

Chapter 1

Seafaring in the Mesolithic Mediterranean

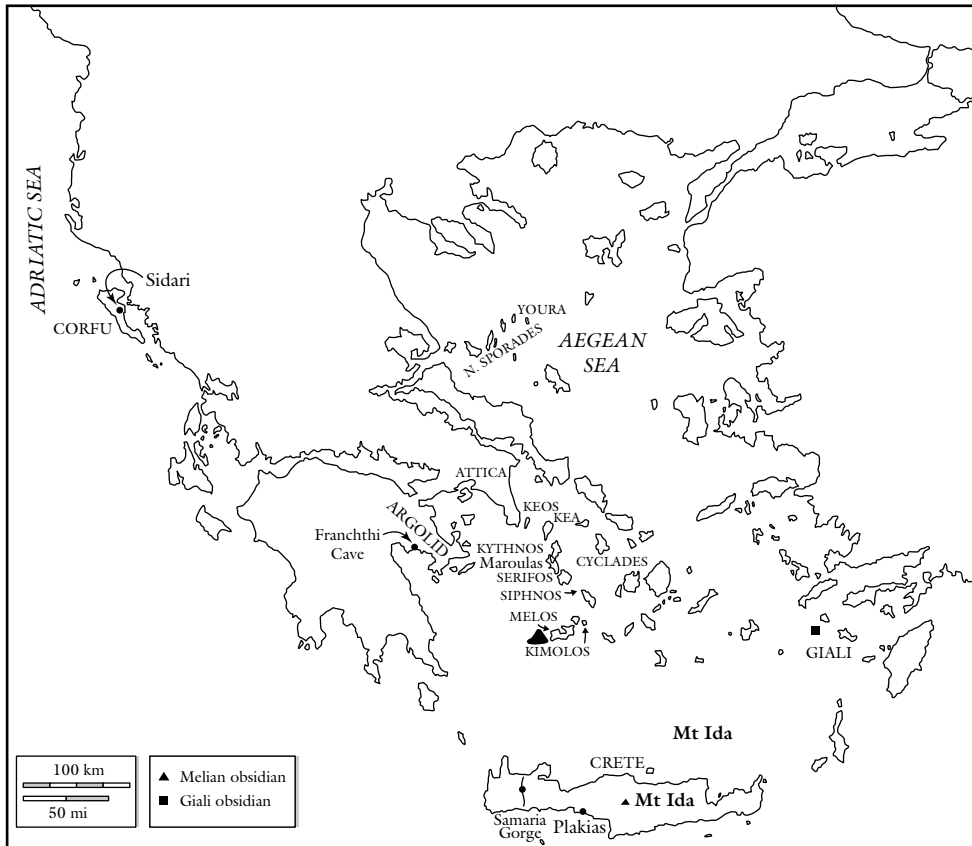
Obsidian Acquisition as Evidence for Seafaring

The Aegean

While seafaring is attested in the Pacific with the arrival of human beings in Australia some 40,000 years ago (O'Connell and Allen 2004),¹ the earliest evidence of Mediterranean seafaring dates to the tenth to ninth millennium BC: obsidian found in Mesolithic levels in the Franchthi Cave in the Greek Peloponnese (Broodbank 2006).² Analysis has identified with great precision the source of obsidian as the Cycladic island of Melos (Tykot 1996; Tykot and Ammerman 1997). Since Melos had never been attached to the mainland during the Holocene, the obsidian must have been brought by sea.

According to Perlès, a specialist on the Franchthi Cave and obsidian, the quantities found are too small – at most 1 percent of the total lithic material – to have been the result of regular maritime expeditions to Melos by the occupants of the cave, and she suggests occasional collection or very sporadic acquisition through exchange routes (1990a: 30; 2003a: 81). Later, in the Upper Mesolithic, the amounts of obsidian increased thirtyfold, but they were still quite small: obsidian made up only 3.15 percent of the total lithic material (Perlès 1990a: 48). At that time, the material was imported in unworked blocks and worked on the site.

According to Perlès, the acquisition, working, and distribution of Meli obsidian carried out by individual users who traveled to acquire their own supplies, or came upon it as a side benefit during fishing trips. Rather, she argues it was collected and distributed by specialists (Perlès 1990b; 1992). Her reasoning is that obtaining the obsidian would have required a long trip by both land and water, expert knowledge of the location of the source and of the best route there, access to a boat, expertise in navigation, and time away from other tasks to undertake the long trip. This would have precluded all but a few determined venturers. She suggests, therefore, that the bearers of obsidian to



Map 1.1 Obsidian in the Aegean.

Franchthi were specialized seafaring groups who pre-formed the obsidian into cores on Melos for transport. Because great skill was required in knapping, and this was unlikely to have been a skill acquired by a householder for his own production – one man could produce far more blades than a single household, or even a small village, required – Perlès suggested that the obsidian gatherers also acted as itinerant “middlemen,” moving from village to village, knapping the obsidian as required. The amounts found at Franchthi seem to preclude any great activity on the part of the inhabitants of the Franchthi Cave in this “industry” of acquisition, transport, and production.

The missing element in this picture – people who do seem to have been involved in the acquisition, transport, and distribution of obsidian – may be provided by the recently excavated Mesolithic island site of Maroulas on Kythnos, whose occupation is contemporary with the Franchthi Cave (Sampson 1998; Sampson *et al.* 2002). Obsidian from Melos has been found at Maroulas in large quantities, amounting to 16.87 percent of the total lithic assemblage (as compared with 3.15 percent at Franchthi). Cores were found, indicating that obsidian was worked on the site, although, according to the excavators, the large proportion of obsidian tools (36.36 percent) may mean that some were imported as finished products (Sampson

et al. 2002). The occurrence of obsidian at Maroulas adds substantially to the evidence of Franchthi Cave for Aegean seafaring in the Mesolithic, and it also suggests a possible explanation for the small amounts of obsidian found at Franchthi: that site lay near the end of an obsidian transport route that ultimately led to the Argolid: Melos, Kimolos, Siphnos, Seriphos, Kythnos, Keos, Attica, Argolid.

Maroulas is also the only Aegean island site to have provided evidence of occupation in the Mesolithic in the form of dwelling remains and burials (Sampson *et al.* 2002). Three circular flagstone floors more than 3 meters in diameter and bordered with small and large stones have been found, as well as three flagstone constructions in irregular ellipsoid form that have not been so well preserved. Under the surface of one of the circular floors, an adult burial was discovered under a large slab. Another burial was that of a child interred with the bone of a dog. In all, nine burials were found, most were only partly preserved; other burials appear to have been destroyed by sea erosion. The burial customs (inhumation under the floors of houses, and burials associated with dogs), and the use of circular dwellings, have parallels in the Natufian culture of Syria and Palestine, dated 12,500–10,200 BP,³ and are thus in the same time frame as the early finds of obsidian at Franchthi Cave (Davis and Valla 1978; Valla 1998: 187; Davis 1991). People, presumably families, were living on Maroulas for at least part of the year, although they may have incorporated their stays into a seasonal travel pattern in order to maximize their resources.

How did these earlier obsidian carriers cross the sea? For this date, there are no preserved remains of boats in this area, and reed vessels seem to be the likeliest possibility. To test this, in 1988, a group of archaeologists and students used a reproduction of a double-prowed papyrus vessel propelled by oars on a test voyage from Laurion in mainland Greece to Melos (Tzala 1995), a route perhaps similar to that taken by the carriers of the Franchthi obsidian, had they gone part of the way overland. The modern trip involved a full-time crew of six, with an additional rower occasionally used, and required seven days (not counting delays caused by adverse weather). Reed boats were in use in Corfu in the 1960s (Sordinas 1970: 31–4 and plates 1, 2), and papyrus or reed boats are still used in Sardinia at the regatta festival of fishermen held annually in August (“Is Fassonis”) at Santa Giusta, in the vicinity of Monte Arci, the principal Sardinian obsidian source.

Another Aegean island site that has yielded Melian obsidian in Mesolithic levels as evidence of maritime visits is the Cyclops Cave on Youra, one of a group of islands (the “Deserted Islands” – Kyra Panagia, Youra, Psathoura) in the Northern Sporades (Sampson 1998; Broodbank 2000: 116; Sampson, Kozłowski, and Kaczanowska 2003). Other small Mesolithic sites have been found in the island group, and Sampson (1998: 20) reports three submarine cavities that are likely sites and await investigation.

Fifteen obsidian artifacts, including seven microlith tools, were found in the upper levels of the Cyclops Cave, but the absence of obsidian cores suggests that the tools were brought to the site ready to use. Identical obsidian microlith forms are known from the Antalya region of Anatolia and from the Öküzümlü Cave on the Cilician coast (Sampson *et al.* 1998; Sampson, Kozłowski, and Kaczanowska 2003: 128), as well as at Belbidi, and Pinarbasi in central Anatolia. Although no direct connections can be traced between the Aegean cave and Anatolia, it is probable that the people from Mesolithic sites on the Aegean islands had contacts with western Anatolia, to which the Northern

Sporades from a natural island bridge (van Andel and Shackleton 1982; van Andel 1990; Cherry 1990: 192–4). The fact that some artifacts from the cave were made from local siliceous rocks suggests that the island also had links with the Mesolithic of mainland Greece. It may even have been connected to the mainland, or been within very close “stepping stone” range of it, within human history (see Map 1.1) (Cherry 1990: 165–7).

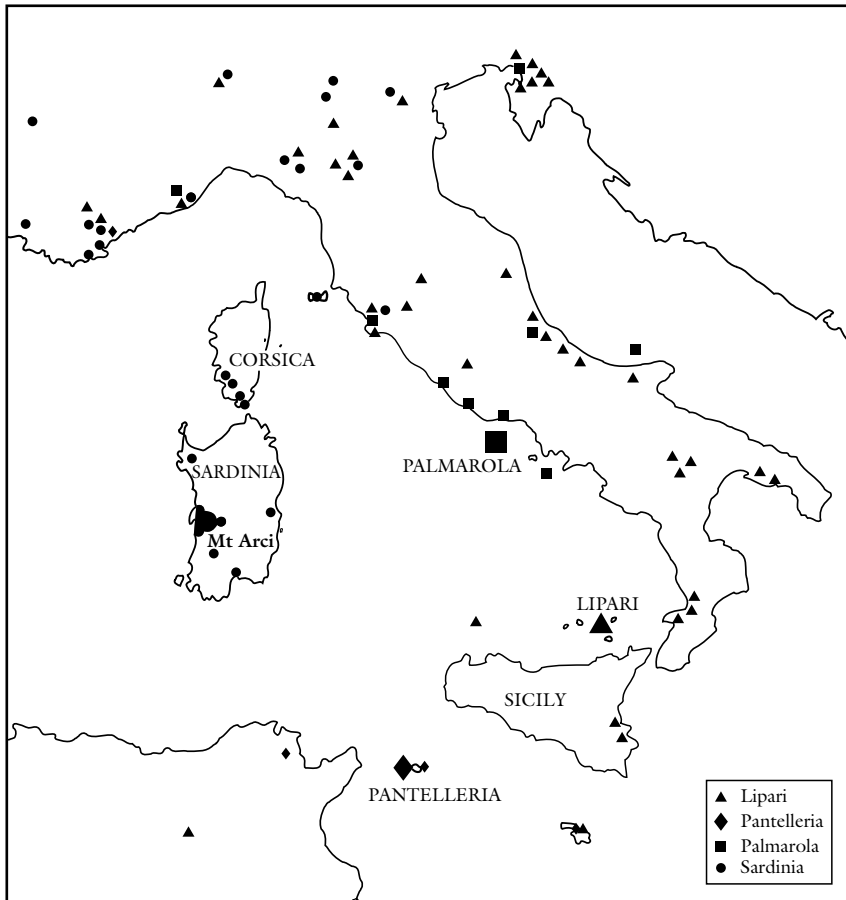
The evidence thus suggests not only considerable seafaring but also the existence of a “complex network of trade activities and large-scale movements in the Aegean and the Greek mainland, extending to Anatolia and indirectly even to the Levant, in the ninth millennium BC” (Sampson 1998: 20–1; see also Renfrew and Aspinall 1990). This is in keeping with the Mesolithic lifestyle, which was generally one of seasonal migrations in search of a variety of resources, with the same campsites being visited repeatedly in an annual cycle. In fact, Broodbank (2000: 115) suggests that part of the Mesolithic population of the islands spent periods of the year moving around the Aegean, likening them to those who “colonised the sea” in early Melanesia (Gosden and Pavlides 1994). In such a situation, sites are difficult to recognize archaeologically: they are “spots on the landscape to which people return regularly,” within the context of continual movement within the larger maritime area, and such “occupants” are unlikely to leave many traces behind them (Gosden and Pavlides 1994: 169). Yet the occupants did leave behind traces of a network of exchange focused on obsidian, which included other worked stone and stone-working methods, and surely other, ephemeral materials. Perhaps most important, it would have served as a network of information.

Central Mediterranean Obsidian Sources and Routes

While Melos was the main source of obsidian in the Aegean,⁴ other important sources of obsidian existed in the central Mediterranean. Perhaps the best known of these sources was Lipari, one of the Aeolian islands. At about the same time that people from the Franchthi Cave first acquired obsidian from Melos, people seeking obsidian visited (but did not settle) the Aeolian Islands, especially Lipari, perhaps attracted by the fiery displays of its volcano (Leighton 1999: 28, 33–4, 72–3). Obsidian would have been easily collected, and there is evidence that reduction into pre-cores occurred on the island long before any settlement took place (Leighton 1999, 75). In the Tyrrhenian Sea, the earliest evidence currently comes from Capri, where from the Middle Neolithic (end of fifth and early fourth millennium) finds of Lipari obsidian have been made in the Grotta delle Felci, the local sanctuary. These are especially significant since they suggest that early exchange may have taken the form, not so much of “trade,” as of “dedications” by visitors to holy sites.

Some prospectors at Lipari surely came from nearby Sicily, which was not a true island and had been continuously inhabited since the Palaeolithic.⁵ The earliest exported Lipari obsidian there was discovered in a Mesolithic context (Aranguren and Revedin 1996: 35) and is thought to have been the result of exploration and possibly sporadic exchange rather than systematic exploitation.

At the end of the fifth millennium settlement on the Aeolian islands began when people from Sicily established themselves at Castellaro Vecchio on Lipari and



Map 1.2 Central Mediterranean obsidian. Adapted from Ammerman 1985.

subsequently at Contrada Rinicedda on Salina (Cavalier and Bernabo Brea 1993–4: 987–8; Castagnino Berlinghieri 2003: 45; 51, 121). Both these sites have provided strong evidence for the working of obsidian, which suggests that it was the motivation for their establishment. The large numbers of flakes found in all the Aeolian settlements, from the most ancient (Castellaro Vecchio) up to the final Eneolithic, assure that the local population directly controlled the operations of extracting and working the obsidian (Nicoletti 1997: 260). Obsidian from Lipara was carried regularly to the Italian coast by sea, where the Calabrian Acconia project has demonstrated its reduction and distribution to a number of settlements of the Middle and Late Neolithic (Ammerman 1985; Malone 2003: 283). Obsidian from Lipari also reached southern France, perhaps by way of Corsica, and from there it was carried to central and northern Italy and Croatia (Robb and Farr 2005: 36). The data from Lipari suggest that the height of obsidian extraction and working occurred toward the end of the Neolithic (the period called the *Diana facies*), with a subsequent progressive decline in the Chalcolithic and total disappearance at the beginning of the Bronze Age.

In the central Mediterranean, in addition to the Aeolian islands, Sardinia and the small islands of Pantelleria and Palmarola (one of the Pontine Islands) were sources of obsidian, and they show similar patterns of late settlement (Tykot 1996). The largest and most heavily exploited of these sources was Monte Arci in Sardinia. The obsidian from that site was of the highest quality, and it was widely distributed to Corsica, central and northern Italy, and southern France (Tykot 1996: 61; Walter 2000: 145). It was probably the presence of obsidian that attracted settlers to the island in the sixth millennium. The sources of obsidian found at the small islands of Palmarola and Pantelleria were less heavily utilized. The obsidian from Palmarola is not of high quality, but the island was easily accessible from the mainland, and obsidian could be picked up on the beach; some was found on the Tyrrhenian coast of Italy at the site of La Marmotta (Walter 2000: 143). To the south, the island of Pantelleria, which lies 200 kilometers southwest of Sicily, played a subordinate and localized role in the distribution of obsidian by the middle of the sixth millennium, with material from the island being carried to the tiny neighboring island of Lampedusa, and to Sicily, Malta (150 km distant), and Tunisia (113 km distant) (Camps 1986: 40, 41, 44; Trump 1963; Nicoletti 1997; Vargo, Tykot, and Tosi 2003).⁶

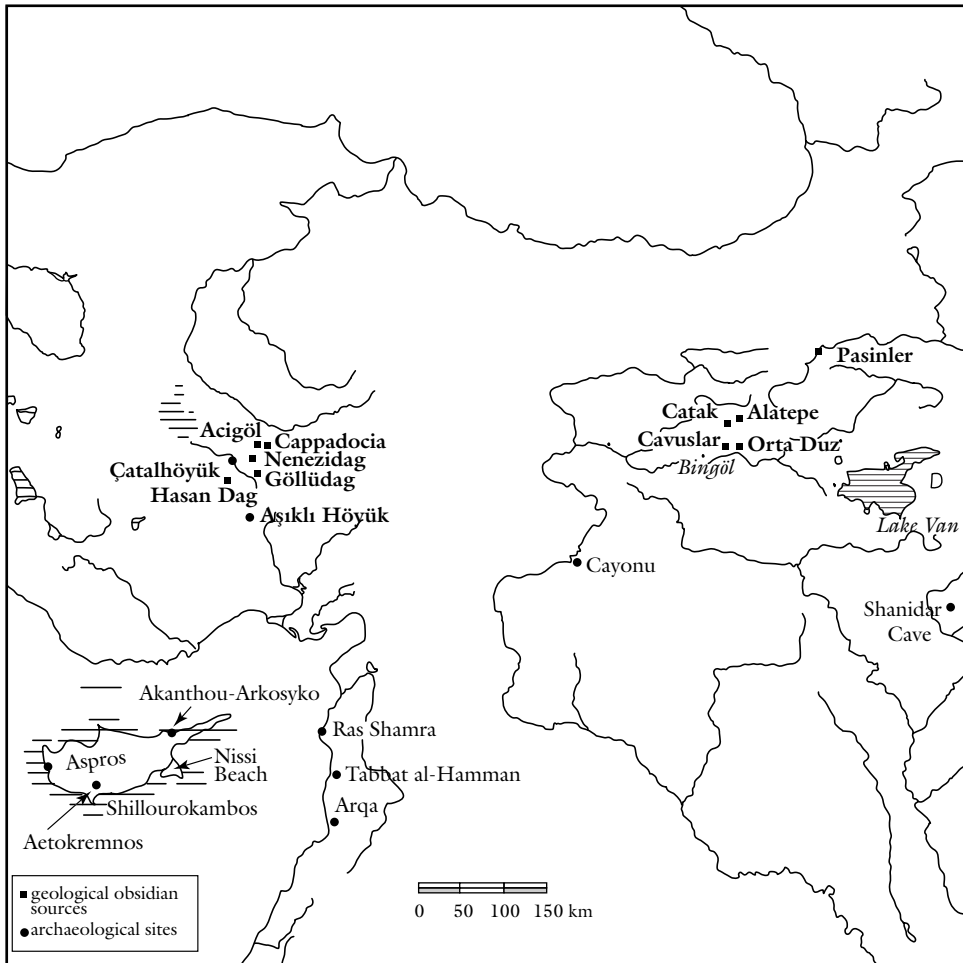
Anatolian Sources Of Obsidian

Another major source of obsidian lay inland in Anatolia, where it occurs principally in two volcanic areas: in the Lake Van region in eastern Anatolia, and in Cappadocia in south central Anatolia (Renfrew, Dixon, and Cann 1966: 35). The travels of Anatolian obsidian also provide important evidence for trade networks and cultural contacts, although these were mostly by land.

In the Upper Palaeolithic small amounts of Anatolian obsidian traveled substantial distances – from Van some 400 kilometers to Shanidar Cave in the foothills of the Zagros Mountains of Kurdistan in Iraq, and from Cappadocia some 350 kilometers to Antalya on the southwest Anatolian coast. In the Mesolithic Anatolian obsidian continued to travel, providing information about potential routes. Small amounts reached as far south as Jericho in the eighth millennium BC (a period called the Pre-Pottery Neolithic A (PPNA)).

By the seventh millennium the pace of obsidian transport had stepped up dramatically. Large amounts were found at the Turkish site of Çatal Hüyük (6300–5500 BC) (Renfrew, Dixon, and Cann 1966), where the excavators suggest its working was a specialization. The craftsmen themselves probably fetched the material from the source (approximately 200 km distant), or sent others, who then can be called traders, “in the strict sense that they were specialists in the transport and exchange of materials for gain” (Renfrew, Dixon, and Cann 1966: 52)

These travels of obsidian in the Pre-Pottery Neolithic East occurred within, and did much to create, a cultural interaction sphere that linked sites from southeastern Anatolia, the uplands of the Tigris and the Euphrates, the Levantine Corridor (the passage from the northern Negev through the Jordan (Rift) Valley to southern Anatolia (see Simmons 2007 and Map 1.2), and extending as far south as the Sinai (Braidwood and Braidwood 1940: 222–6; 1957; de Contenson 1977, 1983: 61–2; Bar-Yosef and



Map 1.3 Anatolian obsidian sources. Adapted from Gratuze 1991.

Belfer-Cohen 1989; Gopher 1989; Cauvin 1991; Garfinkel 1993; Steadman 1996: 147–8; Bar-Yosef and Meadows 1995; Bar-Yosef 1998; Peltenburg *et al.* 2001b: 55–6; Por 2004; Finlayson 2004). These interconnections were first noted by Braidwood, who suggested the terms “co-tradition” or *oikoumene* to indicate the cultural similarities: food-plants and food-animals, housing forms, types of flint and ground stone tools, obsidian bladelets, and, eventually, pottery, all made in much the same general way, and clay figurines of the “mother-goddess” type (Braidwood and Braidwood 1957: 79; see too Gopher 1989). The sphere also encompassed the earliest metallurgy – the cold working and annealing of native copper – which occurred in eastern Anatolia in the eighth millennium at the agrarian site of Çayönü Tepese (Muhly 1989a; Muhly, Stech, and Maddin 1998), and at the site of Aşıklı in central Anatolia, where the economy was based on hunting (Esin 1995). The *oikoumene* goes by various names, as the “aire culturelle” (Stordeur 2003: 370), and, perhaps most widely, the “Levantine Interaction Sphere” (Bar-Yosef and Belfer-Cohen 1989).

The sea was also used for the transport of Anatolian obsidian from very early times, although to a much lesser extent than the land routes. In the seventh millennium, after the widespread development of settled farming communities on Cyprus, obsidian reached virtually all the excavated settlements on the island, becoming a useful indicator of significant seaborne connections. During the seventh to sixth millennium, in the Early to Middle PPNB, large quantities of Cappadocian obsidian, including over a thousand worked blades, were found at Akanthou-Arkosyko on the northern coast of Cyprus, possibly exchanged for picrolite, an attractive, easily carved stone used for figurines and ornaments (Sevketoglu 2002).

The seaborne transport of obsidian is also reflected in finds along the Levantine coast (Renfrew, Dixon, and Cann 1966; Yener 2005: 195): at Mersin and at Byblos, dated to ca. 6000 BC (Renfrew, Dixon, and Cann 1966); at Ras Shamra dated to ca. 6410 BC (Schaeffer 1962: 158); and at Tabbat al-Hammam, dated to ca. 6000 BC (Hole 1959). The maritime distribution of Anatolian obsidian even reached Minoan levels at Knossos on Crete (Panagiotaki and Evans 1998; Renfrew, Dixon, and Cann 1966: 48).

Island Occupation/Visitation by Sea as Evidence of Seafaring

Evidence for Mesolithic seafaring can be traced not only in the travels of obsidian but also in the witness of human activity on previously unoccupied islands to which access must have been gained by sea. Several such cases have been argued, although with varying degrees of credibility.

The Mesolithic visitation of Cyprus

The earliest and best attested case of human visitation and use of islands in the Mesolithic involves Cyprus (Simmons 2001; Simmons 1991; 1999: 208–9; Manning 1991; Cherry 1990: 163). At about the same time that humans first visited Melos and the Aeolian Islands for obsidian (10,800–9600 BC), there is evidence of Mesolithic presence for at least short periods of time at a rock shelter at Aetokremnos, on the southern coast of Cyprus, at the time probably near but not on the sea. The group perhaps consisted of a hunter/gatherer band of some 25–50 individuals, although Simmons (1999: 322) believes it likely that far more individuals were involved in order to provide a sustainable population. There is no evidence for the presence of women or children; however, they may not have been included if the camp was occupied only seasonally by transient hunters.

Simmons (2001: 5) argued that the site was “a limited activity faunal processing locality” for Mesolithic pigmy-hippo hunters, whose activities were responsible for the extinction of the pigmy hippos on the island (Ammerman and Noller 2005; Simmons and Mandel 2007). The situation is not entirely clear, however (Bunimowitz and Barkai 1996; Vigne 1999). The site contained four major levels, separated by only brief intervals, only two of which provided evidence of human activity. Stratum 4 contained the majority of the finds of animal bones (over five hundred pigmy hippos of various ages, three dwarf elephants, and a few other birds and animals); about 30 percent of the bones had been burned, most of them severely, which has been interpreted as evidence

of human activity. Stratum 4 also contained eleven “cultural features,” most of which were “casual hearths.” The majority of the artifacts (over a thousand chipped stone artifacts, stone and shell beads, and a few ground implements) were found in Stratum 2. Stratum 1 was a mixed context, and Stratum 3 was sterile. Thus there seems to have been little if any overlap between levels with evidence for human activity and the level with animal remains.

Whatever the reason for their presence, the visitors were unlikely to have lived at the shelter, which was not large enough for a person to stand upright; however, the distance from the mainland practically guarantees that they spent some time on the island, for daily “commuting” would have been impossible. That a base site nearby is probable, but it has not been discovered.

What drew these visitors to Cyprus is a matter of speculation. Harsh conditions on the mainland – the cold and dry period called the Younger Dryas – following the period known as the Early Natufian in which benign conditions that had fostered a population explosion (Bar-Yosef and Valla 1991), may have forced a search for new resources and provided the incentive for people to seek out the island’s resources known from earlier reports of adventuring. There are no obsidian sources on the island, and Held (1989) described Aetokremnos as a “difficult colonization ‘target’” especially for a largish group using very basic craft.

The mainland origin of the visitors is not known, but it must have been in the Cyprus-facing coastal areas of southeast Turkey or the Levant. The stone tools at the site have some similarities to materials in both of these areas, but they are a selective assemblage, unique to Cyprus, and probably reflect a specialized adaptation to local conditions (Simmons 1999: 319–20), reinforcing the idea that their arrival had been preceded by previous visits or exploration. Simmons (1999: 319–20) favors a Levantine origin on the basis of the site’s location on the south coast of the island, and the lack of any contemporary sites on the island’s north coast, which offered the closest access from Anatolia. Moore’s list of more than a dozen potential sites in the Levantine coastal area in Mesolithic 1 and 2 (1978: figures 5 and 6), may provide some support for a Levantine origin: the evidence cited for the use or brief occupation of the site of Byblos, possibly in the Mesolithic, demonstrates the ephemeral nature of such evidence (p. 330).

In the Amuq Valley, which provides access to the sea across a generally mountainous and forbidding area, stray evidence for Paleolithic activity has been found on the hillsides. Such sites would have been attractive to Mesolithic hunters and may have offered temporary shelter to groups who made visits to Cyprus.⁷ For example, Upper Paleolithic remains were found at Üçagızlı Cave, about 15 km south of the mouth of the Orontes River (Minzoni-Deroche 1992), an area with many caves and rock shelters and with access to the Mediterranean through a ravine to the Adana Plain and to the north via the Karasu and Orontes rivers to the open sea (Garrard, Conolly, Moloney, and Wright 1996). Looking to the southwestern Anatolian coast, the cave at Öküzünü provides evidence of prolonged occupation by a well-established group at a site near the coast and suggests another possible home base for the adventuresome hunter-gatherers (Otte *et al.* 1995).

The site of Aetokremnos was utilized for a few hundred years at most, and the variety of evidence supporting different sites of origin for the visitors may simply reflect the fact that no one group visited the island, but that it was subject to repeated visits by groups

from various locations. In the end, Simmons argues, the visitors abandoned the site. He saw no evidence that they remained on the island, or that their descendants contributed to the later Neolithic settlements on Cyprus that are dated from ca. 8200 (Simmons 1999: 322, 323). However, new discoveries have begun to fill this apparent gap in island habitation, suggesting that, even if not permanent occupation, at least sporadic contacts were maintained with the mainland (McCartney 2005; McCartney and Todd 2005; Peltenburg *et al.* 2003: 96–7).

The remains of two Mesolithic campsites on the island, at Nissi Beach (Ayía Napa) and Aspros, that date between 10,000 and 9000 BC (Ammerman *et al.* 2006), demonstrate that the occupation/use of Aetokremnos was not an anomaly. At Nissi Beach, some 230 stone tools were found. These campsites, which reflect an extensive familiarity with the Cypriot coast, were probably occupied seasonally and only for short periods, as the rocky territory of their sites is not suitable for long-term occupation. They offer more evidence for seafaring on a regular basis in the eastern Mediterranean from an early date, at more or less the same time as the evidence from Franchthi. At least 20 more such sites are thought to lie submerged because of the sea incursion that occurred at the end of the last Ice Age; their underwater remains still await discovery.

Seaborne Mesolithic occupation in the Adriatic

Mesolithic occupation by sea has been attested in the Adriatic at Sidari, on the eastern coast of Corfu, in the late seventh to early sixth millennium. These people appear to have lived on shellfish, creating a shell midden. They made very primitive microliths using flint that they apparently brought with them (Sordinas 1969; 1970). The lithic assemblage has little in common with the stone tools of the Greek mainland, and Sordinas has proposed that after the island of Corfu became separated from the mainland in the sea regression at the end of the Palaeolithic people began island hopping along the Adriatic coast in small reed boats – similar to those still in use in the 1960s by lobster fishermen on the island – bringing contact with the cultures of the Italian mainland (1977; 2003: 96; 1970: 31–4 and Plate 1, 1), a situation also suggested for the Franchthi Cave. The settlers were succeeded by Neolithic inhabitants, but only after a break in occupation.

Possible Mesolithic occupation of Sardinia and Corsica

Possible early human occupation by sea, going back even to the Palaeolithic, has been argued in the case of the large islands of Sardinia and Corsica.⁸ This, however, is a contested issue. It is, however, generally agreed that firm evidence for human occupation on these islands comes from the beginning of the Mesolithic, ca. 8000 cal. BC (Tykot 1999: 69). This is based on the discovery of human bones in the Corbeddu Cave on Sardinia and evidence for human occupation at several rock shelters on Corsica, which was separated from Sardinia by an easily crossed strait (Tykot 1999: 69). The remains have morphologies “outside the range of modern human variation and [are] probably due to endemism in an isolated population” (Spoor and Sondaar 1986 citing Tykot 1999: 69) These Mesolithic settlers must have reached the islands by sea, but this need not have entailed a significant sea-crossing since Corsica was separated from the

Italian mainland by only a brief span of water before the glacial meltdown. Mesolithic people on Corsica and Sardinia, do not appear to have been attracted to, had access to, or have exploited the obsidian resources on Sardinia (Tykot 1999: 69). Broodbank (2006: 207) suggests that the visitors' stay was brief and temporary, possibly a refuge occupation, with no evidence for continuing contact through the exchange of artifacts between the mainland and the islands or for the subsequent development of a Neolithic economy. Vigne and Desse-Berset (1995) argue that, in that it involved built structures and a burial, the occupation of Corsica was a true colonization and that it was continuous. They also see Mallorca as providing evidence for true colonization, with artifacts that differ from those of the nearest mainland, supporting a classification as Insular Pre-Neolithic, rather than Mesolithic, culture.

A Mediterranean Interaction Sphere?

It has been noted that the maps tracing obsidian distribution show little overlap between networks operating in the western Mediterranean, the Aegean, and the Levant.⁹ Tykot (1996: 61; 1999) even suggests that these networks might have acted, through prolonged distances and difficult maritime conditions, not as systems of common interaction and information flow, but as cultural or ethnic boundaries. But obsidian does not provide the full story. Other, less easily traceable items also traveled – marble, marine shells, ochre, and greenstone (picrolite) for ornaments and (possibly) ritual objects. Some of these were carried along with obsidian, but others had their own networks of distribution. The most important evidence for the crossing of these supposed boundaries, however, consists in the Neolithic expansion of settlement across the Mediterranean, beginning with settlement on Cyprus in the ninth millennium, for which expeditions to obtain obsidian probably provided the cognitive map. If there were boundaries, they were porous.

Notes

- 1 For a useful discussion of claims – and evidence – for very early use of the sea by humans, or their predecessors, see Broodbank (2006).
- 2 Obsidian was also found in the Aegean on Nisyros and on Antiparos in the form of small round pebbles, but these sources were not widely used either, see Evans and Renfrew (Evans and Renfrew 1968 Appendix IV). There was also a source on the island of Giali that was used for stone vases in the Late Neolithic; however, it was not of good quality for other uses and had a very limited distribution (nearby Kalymnos, Kos, and Rhodes; Saliagos on Greater Paros; and Crete) (Cherry 1985: 15). See web site: <http://www.fhw.gr/chronos/01/en/intro/obsidian.html> (accessed May 19, 2011).
- 3 All dates are wide estimates, but the “present” of BP was fixed for analytical reasons at a single point, the year AD 1950, see Wikipedia, “Before Present.”
- 4 Small amounts of unworked obsidian of lesser quality were found at Antiparos; obsidian from Giali was used to make vases in the Neopalatial Period (Betancourt 1997a).
- 5 The problem of the continuous existence of the strait throughout the Pleistocene is a matter of debate. Paleontologists maintain that the evidence for mammalian fauna of the final

Pleistocene is so abundant that they could not all have reached the island as a result of hazardous crossings or by chance; on the other hand, opportunities for access must have been brief and restricted, for the horse, ibex, chamois, and wolf never made the crossing (Mussi 2001: 89–90, 200–2).

- 6 <http://www.let.rug.nl/ItalianArchaeology/abstracts15a.htm> (accessed August 24, 2008).
- 7 Any evidence from valley lowlands would probably have been buried under later natural sediments, cultural deposits, or large mounds, which would have completely obscured any earlier use of the area.
- 8 Claims: Hofmeijer and Sondaar (1992, with refs); recently, Melis and Mussi (2002) have argued for an Upper Palaeolithic occupation on the basis of a “controlled stratigraphical position” of tool types that fit well into this period; this suggestion has not as yet received independent evaluation, although Broodbank (2006: 206) sees the tools as “further confirmation” of human presence. Palaeolithic occupation is disputed by Cherry (1990: 175–8; 1992); Vigne (1990); Tykot (1992; 1999: 68–9).
- 9 Evans and Renfrew (1968: 105) cite finds of a few pieces of Anatolian obsidian (from Çiftlik) in Crete.