The Transport Amphorae and Trade of Cyprus

Edited by Mark L. Lawall & John Lund

GÖSTA ENBOM MONOGRAPHS

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Amphora attributed to the painter Syriskos, Athens 500-470 BC, Collection of Classical and Near Eastern Antiquities, The National Museum of Denmark, i.n. Chr. VIII 320.

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A White Painted IV jug. London, British Museum i.n. 1926.6-28.9. Courtesy the British Museum.

Back cover:
Amphora in the National Museum of Denmark, Collection of Classical and Near Eastern Antiquities, i.n. 9707 from Tomb 80 at Marion; Late Roman 1 amphora in situ from a wreck at Cape Zevgari. Photo by courtesy of Justin Leidwanger.

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Preface

BY PER KRISTIAN MADSEN
DIRECTOR GENERAL
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Transport amphorae, the more or less standardized ancient ceramic containers primarily used for the shipping of agricultural products, offer a great potential for elucidating important aspects of the economic history of the Mediterranean in Classical antiquity. This is probably the main reason why they have been the focus of many studies in recent years, a situation reflected by this volume. Earlier versions of some of the chapters were read at a workshop on *The Transport Amphorae and Trade of Cyprus* held at the Danish and Canadian Institutes at Athens in 2007.

The contributions gathered here are also symptomatic of a growing awareness of the societal and economic aspects of ancient pottery. The latter constituted one of the main themes of the research programme "Pots, Potters and Society in Ancient Greece", which the Danish National Museum launched in 2008 thanks to a substantial grant from the Foundation of Consul General Gösta Enbom.

The focus on Cyprus in this volume may be perceived as a natural consequence of the special place of pride Ancient Cyprus holds in the Danish National Museum, where a new gallery of Cypriot antiquities was inaugurated in 2002, thanks to a large donation by the A.G. Leventis Foundation in Nicosia. Moreover, in the early 1970s, Dr. Vassos Karageorghis, then Director of Antiquities in Cyprus, had invited Danish students of classical archaeology to participate in his excavations at Kition, and this led to a Danish involvement in a Canadian landscape survey around the city of Palaepaphos (modern Kouklia) in the 1980s. Between 1989 and 1992, the University of Aarhus organised a landscape survey and excavations in the Akamas peninsula, and the University of Copenhagen investigated from 1992 to 1999 a rural settlement at Aradippou in the Larnaka area. After the turn of the millennium, Danish archaeologists returned to the island to participate in the Troodos Archaeological and Environmental Survey Project organized by the University of Glasgow.

Consul General Gösta Enbom (1895-1986).

The Transport Amphorae and Trade of Cyprus thus bears witness to former and present Danish engagement in the archaeology of Cyprus as well as the international collaboration in the archaeological exploration of the island, which the Department of Antiquities in Cyprus has promoted for several decades.

I wish to conclude by expressing my gratitude to of the contributors to this volume and to all other individuals who have helped in one way or the other, in particular the anonymous reviewers and the editors Mark L. Lawall and John Lund. Last but not least I thank the Foundation of Consul General Gösta Enbom, which made it all possible by its generous support.

Introduction

BY MARK L. LAWALL & JOHN LUND

Placed as a stepping stone on the sea route between Europe and the Near East, Cyprus has always been a meeting place of many cultures. Though rarely united politically through many millennia of history – and for extended periods subject to foreign rule – the island nonetheless managed to maintain specific and unique identities.[1] This publication focusses on aspects of the economy of Cyprus between c. 700 BC and AD 700, a crucial millennium and a half of her history. True, several generations of scholars have elucidated many aspects of the Cypriot economy and trade in these centuries,[2] not least the important role played by the copper mines throughout history.[3] But gaps remain in our knowledge of the role played by the island's export and import of agricultural products at the regional and interregional level.

The aim of this volume, *The Transport Amphorae and Trade of Cyprus*, is to throw new light on these questions. The title was chosen so as not only to cover the transport amphorae produced in the island but also the imported amphorae manufactured in other parts of the ancient world. Both categories need to be taken into consideration if the potential of amphorae as a source for the economic history of Cyprus is to be fulfilled. While the shipping containers, the transport amphorae, are our focus, it is important to recognize that amphorae (like any other type of archaeological and historical evidence) can only further our understanding of parts of the picture. Indeed, all relevant classes of material need to be taken into account in our quest to arrive at a better understanding of the ancient economy. Still, the amphorae remain a prime source for the ancient trade in agricultural products and other foodstuffs, even if other types of containers were also used – in particular for overland shipments – for this purpose.[4]

A good deal of new information has emerged in recent years about transport amphorae manufactured in and shipped around the Levant in general. But we are far from having a comprehensive understanding of Cypriot amphorae, and in fact the present volume is the first monograph devoted to this subject. Scholarly interest in the amphorae of Cyprus may be traced back at least to the final decades of the 19th century, when Luigi Palma di Cesnola and his brother Alessandro Palma di Cesnola conducted extensive excavations in the island.[5] They shipped many of their finds to Great Britain and America, where they subsequently became scattered between public museums and private owners. Some of the transport amphorae – in particular the Rhodian ones – were published,[6] but there was little understanding of the pottery of Cyprus until Einar Gjerstad and his collaborators in the Swedish Cyprus Expedition (1927-1931) imposed an archaeological methodology developed in Sweden on the Cypriot material.[7] They established an overall chronological framework of the island, subdividing the centuries of concern here into the (Cypro-)Archaic, Classical, Hellenistic, Roman and Late Antique periods – a division which is still often used.[8] Yet, as far as transport amphorae were concerned the results were somewhat inconclusive. In many cases, no distinction was made between amphorae produced in Cyprus and imported ones, and the classification of fabrics was notably generic. Virginia R. Grace, in a series of trips to Cyprus, did make a detailed study of finds from the Swedish Expedition, and her notes, now in the archives of the American School of Classical Studies at Athens, include suggestions of which jars are imported and which are local Cypriot.

Jean Deshayes' study from 1963 of the Late Classical and early Hellenistic amphorae found at Ktima, the predecessor of Nea Paphos,[9] remains the most comprehensive treatment

1 See for instance Mikrakis 2012.
2 Karageorghis & Michaelides (eds.) 1995; Mehl 1995; Papacostas 2001; Leonard 2005; Coureas 2005.
3 Kassianidou 2000; Kassianidou 2004 and forthcoming; Given *et al.* (eds.) forthcoming.
4 See the contribution by Tønnes Bekker-Nielsen to the present volume.
5 For the activities of Luigi Palma di Cesnola, see Marangou 2000.
6 Cesnola (A.P. di) 1881; 1882, and Cesnola (L.P. di) 1903; Hall 1885.
7 Houby-Nielsen 2003. For critical assessments of the legacy of Gjerstad and his associates, see Nys 2008 and Smith 2009, 220-233.
8 Gjerstad 1948, 427: Archaic I from 700 to 600 BC, Archaic II from 600 to 475 BC, Classical I from 475 to 400 BC, Classical II from 400 to 325 BC; Westholm 1956, 71: Hellenistic I, 325 to 150 BC, Hellenistic II, 150 BC to 50 BC, Roman I, 50 BC to AD 150, Roman II, AD 150 to AD 250, and Roman III, from AD 250 onwards. These dates are retained by Karageorghis 1982a, 9, except for the beginning of Archaic I which is dated to 750 BC.
9 Deshayes 1963, 210-212; Salles 1993b, 270-271.

of the unstamped Cypriote amphorae of those periods, but their stamped counterparts have been studied in some detail by Grace, Yves Calvet and Henryk Meyza.[10] Moreover, Zosia Sztetyłło, Calvet and Ino Nicolaou have investigated the imported stamped Hellenistic amphorae found in the island even more extensively.[11] The unstamped transport amphorae of the later Hellenistic and Roman periods have received less scholarly attention, but John W. Hayes' publication of the pottery from the House of Dionysos retains its fundamental value,[12] together with the indispensable communications to be found on the pages of the Report of the Department of Antiquities, Cyprus. In the last decades, our knowledge of the Late Antique amphora production of Cyprus was significantly advanced by the publications of evidence from amphora kiln sites by Stella Demesticha and Demitrios Michaelides.[13] There has nevertheless been little collation, interpretation, or synthesis of the data until recently. But this situation is rapidly changing, thanks in no small part to the contributors to the present volume, who are actively engaged in new studies of transport amphorae from shipwrecks, surveys and excavations. Moreover, the Hellenistic transport amphorae of Cyprus are the focal point of an ongoing Ph.D. project by Agata Dobosz at the Instytut Archeologii Uniwersytetu Jagiellońskiego, Kraków, and Anthi Kaldeli initiated a major new research programme in 2010 on the "Roman amphorae from Cyprus: interpreting Production, Trade and Exchange in the eastern Mediterranean".[14]

The time seems appropriate, therefore, for the present volume, which has the following goals: 1) to gain a first overall view of both the Cypriot production of transport amphorae and their distribution around Cyprus and beyond, 2) to gain a better understanding of the trends and patterns in imports to Cyprus and 3) to begin coordinating the amphora material with evidence of the trade routes, harbour facilities, and, within the island itself, the overland routes that made this trade possible. We have deliberately chosen a long time frame with the expectation that trends, models, or interpretive ideas from one period may prove useful for others. These goals, however, may ultimately lay the foundation for achieving the wider aim: to start a discussion about what the evidence of amphorae can tell us about the fluctuations in the economy of Cyprus from the Archaic period through to Late Antiquity.

The starting point for the chronological range of this volume roughly coincides with the capture of Cyprus in 709 BC by the Assyrian empire.[15] This is seen as a period of considerable autonomy as well as fragmented political structure with ten kingdoms attested in Esarhaddon's list of 673 BC.[16] This period sees considerable prosperity with both Greek and Levantine influences being seen at many sites and plenty of imported goods from both sides. Even if such influences, likely via trade contacts to at least some degree, were engendered by the need to provide tribute to the Assyrians, Cyprus shows no lack of foreign contact in this period.[17] Perhaps the best illustration of this dynamic period is illustrated on the cover of this volume: the Bichrome IV jug from Karpass showing a merchant ship with two, possibly Phoenician, amphoras perched on the deck. The recent studies of Archaic shipwrecks with mixtures of Cypriot and Greek cargoes off the southwestern coast of Turkey, reported here by Elizabeth Greene, Justin Leidwanger and Harun Özdaş, both provide vivid examples of Cyprus' connections to the Aegean world and begin to explore the institutional frameworks underlying this exchange. K. Levent Zoroğlu's paper highlights the intensity of activity in the area between the Cilician coast and Cyprus already in the 7th century and continuing into the early Hellenistic period.

Cyprus' contacts and trade with the broader Mediterranean world show little negative impact from the collapse of the Assyrian empire in 612 BC. The brief period of control by Egypt *c.* 560-545 BC (Hdts. 11.182) is seen as a time of increased Egyptianizing elements in Cypriot material culture, but contact with the Aegean world continues.[18] It is difficult to specify illustrative details of the amphora record for such a relatively narrow chronological window, but various Chian white-slipped, bobbin-shaped amphorae from Cypriot tombs might well date to this period of Egyptian control.

Persian domination, starting *c.* 545 BC (Hdts. 3.19) under Cyrus and continuing with substantial administrative reforms under Darius, brought with it both developments of economic practice (e.g., the emergence of coinage *c.* 520 BC) and an apparent intensification of Aegean-Cypriot interaction.[19] Some of the Cypriot kingdoms (though not Salamis or Amathous) joined the Greek cities of Asia Minor in the Ionian Revolt albeit briefly (Hdts. 5.116), but Cypriot ships are then attested on the Persian side at both the battles of Lade and Salamis.[20] Persian control of the island began to fragment after 480 culminating in the expanding

power of Salamis under Evagoras I starting in 411 BC.[21] Persian control was re-established with the King's Peace of 386 and further strengthened throughout subsequent decades.[22] In 332 BC, the Cypriot fleet shifted its allegiance to Alexander the Great during the siege of Tyre.[23] Despite the volatile political history of the island with respect to both the Aegean and its nearer neighbours in the Levant, Cyprus remained a significant crossroads in the later Archaic and Classical amphora trade. Mark Lawall's chapter in this volume offers a preliminary attempt to characterize this trade with consideration of the Aegean amphora forms imitated locally on Cyprus as well as the regional variation in imported amphoras.

After Alexander's death, the island's cities were variously aligned with Ptolemy I and Antigonos Monophthalmos with Ptolemy gaining the upper hand in 312.[24] This state of affairs reversed when Demetrios Poliorketes captured Cyprus in 306. In 294, however, Ptolemy regained control of Cyprus, and the island remained a fundamental part of Ptolemaic maritime power with only brief interruptions all the way down to the period of Rome's intervention in Ptolemaic affairs in the early 1st century BC culminating in Octavian's victory at Actium in 31 BC. The connection between Cyprus and Ptolemaic Egypt plays a significant role in a number of papers in this volume. Kristian Göransson reports on rare fragments of Cypriot basket-handle amphorae, from an early 3rd century BC context, found in excavations at Euesperides in Cyrenaica. The marine 'landscape' shaped by prevailing winds and currents, together with prevailing Ptolemaic political alliances, must have significantly shaped the dominant presence of Rhodian amphorae in Hellenistic Cyprus already at the very beginning of the 3rd century. The papers by Craig Barker and Agata Dobosz provide various perspectives on the Rhodian record on Cyprus. The same Rhodes-to-Alexandria trade corridor, with Cyprus as a key nodal point, may also be indicated by the frequent discovery of Cypriot amphorae amongst the otherwise Rhodian-dominated amphora record of Alexandria as is documented here by the work of Gonca Cankardeş-Şenol and Ahmet Kaan Şenol. The further circulation of Cypriot amphorae of the Hellenistic period is also attested extensively at sites in Israel, and these finds are presented here by Gérald Finkielsztejn.

Once Cyprus became part of the Roman Empire,[25] the connections evidenced by the amphora record multiply considerably, yet the regional importance of the island remains clear. Anthi Kaldeli's paper on the amphora records of Nea Paphos and Amathous the 1st century BC to early 3rd century AD highlights the increased geographical range of Cyprus' imports, now with direct imports from the Western Mediterranean at Nea Paphos while Amathous shows a continued dependence on circulation and re-circulation of goods within the Eastern Mediterranean. Complementing Kaldeli's paper, Henryk Meyza and Dobiesława Bagińska's paper on the amphorae from the Polish excavations at Nea Paphos illustrates this mixture of Mediterranean types present at the site and continues the account into the late Roman period. While sites such as Nea Paphos and Amathous show various imports from the Aegean basin, the ceramic evidence for shipping from Cyprus towards the Aegean can be surprisingly sparse as Tamás Bezeczky's paper notes for the case of Roman Ephesus. Amphora production on Cyprus and nearby coastal regions is discussed in papers by David Williams and John Lund (the "pinched handle" amphorae, predominantly from Rough Cilicia, 1st - 4th centuries AD) and Stella Demesticha (Late Roman 1 amphorae, 4th - 7th centuries AD, with production appearing to spread from Cilicia to Cyprus and, only in the latest periods, up into the Aegean). Demesticha's paper also tracks the changing

10 For the Cypriot-produced stamped amphorae see Grace 1979; Calvet 1986, 509; Meyza 2004.
11 Sztetyłło 1976; 1984; 1985; 1991 and 2010; Barker 2002a; 2002b; 2004; Nicolaou 2005.
12 Hayes 1991; see also Papuci-Władyka 1995.
13 Demesticha 2000; 2003; 2005; Demesticha & Michaelides 2001.
14 This project continues and expands Kaldeli's Ph.D. thesis (2007).
15 Karageorghis 1982b, 57-64; Grayson 1991a, 90 and 1991b, 107; Reyes 1994 focuses on the 8th through 6th centuries; see too, Iacovou 2008; Cannavò 2011.
16 Karageorghis 1982b, 57-59; Grayson 1991b, 127; Iacovou 2008, 632-633; Reyes 1997, 308.
17 Karageorghis 1982b, 60-64.
18 Karageorghis 1982b, 64-68.
19 Karageorghis 1982b, 69-70; Maier 1985; 1994; Wiesehöfer 1990; Pouilloux 1989; Raptou 1999.
20 Maier 1994, 306-308; Georges 2000; Raptou 1999, 238-243.
21 Maier 1994, 308-312; Costa 1974; Raptou 1999, 250-261.
22 Maier 1994, 312-317; Ruzicka 1999.
23 On the period after the King's Peace down to the treaty of the Diadochoi in 311 BC, see Maier 1994, 326-336.
24 A recent overview of the Hellenistic history of Cyprus is found in Gordon 2012, 70-90; see too Will 1984a; 1984b; and Heinen 1984.
25 Gordon 2012, 279-302.

extent of distribution of LR 1 amphorae through successive typological developments. While the geographical extent of such production of Cypriot-related amphorae was expanding in the Late Roman period, however, Cypriot amphora commerce appears to have become more intensively regional in scope. Justin Leidwanger's survey of maritime sherd scatters along the south coast of Cyprus shows a dominance of amphora types from the Eastern Mediterranean; even the Aegean is more often represented by Hellenistic types instead of Late Roman pieces. On land, Marcus Rautman's report on patterns identified in the Vasilikos Valley likewise highlights the dominance of LR 1 amphorae with far lesser percentages of other Eastern Mediterranean types. Kristina Winther-Jacobsen's paper comparing finds from the Troodos mining region with surveys of other contemporary regions, Methana in Greece and the Eastern Desert mining regions in Egypt draws attention to the ways that amphora types (present and absent), alongside the record of non-amphora ceramics, can begin to fill in the historical developments of broader commercial practices, in this case the extraction of mineral resources.

Taken as a whole, then, the contributors throw new light on a variety of relevant issues and in particular on the emerging patterns of regionalism in Cyprus – islands being particularly well suited for regional studies of this kind.[26] They trace an outline of a pattern (or patterns) of exports from and imports to the island through time of amphora-borne agricultural products. It may well be that wine constituted the most important of these commodities, but scientific residue analyses are urgently needed to ascertain the contents of the amphorae.

It is easy to form the impression that Cyprus was largely self-sufficient in olive oil and wine – with the exception of years of crop failures – and that her considerable import of wine was mainly due to a thirst for more exotic vintages than those produced locally. But the verdict is still out on this and many other issues, because the evidence gathered here underlines more than anything the need for new research aimed at helping us distinguish more clearly the amphorae produced in Cyprus from the imported ones - new discoveries of kiln sites in the island will surely contribute to solving this quandary in the future. Also, more publications of quantified amphora material from Cyprus and the surrounding areas need to be made available. In the absence of such analyses it is well-nigh impossible to determine the scope of the island's import and export trade in amphora-borne foodstuffs and hence their importance to the economy of the island. Therefore this volume cannot (and does not) claim to provide definite answers to the involved issues, but we hope that it may constitute a new point of departure for the future study of the transport amphorae and trade of Cyprus.

26 For recent discussions of "island archaeology" with reference to Cyprus see Knapp 2008, 13-30 and Kopaka & Cadogan 2012, 18-24 and 28-29.

Transport in Ancient Cyprus

BY TØNNES BEKKER-NIELSEN

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Over the last two generations, the systematic study of amphorae has provided insights into the extent, scope and organization of trade in the ancient Mediterranean that no other category of source material can offer. It needs to be borne in mind, however, that the goods transported in amphorae form only part of a much larger picture of ancient commodity flows, most of which have left little or no trace and can only be reconstructed in very general outlines.

WAYS OF COMMUNICATION

Land and water

In classical antiquity as in other pre-industrial societies, land transport was expensive: the resource input required to produce a ton-mile of overland transport was five times that required for transport by barge on an inland waterway, and twenty-five times greater than that required to move the same quantity over the same distance on the high seas. The cost of transport by coasting vessel has not been calculated, but would lie somewhere between that of river and sea transport.

For non-perishable goods, water was generally preferred over land transport. For travellers and couriers, on the other hand, road travel had the advantage of predictability. A sea traveller might have to wait days or weeks in port for a ship and a favourable wind.[1]

In Cyprus, sea transport predated road transport. The Neolithic colonists who were able to cross the sea from the mainland to Cyprus will have had little difficulty navigating the coastal waters of the island and in the 2nd millennium BC, the Uluburun wreck, laden with some ten tons of Cypriot export wares such as copper and ceramics, testifies to the sea trade between Cyprus and the mainland coasts.

Most of the ancient royal cities – the exceptions being Idalion and Tamassos – had ports. In the Ptolemaic and Roman period, every *polis* of Cyprus was a port city. Karpasia (Rizokarpaso/Dıpkarpaz) had two harbours, one on either side of the Karpas peninsula.[2] Some port cities were located in bays, facilitating the transport of raw materials from the periphery of the *chora*. For instance, Marion (Polis tou Chrysochou) was supplied with building stone from a quarry at the water's edge near Agios Nikolaos on the western shore of Chrysochou Bay. The importance of coastal shipping for goods transport in Cyprus is attested by the port and emporium at Dreamer's Bay, formerly thought to have been only a Late Roman trading settlement but now known to have been in use throughout the Hellenistic and Roman periods.[3] Since the port at Dreamer's Bay is not tied into the highway network of the island, its primary function was apparently as "a transshipment port through which local and regional trade goods (many contained in amphorae) passed bound for other destinations and markets",[4] linked to the other ports of Cyprus by coastal shipping. Less exclusive imports and staple export goods (such as timber and grain, to which we shall return below) will also have passed directly to or from the *poleis* and local ports.

ROADS AND VEHICLES

Compared to that for sea transport, our evidence for roads and wheeled vehicles is both later and sparser. Horse-drawn war chariots were among the grave goods deposited in one of the royal graves (tomb 79) at Salamis in the 8th or 7th century BC, and a terracotta model of a quadriga or four-horse chariot was found in the sanctuary at Agia Irini (7th century BC) at the opposite end of the Mesaoria. With their wide wheelbase and large wheel diameter, light vehicles such as these were able to range over the central plain of the island, independently of roads.

A terracotta model from Tamassos of c. 500 BC shows a covered two-wheeled vehicle (Fig. 1). Carts typically had a narrower wheelbase of c. 1.4 metres and were drawn by mules, donkeys or, more rarely, horses or oxen, yoked in pairs. The two-wheeled cart is simple to construct and maintain, can be easily controlled on a descent and is capable of turning in a narrow circle, which was important on switchback roads. Its chief limitation is its load capacity, which rarely exceeded 300 kilograms. Light two-wheeled vehicles would normally be drawn by mules or donkeys.[5]

The four-wheeler was a heavier vehicle with a correspondingly greater carrying capacity, up to 800 kg, and requiring greater tractive capacity: teams of up to ten mules are recorded[6] but for heavy work, oxen were generally preferred. In its simplest form with two fixed axles, the four-wheeler required good roads without excessive

gradients or narrow curves. More complex versions with a movable front axle and brake gear are known from other parts of the ancient world,[7] but there is as yet no evidence that these were used in ancient Cyprus.

Like sea transport, the land transport network within ancient Cyprus must be conceptualized as operating on two levels. At one level, it served the needs of local and inter-urban trade, connecting one farmer with another, connecting the *polis* with its *chora*, or two *poleis* with each other. At another level, land transport links formed part of long-distance trading networks, but in a secondary and ancillary rôle in relation to sea transport.[8] This dualism is reflected in the development of the Cypriot highway network.

Recent fieldwork suggests that much of mainland Greece was criss-crossed by man-made roads as early as the Archaic period,[9] but there is no good evidence for a similar network in Cyprus. By the end of the 4th century BC, however, long-distance roads were in existence, forming two sub-networks: a somewhat rudimentary western road system connecting Palaipaphos, Marion and Nea Paphos,[10] and a more developed network in the east, branching out from Salamis to link up with the central Mesaoria, the Karpas peninsula and the *poleis* of the southeastern coast. Under Ptolemaic rule, the road system was extended from the new administrative capital at Nea Paphos into the city's *chora*, but there is nothing to suggest that the early Ptolemaic *strategoi* had any overall road policy. The western and eastern sub-networks were not joined up; there was no road connection between the capital at Nea Paphos and the Mesaoria, and a traveller going from central Cyprus to Rhodes had to embark at Kourion.[11] Only shortly before, possibly after, the Roman annexation were roads built along the north and south coast to link the Salamis and Paphos networks, creating the peripheral highway that is a striking feature of the island as depicted on the mediaeval *Tabula Peutingeriana* (Fig. 2). This route and the highway from Salamis into the Karpas peninsula are the only Roman roads in Cyprus from which milestones are known. These testify to major renovations of the coastal highway in AD 198 and again in the late 3rd and the early 4th centuries. On the first occasion, the work included the construction of a direct link between Coral Bay and Arodes on the west coast highway,[12] eliminating a detour via Drepanon (Agios Georgios Pegeias) and shortening the journey by twenty stades (4 km), an impressive feat of road engineering (Fig. 3).

Fig. 1. Terracotta model of a covered two-wheeled wagon from Tamassos, c. 500 BC. Height 13cm, length 16cm. Cyprus Museum, Nicosia. Reproduced by the permission of the Department of Antiquities, Cyprus.

1 Cf. the travel diary of Rutilius Namatianus, who left Rome in mid-October AD 417 hoping to reach Gaul before winter, Rutilius spent two weeks in Ostia waiting for a favourable wind (*De reditu suo*, 1.205-7) and four weeks after his departure from Rome, he had progressed no further than Pisa (*ibid.* 1.630-32). Had he gone by the *via Aurelia*, the journey would have taken no more than two weeks.
2 Strabo, 14.6.3.
3 Leonard & Demesticha 2004, 197-198.
4 Leonard & Demesticha 2004, 202.
5 Landels 1978, 173.
6 *Codex Theodosianus* 8.5.8 (AD 357).
7 Greene 1990, 37-38.
8 Metal exports from the mining areas (Kalavasos, Skouriotissa) form part of a similar land-sea transport chain, but because of its specialized and localized nature, metal transport will not be discussed in this paper.
9 Pikoulas 2007, 79.
10 Bekker-Nielsen 1993, 186-188.
11 Bekker-Nielsen 2004, 106-107; Strabo, 14.6.3.
12 Bekker-Nielsen 2004, 112 and 126-130; 1995, 107-110.

Fig. 2. Cyprus as depicted on the Tabula Peutingeriana*, Codex Vindobonensis 326, Österreichische Nationalbibliothek, Wien.*

The other main road shown on the *Tabula*, the trans-island highway from Soloi via Tamassos to Kition, was created at an unknown date by running a road from Morphou Bay into the southern Mesaoria, where it linked up with an older road towards the east.[13]

In the comparatively unimportant island province of Cyprus, we find few roads to match the Roman highways that we know elsewhere. There was no overall attempt to upgrade the road system of the pre-Ptolemaic or Ptolemaic period to Roman standards, and many routes included steep and narrow sections that were more suited to pack-animals than to wheeled vehicles (Fig. 4).

The mule or donkey carrying a pack-saddle has been a mainstay of land transport in the Levant since time immemorial, and remains in use even today. It has a limited carrying capacity (90-120 kilograms for a mule, 54-90 kilograms for a donkey[14]) but has the advantage that it is to some degree independent of roads. Thus a pack train could take short cuts across level country, for example in the Mesaoria, saving time and effort. As late as the 1990s, it was still possible to encounter pack trains on the byways of western Cyprus.

COMMODITIES

What types of goods were transported on the roads of Cyprus, and how? Let us consider some examples.

Salt

In the *History of Animals*, Aristotle notes that the shepherds of his time "give the flocks salt every five days in summer, to the extent of one *medimnos* to the hundred sheep, and this is found to render a flock healthier and fatter".[15] That works out at six *medimnoi* or 312 litres of salt per month for a flock of a hundred sheep (or goats), or 3.75 kilograms per animal. In recent history, the population of sheep and goats in Cyprus has been large, about one per each head of population. We have no reliable estimates for the human, nor for the animal population of ancient Cyprus, but for the present purpose, absolute numbers are not important. Whether the sheep and goat population numbered 20,000, 50,000 or 100,000, we are talking about a significant transport operation.

Since Cyprus possessed neither salt mines nor inland salt springs, all salt had to be transported from salines on the coast to the grazing areas, which in summer would often be in the high hills and inaccessible to vehicles. As it happens, one *medimnos* of salt is about equivalent to one donkey load.[16] Taking, for the sake of argument, the middle figure as our point of departure, 50,000 grazing animals would require 500 *medimnoi* every five days, that is 100 donkey-loads per day. Assuming that on average a donkey made one return trip per day, a hundred donkeys – perhaps twenty donkey trains of five animals each – would be working the roads and byways of Cyprus in order to keep the inland and upland pasturing areas supplied with salt.

Forestry products

In the ancient Mediterranean world, there was a constant demand for timber of good quality and large dimensions, suitable for constructing ships and houses. As not every region possessed tall forests, there was a lively maritime trade in timber and in other forestry products, such as pitch.[17]

In the Classical period, the Cypriot kingdoms, led by Salamis, had maintained large navies and shipyards.[18] Writing in the 4th century BC, Theophrastos[19] specifically mentions the use of Cypriot pine for shipbuilding; he also notes that the tall stands of timber in the mountains of the island were not exploited commercially because transport was difficult at a times when roads had not yet been built into the upland forest areas.[20] Seven centuries later, Ammianus Marcellinus remarks that Cyprus was so well endowed with nature's gifts that she could outfit an entire cargo vessel, from mast to keel, from her native resources.[21]

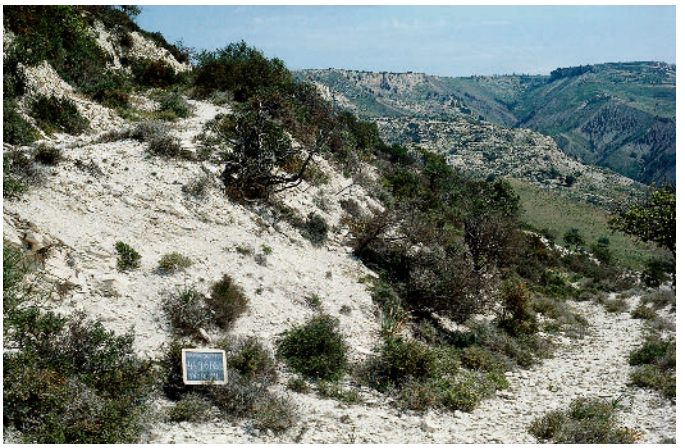


Fig. 3. Overgrown switchback ascent on the road between Coral Bay and Arodes, on the highway from Nea Paphos to Marion. This section was built at the end of the second century AD and engineered to Roman standards. Author's photo, April 1991.

The island's timber resources were concentrated in the upland areas, and whether intended for shipbuilding, for export as raw planks,[22] or as prefabricated boats,[23] the timber had to be hauled down to the coast, presumably after being rough-trimmed on location. Since it would be impractical to load the long timbers required for masts, spars and rafters on a vehicle or on a train of pack animals, these must have carried by teams of workmen or slaves. Shorter pieces of timber could be loaded on carts or dragged on sledges.

13 Bekker-Nielsen 2004, 179 and fig. 37.
14 Landels 1978, 172. For carrying capacities of ancient pack animals and the somewhat contradictory evidence of the ancient sources, see Bekker-Nielsen 2004, 74.
15 Aristotle, *HA* 596a.
16 A *medimnus* of salt weighs c. 62.5 kilograms. See also note 15, above.
17 Hannestad 2007, 92-96.
18 Raptou 1996, 254-255, with references.
19 *HP* 5.7.
20 *HP* 5.8; cf. also Bekker-Nielsen 2001.
21 *History* 14.8.14.
22 Cf. the "40,000 cubits of squared pine planking" donated to the citizens of Rhodes in 227/6 BC by Ptolemy II Euergetes (Polybios 5.89): much of this presumably came from Cyprus.
23 Strabo. 16.1.11.

Grain

In the Ptolemaic as well as the Roman period, Cyprus was subject to a land tax that was in effect a tithe on grain and other agricultural products, such as olives.[24] On the analogy of other provinces, we may take it that the tithe was assessed on the threshing floor or in the barn, but that it had to be delivered to a central collecting point in the city – that is, on the coast. For this purpose, vehicles could be used, since the network of tracks and roads in the island converged on the *poleis*. From some areas, however, water transport may have been preferable: this would apply to some districts in the *chorai* of Marion, Soloi, Salamis, Kition and Kourion. The extent of the island's grain production is no easier to estimate than its goat and sheep population, but by any reckoning, moving one-tenth of the grain harvest over an average distance of at least 10 km would represent a considerable transport chore.

If we take a human population figure of 100,000 – a conservative estimate[25] – as our point of departure and the estimate of Foxhall and Forbes (1982) of 212 kg/year as the average grain consumption of an adult, we may, very roughly, estimate the gross harvest at 27,000 metric tons and the tithe at 2,700 tons. At most, one-third of this could have been transported by water, leaving 1,800 tons of tithe grain to go by road. Loaded on two-wheeled carts carrying an average load of 250 kg, this adds up to 7,200 cart-loads and 144,000 vehicle-kilometres (including the empty return journeys) annually. Assuming that each cart could make thirty return trips between the end of the harvest and the deadline for delivering tributary grain to the *polis* (an entirely arbitrary assumption, since the date of neither is known), no less than 240 carts and mule teams would be required during the season.

CONTAINERS

So far, we have considered examples where transport must have taken place on an extensive scale but has left no trace in the archaeological record, because no transport containers have been preserved: either the commodity was not packaged at all (forestry products) or it was shipped in containers made of organic, perishable materials, probably sacks (salt and grain). This is a useful reminder how much ancient trade and transport remains "invisible" to the modern eye, and confirmed by the pictorial evidence for goods being loaded in bales, bundles or nets as well as the description of a mixed cargo that was – or so at least it was claimed – lost at sea in the 4th century BC: "jars of Koan wine, *bales* of wool, jars of salt-fish, *bundles* of goat-skins".[26]

From the point of view of this conference, however, these commodities are less interesting than liquids, which could not be transported in sacks or in bulk: wine, olive oil and fish sauce, all of which required a container.

Amphorae

The amphora is too well-known to require any introduction. It was an extremely versatile container that came in a wide range of shapes or sizes, reflecting local traditions as well as functional considerations. It was the maritime transport container *par excellence*,[27] but less suitable for land transport because of its high tare weight. The last century BC witnessed several innovations in marine transport with a view to obtaining better tare:weight ratios. One was the wine tanker with permanently fitted *dolia*,[28] another was the wooden barrel (see below).

Skins

Animal skins were used as liquid containers in Greece and the Levant from an early date until recent times. The smaller, easily portable skin bottles were made from the skins of lambs or kids, larger containers from sheep, goats, hogs or oxen. Skins of even larger animals are recorded in the ancient literary sources but were hardly suitable for everyday use.[29]

A skin container was made by flaying a quadruped, keeping the skin as intact as possible, sewing it up and closing all orifices except the neck where a tube-like spout with a stopper was inserted. The process is simple enough, but care has to be taken throughout: for a good result, unnecessary perforations must be avoided; the skin must be cleaned well on the inside (whereas the outside is left more or less in its natural state); the edges and leg orifices must be sewn and sealed carefully to achieve a sturdy, watertight seam. The resulting "bottle" is light, unbreakable and portable. We are told that when Odysseus set off to meet the Cyclops, he decanted some of the wine carried in amphorae aboard his ship into a "large skin bottle" made from the skin of a goat.[30]

Animal skin is not entirely impermeable and there will be a small amount of evaporation though its pores; furthermore, if the skin container is placed against a surface such the floor of a wagon or a ship's deck, it will leak at the edges and the points of contact. For this reason, small

Fig. 4. The northern ascent to the pass at Melounda/Mallidağ where the road from Aphrodision to Salamis passed through the northern range. (Author's photo, October 2012).

skin bottles are often carried in a rope sling attached at the ends and hung over the shoulder or from a hook. In Gaul, a number of inscriptions were set up by, or in honour of, *utricularii* or their professional corporations. So far, we have no parallels from Cyprus or the eastern part of the empire. The functions of the *utricularii* have been much debated. Since skins (*utres*) were also used for flotation,[31] some researchers have interpreted the *utricularii* as masters of river vessels supported on air-filled skins, and inscriptions recording *utricularii* are often found on sites that were river ports in the Roman period. It is more likely, however, that *utricularii* were artisans producing skin bottles, for which there would be great demand in river ports where shipments of wine, oil or *garum* arriving in large containers (amphorae or barrels) were repackaged in smaller units. Did this also take place in Cyprus?

To my knowledge, we only have one ancient image depicting wine transport in Cyprus: the "wine drinker" mosaic in the so-called house of Dionysos at Nea Paphos.

24 Bagnall 1976, 109; Hadjisavvas 1996, 135.
25 Michaelides 1996, 143 estimates the island's population in the 2nd century AD at 200,000.
26 Demosthenes, 35.34 (*Against Lakritos*).
27 Maarleveld 2010, 268-269.
28 Heslin 2011, 162-163.
29 Marlière 2002, 21-23.
30 *Odyssey*, 9.196; 212.
31 E.g., Suetonius, *Divus Julius* 57; Zosimos, *New history*, 3.89.

The scene is based on the sad story of Ikarios, whom Dionysos rewarded with a gift of wine. Ikarios shared this with his neighbours; when they felt its effects, they suspected Ikarios of being a poisoner and killed him. On the left stands Ikarios, to the right are shown two of his stupefied neighbours, and for good measure the legend informs the observer that this pair are "the first wine-drinkers". In the centre is a schematic depiction of a two-wheeled vehicle loaded with wine-skins: a box-like superstructure resting on a single axle with solid disc wheels and drawn by two oxen. The mosaicist's intention was presumably to depict a heavy farm cart.

Transporting a load of wine in the way shown on the mosaic would not really be practical since the skins would rub against each other, causing them to leak, and the load pressing down on the skins at the bottom of the pile would rupture them.[32] More significant for our purpose is that when the mosaicist wanted to depict a load of wine, he chose skins, not amphorae. It would appear that to his audience, a skin bottle was a more familiar sight, and/or more directly associated with wine, than an amphora.

Barrels

Barrels make their appearance in the archaeological and pictorial record much later than skins and amphorae; they are not attested until the last century BC and seem to have been especially popular in the western and north-western provinces. Barrel-making may have been introduced to the Romans by Celtic craftsmen who were known for their joinery skills, which they used, *inter alia*, in the manufacture of wheels and war-chariots. Barrels could be made to any capacity from 3 up to 1,300 litres. The largest examples so far known have been found on the Rhine frontier and were presumably used for military supplies of wine. Unlike skins and amphorae, barrels did not need to be carried but could be rolled, thus easily transferred from boat to shore and vice versa, which may account for their popularity in river-borne shipping. Sturdier and lighter than amphorae, and well suited to transport on carts, the barrel became a popular container in the west and in Italy itself.[33]

ROADS, VEHICLES, CONTAINERS

Our knowledge of land transport routes and overland trade in Cyprus is essentially based on two categories of archaeological evidence: routes (roads) and containers (amphorae). With both, we face a series of problems of interpretation.

The ancient road map of Cyprus shows many radial roads converging on the ports that were also the *poleis*. This may reflect the dominant position of the ports within the pattern of commodity flows; it may also reflect the dominating position of the *poleis* within their territories and that major road construction projects within the *chora* presumably required the approval and financial support of the *boulê* of the *polis*. Thus it remains an open question to what degree the road system reflects the economic geography of the island (i.e. commodity flows and trading patterns) as opposed to the *political* geography. Did the transport network (roads) created by political factors shape commodity flows and trading patterns, or vice versa?

The distribution of amphora finds across the island might provide some pointers to flows of imported liquid or semi-liquid commodities such as pickled fish, fish sauce, wine and olive oil. It needs to be kept in mind, however, that the point at which the empty amphora is discarded will not always be the point of its contents' final consumption. Liquid goods coming into Cyprus would pass several "break of bulk" stages.

Let us try to imagine a consignment of amphorae from a single producer arriving in Cyprus from overseas – coming into Salamis, Dreamer's Bay or Nea Paphos by ship. Part of it would be acquired by one wholesaler, another part by another; some customers would buy a dozen amphorae, others less. Some of these sub-consignments would be sent onwards by coastal shipping to minor ports and landing-places, where they would be sold to local retailers. Eventually the contents of the amphorae would find their way to the end-users, either through retailers in the city or through itinerant merchants. But only a few wealthy householders (who would be found in the *polis* itself) would buy a whole amphora of imported wine at one go, and even fewer would require a whole amphora of first-class olive oil or fish sauce. At the retail stage, the contents were presumably resold by measure and taken home in the customer's own container (as is still the case today in many parts of the Mediterranean world).

If this reconstruction is correct, we should expect to find the largest concentrations of amphora remains at the points where the contents were either resold in smaller quantities, by measure, or transferred to other containers for onward transport by road. This would be not unlike the distribution

patterns found in other parts of the Roman Empire, where large concentrations of amphora fragments are typically found in cities, in ports and in military camps.

From the viewpoint of road studies as well as those of economic history and amphora studies, it would be useful to correlate the evidence for roads and transport routes in Cyprus with that for transport containers. Unfortunately, at present the Roman amphora material from Cyprus does not permit statistical or geographical analysis at the macro level;[34] it is not possible to draw a reliable distribution map for comparison with our map of the road system. For the time being, we have to limit ourselves to some general observations.

CONCLUSIONS: LAND AND SEA TRANSPORT

In ancient Cyprus, land and sea transport formed complementary systems. Land transport of goods was primarily radial, i.e. between ports/*poleis* and inland settlements, while shipping offered a more economical alternative for goods transported along the coast. These could travel in the vessels of local shippers, or in the incoming ships from the mainland which might call at several ports in the island before returning.[35]

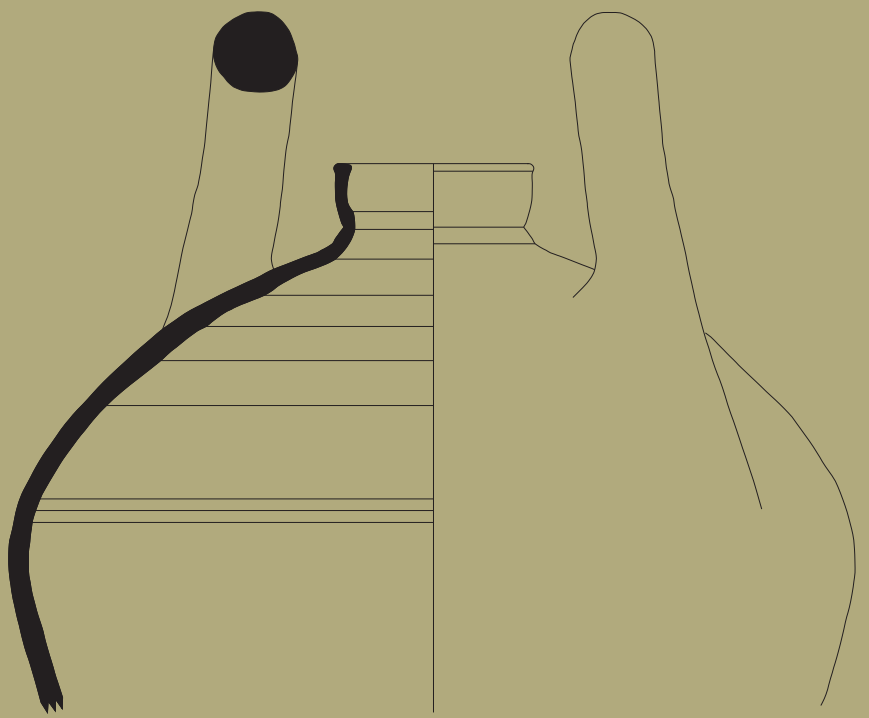
Import goods entered Cyprus through major *emporia* (e.g., Salamis, Dreamer's Bay) as well as minor landing-places (e.g., Kioni, Thronoi). Liquid goods may have been repackaged for resale or for onward transport into the interior by pack-animals. The nature of the containers used for secondary transport of imports (after repackaging) so far remains conjectural, but skins may have played a significant role; in an island rich in goats and sheep, the material for skin bottles will have been readily available.

Goods for export (metals, timber, tithe grain) were probably taken from the interior to the coast using pack-animals or light two-wheeled carts. Since the first two required no packaging and grain would have travelled in bulk or in sacks, these exports would not leave traces in the archaeological record in the same way that imports of amphorae did.

32 Marlière 2002, 22.
33 In AD 238, a Roman army approaching Aquileia from the south had no difficulty in collecting enough empty wine barrels to build a pontoon bridge, Herodian, *History of the empire* 8.4.4.
34 Cf. Jacobsen 2004, 144 for an overview of the problems involved.
35 Cf. the ship in Demosthenes' *Against Lakritos* (note 26, above) which called at several ports in the Crimea before returning to the Aegean.

Expanding Contacts and Collapsing Distances in Early Cypro-Archaic Trade:
Three Case Studies of Shipwrecks off the Turkish Coast

BY ELIZABETH S. GREENE, JUSTIN LEIDWANGER & HARUN ÖZDAŞ



Expanding Contacts and Collapsing Distances in Early Cypro-Archaic Trade: Three Case Studies of Shipwrecks off the Turkish Coast

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In his discussion of Archaic Greek identity formation within the context of expanding Aegean and Near Eastern contacts, Alexander Fantalkin draws attention to what he considers a brief but crucially transformative period around the late 7th century BC. Over the course of perhaps just a quarter century BC, he argues, East Greece broadened its horizons and "rediscovered" the larger eastern Mediterranean world through the movement of goods and people.[1] What Ian Morris describes as a "collapse of distance", influenced in part by new shipbuilding technology, facilitated the drawing together of certain peoples around the eastern Mediterranean closer than ever before since the Bronze Age.[2] If seaborne trade went hand in hand with these expanding cultural horizons, the distribution of pottery should provide some index of emerging contacts. How to interpret the presence of concentrations of East Greek ceramics along the coasts of the eastern Mediterranean and where to assign agency for this exchange remain contentious issues: does the distribution of East Greek pottery signal direct East Greek-led trade, commerce through some intermediary, or rather the physical presence of Greek populations – like mercenaries or early emporia – abroad?[3]

Comparative insights are sorely needed for evaluating these nascent connections, but firm evidence to substantiate the actors and distribution networks within the early Archaic economy is scarce. The underwater material record of shipwreck cargos often provides primary evidence for such patterns and mechanisms in antiquity, yet the relatively few Archaic shipwrecks known across the Mediterranean world (in particular from the eastern Mediterranean) leave us with a poorly representative sample.[4] Each new discovery and investigation offers the possibility of significantly deepening our understanding of mechanisms of exchange and the economy more broadly. Building economic models that span the Greek world and the Near East on the basis of few examples – or at times even a single shipwreck – may be an enterprise fraught with conjecture, but it also provides a framework for productive speculation.

In the case of the overseas trade of Cyprus, we are in an unusually fortunate position for this challenging period. Although no Archaic shipwrecks have yet been reported in Cypriot waters, three sites have come to light during surveys off the coast of south and southwest Turkey, directly between the Aegean world and the Near East. All of the sites can be dated between approximately the mid-7th and the turn of the 6th century BC, spanning Fantalkin's critical point of transformation in seaborne contacts around the eastern Mediterranean.[5] Each of the cargos presents a new facet to these seaborne networks, yet the overall picture appears rather consistent: cargos dominated by Cypriot basket-handle amphorae but exhibiting strong material connections to East Greece. From the standpoint of distribution within an emerging agricultural economy, these assemblages offer solid archaeological evidence for expanding relationships between the Greek world and the broader eastern Mediterranean, a sphere of interaction somewhere between the local links that tied together single islands or coastal regions, and globalization or "Mediterraneanization" models proposed for the Iron Age.[6] They allow us to explore the role of commerce and the possible agency of different groups within a model of developing cultural exchange, and in particular offer insight into the role of Cyprus within this world of collapsing socioeconomic distances.

BACKGROUND

A series of underwater surveys by the Institute of Nautical Archaeology (INA) since the 1970s brought to light two of the three shipwrecks examined here: located at Kekova Adası and Kepçe Burnu. The third site was located only recently, by the Dokuz Eylül University (DEU) survey team in 2008 at Çaycağız Koyu. Over the past few years, the sites have been the focus of systematic survey by collaborative teams from DEU, Brock University, and INA.[7] Renewed studies of these sites aimed to achieve more comprehensive

Map of the key Archaic sites in the eastern Mediterranean showing the Kekova Adası, Kepçe Burnu, and Çaycağız Koyu wreck locations. Map by J. Leidwanger.

photographic documentation and artefact counts, along with selective sampling to gauge the range of materials at each site and to contextualize better the finds raised by the initial INA surveys and currently housed in the storerooms of the Bodrum Museum of Underwater Archaeology. Better dates can now be offered for each of the wrecks in light of detailed studies of the pottery completed over the past few years. Compositional analysis of selected samples was undertaken at Brock University in Canada. The results provide more secure evidence for the origin of the different cargo components as well as the scale of production and the number of workshops that may have contributed to these shipments.[8]

KEKOVA ADASI

Located along the Lycian coast just east of Kaş, the shipwreck at Kekova Adası (Kekova Island) rests inside the channel behind the long narrow island after which it is named (Map). This protected area may have offered opportunistic shelters that served as stopping-points for coastal sailors plying these waters between the Aegean and the eastern Mediterranean even before the Archaic period.[9] The extensive assemblage of perhaps 130 cargo amphorae along with other remains lies strewn from approximately 8-24 m of depth across the sloping topography of a reef, the tip of which today rests less than a couple of meters from the water. In antiquity, this reef may have broken the surface and presented the danger that claimed the unsuspecting vessel, whose trail of ballast begins near the top of the reef.[10] Within

1 Fantalkin 2006.
2 Morris 2000, 257-261.
3 E.g. East Greek pottery at the site of Meẓad Ḥashavyahu: see Na'aman 1991; Fantalkin 2001. On the proto-history of East Greek mercenaries, see Luraghi 2006; Hodos 2009a, 225-228 offers an overview of "pre-colonization activity".
4 Parker 1992 fig. 3 represents numbers only as of the publication date, but still remains the most up-to-date account of diachronic shipwreck data across the Mediterranean. Shipwrecks dating to the Archaic period may be slightly more common, at least in the literature, in the western Mediterranean, though the sample is still small: see generally Dietler 2007, 267-270.
5 Fantalkin 2001, 202-204.
6 Globalization, Hodos 2009a; Mediterraneanization, Morris 2003.
7 Greene *et al.* 2011, 60-65 with bibliography on earlier surveys at Kekova Adası and Kepçe Burnu. Recent work at Caycağız Koyu is noted in Leidwanger *et al.* 2012, 401-402; Özdaş *et al.* 2012, 272-273.
8 For a preliminary note on the fabric analysis of finds from these shipwrecks, see Leidwanger *et al.* 2012. The Institute for Aegean Prehistory and ASOR's Harris Grant program supported the study of these samples. Additional support was provided by the Social Sciences and Humanities Research Council of Canada and Brock University, where debts of gratitude are owed to John Menzies and the Department of Earth Sciences.
9 E.g. for vessels like those which sank at Uluburun and Cape Gelidonya, just to the west and east respectively, while traveling along this stretch of the Lycian coast.
10 Flemming has suggested a localized coastal subsidence of between 0.9 and 1.0 m per millennium for this region during the Holocene era, a relative sea level change that would place the reef, now submerged some 2.4 m, virtually at the water's surface in antiquity. See Flemming 1978, 412-413.

this assemblage dominated by transport amphorae, several additional ceramics and finds hint at life on board the ship.

Among the scattered fragmentary ceramics that mark the site on the seabed, the distinctive massive handles and bulky sherds of basket-handle amphorae are the most numerous and conspicuous (Fig. 1). Although no intact jars of this type were recorded, quantification of the fragments reveals evidence for 90-100 examples, fully three-quarters of the total assemblage by number. The basket-handle amphorae from the Kekova Adası wreck are characterized by a wide biconical body with slightly convex shoulders and a maximum diameter above the midsection, thick and high looping handles, a simple base with a flat resting surface and circular recess underneath, and a low cupped rim that terminates in a rolled lip (Fig. 2). Most of the rims raised for study exhibited a diameter of around 0.123-0.125 m, although another group of rims shows a diameter of only around 0.11 m, raising the possibility that either some range of jar sizes was employed in the shipment or details like rim size were highly unstandardized.[11] A variety of better preserved samples allow the reconstruction of overall dimensions for an amphora at the larger end of the spectrum: diameter of 0.53 m and height of around 0.70 m. Three-dimensional modelling based on a composite line drawing provides an estimate of the volume at 69.1 l.[12] Petrographic analysis of seven samples revealed that the fabrics all belong to a single broadly defined and rather plain calcareous group that should probably reflect manufacture confined to one general geographical region. Though the fabric group is not particularly distinctive, the most likely candidate seems to be Cyprus, probably eastern Cyprus, due not only to the geology of the area but also to the general consistency between the mineralogy of these samples and *comparanda* that are almost certainly local products studied from among the finds in the early Archaic necropolis of Salamis.[13]

Amphorae of this type are well represented in Cyprus, and it seems likely that the primary origin of the type, at least during its early production, is also to be found on the island. The first well dated examples come from tombs at Salamis, where they appear to have been produced locally from the late 8th century BC onward.[14] It is only in the 7th century BC – the latter part in particular – that the type appears consistently outside Cyprus: at sites in Cilicia as well as the northern and southern Levant and as far south as Egypt.[15] Beyond this narrow corridor,

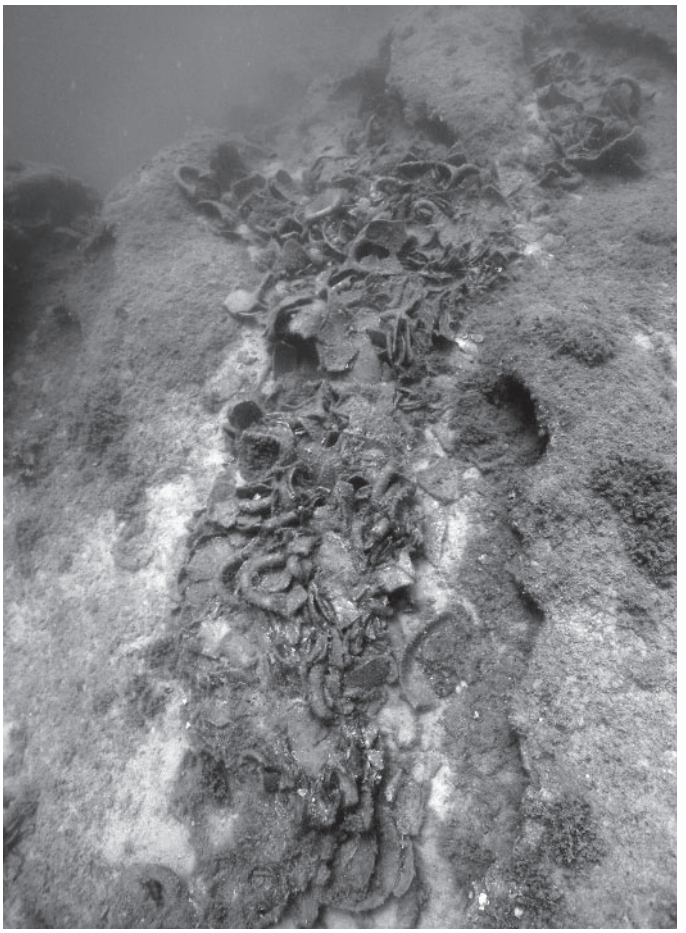

Fig. 1. General view of the wreck assemblage scattered on the sloping seabed at Kekova Adası. Photo by H. Özdaş.

11 Visual analysis and preliminary measurements by the authors of the larger basket-handle amphorae from Tomb 79 in the necropolis of Salamis suggests that the rims could range considerably in size independent of any similarity in overall dimensions between jars.

12 Thanks to Toby N. Jones, Newport Medieval Ship, for undertaking the three-dimensional reconstruction and providing the volume calculation.

13 Samples were obtained as *comparanda* from several of the Archaic tomb assemblages at Salamis. Thanks are due to the Department of Antiquities Cyprus for permission to undertake that part of a larger project on basket-handle amphorae.

14 Karageorghis *et al.* 1973, 115.

15 See generally Sagona 1982, 106-108; Lehmann 1996, 443-445 Form 421. Cf. also the contributions by Zoroğlu and Göransson in this volume.