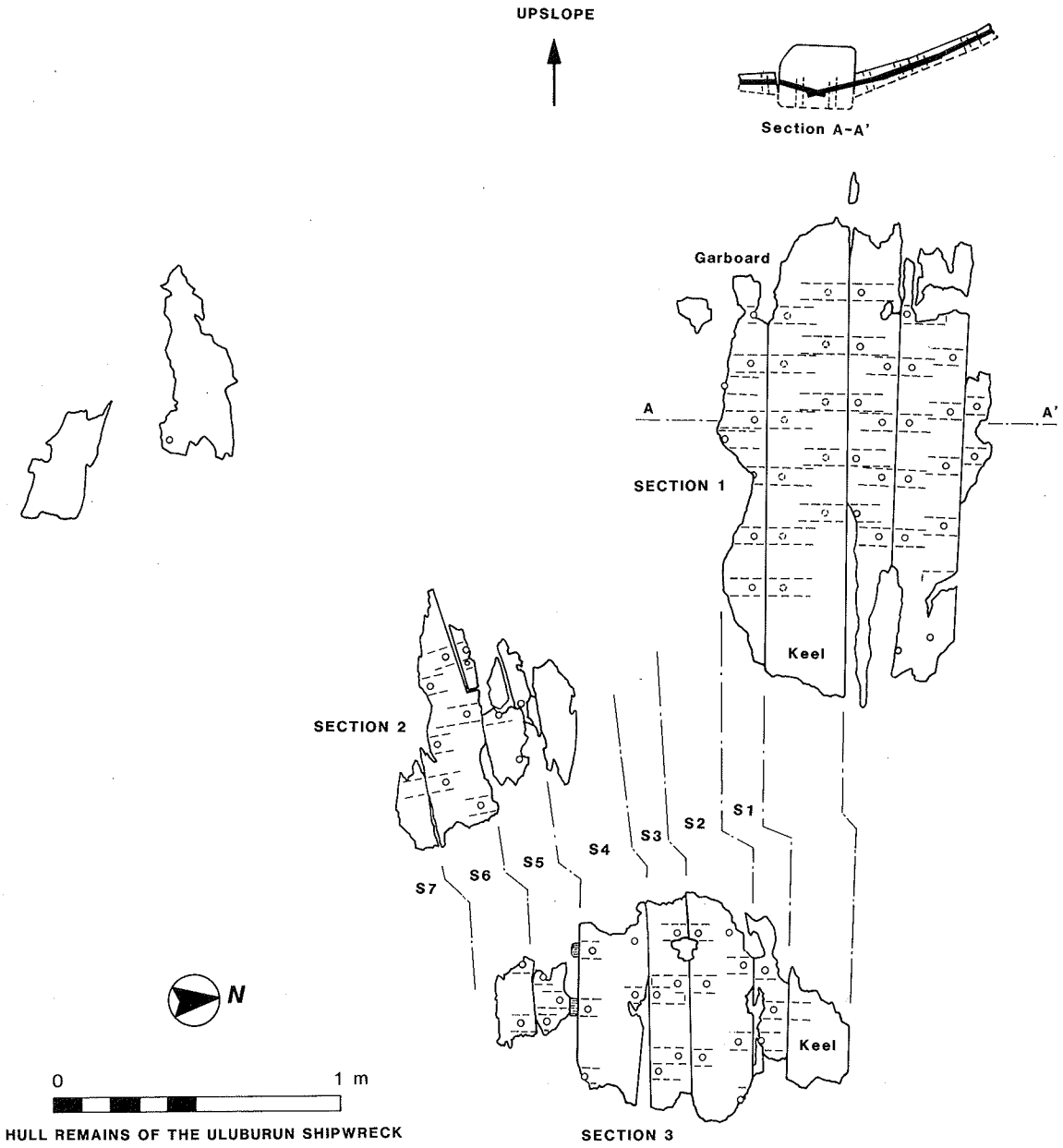


Fig. 2. *The three preserved sections of the Uluburun hull, with a fourth at left (not labeled) consisting of only disarticulated plank fragments. The hull sections are drawn as projected onto a horizontal plane and therefore appear slightly foreshortened in length, due to the steep angle of the slope on which they were found.*

Fig. 3. *The five sharpened stakes and closely spaced parallel withies lying on top of them probably represent remnants of the ship's wickerwork weather fencing designed to keep out waves in rough seas.*

Fig. 4. *View of the keel and part of port garboard (left), looking upslope (west). Note that the keel's exterior has been completely destroyed, while its interior sided face retains part of its original surface. The white dots mark the locations of pegs that lock the mortise-and-tenon joints.*

Fig. 5. *Approximately one-half of a preserved tenon from the Uluburun shipwreck (Pres. L. 15 cm; Max. W. 6.2 cm).*

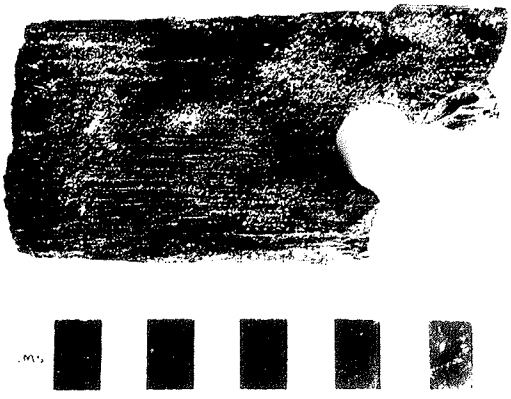


Fig. 6. *The partially preserved single tenon recovered from the Cape Gelidonya shipwreck (Pres. L. 11.8 cm; Max. W. 5.3 cm).*

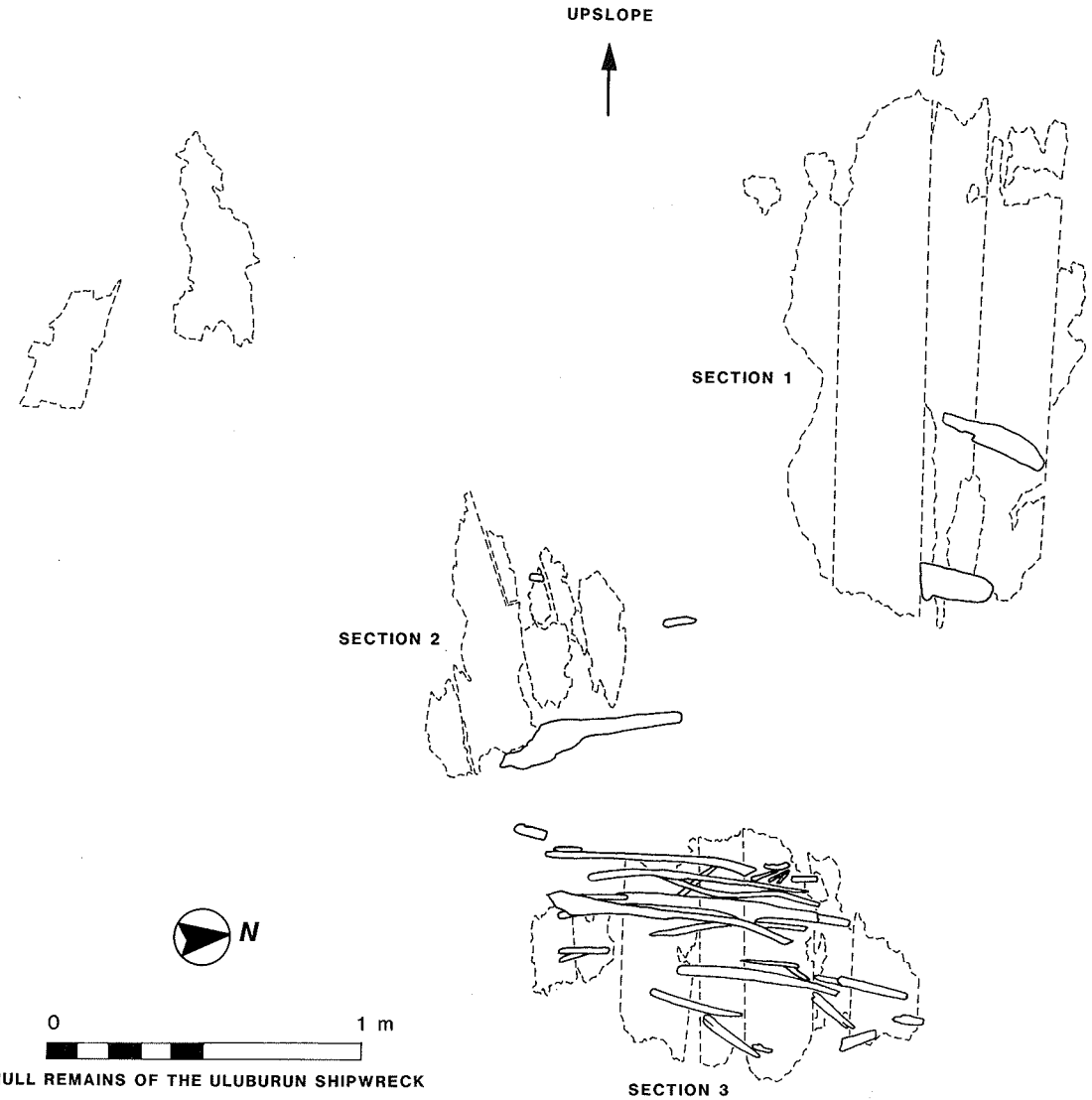


Fig. 7. *The 11 tons of copper ingots aboard the Uluburun ship were placed on loosely laid cushioning branches that were oriented perpendicularly from either side of the hull toward the keel.*

Afternoon Session Discussion

Chairman: Professor Paul Åström.

CHAIRMAN: Any questions for Mr. Karageorghis?

Obviously it was so clear, there are no questions!

So who would like to ask me questions?

DOUMAS: I don't want to ask a question, but I would like to mention something said by Mr. Kyrou at lunch time. You suggested that the boat capsized, and he told me that a local fisherman had suggested that this boat capsized too. Isn't that so?

CHAIRMAN: I'm glad to hear it. Thank you. So perhaps that's why the objects sank to the bottom and were left there.

KANTA: I just wanted to mention in regard to the date that I personally am not certain about the existence of a proper IIIB2 period in Crete. It may exist, but a very late IIIB date or end of IIIB date or something like that would be appropriate. We are talking about the same thing, anyhow.

CHAIRMAN: Yes, I meant contemporary with IIIB2 in the Argolid, when I mentioned Late Minoan III.

RUTTER: I just wanted to ask Dr. Karageorghis, and also you, Professor Åstrom: in the examination of the material we have been finding at Kommos, in the ruins of the large Protopalatial Building AA at Kommos, which is a Middle Minoan IIB context, we have Cypriot imports. You mentioned in your paper that the trade between Cyprus and the Aegean really was a 15th to 13th century phenomenon. This is 18th century material, I imagine. It may be very different —obviously the contacts were very different than later on— still, the Cypriots were in contact with the Minoans in the 18th century.

KARAGEORGHIS: Yes, we have several white painted Middle Bronze Age pots. But half a dozen pots do not allow us to talk about trade.

KANTA: I would like to agree with Jeremy Rutter on that, because in the general survey of the relations that I recently did for the exhibition that Prof. Stambolidis and Mrs. Karetsou organised in Iraklion, the same picture emerges, if we take into account all the possible finds that exist, that relations did exist as early as that, and perhaps even earlier.

ANDREOU: We heard about these very interesting patterns of distribution of various kinds of pottery between sites or between sites and burials; is there any evidence for the intra-site distribution of all these products?

RUTTER: Yes, actually, it's quite interesting what happens. I can't go through all the details, but I'll give you a few examples. The Egyptian and the Canaanite jars tend to be located down in the harbour area and not in anything like as much quantity up on the hillside, where the houses are located; if you have a copy of the handout that I circulated, you can figure this out yourself from the way the material is presented there, OK? The Italian material, on the other hand, doesn't occur in the public buildings at all. It only occurs in the private buildings, so it seems to be something that shows up in residences. The Cypriot material, which is all table wares, if you discount the pithoi, is found fairly evenly distributed all over the site. So every one of these categories has its own date distribution, its own shape distribution, and its own distribution internal to the site, as well as a distinct distribution around Crete as a whole.

KARAGEORGHIS: With regard to anchors being used as column bases, we have exactly the same phenomenon at Kition. For your mysterious jars, I urge you to look into Syrian pottery.

KANTA: I would like to mention that this supposed difference in the presence of Canaanite jars between Crete and the Greek mainland, where they appear in tombs, which you mentioned and which exists in the bibliography, may be accidental, because as you will see from the catalogue of our exhibition, they have now started appearing in Cretan tomb groups as well.

RUTTER: I thank you very much for that catalogue, which was enormously helpful to me in preparing the paper. But I think that certainly one is a Neopalatial tomb, which is much earlier than the period we are talking about. What I find interesting is that the Mycenaean Canaanite jars are in tombs in the 13th century and 14th century, and therefore the IIIA and IIIB periods; it's that period when on Crete you have plenty of tombs and no Canaanite jars in them, and that's what I find to be a striking pattern. There is one LM III example from Hania? Yes, thanks for correcting me.

CHAIRMAN: Any questions for Dr. Vagnetti?

KANTA: I would like to make a point about that very interesting imitation that Dr. Vagnetti showed us from Italy. This is a shape which is common in the tomb groups in the area of Rethymnon. Of course it exists further west as well, and such vases have now started being called The Rethymnon Workshop. So I don't know if yours has been analysed and whether it is local as opposed to Cretan clay.

VAGNETTI: The group of what we have been calling Broglio Amphoras, I'm afraid, appears in large numbers at Broglio di Trebisacce. That is one of the main sites where locally made Mycenaean and Late Minoan III pottery appear. Most of them have been analysed and defined as locally made by Dr. Richard Jones. In fact, in the publication that we gave of the campaigns from 1979-1985, which appeared in specific monographs, I had considered some examples from Crete of this kind of amphora, which don't match the series, the typology of the Mycenaean amphoras, based on information from the very preliminary publications that appeared in the Deltion, so I am particularly glad to know that studies have developed and defined in a better way this shape as Minoan, and specifically from Rethymnon, so we may go on defining better the origin of the potters who were working abroad.

KARAGEORGHIS: I am very much intrigued by an amphoroid krater which I've not seen and I don't know where it comes from ...ah!, it comes from Sicily. It was published by La Rosa and apparently it is good Mycenaean. How do you explain the fact that it is very unorthodox with regard to the handles?

VAGNETTI: Yes I know it is unorthodox. It was restored in Rome.

KARAGEORGHIS: Is the restoration wrong?

VAGNETTI: I'd like to check the drawings with the sherds.

KARAGEORGHIS: What I'm trying to get at is, that good Late Minoan or Mycenaean could be produced locally in Sicily.

VAGNETTI: Yes. I think that I introduced this concept 10 years ago. I'm afraid I introduced it in Italian, so nobody knows about it! But anyway alongside the locally made pottery, there is still a continuation of imports. Most of the IIIA material is imported as far as we know. From IIIB on the things go together. I know that they are able to produce a good imitation of Minoan and Mycenaean, but that krater which you mentioned has been analysed and matches with central Crete.

CHAIRMAN: Any questions for Cemal Pulak?

KOTSAKIS: Just a sailor's question: what winds could this boat sustain? Do you have any idea about that?

PULAK: I have no idea. I don't think we have enough remains to be able to make a reconstruction like the Kyrenia vessel and actually try out the ship to see what its sailing qualities are. But considering that it is coming from either Syria or Cyprus and has made it past Cape Gelidonya and on to Uluburun, I suppose that in terms of its sailing capabilities it is as efficient as later period ships.

End of Afternoon Discussion

Round Table Discussion

Chairman: Professor Spyros Iakovidis

CHAIRMAN: This is now a round table discussion. I would like to remind you that the topic is the Iria Wreck and NOT the archaeology of the Eastern Mediterranean in the second half of the second millennium. I have noted down a few questions which I think we should discuss, questions which are the result of what has been said and mentioned:

- The first question would be: the reasons why and the way in which the ship was wrecked. Was it the weather? Was it the earthquake? Was it something else which we don't know, too much cargo? Whatever.
- The second question would be the date of the shipwreck.
- The third would be the provenance and the destination of the ship.
- The fourth would be the nationality of the ship, as far as we can ascertain it.
- The fifth (about which we have not much to say) is the size and the dimensions of the ship.
- The sixth would be the kind of cargo it carried.
- The seventh and last, would be whether it was fully loaded or not.

That is what I came up with. If there is any other question which you think should be discussed, please let us know now. Yes?

PARLAMA: I would like to say a word about the voyage of this ship. Already in the morning session Mr. Doumas and Mr. Kotsakis expressed their doubts about the possibility of the ship coming from Cyprus, and the size of the ship was a factor that led to this doubt. I think, therefore, it is possible to think and to see things from this standpoint. And Dr Vagnetti also said earlier, If I understood her rightly, that we are possibly dealing with a local ship. In other words, that for example the Cypriot pithoi could already have been brought to one of the Mycenaean centres on the east coast of the Peloponnese, perhaps even southern Crete in the Chania region. In other words, it seems to me that this ship could have made the Crete-Argolic Gulf voyage, but I think it was a local ship from the east coast of the Peloponnese. This might also explain the small cargo and few objects. In other words, a vessel trading as an intermediary.

VICHOS: Let's discuss whether the case of Iria fits with the known patterns of oxhide ingots from other shipwrecks and the other evidence we have.

ANDREOU: Maybe it would also be interesting to consider what problems we can discuss with the evidence provided by the shipwrecks.

CHAIRMAN: Personally I would think that that is self-evident. There is no latitude for discussion. But if you like, yes, by all means. So shall we begin. Who would like to say something about the way and the reasons for the shipwreck?

VICHOS: I should start, because that was a part of my paper. As I said, the place, Point Iria is highly dangerous for navigation at all periods. We know that from the experience of the local fishermen, and, as I said, we faced serious problems during the three months we spent in the area. I think the cause of the shipwreck was bad weather. The most dangerous wind in the region is the west wind, the *pounentis*. This wind, combined with the local conditions and the local topography, with the two mountain masses and between them the mouth of the river Selas, and the existence of the island of Ipsili, which I showed you on the map, create a turbulent wind which is very dangerous for navigation. We were also faced with very strong sea currents that made our work under water very difficult. So the combination of the easterly sea current and the easterly strong wind seem to me a fair case for a shipwreck in any period. We also have other evidence. We found the krater about 50 metres away from the main concentration of the ceramic cargo. That means that the wind at the time of the wreck was westerly. As a light vessel, the krater took some time before it went down to the bottom. This is for me an indication of the direction of the wind at the time of the wreck.

RUTTER: First, the issue has been raised: how reliable are the data? And this isn't a question of trying to prove somebody wrong. I just think we need to find out what we can really depend upon, as opposed to what is not really dependable evidence. So, for example, the spouted krater that you're talking about, which was found well outside the concentration of pottery: I think it is a possibility —not a certainty, but a possibility— that this is a late Middle Bronze to early Mycenaean Aiginetan spouted krater that has nothing to do chronologically with the rest of the wreck. It's just a possibility. To judge from the profile, the way it's drawn in the publications, it looks to me very much like an Aiginetan profile.

Secondly, I think we might be able to agree what kinds of evidence would allow us to get closer to understanding what the nature of the wreck was. There were, as you point out, the weather conditions in the immediate vicinity of the wreck: that's one consideration. Another primary consideration

seems to me to be what the distribution of the pottery is on the bottom. What pottery is found where, where the stone material is, and so on. And I think you made a good case in your lecture that the stone material —the ballast, the anchor (if they in fact belong to this wreck)— are in one area, while the pithoi are in another.

KOTSAKIS: So, if I may continue on this issue about how the ship was wrecked, I think this is very closely related to the depositional and post-depositional factors that actually affected the wreck. And this is very much related to the issue I put before, concerning the accuracy of the data or whatever it is called. So, I'm not really persuaded, or I wasn't able to follow very clearly how you define the site in terms of distribution of finds. You said that this is a kind of concentration of finds, but on the other hand there are many finds that are superimposed from different wrecks if I understand correctly, or there might be, so in order to sort things out and decide whether this find actually represents a wreck we need some sort of archaeological evidence that can separate finds from different episodes, different wrecks, and then we can start talking about commerce or about the conditions of the wreck, etc. So, that was my point.

KARAGEORGHIS: But how can we draw any conclusions about a shipwreck where we are not certain whether all the evidence has been uncovered? We have been told there is a strong possibility that a large portion of the ship, or the cargo, may still be there, and which has not been uncovered.

ÅSTRÖM: May I clarify my hypothesis? When I studied this pottery, I arrived at the conclusion that the Cypriot pottery in relative chronology is to be dated to the end of the Late Cypriot phase, Late Cypriot IIC, which corresponds to Mycenaean IIIB. And today I think there is no one who has advocated anything later than that. So relatively speaking, this happened exactly at the time when we know that there were catastrophes of an earthquake character. Relative chronology cannot be as exact as absolute chronology, that's why it's called relative, but it is in a sequence. We have stratigraphical evidence for Mycenaean IIIB 2, for Late Cypriot IIC, and these two phases are contemporary, and that the Cypriots actually got pottery from the Argolid which is contemporary with what we are talking about.

KOTSAKIS: In twenty years' time you could have two or three wrecks. Wouldn't it be possible? In a very dangerous spot like Cape Iria, with this dispersal of finds, it could be a possibility.

DOUMAS: First of all, I don't know whether the cause of the shipwreck might have been an earthquake, but certainly one of the strongest reasons must have been bad

weather, rough sea. If in fact it was rough sea, then from what we have heard the rough sea would have been in this place, while just behind the peninsula it was calm. So I suspect the boat was coming from the south and trying to enter the gulf and was quite well-sheltered, and therefore the captain was sure that he would pass the point. As very often happens, captains misjudge the weather, and when the bad weather overtook them, he found that it was impossible. But as to whether these finds belong to several cargoes within the space of 20 years, I think that if one shipwreck happens because of the mistake of the captain, it is not going to occur again within living memory, Because they all remember the lost lives and they try to avoid repeating the same mistakes.

ANDREOU: I remember there was a shipwreck a few years ago and I don't think they ever found what the cause was, so I wonder if several thousand years later, it is legitimate to try to find what the exact cause of the shipwreck was. And that takes me to the issue I proposed: what are the problems that can be legitimately discussed with this kind of evidence.

VICHOS: I will try to summarise all the points we heard over the last 10 minutes. The ship couldn't have come from the south or from the west or from the south-west, because south of Point Iria is the big island of Ipsili, and the problem of navigation in that specific area is due to the turbulent winds in this channel. So we have two possibilities: either the ship was coming from the south-east (Spetses or Masis) and making for the central area of the Argolic Gulf, or the opposite, and after passing Asine it was making for the eastern part of the gulf. These are two possibilities. I can't say which is the most probable. The only thing I can say is that at least on Greek coasts 90% of the wrecks are caused by ships running onto rocks. This seems to me the most probable cause of the wreck. Whether the ship was damaged first and sank soon after and farther from where it first struck, we will never know for sure. Now, concerning the distribution of the finds, I would like to ask Mr Agouridis to say more about the distribution of the main cargo finds and the later finds.

AGOURIDIS: I would also like to stress that the vast majority of the contemporary Late Helladic finds was in this area. Of course there were other finds around the area, but more than 95% were concentrated within the perimeter that we conventionally set around this concentration of the finds. After a careful survey of the whole area, including Cape Iria, we located many contemporary, earlier and later finds, but the vast majority was concentrated on this particular site, which is why we concluded that there was a wreck here.

CHAIRMAN: May I say something? Usually the chairman does not take part in a discussion, but as I think I said at the beginning, a shipwreck is a closed find. So if

we find evidence for a shipwreck, and if the contents of the ship do belong to a certain date —which we can discuss if you like, but they still belong to a certain date—, and if near this shipwreck there is something that is 200 years earlier or 100 years later, then it obviously cannot belong to the ship. Therefore I don't agree with the idea expressed by Prof. Kotsakis, that if we have all sorts of antiquities, let's say, of pottery or whatever, belonging to different periods, on the bottom of the sea, then we can talk of several or many shipwrecks on the same spot. And I think there is a general consensus that we do have a ship there, and I would like to move the discussion on from this point, because we still have some time, but not all that much, and at the end of the allotted time we will have to finish the discussion, whether or not we have reached the end of our questions, because we have to go to the reception!

LOLOS: I would like to stress that the cargo of pottery containing three different ceramic groups presents a chronological homogeneity. Prof. Rutter referred to the deep bowl krater; did I get it right that you date it to the late Middle Bronze Age or the early Late Bronze Age?

RUTTER: It's a possibility. That's what I said.

LOLOS: Well, personally I have no doubt that this deep bowl krater is to be dated to an advanced phase of LH IIIB on the basis of exact parallels from Tiryns, Athens and Euboea. It is not an "early pot." It is a "late pot."

CHAIRMAN: So far as I understand it, we have two explanations. One is the tsunami tidal wave after an earthquake, and the other is just bad weather. I don't think we can go any further. Or do we take a vote?

RUTTER: A third point of view is that we don't have enough evidence one way or another to say what caused the wreck. It simply doesn't exist.

CHAIRMAN: Yes. There is a third point of view, as Prof. Rutter points out. So it's either a tidal wave, bad weather or we don't know.

VICHOS: As Mr. Tsouchlos has reminded me, statistically we have bad weather perhaps at least once a week and an earthquake with a tsunami every 50 years.

CHAIRMAN: Shall we proceed to the next question, what is the date of the shipwreck?

LOLOS: To continue on the matter of the deep bowl krater. I think this pot belongs with the cargo of pottery of the boat. We've got the main concentration of ceramic finds within this perimeter and only a limited number of ceramic finds at a distance from this perimeter, and this pottery, including the deep bowl krater, can be dated to late LH IIIB. Well, I would like to draw attention to the state of preservation of this krater. Its walls are very worn and it

gives one the impression that it is somehow "early". It is a fine pot with late features which has good counterparts from at least three sites: in the Argolid, Attica and Euboea. Perhaps Dr. Demakopoulou would like to comment on the date of this pot, with all the experience you have?

DEMAKOPOULOU: It's very difficult to say. I was wondering myself this morning when I saw it. I'm inclined to agree with Prof. Rutter, but I'm not quite sure. We know only the shape as nothing of the decoration has been preserved, and this makes things so complicated. But if I may, I would like to proceed to the date of the wreck and say that I agree with the date you gave: end of the 13th century BC, around 1200. I must stress again the similarity between most of the Iria pots of the two categories, the Mainland and the Cretan, with ceramic material from Midea which is dated exactly to this period - the end of the 13th century BC. This is a very advanced phase of LH IIIB 2, nearly the end of this period. There are many similarities between the Iria and Midea pottery groups, which I mentioned this morning. May I refer again to the storage stirrup jar category? We have a lot of them from Midea: they are very similar to your stirrup jars, as the shape is the same and they have a very high spout like yours. It must be noted that only one of the Iria stirrup jars preserves its decoration, while there are many from Midea with this decoration of bands on the belly and a spiral on the false mouth; there are also a lot of stirrup jars with stylised tentacles like the examples shown today by Prof. Rutter. Similarities also between the cooking vessels from Midea and the Iria pots. So I think it's a very good point to date the ceramic material from Iria to the end of the 13th century BC, like the pottery from the destruction level at Midea.

LOLOS: You referred to the cooking pots. One of them (A55) was found outside the perimeter at some distance from the main finds. And a further comment on the krater. I have not seen the Tiryns and Athens examples, but I have seen the Mistros example in the Museum of Chalkis. It is a good counterpart. The Mistros example is a fine decorated pot datable to a very late stage of LH IIIB or to the LH IIIB 2/LH IIIC early phase, and I believe that originally our krater bore painted decoration. It's a fine quality pot.

PAPADOPOULOS: I would like to ask two questions. Is the date of Cypriot pithoi fixed in Late Helladic IIIB, or do they have a long duration of use? That's one point. I saw this morning, two or three large two-handled storage jars. These remind me —they are not exact parallels, but similar in some way to Achaean ones, which are dated early or later IIIC, so is it possible to think that some of the cargo can be dated later than the end of the Late Helladic IIIB, to early or late Late Helladic IIIC?

RUTTER: I really didn't mean to cause a big problem about this krater. It was just as an example of methodology, really. I would simply like to establish what the parameters are. The maximalist point of view —and I think that is the view of the excavators— is a great place from which to begin. And just for purposes of argument, I would like to advocate a minimalist point of view. And then we can talk back and forth until we agree where we should end up. So we need to get this out of the way sooner rather than later. As far as the date is concerned: what is the lifetime of some of these pots? A large pithos may well stay in circulation for four to five times longer than a small drinking vessel. We all agree on that, right? OK. We also need to figure out where the pots are coming from and, in the first place, if they came from a far distance away, of course. There may be some temporal lag between their date of production and their date of deposition. They may have been in their home country for 10 or 20 years and then have been shipped somewhere else. Another reason why they could look considerably earlier than the context in which they end up: where were the vases found on the bottom of the sea? This is why I chose the spouted krater as a place to begin. Because this is a vase that you state was found outside the perimeter, not a little bit outside, but way outside —50 meters away! And yet it was introduced as a piece of evidence for how the wreck went down. And that's the problem. If it might not even belong to the wreck, then we need to agree to exclude it from further consideration. Aiginetan kraters: I can cite you parallels from 25, 30, or even 50 sites. It doesn't make any difference how many parallels can be cited. The question is: do we agree that the parallel is convincing? And it is very easy to answer this question. You just take a slice out of this Aiginetan krater. Aiginetan clay is very diagnostic. You'll know immediately if it is Aiginetan clay or not. An experienced petrologist like Peter Day could tell you in five minutes. But the issue is not really this one vase. The issue is, what is the total number of vases we can associate with this wreck. For example, the cooking pots: I have some doubts about the cooking pots. I am not sure they belong.

KARAGEORGHIS: I never mentioned Sea Peoples or turbulent years. Exactly, this ship dates earlier, because there is nothing IIIC.

IACOVOU: Can we agree? That's what I thought when you mentioned light vessels and people being transported to the eastern Mediteranean.

KARAGEORGHIS: I wasn't referring to the Iria shipwreck, but exactly what followed this shipwreck. Before making your remarks you ought to have understood exactly what I said, and it seems that you did not.

IACOVOU: I'm very pleased to hear it. May I put a final note on it? This is probably into the next question. But if we can agree that we are dealing with the latter half

of the 13th century, then this was either a vessel that operated within the Mycenaean palace economy or it belonged to the kingdom of Alasia (Cyprus); in the latter case we may as well think of what is missing from this wreck, of what Cypriot material should have been there, and is not: if a Cypriot crew was on board, and especially if the vessel had just concluded a long voyage from the eastern Mediterranean, then the absence of Canaanite amphorae among the transport vessels —we were assured this morning that not a sherd in the extant cargo comes from the Syro-Palestinian coast— is curious; even more curious, however, is the complete absence of a Cypriot "carte de visite", namely White Slip Ware pottery.

LOLOS: I've got the same feeling about the character of the cargo after 4 or 5 years of studying the material. But perhaps this is so because we constantly turn to Uluburun for comparisons. I would like to recall two other instances of older wrecks: the cargo of ingots in the harbour of Kymi, which in my opinion belongs to the LM I period and consists only of copper ingots, nothing else, and the wreck at Sheytan Deresi on the Turkish coast excavated by Professor Bass with the participation of Dr. Pulak, and which, to my mind, is also dated to LM I, the time of the Minoan Thalassocracy. There is a recent thesis on the cargo of this second wreck by Ms. Roxani Margariti at the University where Dr. Pulak and Professor Bass teach. The cargo of this wreck contained only pottery (jars, some pithoi and smaller pots) and nothing else, no metal artefacts and no small objects. We should not only make comparisons with the royal, completely exceptional cargo at Uluburun.

KANTA: I wouldn't like to date the Mycenaean material for obvious reasons, but as I said before, the Minoan material is very clearly dated because of certain typological characteristics which appear in good levels at Kastelli Chania, which you will all agree is one of the key sites. If then we all say around 1200, it doesn't mean we can pin-point a precise date. I think, if I interpret it correctly, that we all date it to the end of IIIB. I haven't heard anybody mention IIIC except Mr. Kyrou, and perhaps he would like to say why he dates it in IIIC?

ÅSTRÖM: Prof. Papadopoulos asked something about the pithoi in Cyprus. We have, say, 200 pithoi and more in fragments. The earliest pithos I know was found in one of our wells which is dated to 1375. That's just one piece that might be intrusive. There is one at Enkomi of about 1350, and then out of all these pithoi, I have chosen to illustrate the closest parallels, which you saw this morning, and the closest parallels occur there in Late Cypriot IIC. All I will say, and I agree with what others have said, is that we are talking about relative chronology, not absolute. The date for the end of IIIB is based on other evidence. We have the latest IIIB vase found together with a vase with the

cartouche of Queen Tusrat of about 1186 BC. That's why I put the date at the end of IIIB to 1190. But it is an approximate date. We are not talking about the absolute date, but the relative moment when this happened. And it's just a hypothesis that it could coincide with what happened elsewhere in the Argolid. As far as Dokos we have a huge earthquake centre with an epicentre somewhere. But it's just one hypothesis among others.

CHAIRMAN: Well, I think if anything about this discussion is to be settled, it is the date. There is no question in my mind and I think in most of our minds, that the shipwreck took place in the last years of the 13th century, what we call IIIB 2 (advanced).

Now, where did the ship come from and where did it go? What was its destination?

KARAGEORGHIS: We've said enough about the pottery. I think we are in a position now to determine the provenance of the limestone. At Demokritos they have —is Dr. Bassiakos here?— a good databank on Cypriot limestone, and an analysis of the stone anchor and the other stones found together, would be quite instructive.

BASSIAKOS: While we are still on the question of provenance, I would like as my contribution to debunk the myths about the competency of the natural sciences in this rather difficult question of origins, which is usually answered —when it is answered— with a large number of question marks, and this is why the different techniques complement each other in order to provide answers.

In the morning we heard that there was some kind of ballast. If it was loose ballast, there is the possibility that it had already been contaminated on the sea bed. If on the other hand it was fixed, then it is good material for a provenance study. I also heard Professor Karageorghis say that we have limestone. An analysis of this, in fact, might show whether it was of Cypriot or Greek origin. I also think that further mineralogical analysis of the pottery by Dr. Peter Day could make a crucial contribution, especially for the ceramic material which formed part of the ship, in the event that bulk material was put in it. All this would certainly help give an answer to one of the questions of provenance, namely a probable answer about the country or place where the ship was built, and not its first or last voyage, as Prof. Kotsakis and Prof. Doumas rightly said. Because here we have to answer three, four or five questions of origin which, naturally, cannot be answered.

One more matter —now that we have a good panel of people who can also raise questions about the future— is that unfortunately we don't yet have

international data banks so that we can make analyses of rocks, volcanic or sedimentary. It would be very useful if we could build up data banks especially for the Mediterranean area, which would answer the needs of Mediterranean archaeology.

KANTA: I think it would be interesting to provide through this discussion some criteria that we agree about which can determine the provenance, rather continue a discussion on the provenance of the cooking pots, the provenance of the pithoi, the amulets etc. I suggest we make out criteria first and then see how many of these criteria the ship meets. Afterwards we can perhaps establish with some degree of possibility the provenance of the ship, let alone the destination.

KRITZAS: Since you give me the opportunity, I would agree with Prof. Kanta. Big storage vessels like pithoi are, I think, a very serious criterion for the provenance of the ship. I don't believe such vases were sold with their contents and that the ship then returned to transport other such vases. The lack of tiny objects doesn't concern this topic, but I take this opportunity to say that in my opinion this means that the whole wreck is not yet fully excavated and that there needs to be further excavation in the future with better techniques to search in the mud and sand for minor objects which could elucidate that question.

DEMAKOPOULOU: May I add some comments on the route of the ship wrecked at Iria? It appears that the ship set sail from a port in Cyprus and called in at Crete, and in particular the region of Chania. It then continued on to the Argolid via Kythera, sailing up the east coast of the Peloponnese. It could well have stopped at Epidaurus Limera in Laconia and then at other coastal sites in the Argolid, such as Palaia Epidaurus and Asine, before it was wrecked at Iria. The position of the wreck and the cargo suggest that the ship was following a major trade route linking Cyprus, Crete and the Argolid —probably part of a wider network of communications and commercial contacts.

VICHOS: I have some notes, if you will permit me to read them. They are not our final conclusion about the provenance or the nationality of the ship, but could perhaps help the discussion. The case for a Cretan homeport is perhaps the least probable, because why would a ship leave Crete to transport olive oil to Mycenaean Greece and have first gone to Cyprus? Unless of course the Cypriot pithoi and jugs had previously been carried in another ship from Cyprus to Crete. A scenario with Crete as a stopping place on the way, is more probable. Crete would have been an intermediary port of call on the Cyprus-Argolida route, less because its geographical position made it necessary for sea-going ships to take that route, than for reasons of trade and barter in view of the close relations between what was by then Mycenaean

Crete and Argolida, and because of the time-honoured links between the eastern Mediterranean (especially Cyprus) and the Near East and Crete, which were very close in this period. The case for a ship setting out from a Mycenaean harbour on the Greek mainland and sailing to Cyprus, perhaps with a cargo of fine-painted Mycenaean pottery and oil, and then returning to Greece via Crete is much more probable. This would explain the presence of the fine Mycenaean vases and the cooking pots, either as the remnants of a cargo that had not been disposed of, or as pots belonging to the crew. The cooking pots might have been used for cooking during the voyage. It is equally likely that the ship was Cypriot. The relatively poor cargo may be more understandable if we imagine a ship setting sail from Cyprus loaded, in addition to pithoi, with some of the organic products, either contained in the pithoi or carried separately and not traceable today, that we know from Linear B sources were exported to mainland Greece at that time. They included wool, clothes, spices, cumin, clothing, alum and purple dye. The pithoi could also have contained fine Cypriot wares like those found in the pithoi from Uluburun, which could be unloaded at ports en route. The juglet found in the Point Iria wreck may be the only one of these wares that was not unloaded from the ship. The ship would have had two destinations. First Crete, where it may have unloaded a part of its cargo, perhaps raw copper in the form of ingots; and there it took on a cargo of stirrup jars and possibly pithoi jars, which along with the Cypriot pottery it would try to sell in some of the many Mycenaean harbours along on its route to the Gulf of Argos. A Cypriot origin would explain the presence of the two jugs, which could have held drinking water for the crew.

KOTSAKIS: Yes I have a conclusion. I think maybe we shouldn't be discussing these kinds of problems. They're not relevant problems and can't be answered with the evidence there is, and this is a reality we have to deal with. For me, it's enough that we've agreed, more or less, that the evidence shows that what we have at that time —and the Iria shipwreck strengthens this—is a complex trade situation, and I think this is very important; and it's also important to note that this trade is fairly cosmopolitan. We've got Cypriot, Mycenaean, Minoan objects. Maybe we shouldn't go farther, as we're pushing the evidence.

CHAIRMAN: The next topics proposed are: whether the cargo was complete or there was only a part of it; the compatibility of data, which has also been covered; and the patterns of sea transport, which are obvious. Should we discuss these?

And lastly, what can be deduced from shipwrecks? Very little, I would say.

Has anyone anything original to say?

KOTSAKIS: One thing that is missing from this discussion is the people. I think we concentrate a lot on commerce as an abstract and very general process, but in this ship there were actually people living and these people normally have a kind of sailor-culture, and I think one of the aims of archaeology should be to understand more clearly what these people were doing in the ship and what sort of separate or different culture they had and used in this ship. I don't think we've discussed this at all. Maybe this is something for the future. Commerce is a very general, abstract and very interesting subject of course, but it's not all there is in a ship. We know from literature that the literature on sea-culture is a very important part of human experience and I think we should look at this as well, if the evidence allows it.

VICHOS: I would like to clarify a few things concerning the lack of some kinds of finds from the Iria wreck. There are three good reasons why some objects are missing. The first reason, as I said, is that we believe the ship unloaded a large part of the cargo in previous stops. The second is that the site was known for a long time to divers, and if they managed to steal such a big find as the Cypriot pithos, then it would have been quite easy for them to steal smaller utility vessels. As I was saying to Cemal Pulak, the finds were barely covered by the sand. We reached natural rock just a few centimetres from the sea-bed. So for the area excavated, we are sure we don't have other artefacts. The Cypriot jug you saw in the Museum was rescued by Nikos Tsouchlos in the seventies, and I'm quite sure that if it hadn't been rescued, we wouldn't have this find now. The third point is that there might just possibly be some small artefacts in the deepest part of the area, where we have much more sand. We did, however dig some trial trenches and we surveyed the site with a metal detector, and we found nothing. I can say that most of us are 90% sure that the largest part of the cargo has been raised.

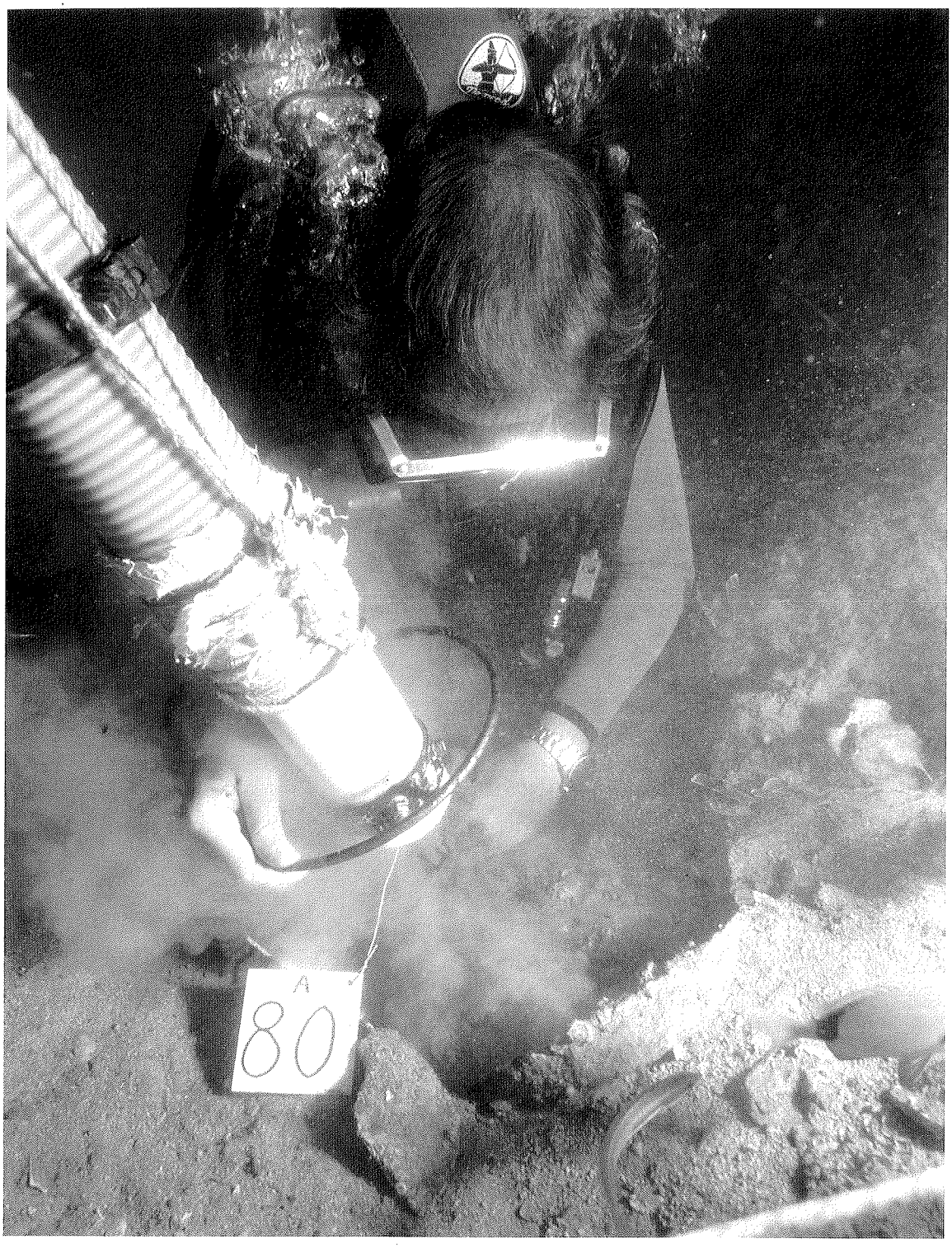
TSOUCHLOS: I think you raised the question about whether things were stolen from the site. I first discovered this wreck in 1962 and I regularly visited it for 10 years. Every weekend and many more days, I dived in this area. At that time there were very few people diving and I can assure you that at least on the surface, except for the finds that were obvious —the stolen pithos, the big broken jar, one pithoid jar and the jug— there were no other obvious finds except the piece of the neck of a jar, and no small finds. The area was exactly as I saw it the first time, minus the big pithos. So, nothing else has been stolen since that time.

CHAIRMAN: The last comment.

LOLOS: Each of us in the research team has his own feelings and views, and I would like to say that I also believed and still believe that what we found was possibly the main bulk of the cargo or a large part of it, but not the whole of it. For

me the strongest argument that the whole of the cargo has not been found is the complete lack of metal objects and tools of different materials. I can't imagine a wreck of 1200 BC without them. Therefore —and we have discussed this possibility between us— there is the prospect of exploring the wider area of the main concentration of finds —and some attempts were made, but the trenches excavated didn't produce anything— using more sophisticated technology, in order to be sure and to get a definitive answer to this question, and also in the deeper parts, as my colleagues have already mentioned. I will finish by saying that we have a duty to carry out a systematic survey over a wider area, using new methods, since what we have here is the third Late Bronze Age shipwreck in the Mediterranean. Perhaps after we have completed this thorough survey, we shall be in a position to discuss for a longer time the questions you raised at the beginning, Mr. Chairman.

End of Round Table Discussion



Point Iria Wreck: Excavating at the wreck site with an air lift.

ADDENDA

The Pottery from the Point Iria Wreck: A Final Comment

by Yannos G. Lolos

With regard to the question raised by Prof. A. Papadopoulos about the precise date of the three pithoid jars: there is no reason to date them to LH IIIC, as they have close parallels in large two-handled jars present in the final LH IIIB2 destruction layer in the Palace of Nestor at Pylos (see relevant references in my paper in this volume; and shown in my Figs. 11-13).

Regarding the date of deep bowl krater A 36 (Exhibit No. 21), Prof. J. Rutter has now very kindly drawn my attention to Aiginetan Matt-painted spouted kraters of LH I date published from Lerna and Akrotiri in Thera. It is true that certain features of shape of our krater are matched on specimens from the above-mentioned sites. The parallels which Prof. Rutter uses are indeed quite convincing; but, on the whole, I do not think that they are more convincing than the Late Mycenaean (LH IIIB2 or LH IIIB2/early LH IIIC) parallels which I have repeatedly referred to. A crucial element for the close dating of this vase would, of course, be its painted decoration, but this is now unfortunately missing. Its fabric cannot provide an answer either. Dr. P. Day, after examining the vase a few years ago in the Museum of Spetses, told me that petrographic analysis could not be applied to such a fine clay and refused to take a "slice" from it. The fact that the krater was located at some distance away from the main concentration of finds, i.e. well outside the conventional perimeter of the wrecked cargo, is not a problem. A large body fragment of a Cypriot pithos with a horizontal relief band (A 58, Exhibit No. 5), that certainly belongs to our cargo, was likewise found well outside the "perimeter", and towards the opposite direction (!). The complete state of preservation of the krater (except for its fragile horizontal spout) is a rather strong argument, I think, in support of the view that it belongs with the ship's cargo. A solitary complete Aiginetan krater, that can hardly be viewed as incidental "litter" from a passing boat travelling during LH I, would seem to be out

of place here, in an underwater "environment" strewn with the remnants of a Cypro-Mycenaean wreck of ca.1200 BC. It is an extreme possibility. Thus, having taken into account all the parameters of the find, including the existing close typological parallels, it is best to accept that the Late Helladic deep bowl krater A36 is part of the wrecked cargo. If I take the "maximalist" point of view, as Prof. Rutter put it, it is because I want to "save" the evidence that exists outside the conventional, and somewhat misleading, perimeter of the wreck: I firmly believe that the spots where A36, A58 and A55 were found give some idea of the extent of the scatter of the ship's cargo on the bottom, and this should form the basis for a future intensive search of the seabed in this area.

Achaea and Cyprus in the Late Bronze Age

by Th. J. Papadopoulos

As I have stated elsewhere,[1] Achaea and Cyprus maintained contacts during the entire Late Bronze Age period. This is evidenced by the exchange of goods (such as some characteristic Achaean pots found in Cyprus and vice versa) betweeen the two areas and the similarities and common elements traced in some pottery-shapes (bird-askoi, composite vessels, tripod cups) and decorative motifs (triangles and concentric semicircles linked by a multiple chevron, semicircle within a triangle, fringed patterns and successive bands round the body of stirrup jars). Further common elements can be traced in some bronzes (two mesomphalic cups and especially in the pairs of bronze greaves from Kallithea and Enkomi) and iron knives.

The combined evidence of pottery and artefacts indicates relations between Achaea and the island of Cyprus, possibly with some interruptions, from LHII-IIIA:1 lasting down to and including the Submycenaean period.

Lastly, the foundation legends of Cyprus speak of colonization of the island from Achaea. In particular, though it is not stated, Keryneia on the north coast of Cyprus was most probably founded by Kepheus, who was storm-driven to the island after the fall of Troy as chief of a contingent of people from the Achaean city of Keryneia in the region of Aigion (*ἦν δέ ὁ μέν Κηφεύς ἐξ Ἀχαΐας. ὁ δέ Πράξανδρος ἐκ Λακεδαίμονος καί οὗτοι παρεγένοντο εἰς Κύπρον, ὥς φησι Φιλοστέφανος*, Schol. Lykophr. 586). As there is no reason to doubt that the legend has preserved a historic record, this further strengthens the archaeological evidence for contacts between the two strongholds of the Mycenaean culture and civilization, Achaea and Cyprus, in the Late Bronze Age.

[1] Th. J. Papadopoulos, "The Problem of Relations between Achaea and Cyprus in the Late Bronze Age," Πρακτικά Β΄ Διεθνούς Κυπρολογικού Συνεδρίου Α΄ (Nicosia 1985) 141-48, pl.1-6.

Ενάλιες Αρχαιολογικές Θέσεις: Προβλήματα Μεθοδολογικά και Ερμηνευτικά (Σημειώσεις)

του Κώστα Κωτσάκη

Οι περισσότερες ανακοινώσεις περιστράφηκαν γύρω από το θέμα του εμπορίου. Για το λόγο αυτό και οι παρατηρήσεις που ακολουθούν θα στραφούν γύρω από το ίδιο θέμα, που άλλωστε, είναι και το θέμα της ημερίδας. Κατά τη γνώμη μου όμως, πριν προχωρήσει κανείς στη σύνθεση αυτή —γιατί πρόκειται βέβαια για σύνθεση— πρέπει να εξετάσει τα όρια και τη φύση της αρχαιολογικής μαρτυρίας· αυτό αποτελεί βασική επιταγή της αρχαιολογικής μεθοδολογίας. Είναι αυτό που ονομάζουμε «formation processes» και «post depositional distortion». Φυσικά έχω συνείδηση της ιδιαιτερότητας μιας υποβρύχιας θέσης και μάλιστα ενός ναυαγίου, που αποτελεί μια ιδιότυπη μορφή αρχαιολογικής θέσης. Βλέπω τέσσερα ζητήματα εδώ, που χρειάζονται κάποια σκέψη και για τα οποία οι ερευνητές —κάθε ναυαγίου— αναμφίβολα μπορούν να δώσουν απαντήσεις που θα είναι χρήσιμες σε εμάς που δε γνωρίζουμε τόσο καλά τις ιδιαιτερότητες της υποβρύχιας αρχαιολογίας.

1. Προβλήματα μεθοδολογικά

1.1 Ο ορισμός της «θέσης». Ποιές είναι οι διαστάσεις, τα όρια, ο τρόπος ορισμού της θέσης;

1.2 Πόσο μπορούν να προσδιοριστούν οι αποθετικοί και οι μεταποθετικοί παράγοντες; Ποιά είναι η στρωματογραφική μαρτυρία; (Δεν εννοώ μόνο την ιζηματογένεση, αλλά και τη σχετική θέση, οριζόντια και κάθετη των ευρημάτων).

1.3 Το ζήτημα του «κλειστού ευρήματος». Σύμφωνα με τον κλασικό εγχειριδιακό ορισμό, ένα εύρημα θεωρείται κλειστό όταν αντιπροσωπεύει μια μοναδική ανθρώπινη δράση, τα υλικά κατάλοιπα της οποίας παρέμειναν αδιατάρακτα μέχρι σήμερα. Στο ναυάγιο όμως έχουν επιδράσει μια σειρά μετασχηματιστικών μεταποθετικών διαδικασιών που έχουν κατά τεκμήριο αλλοιώσει το δείγμα. Συγκεκριμένα: (α) Φυσικές διαδικασίες: αποσύνθεση οργανικών και ευαίσθητων υλικών, μετακίνηση αντικειμένων στο βυθό, κάλυψη από ιζήματα κ.ά· (β) Ανθρωπογενείς διαδικασίες: άλλα ναυάγια, απορρίψεις αντικειμένων κλπ.

Το ζήτημα του κλειστού ή όχι ευρήματος έχει στενή συνάφεια με τη χρονολόγηση. Π.χ. το δείγμα (δηλαδή το περιεχόμενο του πλοίου) συγκροτείται, δεν προκύπτει αυτοτελώς, και συγκροτείται με βάση το κριτήριο της χρονολογικής και της χωρικής συνάφειας και το αντίθετο. Εντέλει δεν πιστεύω καθόλου ότι το ναυάγιο είναι κλειστό εύρημα, και δε νομίζω ότι είναι σωστό να ξεκινά κανείς με αυτή την υπόθεση.

1.4 Συναφές ζήτημα είναι το ζήτημα της αντιπροσωπευτικότητας του δείγματος. Φυσικά αυτό είναι ζήτημα που αντιμετωπίζει η σύγχρονη αρχαιολογία σε κάθε περίπτωση, αλλά στην προκείμενη περίπτωση

ίσως έχει ακόμη κεντρικότερη σημασία. Εννοώ με αυτό ότι η σύγχρονη αρχαιολογία ενδιαφέρεται να κατανοήσει καλύτερα τί είδους συγκεκριμένες πράξεις αντιπροσωπεύει η αρχαιολογική μαρτυρία και όχι μόνο γενικές αφηρημένες διαδικασίες, όπως το εμπόριο. Σε αυτό θα επανέλθω. Εδώ μόνο τονίζω ότι προϋπόθεση για την κατανόηση αυτού του μέρους της πληροφορίας είναι ο έλεγχος των παραμέτρων της αρχαιολογικής μαρτυρίας. Αυτό που αντανακλάται στο δείγμα είναι μόνο το εμπόριο;

Περνώ τώρα στο συνθετικό μέρος, το εμπόριο και στην ανασύνθεσή του με βάση τα ναυάγια —δεν μιλώ μόνο για το συγκεκριμένο.

2. Η κλίμακα του εμπορίου

Μπορεί να αποκατασταθεί μόνο με βάση τα περιεχόμενα του πλοίου; Αυτό είναι ένα θεμελιώδες ζήτημα για το οποίο μπορούν να γίνουν μερικές παρατηρήσεις:

2.1 Από την ανακοίνωση του Peter Day φάνηκε ότι η κεραμική κυκλοφορούσε στην ανατολική Μεσόγειο, ανεξάρτητα από την πετρολογική της προέλευση.

2.2 Τα εμπορεύματα μπορούν πάντα να ανακυκλώνονται, συσκοτίζοντας τα εμπορικά δίκτυα που αποκαθιστώνται μέσω της πετρολογικής ή αρχαιολογικής προέλευσης.

2.3 Δεν είναι καθόλου δυνατό να ελέγξει κανείς τον χρονικό παράγοντα των ταξιδιών. Πόσα χρόνια ταξίδευε ένα πλοίο; Πόσους ιδιοκτήτες άλλαζε ένα πλοίο; Η παρατήρηση αυτή πρέπει να συνδυαστεί με την παρατήρηση 1.4 παραπάνω.

2.4 Πόσο πιθανή, επίσης, είναι μια δραστηριότητα που δε συνδέεται με εμπόριο; Π.χ. ψάρεμα, πειρατεία μικρής κλίμακας κλπ.

3. Ο χαρακτήρας του εμπορίου

3.1 Σύμφωνα με την ανακοίνωση του Jeremy Rutter, το εμπόριο φαίνεται να είναι μια ιδιαίτερα πολύπλοκη δραστηριότητα, με πολύπλοκα δίκτυα διανομής.

3.2 Θα πρέπει επίσης να λάβει κανείς υπόψη τις διαβαθμίσεις του εμπορίου: μεγάλης ή μικρής εμβέλειας, μεγάλης ή μικρής κλίμακας;

3.3. Ο έλεγχος του εμπορίου. Ποιός ελέγχει τη δραστηριότητα αυτή; Οργανωμένο, κεντρικό εμπόριο, μικρής κλίμακας από μικρούς τοπικούς εμπόρους, εμπόριο παράλληλο με άλλες οικονομικές δραστηριότητες, παράνομο εμπόριο, πειρατικό εμπόριο, κλπ.

3.4 Δεν πρέπει να ξεχνούμε και τις αγορές, χωρίς τις οποίες δεν υπάρχει εμπόριο. Μία ομοιόμορφη ή πολλές αλληλοκαλυπτόμενες αγορές; Και με τον όρο εδώ δεν εννοώ το χώρο, αλλά ομάδες ανθρώπων με τις δικές τους ειδικές ανάγκες και απαιτήσεις.

4. Αυτό που εικονίζεται στο δείγμα είναι μια εικόνα των προτιμήσεων των ανθρώπων. Όχι πλήρης βέβαια, γιατί οι προτιμήσεις έχουν σχέση και με το περιεχόμενο των αγγείων (αλήθεια έχει σκεφτεί κανείς χημική ανάλυση για τα κατάλοιπα μέσα στα αγγεία; ή μήπως

το νερό της θάλασσας κάνει ανέφικτη μια τέτοια ανάλυση;). Για το λόγο αυτό τα ειδικά αυτά δείγματα δεν είναι εύκολο να συγκριθούν με τα ανάλογα της ξηράς. Στη θάλασσα η παρουσία της κεραμικής διαμεσολαβείται από το εμπόριο. Κάποιες ομάδες ανθρώπων, που κατοικούν στους οικισμούς, μπορεί κάλλιστα να μην παίρνουν μέρος στο δίκτυο αυτό. Νομίζω ότι χρειάζεται εδώ προσοχή.

5. Νομίζω ότι ένας θεωρητικός κίνδυνος που διαβλέπω στη συζήτηση για την αποκατάσταση των γεωγραφικών δικτύων του εμπορίου με βάση την κεραμική είναι η επανάληψη της παλιάς ιδέας της αποκατάστασης των μεταναστεύσεων των λαών με βάση την κεραμική. Έχω την εντύπωση ότι το ρόλο των λαών μπορεί να παίζουν εδώ τα πλοία. Η έρευνα έχει δείξει ότι οι μεταναστεύσεις είναι ένα πολύ πιο σύνθετο φαινόμενο από όσο η αρχαιολογία έχει υποθέσει. Το ίδιο πιθανότατα συμβαίνει και με το εμπόριο. Τα αγγεία δε συνδέονται κατ' ανάγκην με την καταγωγή των ανθρώπων ή του πλοίου, ή ακόμη και με τις ταυτότητές τους «εθνικές» ή άλλες, ιδιαίτερα σε μια κοσμοπολίτικη περίοδο, όπως αυτή της Ύστερης Εποχής του Χαλκού.

6. Μια πιθανή εναλλακτική προσέγγιση: Το καράβι αποτελεί μια «πολιτισμική κάψουλα», κυριολεκτικά «στη μέση του πουθενά». Οι άνθρωποι που ζουν στο πλοίο ανήκουν σε έναν ειδικό πολιτισμό, μια θαλασσινή κουλτούρα ας πούμε, είναι πιθανότατα ένα είδος θαλασσινών νομάδων. (Είχα γνωρίσει στα τέλη της δεκαετίας του '60, ψαράδες στη Χαλκιδική που έφταναν εκεί από τα Δωδεκάνησα, με μικρές ψαρόβαρκες 5-6 μέτρα μήκος. Άρχιζαν το ταξίδι της επιστροφής την ημέρα του Αγίου Δημητρίου, και ανέβαιναν στην αρχή του καλοκαιριού. Κάθε χρόνο το ίδιο).

   Οι άνθρωποι αυτοί χρησιμοποιούν τον υλικό πολιτισμό με τον δικό τους τρόπο. Υπάρχει τρόπος να μελετηθεί αυτή η ιδιαίτερη κουλτούρα (πολιτισμός); Πώς ενεργούν οι άνθρωποι αυτοί; Ποιά είναι η καθημερινή τους ζωή στη θάλασσα; Αυτό θα είχε ιδιαίτερο ενδιαφέρον και θα ήταν πολύ κοντά στις πιο σύγχρονες τάσεις της αρχαιολογίας, που απομακρύνεται από τις γενικές —και αφηρημένες— διαδικασίες, όπως το εμπόριο, η οικονομία, η κοινωνία κλπ, —τις οποίες εκ των πραγμάτων απλουστεύει σε βαθμό σχεδόν αποτρεπτικό. Αντίθετα στρέφεται προς την ανθρώπινη πράξη, στη διαχείριση της πραγματικότητας από τον ίδιο τον άνθρωπο διαπιστώνοντας ότι τα κατάλοιπα που μελετούμε αποτελούν ίχνη δραστηριοτήτων πραγματικών ανθρώπων και όχι αφηρημένων διαδικασιών στις οποίες οι άνθρωποι απλώς μετέχουν. Προσπαθεί, δηλαδή, η σύγχρονη αρχαιολογία να δώσει ένα περισσότερο ανθρώπινο πρόσωπο στο παρελθόν, ενσωματώνοντας το προσωπικό και το ειδικό, το τυχαίο και το απρόβλεπτο και όχι μόνο το γενικό και το συλλογικό, το προβλέψιμο και το αναγκαστικό, που συνιστούν γενικές διαδικασίες και νόμους. Σε τελική ανάλυση, οι άνθρωποι πάντα έκαναν πράγματα αντίθετα από εκείνα που οι συνήθειες και οι συμβάσεις (οι νόμοι) επιτάσσουν.

LIST OF PARTICIPANTS

Χρήστος Αγουρίδης
Καθηγ. Στυλιανός Ανδρέου
Φαίδων Αντωνόπουλος
Δημήτρης Ασδραχάς
Καθηγ. Paul Åström
Νικολέττα Βαλάκου
Κώστας Βασιλειάδης
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Μαργαρίτα Βενάκη
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Δρ Γιάννης Βήχος
Φωτεινή Βλαχάκη
Dr Lucy Blue
Σταύρος Βοσυνιώτης
Ντόρα Γαρταγάνη
Ευγένειος Γιαννακόπουλος
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Δρ Φανουρία Δακορώνια
Κατερίνα Δελαπόρτα
Κατερίνα Δελούκα
Φίλιππος Δεμερτζής
Στέλλα Δεμέστιχα
Δρ Αικατερίνη Δημακοπούλου
Dr Peter Day
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Θεοτόκης Θεοδούλου
Μαρία Θεοχάρη
Γιώργος Θυμαράς
Καθηγ. Σπύρος Ιακωβίδης
Καθηγ. Μαρία Ιακώβου
Αριστέα Καββαδία-Σπονδύλη
Καίτη Καλαντζή
Καθηγ. Αθανασία Κάντα
Καθηγ. Βάσος Καραγιώργης
Αλεξάνδρα Καρέτσου
Παρασκευή Κατημερτζή
Χάρις Κοιλάκου
Φρύνη Κοκκώνη
Βασίλης Κονιόρδος
Ελένη Κονσολάκη
Μαριάννα Κορομηλά
Δημήτρης Κοσμίδης
Κώστας Κουλαλόγλου
Δρ. Δημήτρης Κουρκουμέλης
Χαράλαμπος Κριτζάς
Βάσω Κυριακοπούλου
Άδωνις Κύρου
Καθηγ. Κωνσταντίνος Κωτσάκης
Αχιλλέας Λαγοπάτης
Γιάννης Λάππας
Καθηγ. Γιάννος Λώλος
Αλεξάνδρα Μαρή
Δέσποινα Μαρσινοπούλου
Γρηγόρης Μίχας
Δρ. Γιάννης Μπασιάκος
Τάσος Μπέλλας
Καθηγ. James Muhly
Γιάννης Νάκας
Ήβη Νανοπούλου
Καθηγ. Χρίστος Ντούμας
Δρ Γιώργος Παϊσίδης
Δρ Πάντος Πάντος
Μαίρη Πάντου
Καθηγ. Αθανάσιος Παπαδόπουλος
Νίκος Παπαδόπουλος

Καθηγ. Λίτσα Κοντορλή-Παπαδοπούλου
Γιώργος Παπαθανασόπουλος
Καίτη Παπαμιχαήλ-Νεγρεπόντε
Σπυριδούλα Παπανίκου
Χριστίνα Παπαχριστοπούλου
Δρ Λιάνα Παρλαμά
Δρ Βάσω Πέννα
Δάφνη Πέννα
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