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ISLAND ARCHAEOLOGY AND THE ORIGINS OF SEAFARING IN THE EASTERN MEDITERRANEAN

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THE AEGEAN MESOLITHIC: ENVIRONMENT, ECONOMY AND SEAFARING

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Abstract

The re-establishment of the environment during the early Holocene is one of the most principal aims of the research, in order to interpret the behavioural patterns of the prehistoric people who crossed the Aegean during the final Paleolithic and Mesolithic period. The multitude of questions which arise from the archaeological record would find much simpler answers if one had to hand the area’s environmental situation as it was 11,000 years ago. It is very likely the microenvironments that were created at the beginning of the Holocene very probably took dramatic dimensions much more serious than these in central and western Europe. The hunters and foragers that lived in regions of the Aegean had to face the all contrarities of new environment, deprived of the usual alimentary sources that probably existed still in the mainland.

The Aegean Mesolithic may also be viewed as a period with sharp regional differentiation and economic complexity as well as a period of experimentation, regarding food procurence. Elements of proto-neolithization, appearing in the Aegean during the Mesolithic, may indicate, on the one hand, the possible local existence of domestication cases, resulting of economic social habitats and land use particularities as well as the existence of a focus of neolithization, comparable to the Cypriote one. On the other hand, they presume the possibility of direct or indirect contacts between local populations and Eastern groups as well as sea routes or ideas on their diffusion during Pre Pottery Neolithic.

The similarities of the Mesolithic tools from the Cyclops Cave with them of the southeast Anatolia (the area of Antalya) and the common stone industry of Ikaria and Kythnos, as well as the transportation of the obsidian from Melos and Yali to different parts of the Aegean lead to the assumption that sea routes existed at least since the 9th mill. BC.. Smaller sea routes could existed among the islands of the central and southern Aegean serving for the distribution of Melos and Yali obsidian to the Mesolithic centers. A new Mesolithic site in Naxos is lying in the course of the voyage from Ikaria to Melos. Another one was responsible for the transport of Melian obsidian to the Dodecanese (Chalki island).

A sea route is supposed to be in use in the Upper Mesolithic connecting Melos to Crete. Obsidian artifacts from Melos resembling the Aegean Mesolithic counterparts is present in Knossos aceramic levels from 7000 BC. Another sea route could exist connecting the southern Peloponnese to Crete via the Kythera and Antikythera islands.

Presupposition for the cultural diffusion from the East to the Aegean islands are the Pre-pottery Neolithic sea routes in the eastern Mediterranean, especially between Anatolia, the Levantine coast and Cyprus. It is very likely that this marine communication and the contacts were not unilateral but reciprocal and became also from both directions that is to say from the east to the west and vice versa.

Key words: Early Holocene, Mesolithic foragers, Proto-Neolithization, Seafaring, Obsidian circulation

INTRODUCTION

In the last two decades, Mesolithic sites have been located and excavated around the Aegean Basin such as Cyclops Cave in the Northern Aegean, Maroulas at Kythnos in the Cyclades and Kerame in Ikaria in the eastern Aegean. Furthermore, other Mesolithic sites have been found in Naxos and Melos of the Cyclades region as well as on the island of Chalki in the Dodecanese. and Mesolithic sites have been reported in eastern Crete (Strasser et al., 2010) and the island of Gavdos (Kopaka and Matzanas, 2009). In the island of Kythnos more than
six Mesolithic open sites were located, while Maroulas is (for the moment) the most important Mesolithic settlement in the Aegean (Sampson et al., 2010). The same settlement pattern appears in eastern Ikaria, where Kerame seems the main settlement with five satellite sites a small distance away (Sampson et al., 2008a, 2012). Consequently, it appears that the Mesolithic stage existed throughout the whole Aegean Basin. In the early Holocene, dramatic environmental and climatic changes contributed to the development of seafaring and fishing, while the early domesticated animals evidenced in Cyclops Cave presuppose long term navigation between Aegean and the East (Anatolia and Cyprus). Numerous C14 dates, transportation of raw materials and correlation of the lithic industries attest long and short-term movements from northern to southern Aegean and from west to east. For 2000 years the Mesolithic groups sailing in the Aegean were following the same sea routes with the aid of the sea currents.

THE ENVIRONMENT

The representation of the environment during the early Holocene is one of the principal areas of research seeking to interpret the behavioral patterns of the prehistoric people who crossed the Aegean during the final Paleolithic and Mesolithic periods. The multitude of questions arising from the archaeological record would find much simpler answers if the environmental conditions prevalent 11000 years ago were better understood. It is very likely that the micro-environments created in the Aegean basin at the beginning of the Holocene provided a much greater contrast to what had been previously dominant than in central and western Europe. If so, then the hunters and foragers who lived in regions of the Aegean had to face all the adversities of the new environment, deprived of the previously available food sources that probably still existed in the mainland. Anthracological and pollen analyses in the Cyclops Cave shed new light on the formation of the environment of Northern Sporades in the beginning of the Holocene. Oak trees and all the macia species are represented (Ntinou, 2011; Ioakeim, 2011).

Figure 1 illustrates the topography in the immediate vicinity of Youra island. The terrain of Youra island along with that of all the surrounding islets, as well as the rocky and precipitous coastline in juxtaposition with the deep seas a product of the significant changes in sea level which took place at the end of the last Ice Age, contemporaneous with the beginning of the Mesolithic period (Sampson, 2008a, 2011). When the sea level rose suddenly and the island creation began, the people who lived in the area were forced to adapt to the new conditions and obliged to invent new sailing and fishing techniques very early on. It is quite possible that the low-lying areas which were inundated created particularly favorable fishing conditions which the the people who lived there turned to their advantage. This response is certainly one way to explain the archaeological evidence of intense fishing activities in the Aegean. An example of these potentially rich fishing grounds is the benches formed by the sea rise between Youra and the islet Psathoura (Fig. 1), which during the Upper Palaeolithic were joined together by dry land.

The dramatic change of the environment is evident in Maroulas on Kythonos, part of which has been eroded by the sea level rise (Fig. 2). In fact, the site was a peninsula in the early Holocene with the coast 500m away. Probably, a thick forest of oak trees covered parts of the island as in the adjacent island of Keos which still features today clumps of the same tree. Similar environmental conditions prevailed in Kerame in Ikaria (Sampson et al., 2008, 2012) where the sea rise destroyed a large part of the settlement which lay on sediments of conglomerate rocks (Fig. 3). The depth contours indicate a different shoreline with a formation at the 20-25m depth, which may have functioned as a harbor.

Nevertheless, some scholars insist that the scenarios regarding the rise in sea level cannot be accepted on an archaeological and geological level. (Pirazzoli, 1986, 1991; Pirazzoli et al., 1992). They believe that there were no natural mechanisms that could have caused such great rises of 10 or 15 meters, while, on the other hand, tectonic movements could have possibly brought on mainland sinking of up to 9 meters as in the case of southwest Crete.
THE MESOLITHIC ECONOMY

Until the 1990s only the excavated site of Franchthi had revealed a pure Mesolithic economy based on hunting, gathering and fishing. The recent excavation of Cyclops Cave appeared to reveal a seasonal camp of hunters-gatherers who specialized in fishing and bird hunting (Sampson, 2008a, 2011). However, good preservation and meticulous study of the faunal material from the Cyclops Cave showed a new model of Mesolithic economy with Capra aegagrus at a transitional stage of domestication already in the Lower Mesolithic (8,600-7,500 BC). At this level (end of 9th millenium BC) the majority of caprids belonged to goats (Capra aegagrus) and...
Fig. 2. The Maroulas settlement on Kythnos

Fig. 3. Sea contours at Kerame settlement on Ikaria
few bones to sheep (Trantalidou, 2011). Sheep bones in bigger quantities were found in layers of the 1st half of the 8th millennium BC. (Sampson, 2005). The absence of wild ancestors from the environment of the Aegean and continental Greece in the beginning of the Holocene makes a powerful argument for the importation of these animals from the East during the first attempts of domestication (Masseti, 1998:9). It is of paramount importance that this spread of such an early domestication in the Aegean basin is almost contemporaneous with the early experiments of domestication in the Zagros mountains (8500-8000 BC calibrated) testifying rapid movements from Anatolia along naval routes. Probably, other waves of movements from Cyprus brought the sheep to the Aegean during the 8th millennium BC.

However, it appears that the Mesolithic resident of Youra performed precocious veterinary surgeries on animals domesticated by him/her or already at an initial stage of domestication. This is mainly the case concerning goats (Capra aegagrus) in more inferior Mesolithic (Trantalidou 2003? Trantalidou 2011) and Theopetra (Newton 2003), a small number of pigs (Sus scrofa) in Youra and Maroulas in the same period, and a minimum number of sheep (Ovis orientalis) in Youra in a somewhat later stage. Especially about the pigs, Trantalidou speculates a particular relation of management from the person that combines control of animals and hunting (animals free in the island in semi-wild status), without however being able to prove it sufficiently because of the small and non-homogeneous sample. In any case, the abundance of flora [oak] in the Aegean during the Mesolithic implies the abundance of acorn (comestible also by humans, as argued in Mesolithic Europe) and potentially strengthens indirectly the argument for free pasturage of pigs. The ethnic parallel shows the usefulness of pigs for the cleaning of fishing nets which may lead to one more idea about the likely management of animals by Mesolithic fishermen of the Aegean. On the issue of pigs present at Youra and Maroulas, Trantalidou (2010) speculates a particular relation of management that combines control of animals and hunting (animals roaming free in the island in a semi-wild status), but she was unable to verify this because of the small and non-homogeneous sample. Pigs could be fed from the mast generated by the forest of oak trees and probably were used to clean the fishing nets judging from ethnological parallels (Trantalidou, 2011). Pigs are also present at contemporary sites on Cyprus (see Vigne in this issue). The economy of the Mesolithic inhabitants of Maroulas was primarily focused on the exploitation of marine resources, principally fishing, but the quantity of the material is much less than in Cyclops Cave and Franchthi. The study of animal bones showed that this material was very scarce in Maroulas (1193 bones of vertebrate faunal taxa among which 558 mammal and bird bones), while 41.32% of the total vertebrate fauna collected belonged to the Suidae family (Trantalidou, 2010). Fishermen were oriented toward two types of resources, the migratory, seasonal fish, and certain species of inshore fish. They fished medium size migratory fish and the largest of the inshore fish. Maroulas, like Cyclops Cave, provides evidence for the processing and preservation of fish, and therefore the specific size range might have been chosen as the most suitable for this purpose. A nomadic residential mobility suits better the Mesolithic groups of Kythnos who probably exploited on a seasonal basis other islands or some regions of Attica. Maroulas was a permanent or semi-permanent settlement in contrast to the other five small Mesolithic sites found in coastal areas in the eastern side of the island. This is also characteristic of eastern Ikaria, where Kerame seems to be a seasonal base with the other five sites at a small distance (Fig. 4).

During the same period in continental Greece a different subsistence strategy is recorded linked with older, more conservative, choices. However, even this area is not unified, but features local variations as implied by the finds of the Mesolithic hunters/gatherers of Sarakenos Cave in the Kopais plain who used local limestone materials for their tools (Sampson, 2008b; Sampson et al., 2009).

**MESOLITHIC SEA ROUTES**

The geographic and environmental conditions in the Aegean basin were ideal in the beginning of the Holocene for the investigation of sailing and fishing. The small distances between the islands offered a surmountable challenge thereby encouraging the development of sailing skills. In
the same period the situation in the southeastern Mediterranean (Cyprus and Syro-palestine) would be much less favorable since small islands are absent and the greater sea distances would have been more daunting. Also, the Levantine region generally is more sensitive to climatic changes as it lies in the boundaries of the semi arid/ arid area. An abrupt environmental change (Berger et al., 2009) happened during the PPNB period (8000 cal BC) and the climate became cooler, but at the end of PPNB (7000 cal BC) the climate became increasingly arid (Robinson et al., 2001). During this period of climatic crisis, populations from the East started searching for areas with more hospitable climates to the west. Sea currents prevailing in Cyprus and East Mediterranean seem to facilitate the navigation from the east to the west, but we do not know the direction of these currents during the whole year. It is very probable that the first attempts of sailing began in the Aegean in a period of lower sea level when the islands were closer to each other. All those experiences should be transferred from the Aegean to the east Mediterranean. The kind of transportation means is unknown but the sea conditions in the Aegean do not allow the use of a canoe, whereas a papyrella boat of adequate size would be more effective (Tzalas, 1995, 2002). Much has been written about the prehistoric sea routes from the northeast Aegean to the south (Melos) through the Evoikos gulf (Sampson, 1985; Agouridis, 1997), which had provided the necessary safety for prehistoric vessels. In addition, sea-surface circulation which would have been well recognized back then (Papageorgiou, 1997), was a significant factor in seafaring in northern Aegean, especially in the early periods (Mesolithic-Neolithic) when sails probably were not in use (Fig. 4). The northeastern Aegean current from Ellispontos to the southwest facilitates voyages from northeast Anatolia to Lemnos, Ag. Efstratios, Youra, Alonnessos, Skopelos, Skiathos, and Thessaly, especially during the summer. The similarities between the

Fig. 4. Ikaria. Kerame settlement and surrounding sites
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stone industries of Ikaria (Sampson et al., 2012) and Kythnos may lead to the assumption that a sea route existed since the 9th millennium BC connecting the two sides of the Aegean along the chain of the Cycladic islands (Andros, Tenos, Mykonos, Ikaria, and Samos). Despite the open sea between Mykonos and Ikaria (the Ikarion Pelagos), visual contact between the two islands and the marine currents would facilitate the sail (Fig. 5). In fact, recent studies (Papageorgiou, 2008) have proved that the marine currents during winter- and summertime even in the summer in the islands of the Cyclades facilitate voyages from Asia Minor to the western Aegean and back. These currents start from Attica and Euboea and lead through the islands of Andros, Tenos and Mykonos continue to Ikaria and Samos.

A similar route to the East for the Mesolithic groups of the Aegean can be postulated, based on the similarities found among the Mesolithic tools from Cyclops Cave with those in the Antalya region in southeast Asia Minor (Kaczanowska and Kozlowski, 2008). Taking into account the rough weather conditions which prevail in the open sea of the Myrtoon Pelagos and the fact that no helpful currents existed in this area, and the results of our survey in 1999 on the small islands of Falconera and Parapola (Sampson, 2006), we come to the conclusion that the transfer of obsidian to Franchthi was not carried out straight from Melos, but through the islands of the western Cyclades and Attica (Fig. 5). Smaller sea routes probably existed among the islands of the central and southern Aegean for the distribution of Melos and Yali obsidian to the Mesolithic centers. A new Upper Mesolithic site in Naxos (Fig. 5) lies in the course of the voyage from Ikaria to Melos (Sampson, 2010). Another Upper Mesolithic site was found in Chalki island (Fig. 5) with enormous quantities of Melian and Yali obsidian (Sampson, 2010) resulting a sea route from Cyclades to Dodecanese. A sea route is thought to have been in use in the Upper Mesolithic connecting Melos with Crete. Obsidian artifacts from Melos

![Fig. 5. Probable sea routes during the Mesolithic](image-url)
resembling their Aegean Mesolithic counterparts are present in Knossos aceramic levels from 7000 BC (Kaczanowska and Kozłowski, 2011). Another sea route probably existed connecting the southern Peloponnese with Crete via Kythera and Antikythera islands. We believe that once ancient mariners gained experience sea movements were limitless, especially in the case of the Aegean, where they were facilitated by the existence of numerous islands, but also in the case of SW Anatolia and Cyprus because cruising along the coast was performed effortlessly. We must assume the existence of even earlier navigation in the Aegean as numerous Middle Palaeolithic sites were found on the island of Euboea and in the Northern Sporades (Sampson, 1996, 2006). Another example attesting seafaring activities in the central northern Aegean during the Middle Palaeolithic (OIS 5 or 5a) is the site of Alonissi on the island of Agios Eustratios discovered three years ago. The island during this period was not connected to the mainland. The latest Palaeolithic site at Fisini of Lemnos (Efstratiou et al., 2013) has not been precisely dated yet, however types of stone industry seem to bear similarities with the epipalaeolithic stone industries of the Antalya caves (Öküzini Cave; Yalçinkaya et al., 2002) and may attest to earlier movements in the Aegean.

**DISCUSSION**

The Aegean Mesolithic may also be viewed as a period with sharp regional differentiation and economic complexity as well as a period of experimentation, regarding food procurement. Elements of proto-neolithization appearing in the Aegean during the Mesolithic may indicate, on the one hand, the possible local existence of domestication cases resulting from economic social habitats and land use particularities as well as the existence of a focus on neolithization, comparable to the one in Cyprus (multi-focus neolithization theory; cf. Sampson and Katsarou, 2004; Sampson, 2005, 2006, 2010). On the other hand, they presume the possibility of direct or indirect contacts between local populations and Eastern groups as well as sea routes or ideas diffused during Pre-Pottery Neolithic. The focal points recorded at the present moment bring to light local histories and place the island Aegean in a new frame. The Aegean basin is upgraded from a regional area to the “cradle”- focal point in the map of multi-centric Neolithization, which could gradually replace the unique “cradle” in the eastern Mediterranean. An open and creative social area emerges on the islands, which does not have the attribute of the exclusive receptor (demic diffusion theory) or the isolated and introvert model suggested by Seferiades’s extreme indigenist Neolithic theory (2007). The prevalent “model” seems to be that of a constant presence in the Aegean for roughly 2000 years by populations living in a mixed Mesolithic/Neolithic stage, familiar with the sea, navigation and geography, and participating in common networks of exchange of raw material and sharing common technological types. These are dynamic populations of the Aegean who have acquired skills in navigation, specialized in fishing techniques and food preservation and choose to settle near the coasts and rarely inland. The recent discovery of a large settlement on the island of Chalki (Sampson, 2010) constitutes a stop in the SW Aegean and suggests routes to Cyprus and Crete. Until now the choice to inhabit small islands is related to their interests in key positions suitable for fishing and belonged to a network of sea routes. The common industries of Kythnos, Ikaria, Naxos, and Chalki probably indicate the same active population that extends to the southern half of the Aegean and shares similar nutritional needs. So far the absence of the nutritional model of Youra (combination of food producing economy with fishing) in the southern Aegean cannot imply a cultural and economic deviation but is probably due to the absence of cave sediments on these islands and the large erosion of the open-air sites. These elements of proto-neolithization presupposes intense activity along the main sea route from the southern Aegean to Cyprus and Pre-pottery Neolithic seafaring in the eastern Mediterranean, especially between Anatolia, the Levantine coast and Cyprus. It is very likely that this marine communication and the contacts were not unilateral, but reciprocal, and came from both directions, namely from the east to the west and vice versa (Fig. 6). Flake industries from sites of Cyprus such as Nissi
Beach (Ammerman, 2010, 2011; Ammerman et al., 2008), though they cannot be dated for the moment, are probably evidence of contacts between Aegean Mesolithic groups searching way out to the East and Cypriote hunters and foragers.

Admittedly, great progress is still ongoing regarding Mesolithic research although there are still pending questions about the interpretation concerning the Mesolithic society and economy in Greece. Admittedly, the revealing and excavation of Mesolithic strata has been hindered by the existence of over-laying and subsequent deposits. Consequently, cave excavations may provide the best new material and show the real importance of Mesolithic presence in each area. Therefore, it is essential to employ a strategy of research combining excavations in rock shelters or caves with intensive surface survey, as well as conduct studies of material by means of stratigraphy and absolute dating.

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