### An offprint from

## CONNECTED BY THE SEA

Proceedings of the Tenth International Symposium on Boat and Ship Archaeology Roskilde 2003

# Edited by Lucy Blue, Fred Hocker and Anton Englert

#### ISBSA 10

Hosted by
The Viking Ship Museum, Roskilde
The National Museum of Denmark Centre for Maritime Archaeology
The National Museum of Denmark Institute of Maritime Archaeology
The Centre for Maritime Archaeology, University of Southampton

With support from
The National Research Foundation of Denmark
The National Humanities Research Council of Denmark
Queen Margrethe's Fund

© Oxbow Books 2006

ISBN 978 1 84217 228 5 1 84217 228 X

## Contents

	t of Contributorsface	
	ynote address: An international forum for nautical research 1976–2003 by Ole Crumlin-Pedersen	
	n McGrail: Walking on water: Maritime archaeology by air, land and sea by Jonathan Adams	
Sca	in McGran. Warking on water. Maritime archaeology by an, land and sea by Johaman Adams	X V I I
A.	Experimental Archaeology	
1.	Experimental archaeology and ships – principles, problems and examples	
	Ole Crumlin-Pedersen	1
2.	Experimental boat archaeology: Has it a future?	
	Seán McGrail	8
3.	Experimental archaeology at the Viking Ship Museum in Roskilde	
	Søren Nielsen	16
4.	History written in tool marks	
	Thomas Finderup	21
5.	Reconstruction of rope for the copy of Skuldelev 2: Rope in the Viking Period	
	Ole Magnus	27
6.	Trial voyages as a method of experimental archaeology: The aspect of speed	= /
••	Anton Englert	35
7.	An example of experimental archaeology and the construction of a full-scale research model	55
	of the Cavalière ship's hull	
	Sabrina Marlier	43
8.	Reconstruction of the large Borobudur outrigger sailing craft	13
0.	Erik Petersen	50
9.	The construction and trials of a half-scale model of the Early Bronze Age ship, Ferriby 1,	50
٠.	to assess the capability of the full-size ship	
	Edwin Gifford, Joyce Gifford and John Coates	57
10	The value of experimental archaeology for reconstructing ancient seafaring	57
10.	Timm Weski	63
11	The Pacific migrations by canoe-form craft	03
11.	James Wharram and Hanneke Boon	68
	James wharram and Hanneke Boon	00
В.	THEORETICAL ISSUES IN THE CONSTRUCTION OF SHIPS	
12.	New light on the false clinkers in ancient Mediterranean shipbuilding	
	Patrice Pomey	74
13.	A preliminary report on the hull characteristics of the Gallo-Roman EP1-Taillebourg wreck (Charente-	
	Maritime, France): archaeological evidence of regional practices of ancient flat-bottomed construction?	
	Eric Rieth	78
14	The Dor 2001/1 wreck, Dor/Tantura Lagoon, Israel: Preliminary Report	
	Yaacov Kahanov and Hadas Mor	84

15.	A hypothesis on the development of Mediterranean ship construction from Antiquity to the	
	Late Midde Ages	
	Carlo Beltrame and Mauro Bondioli	89
16.	Geometric rules in early medieval ships: Evidence from the Bozburun and Serçe Limanı vessels	05
17	Matthew Harpster	93
1/.	Brad Loewen and Marion Delhaye	00
18	Ship design in Holland in the eighteenth century	
10.	Ab Hoving	105
19	Archaeobotanical characterisation of three ancient, sewn, Mediterranean shipwrecks	103
1).	Stéphanie Wicha and Michel Girard	111
20.	Coating, sheathing, caulking and luting in ancient shipbuilding	
	Ronald Bockius	117
C.	Between land and sea	
	Roman techniques for the transport and conservation of fish: the case of the Fiumicino 5 wreck	
_1.	Giulia Boetto	123
22.	Land and sea connections: the Kastro rock-cut site (Lemnos Island, Aegean Sea, Greece)	123
	Christina Marangou	130
23.	Local boat-building traditions in the Bristol region	
	Anthony J. Parker	137
24.	The harbour of Haiðaby	
	Sven Kalmring	143
25.	Money, port and ships from a Schleswig point of view	
	Christian Radtke	147
26.	Inland water transport in the Pre-Roman and Roman Iron Age in Northern Germany	
	and its role in intra- and intercultural communication	
	Ulrike Teigelake	152
27.	Staraya Ladoga: a seaport in medieval Russia	
	Petr Sorokin	157
28.	The APES Archaeological Study: The North Carolina Sounds, an interface between land and sea	
	Lawrence E. Babits, Frank Cantelas and Keith Meverden	163
D.	Long distance seafaring and the connections between cultures	
	The ends of the earth: maritime technology transfer in remote maritime communities	
	Valerie Fenwick	171
30.	The ships that connected people and the people that commuted by ships: The western Baltic	
	case-study	
	George Indruszewski, Marcus Nilsson and Tomasz Ważny	177
31.	Early cogs, Jutland boatbuilders, and the connection between East and West before AD 1250.	
	Fred Hocker and Aoife Daly	187
32.	Couronian ship building, navigation and contacts with Scandinavia	
	Inese Karlina	195
E.	HISTORICAL, ICONOGRAPHIC AND ETHNOGRAPHIC SOURCES AND APPROACHES	
33.	From Carl Reinhold Berch to Nils Månsson Mandelgren: On the concept of maritime history,	
	(Sw. <i>sjöhistoria</i> ), and its meanings in Sweden since the latter 18th century	
	Carl Olof Cederlund	199
34.	Ships and subsidies	
	David A. Hinton	205
35.	Sea-lanes of communication: Language as a tool for nautical archaeology	
	Katrin Thier	210
36.	Medieval shipping in the estuary of the Vistula River. Written sources in the interpretation	
	of archaeological finds	
	Robert Domzal	217

37.	Linking boats and rock carvings – Hjortspring and the North	222
38	John Coles	223
50.	the Italian Final Bronze Age	
	Claire Calcagno	226
39.	Western European design boat building in Buton (Sulawesi, Indonesia): a "sequence of	<b></b>
	operations" approach (SOA)	
	Daniel Vermonden	234
40.	Balagarhi Dingi: An anthropological approach to traditional technology	
	Swarup Bhattacharyya	243
F.	News from the Baltic	
41.	The Roskilde ships	
	Morten Gøthche	252
	Two double-planked wrecks from Poland	
	Waldemar Ossowski	259
43.	Mynden. A small Danish frigate of the 18th century	
	Jens Auer	266
44.	The wreck of a 16th/17th-century sailing ship near the Hel Peninsula, Poland	0.70
	Tomasz Bednarz	273
-	News from around the world	
45.	Sewn boat timbers from the medieval Islamic port of Quseir al-Qadim on the Red Sea	
	coast of Egypt	
	Lucy Blue	277
46.	A Roman river barge from Sisak (Siscia), Croatia	
	Andrej Gaspari, Miran Erič and Marija Šmalcelj	284
47.	Contributions of maritime archaeology to the study of an Atlantic port: Bordeaux and its	
	reused boat timbers	200
4.0	Patricia Sibella, John Atkin and Béatrice Szepertyski	290
48.	A Roman barge with an artefactual inventory from De Meern (the Netherlands)	20.5
40	André F.L. Van Holk	295
49.	The Arade 1 shipwreck. A small ship at the mouth of the Arade River, Portugal	200
50	Filipe Castro	300
	A Black Sea merchantman  Kroum N. Batchvarov	206
	Medieval boats from the port of Olbia, Sardinia, Italy	300
31.	Edoardo Riccardi	210
	EUVUTUV NICCUTUI	312

## 22 Land and sea connections: the Kastro rock-cut site (Lemnos Island, Aegean Sea, Greece)

#### Christina Marangou

#### Introduction

The island of Lemnos, in the northeast Aegean Sea, located in front of the entrance to the Dardanelles Straits, has been the focus of both mythical and actual travels and population movements since at least the end of the 4th millennium BC. Since the time of Homer, the island has frequently been mentioned by Classical and later authors, partially due to the fact that it was inhabited by non-Greeks, until Athenian occupation around 500BC. The first named possibly Bronze Age inhabitants, were the Sintians "of wild speech" (Odyssey 8.294; Iliad 1. 593–594), reputedly from Thrace (Heubeck et al 1988: 366). According to the myth, the Sintians of Lemos received the pre-Hellenic divinity, who became the god Hephaistos, who became the god of fire and metalworking. Lemnos was his favoured island (Iliad 21.58; Richardson 1993: 58) and became his main cult-centre in Greece (Kirk 1985/1990: 113). Jason and the Argonauts (Minyans) are reported to have stopped here on their way to the Black Sea (Iliad 7. 467-468). Jason's son, Eunos, King of Leminos, despatched wineships to the Acheans during the Trojan war (Iliad 7. 467– 468). Finds of Mycenaean figurines and pottery seem to confirm connections to the Acheans, while Lemnian spinners are mentioned on a Linear B tablet (PY Ab 186, Ventris and Chadwick 1973: 410).

The descendants of the Sintians and the Minyans were replaced, according to Herodotus (VI 137), after the second millennium BC, by Pelasgians, or rather Tyrrhenians possibly from the East (Torelli 1975; Sakellariou 1977: 186 ff, 217–221; Giuffrida 1983: 9 ff). Evidence of their non-Hellenic language survives in inscriptions recovered from the Archaic period (de Simone 2000). The 'Homeric hymn' to Dionysos, refers to the Tyrrhenians as dreadful pirates and raiders. The name 'Sintian' is said to derive from the verb 'to harm, damage, or rob' (Giuffrida 1983: 16). This relates either to their early ability to manufacture harmful weapons, or to their piratical activities; the latter confirmed by the Sintians' raid of Thrace. However, despite the fact that piracy was wide spread and frequently synonymous with trade through Archaic times (Giuffrida

1983: 4–8), the Athenians later used this as an excuse to colonize the island as a form of punishment.

It was probably the Tyrrhenians who at the end of the 8th century BC, introduced the mystic cult of 'Kaveiri' or 'Great Gods' to Lemnos – their sanctuary having been located and excavated on the north coast of the island. The 'Kaveiri' (Hemberg 1950), also known to be metallurgists, were the sons or grandsons of Hephaistos and the pre-Hellenic 'Great Goddess' with the same name as the island, Lemnos, a divinity of nature. In the Archaic period the 'Great Goddess' Lemnos was assimilated with the Phrygian Cybele and was related to the Thracian Bendis (Beschi 1990: 29). The goddess of hunting and wild nature, Artemis, also became incorporated with Bendis, and probably succeeded Lemnos, after Athenian colonisers likely adopted the latter's pre-Greek worship.

#### The site

The modern-day port of the capital of Lemnos, Myrina, is situated on the west coast of the island, facing the Athos-Chalkidiki Peninsula on the Greek mainland (Fig. 22.1).

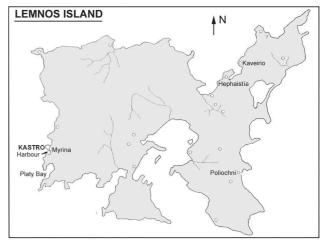


Fig. 22.1. Map of Lemnos Island showing main places mentioned in the text (Compiled by author).

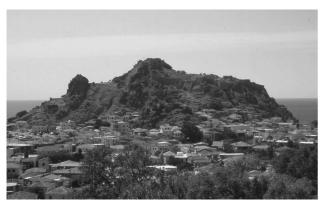


Fig. 22.2. General view of the Kastro Peninsula from the east (Photo by the author).

The northern part of the harbour, the rocky Kastro Peninsula projects towards the west (height c. 115 m; Fig. 22.2). The rock formation dates from the Tertiary period, and the coastal deposits of the surrounding low areas, from the Holocene (Geological map of Greece, 1993).

Various structures have been carved out of the Kastro Peninsula, exploiting the natural shapes and locations of the outcrops and boulders: cavities, platforms, "rooms", flights of steps, niches, conduits (Marangou 2002a). The current research commenced in 2002 with the recording of the visible rock-cut features, and is being completed since 2002, by the unearthing of rock-cut structures in selected areas. In 2003, work resumed in two areas on the southern slope of the Kastro Peninsula located in the outer port. Both areas command a view over the entrance to the harbour and are surrounded by cliffs that overlook dangerous shallows and reefs. Preliminary results suggest that these areas had been occupied at least since the Bronze Age until the Hellenistic period (c. second half of the second millennium-3rd century BC). Subsequently a Byzantine, Genovese, Venetian and finally, a Turkish castle was built on the northern side of the headland (Castrorum Circumnavigatio 1999: 56-57), partially destroying earlier remains.

#### Observation posts and industrial/trade activities?

In Area N/Z some carved rocks offer a convenient observation post (39 m above current sea level) overlooking the entrance to the harbour (Fig. 22.3). Behind them, towards the north, an area of probable industrial activities and/or trade as well as cult, was revealed. Rockcut cavities and conduits, attesting to the containment and management of liquids, might have been used for metallurgical activities, partially indicated by traces of slag. A rock-cut feature with such a function has been identified at the Early Bronze Age (EBA) settlement of Palamari, on the island of Skyros; located on an abrupt slope, it was exposed to prevailing winds, a necessary requirement to obtain the high temperatures necessary for melting the copper (Hadzipouliou 1997: 359). The



Fig. 22.3. Carved rocks in Area N/Z from the north. View towards the entrance of the harbour (Photo by author).

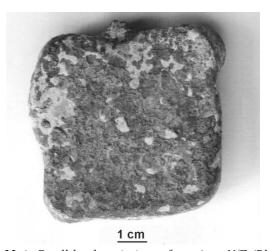


Fig. 22.4. Small lead or tin ingot from Area N/Z (Photo by author).

location of ancient furnaces close to the sea would have facilitated ships unloading and the requirement of sand for extracting lead from litharge (Papadimitriou and Kordatos 2001: 687), would also have been benefited from a coastal location. However, there is no evidence for the existence of metals on Lemnos, which would have had to have been imported by sea, despite the advance in metal working in prehistory, and this particular spot is high above the current sea level, overlooking a rocky coast. Nevertheless, communication with the coast was facilitated (see below).

Finds from the area include a small probable lead or tin ingot (Fig. 22.4), various pieces of metal artefacts, including jewellery, in lead (or tin?), iron and copper-based metal and clay lamps, loom-weights (one of which has a bull imprinted on the top), an unusual bat(?) figure, as well as some later female figurine fragments, possibly related to a female goddess (see below), as well as a small "hoard" of copper-based coins with complex representations, that were discovered near the foundations of a stone wall.

Tin and/or lead ingots are known to have been rep-

resented on Egyptian reliefs since the 15th century BC (Bass 1967: 62–67, 70), and tin ingots were traded in the eastern Mediterranean from at least the Late Bronze Age (LBA) as the Uluburun (Parker 1992: no 1193; Bass 1997: 157; Pulak 1998: 199–201), Cape Gelidonya (Bass 1967: 30, fig. 17; 52, 82–83; Parker 1992: no 208) and Kefar Samir (also lead ingots; Parker 1992: no 540; Muhly 1998: 319)¹ wrecks indicate.

In the northeast Aegean tin has often been found (Pernicka et al 2003: 163): an almost pure tin artefact comes from EBA Thermi, Lesbos (Lamb 1936: 171, fig. 50, pl. XXV). The source of the tin ore remains conjectural (Hall and Steadman 1991; Rapp 1999, 703; Pernicka 2001: 369-371; Pernicka et al 2003: 164, 170-171). Tin may have been traded through the Caucasus area (Colchis) and the Black Sea (Doumas 2002: 53).2 Lead is more common in the Aegean and was involved in the production of silver since EBA Troy (Papadimitriou and Kordatos 2001: 681). It was mined at Laurion (Attica), Thasos, Siphnos and other Cycladic islands since at least the Bronze Age (Bass 1967: 73, 131; 1997: 158; Stos Gale et al 1996; Vavelidis et al 2001: 634; Pernicka et al 2003: 166). Lead was known in Anatolia since the Neolithic (Sayre et al 2001) and several archaeometallurgical sites including lead have been identified in NW Turkey (Pernicka et al 2003: 148 ff, Fig. 1). Numerous different metal ores are known in Kassandra, northwest of the Chalkidike Peninsula (opposite Myrina) (Begemann et al 2003: 198).

Overseas contact for the acquisition of raw metal in Lemnos is without question. In the *Iliad* (7.467–475) the Lemnians are said to have traded with the opposite Anatolian coast, exchanging wine for "copper", "glistening iron", hides, cattle and slaves (21.40–41, 58). Archaic Lemnian exports were found in the northern Aegean islands and mainland Greece, imports to Lemnos originated from the eastern and southern Aegean (Beschi 1998: 75). Direct contacts with the eastern Aegean continue to be attested in the Hellenistic period (Archontidou 2000: 43).

#### A dangerous harbour and offshore anchorage

Area N/E is located a little more to the east on the Kastro Peninsula, about 10 m below Area N/Z, overlooking a small rocky island that served as a sea-mark until recent times. In fact, ships entering the harbour would have had to avoid two shoals situated almost in the middle of the entrance, at an equal distance from this island and from another protruding rock at the end of the opposite peninsula; in the 1950s, the shoals were destroyed and the port dredged. Prior to the destruction of the shoals in the middle of the bay, they were marked with a red buoy in 1929 and a beacon was sometimes placed there at night (Ploigos 1955: 50; Marangou 2002b). The submerged rocks at the entrance of this bay and several shoals close to its southern coastline, are indicated on the 16th-century map of Lemnos by Pirî Reis, who also mentions

that ships lie offshore below the castle, towards the northeastern part of the bay "moor up on shore and drop anchor into the sea" (Pirî Reis 1988: 233, 240, pl. 52/b, 241). However, the bay was treacherous ("malsaine") even more so for smaller boats (Ploigos 1955: 50), with shallows of 4–5 m (*Instructions Nautiques* 1929: 239). The difficulty of entering the harbour in the dark was mentioned in the beginning of the 19th century, although it was less dangerous in daylight, as both the peninsulas that delineate the bay are volcanic and thus dark-brown in colour and thus not easily discernable, in contrast with the coast of the two bays on either side of the Kastro, sandy and light coloured. After entering, the rocky coast was indistinguishable and abrupt (Marangou 2002a).

One of the epic adjectives attributed to Lemnos 'amichthaloessa' (Richardson 1993: 356; Dumézil 1998: 73), meant either smoke enshrouded, foggy, misty and hard to catch sight of, apparently because of Hephaistos' metallurgical activities<sup>3</sup> or because of fumarolic gases (Forsyth 1984), or because it was difficult to come ashore, being rocky and steep, with inhospitable harbours that were difficult to access. The difficulty of approaching the island is also illustrated by the impossible conditions the Lemnians presented to the Athenians: they would only surrender if the Athenians arrived sailing against the north wind from Athens, conditions only satisfied when the Athenians sailed from the Athenian Chersonese (Herodotus VI. 138).

Anchoring was possible in the harbour in nice weather, the best area being at a depth of 18 m (*Instructions Nautiques* 1929: 239). Similar instructions are still given in Ploigos (1955: 50): the best anchoring was between the two shallows, although the seabed was sandy and unstable and the ships had to be on the alert to put off immediately as soon as the wind changed to a westerly.<sup>4</sup> The Myrina harbour is "like open sea" when exposed to western winds. Pirî Reis warned "vessels cannot lie at anchor against winds blowing from the sea, for the place is exposed", and suggested an alternative natural harbour (Platy Bay), four miles to the southwest which "may be entered by large galleys, ... is sheltered" ...(and)... offers anchorage "suitable for all winds" (1988: 233, 240, 241).

Euneos, the King of Lemnos, purchased a slave at Troy in exchange for a silver krater (Iliad 7.467–468) that had been offered to his grandfather, King Thoas, by Phoenician merchants, possibly in return for the right to moor in the harbour or to trade in Lemnos (Richardson 1993: 252). The necessity for pilotage (McGrail 1996: 315) and the importance of a friendly or at least non-aggressive, attitude to the islanders, is self-evident. It would not have been easy if they were pirates or wreckers themselves. It seems significant that areas inhabited by the Tyrrhenians also included the area on the coast opposite Myrina, including that of Mount Athos Peninsula, as well as Imbros and other areas along the route to the Black Sea. As attested in the later Hellenistic and Roman periods, it was common for notorious piratical populations to occupy barren coastal regions, such as Cilicia, bordering crucial sea-lanes, in

order to exact "transit dues" in exchange for guarantees of safe passage (Rauh 2003: 169–201).

#### Crossroads, access routes and cult

Area N/E is a crossroads of a partly preserved, ascending ramp intersected by a flights of steps that climbed up from the edge of the cliffs. Natural and rock-cut segments of ramps and steps, sometimes zigzagging, extended down towards the sea. The main ramp, which was parallel to the coast, continued towards other parts of the site and had probably at some time been transformed into a stone platform that was placed in full view of the harbour and that covered a large part of the Area N/E. A number of lead joints, as well as handles of large, coarse pottery vases were found in connection with the ramp/platform. Two of the flights of steps that crossed the platform arrive either side of a stepped rock. The largest flight of steps turned and continued up above the intersection, leading to another large, carved rock, with a symmetrical flight of a few steps on its opposite side.

A preliminary study of the pottery from both Area N/Z and Area N/E indicates that the area was utilised from the Bronze Age, through to the Archaic, Classical and Hellenistic periods. Pottery from the base of the ramp – thus from its initial occupation – that is still under study, likely dates from the end of the Late Bronze Age (Troy VII, if not already Troy VI) and the beginning of the Iron Age (roughly Troy VIIb), thus including the period around the Trojan war (see Marangou in press), without excluding the possibility of extending the occupation to the time of the Argonauts. This is followed by Archaic pottery of the Tyrrhenian "pirates", to whom the above mentioned industrial activities should possibly also be attributed. Later phases have a strong Athenian bias, the functions of both areas having probably changed in the Classical and Hellenistic periods to now involve, besides that of possible military observation posts and trade, ritual and cult practices.

In fact, a number of clay, female figurine fragments and a few clay artefacts were found in the area of a small stone structure, a single row of stones based on the stepped rock mentioned above, by the inner side of the ramp. One could interpret this as a small open-air altar, or at least a significant place, located at the intersection of access routes to the sea, that may have been used by visitors in the Classical and Hellenistic periods. Small open-air altars are not a rarity outside temples or sacred enclosures, in particular in harbour areas. However, an alternative interpretation of the area as possibly being an observation post must also be retained, or even a double function was feasible. Additional figurine fragments were found in Area N/Z and Hellenistic figurines in other areas of the Kastro Peninsula (Archontidou 1994: 55, figs. 12–13).

The figurines often represent a woman wearing a *polos* (high hat) and veil and/or seated on a throne (Fig. 22.5). *Polos* iconography is known since the 6th century BC



Fig. 22.5. Clay figurine head from Area N/E wearing a high polos hat and veil (Photo by author).

from Thasos. Oriental and Neo-Hittite influences on the type, characterising divinities, have also been noted (Weill 1985: 147–202). This style of headgear is characteristic of pre-Hellenic Lemnos (Beschi 2001; Archontidou 2000: 27, fig. 40), of the Phrygian Cybele, probably related to the Lydian Kybebe and the Syrian-Anatolian Kubaba (Haas 1994: 406–409), but also of 5th–4th century BC Artemis, Demeter, Hera or Hecate (Weill 1985: 193–196). Up until now all the figurines appear to be female and often with attributes of Cybele or Lemnos, however, they are not all of the same type; yet, figurines of Greek gods/goddesses are known to "visit" sanctuaries of other divinities (Alroth 1989: 108–113), while some could also represent mortals.

Artemis was the most important goddess of the island in Classical times, with at least two precincts in Myrina where, in 1860, Conze (1986: 109) mentioned a fragmentary marble statue of Artemis was found near the port. An Archaic and Classical sanctuary was situated on the outskirts of the town (Beschi 2001), and Archaic to Roman vestiges interpreted as a sanctuary have been excavated on the shore, a few kilometres to the north of Myrina (Archontidou 2000: 32-34; Beschi 2001: 218). Besides, a priestess of Artemis collected and sealed the "Lemnian earth" from Mount Mosychlos, where Hephaistos supposedly first fell, close to Hephaistia, the second town of the island (Parker 1994: 344-345); and Archaic to Roman vestiges, interpreted as a sanctuary of Artemis, have been excavated on the shore, a few kilometres to the north of Myrina (Archontidou 2000: 32-34; Beschi 2001: 218).

Since the Archaic period, both Lemnos and Cybele are usually represented seated on a throne (Acheilara 2000: 11, fig. 10); while, the Anatolian Cybele is often represented carved on "rock facades" and occasionally related to "step-altars" (Haspels 1971: 73–111) – she may also be connected with entrances and boundaries, "liminal" areas (Rein 1996: 234). The cult of Artemis is related to headlands, coastal areas and offshore anchorages (Romero Rocio 2000: 118; Fenet 2002, 339–340). She is a divinity

of mariners, as well as of doorways, a guardian of ports and itineraries (Romero Rocio 2000: 77–78), and is associated with Hekate, who is then particularly connected with crossroads, doorways, boundaries, transitional and liminal places. Artemis has borrowed some of Hekate's epithets of liminality, such as "of the (cross)roads", and "watching the harbour"; harbours too being liminal points (Johnston 1990: 21–28 and notes 10, 24). Rituals performed in such places usually protect transitions, beginnings or departures.

Crossroads, carved flights of steps and combinations of natural and artificial passageways are omnipresent on the Kastro Peninsula. Such rock-cut installations have similarities with the Late Bronze Age and Phoenician remains particularly in relation to marine structures (Frost 2001: 197). On an area of rocks closer to the sea, flights of steps that symmetrically ascend towards a flattened space or ramp are attested by old photographs before the destruction of the 1950's. Further sinuous and often invisible flights of steps lead eventually towards the abrupt summit of another rock, strategically located (Marangou 2002b). The pattern of these structures is frequently repeated – a rock with steps on both sides and steps or ramps leading down to the water and up to the summit, although many of these structures are not always visible from the sea, such as those of the above mentioned abropt rock. Thus, besides the hypothesis of maritime rituals, a practical function can also be proposed when interpreting these elevated places, for example for use in transit, observation or the transmission of optical (fire or smoke) signs (Frost 1999: 356-357), also relating to friendly or otherwise, ships and the sea (Marangou 2002b). In fact, ships sailing into the bay were vulnerable, being exposed both to the natural dangers and to the power and good will of the Lemnians, they would be entirely at the latters' mercy, if wrecked or damaged.5

#### Special ships

The nautical connections of the Kastro Peninsula also include a symbolic component: an oared ship, possibly of (Late?) Bronze Age type, about 2.20 m long, has been observed carved on a rock complex, close to the sea on the same side of the peninsula (Marangou 2002c). It is located where boats were repaired up until the beginning of the 20th century, facing the area where ships moored and dropped anchor in Pirî Reis time; it is visible, even conspicuous, from the inner harbour. Similar symbolic or ritual activities are attested by a 3rd-century AD Lemnian ritual involving a famous ship (Dumézil 1998): a theoris (sacred ship) was sent every nine years (or every year) to the island of Delos, in order to bring back new fire (Parker 1994: 345; Burkert 1998: 133). Purification ceremonies took place and fires were extinguished, while the theoris was away. According to the Lemnian Philostratos (c. 215 AD), supposedly well informed about local ritual practices (Maclean et al 2001: xci), if the ship returned before a period of nine days, she had to wait for the end of the purifications and invocations of chthonian and ineffable gods, before entering the harbour – the Kaveiri were away during this period – and the fire had to be kept pure out on the sea (Heroicus 53, 5–14; De Lannoy 1977; Burkert 1998: 137, note 8):

"Then [if too early] she [the ship] cannot come into harbour anywhere on the island, and rides at anchor [in the open sea] floating off the headlands till the time becomes right to sail into the harbour...". Then "the fire is distributed to the houses as well as to the crafts using fire" — in which were included the metal workers — "and they say that a new life starts afterwards" (translated by the author).

#### **Conclusions**

The sectors of the Kastro headland that have been briefly considered in this paper showed strong maritime connections. If life was naturally connected to the sea through all periods in Lemnos and in particular on the Kastro, for obvious reasons of closeness to the water and insularity, the evidence presented here indicates various aspects of these associations and sometimes change of functions diachronically. In a preliminary interpretation, to be tested in future research, such activities might have included:

- Navigation: control of the approach of ships or boats to the land and the entrance into a not-very-hospitable harbour; possible military or piratical observation posts; [Archaic to Hellenistic; end of the Bronze Age-Iron Age not excluded]
- Transit between sea and land: flights of steps and ramps, between low levels, closer to the sea, and higher levels of the occupied area on the rocks; such an itinerary attains a "thoroughfare" located close to the edge of the rocks and parallel to it, leading towards other sectors of the site; [Archaic and later, possibly also earlier]
- Trade and industrial activities: metal ingot [Archaic] and copper-based coins [Hellenistic?]; possibly metalworking in one area [Archaic];
- Cult: clay figurines, a number of which probably represent female divinities of nature, attested in Lemnos at least since the Archaic period, and the Classical and Hellenistic periods (e.g. goddess Lemnos, Cybele, Artemis), included in which are goddesses related to liminality [mostly Classical and Hellenistic].

Metal-working was particularly related to male divinities on the island since pre-Homeric and Archaic times, while ships and navigation are not only represented in the iconography (e.g. ship rock-carvings), but are also associated with myths (Argonauts, the Achaeans and Philoctetes, King Euneos trading on the opposite coast, piratical raids of Sintians and Tyrrhenians) [pre-Homeric] and rituals (Kaveiroi, sacred ship bringing new light) [at

least Classical-Hellenistic; 3d c. AD], some of which at least, had likely origins in real and/or historical events.

These liminal spaces between sea and land, whether used for observation, cult, communication, or trade, at the same time or consecutively, attest to transition both in real and symbolic terms. Continuation of research on the Kastro will hopefully aid better understanding of the overall structure of the rock-cut elements which seem to present a much more complex pattern that initially suspected.

#### Acknowledgements

The author wishes to thank: the 20th Ephorate of Antiquities, its director, Mrs Archontidou, and the Council for the Monuments of the Islands, for granting the study and publication permit; the Institute for Aegean Prehistory for financial support for part of this study; the Myrina Museum staff and several collaborators for their help; H. Frost for precious suggestions; L. Beschi and E. Hatzipouliou for fruitful discussions on pottery and other finds.

#### Notes

- on lead and tin ingots off the coast of Israel see Pulak 1998: 191, 220.
- 2 see objections by Muhly 1998: 321 about Colchis gold.
- 3 "ashy" is also an epithet of Lemnos (Burkert 1998: 125, note 46)
- 4 Bronze Age or ancient ships could also be forced to anchor by submerged reefs, if at a safe distance from the shore (Frost 1999: 368; 2002: 982–983).
- 5 Not only the strategic position of the Medieval castle on a steep prominence surrounded by precipices made impregnable (Pirî Reis 1988: 233 and 240, map 52/b) and it did not fear pirates, but already ancient Myrina resisted the Athenians longer than Hephaistia (Marangou 2002a and 2002b).

#### References

- Acheilara, L., 2000, Η θρησκεία των Λημνίων. In *Lemnos Amichthaloessa* 2000, 11–12. Ministry of Culture. Athens.
- Alroth, B., 1989, Greek Gods and Figurines. Aspects of Anthropomorphic Dedications. Acta Universitatis Upsaliensis. Uppsala.
- Archontidou, A., 1994, Η Μύρινα υπό το φως των ανασκαφών. Archaiologia 50: 50–55.
- Archontidou, A., 2000, Η Μύρινα υπό το φως των ανασκαφών. Ελληνιστικά εργαστήρια της Ηφαιστίας και της Μύρινας. In *Lemnos Amichthaloessa*, 26–34; 42–43. Ministry of Culture. Athens.
- Bass, G. F., 1967, Cape Gelidonyia: A Bronze Age Shipwreck.Transactions of the American Philosophical Society 57.Philadelphia.
- Bass, G. F., 1997, Prolegomena to a study of maritime traffic in raw materials to the Aegean during the fourteenth and thirteenth centuries BC. In R. Laffineur and Ph. Betancourt (eds), *Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age, Aegaeum* 16: 153–170. Université de Liège and the University of Texas, Liège.

- Begemann, F., Schmitt-Strecker S., and Pernicka, E., 2003, On the Composition and Provenance of Metal Finds from Besiktepe (Troia). In G.A. Wagner et al (eds), *Troia and the Troad. Scientific Approaches*, 173–201. Springer. Berlin-Heidelberg-New York.
- Berenson Maclean, J.K., and Bradshaw Aitken, E., 2001, *Flavius Philostratus: Heroikos*. Society of Biblical Literature. Atlanta.
- Beschi, L., 1990, Bendis, the Great goddess of the Thracians, in Athens. *Orpheus* I: 29–36.
- Beschi, L., 1998, Arte e cultura di Lemno Arcaica, *La Parola del Passato* LIII: 48–76.
- Beschi, L., 2001, I disiecta membra di un santuario di Myrina (Lemno). Annuario della Scuola Archeologica di Atene e delle Missioni Italiane in Oriente LXXIX, ser. III, 1: 191–251.
- Burkert, W., 1998, Un feu nouveau à Lemnos. In Burkert, W., Sauvages origines. Mythes et rites sacrificiels en Grèce ancienne, 113–146. Les Belles Lettres. Paris.
- Castrorum Circumnavigatio 1999, Κάστρων Περίπλους. Hellenic Ministry of Culture, Archaeological Receipts Fund. Athens.
- Conze, A., 1986 (1860), Reise auf den Inseln des Thrakischen Meeres. Hakkert. Amsterdam.
- De Lannoy, L., (Ed), 1977, Flavii Philostrati Heroicus. Teubner. Leipzig.
- De Simone, C., 2000, The Tyrrheni of Lemnos. In M. Torelli (ed), *The Etruscans*, Exhibition Catalogue, Palazzo Grassi. Bompiani. Venice.
- Doumas, C., 2002, From Poliochni to Lipari via Akrotiri. In M. Cavalier and M. Bernabò-Brea (eds), *In Memoria di Luigi Bernabò-Brea*, 53–65. Accessorato Beni Culturali ed. Ambientali e della Pubblica Istruzione.
- Dumézil, G., 1998, Le Crime des Lemniennes. Macula. Paris.
  Fenet, A., 2002, Les dieux olympiens et la mer: le cas de la Messénie et de la Laconie. In H. Tzalas (ed), Tropis VII, 7th International Symposium on Ship Construction in Antiquity, 335–344. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Forsyth, P.Y., 1984, Lemnos reconsidered. *Echos du monde classique. Classical views* XXVIII, 3.1: 3–14.
- Frost, H., 1999, Anchors sacred and profane. Ugarit Ras Shamra 1986; the stone anchors revised and compared. In *Ras Shamra Ougarit VI: Arts et Industries de la pierre*, 355–410. ERC. Paris.
- Frost, H., 2001, The Necropolis, Trench and other Ancient Remains: A Survey of the Byblian Seafront. *Bulletin d'Archéologie et d'Architecture Libanaises* 5: 195–217.
- Frost, H., 2002, Syria and Lebanon: the rich potential. In H. Tzalas 2002 (ed), *Tropis VII*, 7th International Symposium on Ship Construction in Antiquity, vol. II, 981–993. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Geological map of Greece, 1993, 1:50.000. Institute of Geology and Mineral Exploration. Athens.
- Giuffrida I., M., 1983, La pirateria Tirrenica. Momenti e fortuna. Bretschneider. Roma.
- Haas, V., 1994, Geschichte der Hethitischen Religion. Brill. Leiden.
- Hadzipouliou, Elizabeth, 1997, Εξειδικευμένες δραστηριότητες στο Παλαμάρι της Σκύρου. In C. Doumas and V. La Rosa (eds), Proceedings of the International Symposium "Poliochni and the Early Bronze Age in the North Aegean", 357–361. Scuola Archeologica Italiana di Atene and University of Athens. Athens.

- Hall, M., and Steadman, S., 1991, Tin and Anatolia: Another look. *Journal of Mediterranean Archaeology* 4.1: 217–234.
- Haspels, C.H. Emilie, 1971, *The Highlands of Phrygia*, Vols I–II. Princeton University Press. Princeton, New Jersey.
- Hemberg, B., 1950, *Die Kabiren*. Almqvist and Wiksells. Uppsala.
   Heubeck, A., West, S. and Hainsworth, J.B., 1988, *A commentary on Homer's Odyssey*. Volume I, Introduction and books I–VIII. Clarendon Press. Oxford.
- Instructions Nautiques, 1929, *Instructions Nautiques. Mediter*ranée Orientale, 1<sup>r</sup> Volume. Imprimerie Nationale. Paris.
- Johnston, S.I., 1990, Hekate Soteira. A study of Hekate's roles in the Chaldean Oracles and Related Literature. American Philological Association. Scholars Press. Atlanta, Georgia.
- Kirk, G.S., 1985 [1990], The Iliad: A commentary, Vols I–II. Cambridge University Press. Cambridge.
- Lamb, W., 1936, Excavations at Thermi in Lesbos. Cambridge University Press. Cambridge.
- De Lannoy, Ludo, 1977 (ed), Flavii Philostrati Heroicus. Teubner. Leipzig.
- McGrail, S., 1996, Navigational techniques in Homer's Odyssey. In H. Tzalas (ed), Tropis IV: 4th International Symposium on Ship Construction in Antiquity, Athens 1991, 311–320. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Marangou, C., 2002a, Rock-art and Landscape in Myrina, island of Lemnos, Greece. In P. Whitehead, W. Whitehead and L. Loendorf (eds), 1999 International Rock-Art Conference Proceedings, Vol 2: 147–153. American Rock Art Research Association. Tucson.
- Marangou C. 2002b, Rocks and Itineraries: Sea and Land Perspectives on an Aegean island. In W. H. Waldren and J.A. Enseyat (eds), World Islands in Prehistory. International Insular Investigations. V Deia International Conference of Prehistory, 7–18. B.A.R Series 1095. Oxford.
- Marangou, C., 2002c, The Myrina ship re-examined. In H. Tzalas (ed), Tropis VII, 7th International Symposium on Ship Construction in Antiquity, 513–522. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Marangou, C., (in press), Diachronic maritime aspects at the Myrina Kastro (Lemnos): Overview of ongoing research. In H. Tzalas (ed), *Tropis VIII*, 8th International Symposium on Ship Construction in Antiquity. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Muhly, J.D., 1998, Copper, tin, silver and iron: the search for metallic ores as an incentive for foreign expansion. In S. Gitin, A. Mazar and E. Stern (eds), Mediterranean Peoples in transition. Thirteenth to Early Tenth Centuries BCE. In Honor of Professor Trude Dothan, 314–329. Israel Exploration Society. Jerusalem.
- Papadimitriou, G.D. and Kordatos, I., 2001 Μεταλλουργική μελέτη αρχαίων λιθαργύρων από την περιοχή του Λαυρίου. In Y. Bassiakos, A. Aloupi, and Y. Facorellis (eds), Archaeometry issues in Greek Prehistory and Antiquity, 679–697. Hellenic Society of Archaeometry, Society of Messenian Archaeological Studies. Athens.
- Parker, A.J., 1992, Ancient Shipwrecks of the Mediterranean and the Roman Provinces. B.A.R. Series 580. Oxford.
- Parker, R., 1994, Athenian religion abroad. In R. Osborne and S. Hornblower (eds), Ritual, Finance, Politics. Athenian democratic Accounts presented to David Lewis, 339–346. Clarendon Press. Oxford.
- Pernicka, E., 2001, Metalle machen Epoche. In J. Latacz et al,

- *Troia. Traum und Wirklichkeit* (exhibition catalogue), 369–372. K. Theiss. Stuttgart.
- Pernicka, E., Eibner, C., Öztunali, Ö., and Wagner, G.A., 2003, Early Bronze Age Metallurgy in the North-East Aegean. In G.A.Wagner, et al (eds), *Troia and the Troad. Scientific Approaches*, 143–172. Springer. Berlin-Heidelberg-New York.
- Pirî Reis, 1988, *Kitab-i Bahriye* (re-edition of the 1526 book), Vol 1. Ministry of Culture and Tourism. Ankara.
- Ploigos 1955, Πλοηγός των Ελληνικών Ακτών, Δ τόμος. Hydrographic Service of the Royal Navy. Athens.
- Pulak, C., 1998, The Uluburun shipwreck: an overview, *International Journal of Nautical Archaeology* 27.3: 188–224.
- Rapp, Jr., G., 1999, Copper, tin and arsenic sources in the Aegean Bronze Age. In P.P. Betancourt, R. Laffineur and W-D., Niemeier (eds), Aegeaum 20, Meletemata. Studies in Aegean Archaeology presented to Malcolm H. Wiener as he enters his 65th year, 699–704. Vol. III. Université de Liège, Liège
- Rauh, N., 2003, Merchants, Sailors and Pirates in the Roman World. Tempus. Gloucestershire.
- Rein, M.J., 1996, Phrygian Matar: emergence of an iconographic type. In E. Lane (ed), *Cybele, Attis and related cults. Essays in memory of M.J. Vermaseren*, 223–237. Brill. Leiden.
- Richardson, N., 1993, *The Iliad: A commentary*, Vol VI. Cambridge University Press. Cambridge.
- Romero Rocio, M., 2000, *Cultos Marítimos y Religiosidad de Navegantes en el Mundo Griego Antiguo*. B.A.R. Int. Series 897. Oxford.
- Sakellariou, M., 1977, Peuples préhelléniques d'origine indoeuropéenne. Ekdotikè Athenon. Athens.
- Sayre, E.V., Joel, E.C., and Blackman, M.J. 2001, Stable isotope studies of Black Sea Anatolian ore sources and related Bronze Age and Phrygian artefacts from nearby archaeological sites. Appendix: New central Taurus ore data. Archaeometry 43.1: 77–115.
- Stos-Gale, Z.A., Gale, N.H., and Annetts, N, 1996, Lead isotope data from the isotrace laboratory, Oxford: Archaeometry data base 3, ores from the Aegean, Part 1. Archaeometry 38.2: 381–390.
- Torelli, M., 1975, Τυρρανοί. La Parola del Passato CLXV: 417-433.
- Tzalas, H., (ed), 1996, Tropis IV: 4th International Symposium on Ship Construction in Antiquity, Athens 1991. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Tzalas, H., (ed), 2002, Tropis VII, 7th International Symposium on Ship Construction in Antiquity, Vols I–II. Hellenic Institute for the Preservation of Nautical Tradition. Athens.
- Vavelidis, M., Gialoglou, G., Trontsios, G., Melfos, V, and Weisberger, G., 2001, Ενα αρχαίο μεταλλείο ώχρας και μολύβδου-αργύρου στην μεριοχή Ελιά της Θάσου. In Y. Bassiakos, A. Aloupi, Y. Facorellis (eds), *Archaeometry issues in Greek Prehistory and Antiquity*, 633–644. Hellenic Society of Archaeometry, Society of Messenian Archaeological Studies. Athens.
- Ventris, M. and Chadwick, J., 1973, *Documents in Mycenaean Greece*. Cambridge. Cambridge University Press.
- Wagner, G.A., E. Pernicka and H.-P. Uerpmann (eds), 2003, Troia and the Troad. Scientific Approaches. Springer. Berlin-Heidelberg-New York.
- Weill, N., 1985, La plastique archaïque de Thasos. Figurines et statues de terre cuite de l'Artemision. I. Le haut archaïsme. Etudes Thasiennes 11. Ecole Française d'Athènes. Athens.