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THE QUESTION OF VOYAGING BY FORAGERS WHO LIVED IN THE CENTRAL MEDITERRANEAN

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Abstract

The large islands of the Central Mediterranean – Corsica, Sardinia, and Sicily – offer the archaeologist the chance to study the foragers who began to go to sea in the time before the Neolithic transition. For years, studies concerned with the origins of voyaging focused on the Neolithic period and the colonization of the respective islands by first farmers. Scant attention was paid to what hunters and gatherers in this part of the Mediterranean were doing in this regard. Now things are beginning to change. Pre-Neolithic voyaging at sea has become a question of interest. In short, it is time to take stock of where we stand today and what still needs to be done in the Central Mediterranean. As in the case of the Eastern Mediterranean where major advances have recently been made in research on early voyaging, it is premature to draw final conclusions at the present time. For the most part, what we are dealing with are investigations in progress. In this review, special attention will be paid to the case of Sicily, where the author has conducted fieldwork. During the years of the Early Neolithic period, it is well known that voyagers were crossing over from the mainland to all three of the islands mentioned above. In our part of the Mediterranean, how far back in time before the Neolithic can we trace the first successful attempts at voyaging? Here voyaging is taken to mean trips on the open sea that involved some distance and that were made on a fairly regular basis and not just rare or accidental crossings of the sea. While Middle and early Upper Palaeolithic foragers exploited marine taxa that they acquired on the shoreline by means of rudimentary technologies, they did not practice, in all likelihood, purposeful seafaring. The appearance of the first boats in our region may have occurred around the time of the Last Glacial Maximum. But this is just a working hypothesis at the present time. The faunal remains from Late-Glacial and Post-Glacial sites suggest that after the Late Glacial Maximum hunter-gatherers began to develop subsistence strategies that made it possible for them to exploit increasingly diverse marine taxa. The analysis of carbon and nitrogen isotopes, however, shows that the consumption of seafood was still rather marginal in Upper Paleolithic diets. In the Holocene, seafood appears to contribute somewhat more to the Mesolithic diet, and this may also hold for those Early Neolithic sites that are located on or near the coast. But there is still a shortage of evidence in support of the idea that there was a substantial reliance upon the exploitation of marine resources in either case. The limited exploitation of marine foods probably acted to delay the acquisition of knowledge of the sea and, along with it, of how to build seaworthy boats. In the Central Mediterranean, the first sustained steps in this direction may have taken place only around the Pleistocene/Holocene transition. Evidence for long-distance crossings, which linked the northern to southern shores of the region, makes its appearance at a comparatively late date: around the time of the climate event that occurred at ca. 8,200 years ago. But it is still not entirely clear whether the crossings were made by foragers or whether they were undertaken by those who now practiced agro-pastoralism.

Key words: Central Mediterranean, voyaging, hunter-gatherers, foragers, seafood, isotope analysis

INTRODUCTION

The lack of direct evidence for boats and other kinds of watercraft in the Mediterranean older than the Neolithic dugout canoe recovered at the lake site of La Marmotta in Italy (Fugazzola Delpino and Mineo, 1995) naturally limits our knowledge of how foragers began to cross the sea (Fig. 1). This means that the archaeologist today is in the position where inferences for voyaging

at sea have to be made on the basis of other kinds of evidence (for a review of how the argument can be made drawing upon less direct lines of evidence, see Appendix B in Ammerman, 2013a). A growing body of archaeological, chronological and genetic evidence indicates that voyaging was well developed during the Early Neolithic period and that it played an important role in the westward spread of early farming across the Mediterranean world (e.g., Zilhão, 2001; Zeder, 2008; Cunliffe, 2008; Broodbank, 2006, 2013; Perlès *et al.*, 2013; the final chapter in this issue by Ammerman). Since the 1970s, the circulation and exchange of obsidian has been studied as the hallmark of voyaging in the Neolithic period (e.g., Ammerman, 2010:83-85; see also his article in this issue). For instance, it is now known on the basis of characterization studies that blades of obsidian from sources in Anatolia reached the PPNA site of Klimonas on the island of Cyprus during the first half of the 11th millennium cal BP. At more or less the same time, we know that chipped stone artifacts made of obsidian, a volcanic glass whose source was on the island of Melos, was moving over the Aegean Sea to Maroulas, a Mesolithic site on the island of Kythnos (Sampson *et al.,* 2010; in this issue, see also the contributions by Kaczanowska and Kozłowski and by Sampson).

In the case of the Tyrrhenian basin (Italy and Sicily), there is good evidence for the circulation of obsidian artifacts from early Neolithic sites dating to the 8th millennium cal BP. It is important to remember that the obsidian story is essentially a Neolithic one in the case of the Cyprus basin and the Tyrrhenian basin as well. No piece of obsidian has yet to be recovered at any of the pre-Neolithic sites on the island of Cyprus. In the case of the Italian mainland and the adjacent island of Sicily, there are very few Mesolithic sites that have produced obsidian artifacts, and the number of pieces found at any one of them is likewise quite small (more on this below). Moreover, the radiocarbon dates that are currently available for the layers at the Mesolithic sites on Sicily, which have yielded pieces of obsidian, are no older than the 9th millennium cal BP. This means that the age of the Mesolithic obsidian recovered on the island turns out to be not all that much older than the obsidian that occurs at Early Neolithic sites on Sicily with radiocarbon dates in the 8th

Fig. 1. Location within the Mediterranean Sea of the main islands and sites mentioned in the text. The shaded area indicates the extension of the land at a sea level around -100m. At the LGM sea levels would have been ~20m lower than that (van Andel, 1989). The sites are indicated by numbers and are from west to east: 1. Cueva de Nerja, 2. Grotta Corbeddu, 3. SHM-1 (Hergla), 4. Grotta dell'Uzzo, 5. Vela Spilja-Vela Luka, 6. Franchthi cave, 7. Akrotiri- *Aetokremnos*

millennium cal BP. In other words, the study of obsidian does not take pre-Neolithic voyaging in the case of Sicily (and southern Italy in a broader sense) all that much further back in time than the time of the Neolithic transition itself. Accordingly, one will have to turn to other lines of evidence, if one wishes to show that voyaging to and from an island in the Central Mediterranean has a greater time depth than about 9,000 cal BP. One of the main aims of this article then will be to see how much further back in time we can trace the history of early voyaging there by looking at lines of evidence other than obsidian.

This review will focus primarily on Sicily, the island that I have studied for many years. In the study of early voyaging, it is important in my view to place emphasis on the larger islands (this position is also held by Vigne, 2013). For our present purposes, the smaller islands will not be taken into consideration because they have, in general, lower carrying capacities than the larger islands (Cherry, 1981; Patton, 1996). For this reason, foragers are less likely to have visited the smaller islands, and this, in turn, tends to make it even more challenging for the archaeologist to discover a pre-Neolithic site and conduct fieldwork on one of the smaller islands. In the literature on Sicily, no article has previously tried to take up at length the question of the time depth of pre-Neolithic voyaging. If we compare the age of the oldest obsidian artifacts found at the site of Maroulas on Kythnos and its C-14 (=^{14}C) dates that go back to the first half of the 11th millennium cal BP (Sampson *et al.,* 2010) with the dates of the oldest obsidian recovered from Mesolithic contexts on Sicily, the former is more than 1,500 years older than the latter. Thus, based on what is currently known about the circulation of obsidian in the two regions, there is, on the face of things, the idea that pre-Neolithic voyaging is older in the Aegean basin than it is in the Tyrrhenian basin. Hence, the second aim of this article will be to consider whether this idea – namely that voyaging, on a regular basis, is older in the Eastern Mediterranean than it is in the Central Mediterranean – is correct or not. The third aim of this contribution to the Wenner Gren Workshop (held at Reggio Calabria in October of 2012) will be to pay special attention to the context or contexts in which early voyaging took place in the Central Mediterranean. In particular, it will be of interest to consider whether there is a close relationship or correlation in the Central Mediterranean between voyaging and a diet rich in seafood or whether the relation between the two is essentially a low keyed one, which is more expedient in character, as Bar-Yosef Mayer (2013) has recognized in her review of the exploitation of fish and shellfish at both pre-Neolithic and Neolithic sites in the Eastern Mediterranean.

By way of introduction, it may be useful to step back at this point and place what I am trying to do in this review in the context of a bigger picture. Here this will be done rapidly in terms of four main points. (1) To begin with, we need to keep in mind that the idea of voyaging is now well established once we reach the time of the Early Neolithic in the respective regions of the Mediterranean basin (Broodbank, 2013). Obsidian represents a common element in the so-called Neolithic package in many parts of the Mediterranean world (with the notable exception of the Iberian Peninsula, see fig. 3 in the last article of this issue), and the wide spatial distribution of Early Neolithic sites with chipped stone tools made of volcanic glass is fairly well known in the literature (e.g., Ammerman, 2010; Tykot, 2011). Given that voyaging by early farmers is now widely accepted for the Middle Sea as a whole, it is then reasonable to think that voyaging might go back to the time before the Neolithic. In short, there may well have been a pre-Neolithic prelude when coastal foragers began crossing the sea in several regions of the Mediterranean. Looking back at the literature in retrospect, there was a comparatively low level of interest in studying this prelude for most of the 20th century. Attention focused traditionally on the Neolithic period. And there was even the notion in some quarters that hunter-gatherers and foragers were reluctant seafarers in the Mediterranean (Cherry, 1990). Today voyaging that pre-dates the Neolithic is starting to be better documented in several regions of the Mediterranean. Indeed, it was the new results that were coming from fieldwork on Cyprus and also on four islands in the Aegean Sea (Youra, Kythnos, Ikaria and Lemnos), which sparked an interest in organizing the Wenner Gren Workshop and in publishing its proceedings. The case of Cyprus is of particular interest. There,

starting in 2003, Ammerman (2010, 2013b) began to take a new and more proactive approach to the discovery of pre-Neolithic sites on the coasts of the island. By using new methods in the field, a fair number of previously unknown pre-Neolithic sites soon came to light on the coastal formations of aeolianite, which occur all around the island. In addition, the first attempt was made at Aspros in 2007 to take the plunge and explore a submerged pre-Neolithic site (Ammerman *et al.,* 2011). By the way, this was something that had not been done before in other regions of the Mediterranean. The site of Aspros now produced a set of lithics showing clear parallels with the chipped stone tools of Epipalaeolithic age found at the site of Öküzini in Southern Turkey (Ammerman, 2013b). In addition, the collapsed rock shelter known as Aetokremnos (Simmons, 1999, 2013) has produced a series of C-14 dates that fall in the 13th millennium cal BP – the time of the Younger Dryas. Thus, Cyprus today provides good evidence for voyaging in the Eastern Mediterranean that goes back to the time before the Holocene. And it also illustrates the contribution that a more proactive approach can make to the study of early voyaging.

(2) Returning to the Central Mediterranean, we face the limitation, as mentioned before, that the study of obsidian does not allow us to take pre-Neolithic voyaging back before around 9,000 cal BP in the case of Sicily. Is there another large island where this same limitation holds but where reliable evidence takes the advent of voyaging back before this time in the Central Mediterranean. In fact, there is such an island: it is called Corsica (Costa *et al.,* 2003; Costa, 2004; Vigne, 2013). Fieldwork on the island has led to the identification of at least eight Mesolithic sites on Corsica, and the excavations conducted at most of them have produced no obsidian (not even pieces from the sources at Monte Arci on the nearby island of Sardinia). At five of the sites, a fair number of C-14 dates have been run, and many of them cluster in the 10th millennium cal BP (e.g., Costa *et al.,* 2003:fig. 2.2). Accordingly, pre-Neolithic voyaging can now be taken back to around 10,000 years ago, and the basic features of local traditions of pre-Neolithic subsistence as well as lithic production have been worked out. In addition, a number of claims have been made for sites on Corsica, which go back to times well before 10,000 cal BP, but none of them so far is based on good evidence (Broodbank, 2006; Vigne, 2013). Such claims for hunter-gatherers there at much earlier dates are not supported by sound arguments: that is, ones that draw upon a combination of well-defined lithic assemblages and reliable radiocarbon dates. Several examples of such questionable claims will be given below. What the current evidence for the island tells us in terms of the big picture is that voyaging foragers were reaching Corsica more than 2,000 years before the time of the Neolithic transition in the Tyrrhenian basin.

(3) At this point, it is instructive to step back in geographical terms and compare the situation in the Mediterranean world with what is happening on a wider stage among groups of seafarers who lived on the basis of hunting and gathering elsewhere in the world. In the ethnographic record, there are a number of societies that led such a way of life in recent times (Murdock, 1967). In most cases, they had diets heavily dependent on the consumption of fish or else sea mammals. And, in the archaeological record, most groups of pioneer foragers who intentionally colonized an island appear to have had a maritime adaptation in the sense of subsistence strategies that focused primarily on seafood (e.g., Rick *et al.,* 2005; Habu, 2010; Erlandson *et al.*, 2011; O'Connell *et al*., 2010). In short, there would appear to be a close connection between going to sea and living on a diet that comes from the sea. However, such cultural parallels from around the world may not have all that much relevance when it comes to the origins pre-Neolithic voyaging and the subsistence strategies of hunters-gatherers in the Mediterranean world. There, on the contrary, human diets appear to be much more broadly based over the span of years between 15,000 and 9,000 cal BP, as we have seen above in the case of the consumption of fish and shellfish at pre-Neolithic sites in the Eastern Mediterranean (Bar-Yosef Mayer, 2013; where one finds little evidence for a primary focus on seafood). As Erlandson (2010) has recently noted, it may not be such a good idea in the Mediterranean to make the assumption that there was a close connection between the nature of human subsistence and the development of maritime technology. In

other words, the archaeologist may be barking up the wrong tree. Here a quotation that gives two questions raised by Erlandson (2010:22) may be in order: "Given the antiquity of coastal foraging by Neanderthals and Upper Palaeolithic peoples around the Mediterranean, why is there so little evidence for Pleistocene seafaring? Did the lower productivity of Mediterranean waters and the dearth of terrestrial resources on islands limit the potential payoffs for the development of seaworthy boats and exploratory island voyages until the beginning of the Neolithic?" The approach that I have taken in writing this article is not to assume that just because Mediterranean foragers were living by the sea they were necessarily obtaining a significant proportion of their diet from seafood. In fact, recent studies of the isotope chemistry of pre-Neolithic foragers who lived fairly close to the coast in Sicily would seem to indicate just the opposite (Mannino *et al.*, 2012). And if we turn to an isotopic study recently done in the context of the early Neolithic, what we find in Southern Italy is a rather limited consumption of fish and shellfish in diets at that time as well (Lelli *et al.,* 2012:389; the authors conclude by saying that the diets of first farmers at eight sites show considerable variability "that includes the consumption of a small amount of marine foods"). In other words, even during the early Neolithic period, when voyaging is well documented by the wide circulation of obsidian, there appears to be scant evidence for a close relationship between diet and voyaging in our part of the Mediterranean.

(4) This brings us to what I propose to call the Sicilian Paradox. The basic concept is that there is an antinomy when we compare, on the one hand, the short distance between the mainland and the island and, on the other hand, the archaeological record of Sicily, which does not provide much evidence for crossings of the Strait of Messina at times other than the end of the Palaeolithic. Today the Strait of Messina is only 3.2 km wide at its narrowest point, and the distance would have been even less during the Pleistocene when sea level was lower. This short distance encourages the archaeologist to think that crossings from the mainland to Sicily may well have been possible in early times well before the Mesolithic period. In contrast, the island's archaeological record, as we shall see below, is quite limited in this regard. Why, we might ask, was Sicily – an island that was apparently so close and easy to reach – only occupied by modern humans on a permanent basis from the time of the late Upper Palaeolithic? Or to put the question another way: "Why so near and yet so far?" While the distance from the mainland to the opposite side of the Strait of Messina is short on the map, it was not so easy to achieve a crossing there even in the time of Homer and the Greeks in the west (Antonioli *et al*., in press). And the further back in time that one looks, the difficulty must have been, in all likelihood, even more pronounced. In fact, making a pre-Neolithic crossing of the Strait of Messina posed marked risks and challenges for those using a small boat. The challenges would have included the strong currents of the Strait, its treacherous whirlpools (the excursion on the last day of the Wenner Gren Workshop took the participants through the roiling waters of several whirlpools on a sailboat; Ammerman, 2013a:11) and high winds on fair number of days each year. In short, distance is only part of the story. The Sicilian Paradox – the disparity between our high expectations and what we actually see in the archaeological record – is put forward here merely as a proposal worthy of further consideration – a catch phrase that may help us to look at pre-Neolithic voyaging in the Central Mediterranean with fresh eyes.

THE EARLY UPPER PALAEOLITHIC

Until quite recently, late Neanderthals living in the southern extremities of the Italian and Balkan Peninsulas were credited with the earliest Upper Paleolithic -- the techno-complex known as the Uluzzian -- and with the independent evolutionary step towards behavioral modernity, which archaeologically it is taken to imply (e.g. Riel-Salvatore, 2010). The humans who made the Uluzzian lithics possessed a more diverse tool kit than their predecessors as well as bone and shell artifacts – all of which are associated with modern human behavior. A recent study by Benazzi and co-workers (2011) suggests that the last Neanderthals who populated the Italian Peninsula were not responsible for the Uluzzian and coexisted briefly with the anatomically modern humans (hereafter

AMH), who introduced the new culture to the Mediterranean around 45,000 to 43,000 cal BP. It has been hypothesized (Moroni *et al.,* 2013) that these groups of AMH reached Italy by following a coastal route from the east (with the tentative suggestion that they may have reached Apulia in the heel of Italy by crossing the Strait of Otranto). The newcomers then spread over most of the Italian Peninsula. However, as in the case of their predecessors, the Neandertals, they too did not make the short crossing at the Strait of Messina to Sicily. The Uluzzian industries do occur at sites in southern Italy, Tuscany and the Veneto region but not on the Mediterranean islands.

While little is known about the maritime adaptations of the Uluzzian hunter-gatherers, their subsistence strategy does not appear to differ markedly from that of their Mediterranean predecessors or successors. Indeed, Morin (2012:271) takes the position that "the faunal record of Western Europe suggests that Neanderthals and early modern humans shared a similar range of foraging behaviors." At Grotta di Castelcivita in the hinterland of southwestern Italy, birds and fish were exploited both by Neanderthals and by AMH who belonged to the Uluzzian and Aurignacian cultures (Cassoli and Tagliacozzo, 1997). Even though there is more evidence for the exploitation of fish by the Uluzzian occupants of the cave, there is no clear evidence that this was the result of a more advanced fishing technology. Indeed, all of the exploited species (*Leuciscus cephalus*, *Salmo trutta* and *Anguilla anguilla*) live in fast flowing streams where they can be captured without specialized fishing technology (Morales Muñiz, 2010). Overall, there is no support for the idea of a developed maritime or aquatic adaptation, and it seems unwarranted to argue that the Uluzzian groups had any form of seafaring technology.

The number of Uluzzian sites is roughly five times lower than that of the Aurignacian. According to Mussi (2001), this disparity reflects a true difference between the population size of the former and that of the latter, whose groups, which came after the Uluzzian, are thought to be more mobile and spread more widely across Italy. However, the early Upper Palaeolithic sites occupied by makers of both the Uluzzian and the Aurignacian techno-complexes are, on the whole, few and far between – suggesting that the Italian Peninsula was probably under-populated (Mussi, 2001). Aurignacian subsistence in the Mediterranean basin is known only from a handful of studies, which show that it was oriented mainly toward the exploitation of terrestrial resources and, in particular, the hunting of mammalian herbivores. Aurignacian foragers exploited birds from a variety of environments, fish from fresh-water habitats and marine mollusks, making them similar in many respects to the last Neanderthals and the Uluzzians (e.g., Stiner, 1994; Cassoli and Tagliacozzo, 1997). This suggests that the early Upper Palaeolithic intensification hypothesis might not hold for the Mediterranean and that the humans living in the region, at least until the time of the Aurignacian, were exploiting marine resources in ways that did not require the use of small boats.

The scattered and few modern human populations in Italy around 40,000 cal BP may have been decimated by the catastrophic volcanic eruption of the Phlegrean Fields. Mussi (2001:210) has hypothesized that, following this event, some human groups may have migrated to Sicily in search of safer territories, explaining in this way the occurrence of the purported Aurignacian site of Riparo di Fontana Nuova on the island (Chilardi *et al.*, 1996). Taking this cultural attribution as a sound one, Broodbank (2006:206) has stated that "the first definite sign of sea-crossing in the Mediterranean is a nominal one over the narrow Strait of Messina, indicated by an undisputed early Upper Palaeolithic Aurignacian site at Fontana Nuova in southeast Sicily." However, the evidence from this site is questionable in light of the fact that the chipped stone materials recovered by Bernabò Brea were obtained by re-excavating the spoil of a previous unsystematic excavation. The chronological attribution of Fontana Nuova was first proposed by Laplace (1964, 1966) and later accepted by Chilardi and co-authors (1996) on the basis of lithic typology. There are other scholars who disagree (Martini *et al.*, 2007). Instead, they attribute the site to the Late Epigravettian, the last Upper Palaeolithic culture present in Italy and Greece after the Last Glacial Maximum (hereafter LGM). In short, Chilardi and co-authors (1996:558) attempted to put forward an Aurignacian age for the site:

(a) because of the absence at the site of *Equus hydruntinus* (an equid that could have made it to Sicily only by means of a land bridge at the time of the LGM) and (b) because of what they take to be an ecological correlation between the environmental conditions at Fontana Nuova (reconstructed on the basis of the mammalian fauna recovered at the site) and a humid phase detected in a Tunisian pollen core, which dates to around 30,000 cal BP. Such an argument is less than convincing. Until absolute dates are available, Fontana Nuova should not be taken to be the oldest undisputed site of Upper Palaeolithic age on Sicily.

WHO FIRST WENT OVER TO SICILY AND WHEN DID THIS TAKE PLACE?

Gravettian hunter-gatherers did not cross the Strait of Messina either. The single claim for their presence on Sicily is based on the typology of purported Gravettian lithic assemblages at Riparo del Castello (Zampetti, 1987), and it should be discarded following a new dating of the site, which shows that it was occupied in the Late Epigravettian (Nicoletti and Tusa, 2012). In fact, radiocarbon dating projects on materials from more recently excavated deposits (Martini *et al.*, 2007) as well as from old collections (Mannino and Thomas, 2007) demonstrate that Sicily was undoubtedly occupied from the Epigravettian or more likely from the Late Epigravettian. Ancient mitochondrial DNA (mtDNA) analyses on the remains of an early Holocene human from the island of Favignana, which would have been still connected with the Sicilian mainland at the time, suggest that this individual may have descended from Gravettian hunter-gatherers on the Italian mainland (Mannino *et al.*, 2012). Moreover, an anthropological study of the individuals from Grotta di San Teodoro has concluded that there are strong affinities between Sicilian and mainland humans of Late Epigravettian age (D'Amore *et al.*, 2009).

A late colonization on Sicily, which coincides with the low stand of sea level at the LGM, has recently become more likely on paleogeographical grounds as well. In fact, a major study undertaken by Antonioli and co-workers (2012; in press) has now settled the longstanding debate over the existence of a land bridge connecting Sicily with the mainland. This multidisciplinary project has taken into account glacio-hydro-isostatic and tectonic movements and also calculated the erosion of the sill bedrock using a model that estimates the paleo-tides and currents of the Strait of Messina. The research team has established that the continental land bridge emerged for at least 1,500 years (21,500-20,000 cal BP) and possibly even longer. The maximum estimated period of emersion of the land bridge is ca. 25,000 to 17,000 cal BP. The bone collagen of a European ass (*E. hydruntinus*) from Grotta di San Teodoro has been dated to 23,000-21,000 cal BP (Antonioli *et al.*, in press), providing additional evidence in support of the existence of a land bridge around that time – given that this equid could not have made it across to Sicily without a continuous land bridge. There is no evidence to suggest that *E. hydruntinus* was hunted and introduced into the deposit at Grotta di San Teodoro by humans, who do not seem to have occupied the cave or (taking the evidence on Sicily at face value) to have been on the island at the time (Mannino *et al.*, 2011).

The earliest undisputed evidence for *Homo sapiens* in Sicily dates to ca. 17,500 cal BP – the oldest calibrated age for the radiocarbon date of 13,760 ± 330 BP (F-26) on a charcoal sample from Grotta dell'Acqua Fitusa in central Sicily (Mannino and Thomas, 2007). This is a *terminus ante quem* for the arrival of Upper Palaeolithic humans, who presumably walked across the land bridge to Sicily along with a complex of mammals at the time (D'Amore *et al.*, 2009; Mannino *et al.*, 2012). It is perhaps worth adding here that, if the land bridge was present only between ca. 21,500 and 20,000 cal BP, then some 2,500 years of archaeology are still unaccounted for on the basis of archaeological contexts that have been securely dated so far. This gap is filled if one accepts the typological attribution of Grotta Niscemi and Grotta di Canicattini Bagni to the Early Epigravettian (Laplace, 1964, 1966). Recent dating projects (Mannino and Thomas, 2007) in combination with the re-evaluation of the lithic typologies (Lo Vetro and Martini, 2012) cast doubt on the occurrence of an Early Epigravettian *facies* in Sicily, however. On the other hand, if the land bridge is taken to have lasted for about eight

millennia, human beings may have walked across it only towards the end of its emergence. And, under this scenario, the absence of Gravettian sites on Sicily would be even more puzzling. The most parsimonious scenario is that the land bridge emerged for a comparatively short span of time and that only a modest number of human beings actually used it (in keeping with the idea that LGM populations in southern Italy were very low and sparse; Mussi, 2001). Paradoxically, if one takes the gap of 2,500 year between the LGM and the earliest appearance of the Epigravettian on Sicily at face value, then it is possible to think that the people who first crossed over from the mainland did so not on foot but came by boat instead. There is clearly a need for more radiocarbon dates as well as for more fieldwork in order to sort out the various alternatives here.

SEA CROSSINGS TO OTHER ISLANDS

Unlike Sicily, the islands of Corsica and Sardinia were never connected to continental landmasses, even at the lowest sea-level stands registered for Pleistocene glacial maxima (van Andel, 1989). What we are dealing with are "true" islands as Vigne (2013) has called them. It was at such times of low sea level that hominins and fauna from the Italian Peninsula would have had the best chance to cross the short stretch of sea separating the Tuscan archipelago from Corsica, which may have been as narrow as 15 km. At lower sea-level stands, this island was joined with Sardinia, forming what was then the largest isolated landmass in the Mediterranean (*Corsardinia*). Interestingly, Sardinia is considered by some scholars to have much the same archaeological record as Sicily, even though the latter has a different degree of proximity to the Italian mainland than the former. The claim has been made that the island was inhabited by *hominins* during the Lower Palaeolithic; it was not occupied during the Middle Palaeolithic, and it was then ostensibly re-colonized during the Upper Palaeolithic around the time of the LGM (Martini, 1999). Likewise, a claim for Middle Palaeolithic presence on Corsica has been made on the basis of purported evidence from Grotte de la Coscia (Bonifay *et al.*, 1998).

However, when such claims are scrutinized more closely, it becomes quite clear that they suffer from the same shortcomings as the claims that have been put forward for the pre-LGM presence of humans on Sicily, Cyprus, the Ionian Islands and so forth (Broodbank, 2006). They are commonly based on undated or poorly dated scatters of chipped stone on the land surface, and the lithics themselves are commonly limited in number and un-diagnostic in terms of typology. In Sardinia, the presence of humans in the Middle Pleistocene has also been argued on the basis of the alleged human role in the extinction of the 'Nesogoral' fauna, which included a monkey, a wild pig and an antelope (Sondaar *et al.*, 1986). The same authors have also interpreted the limited dwarfing among the endemic fauna on Sardinia (e.g., *Megaceros cazioti*) as a sign of human presence in the Pleistocene. Other scholars disagree; they draw attention to the size increase observed in the case of a small mammal such as *Prolagus sardus*, which points in just the opposite direction – a lack of human predation pressure (Vigne, 1999). The occupation of Sardinia by AMH has also been claimed on the basis of human anatomy: in particular, the occurrence of an aberrant alveolar process in the maxilla recovered from pre-Neolithic deposits at the Grotta Corbeddu (Spoor and Sondaar, 1986). They tried to argue that this unusual morphology was not connected with pathology but was instead a feature that was endemic to a human population that evolved in isolation on Sardinia. Spoor (1999) subsequently retracted this claim, admitting that it was based on weak evidence for biological isolation. And there are, of course, other claims that draw upon equally weak evidence. For example, among the human bones found at Grotta Corbeddu, there is a fragmentary phalanx from a Late Pleistocene deposit, which may date to ca. 20,000 cal BP (Sondaar *et al.*, 1995). A similar date – or perhaps one that is slightly earlier – has been put forward by Mussi and Melis (2002) for the archaeological deposit at Santa Maria is Acquas, which they attribute to the LGM. Still another less than convincing case for Late Pleistocene presence on Corsica has been made on the basis of a massive accumulation of bones at the cave called A Teppa di U Lupinu (Salotti *et al.*, 2008). Numerous burnt bones of small

mammals are attributed to the time just after the LGM, even though other studies suggest that the site's stratigraphy has been compromised by post-depositional disturbance. In short, the evidence for early human presence on 'Corsardinia' is rather limited, uneven and contradictory. While Broodbank (2013) more recently takes the view that some of the purported evidence may indicate the use of this landmass as a refuge by foragers from the mainland, who occasionally reached it during the harshest phases of the LGM, there are other scholars such as Vigne (2013) who have doubts about all such claims. Thus, questions that concern if and when hunters and gatherers began to cross over to Corsica and Sardinia during the Pleistocene remain unresolved ones. In contrast, once we reach the start of the Holocene, there is, as mentioned before, good evidence for the presence of hunter-gatherers on Corsica (Costa *et al.*, 2003; Costa, 2004). What is, of course, still missing from the picture on the islands of Corsica and Sardinia is an early site that has not only a good series of C-14 dates that go back to the time before 11,000 cal BP but also a good assemblage of chipped stone tools, which stand up in terms of comparisons with what is observed at Palaeolithic sites on the mainland.

In contrast with the ambiguous and uncertain character of the evidence for human presence on Corsica and Sardinia in the time before the Holocene, a growing body of radiocarbon dates from Mesolithic sites now documents that they were clearly occupied from the Boreal onwards (e.g., Vigne and Desse-Berset, 1995; Costa *et al.*, 2003; Costa, 2004; Floris *et al.*, 2012). Further support for such a date when it comes to the time of arrival of people on the two islands is offered by a study of the spatial distribution of the U5b3 haplo-group in modern populations in Europe (Pala *et al.*, 2009). Its results show that the earliest people to have contributed a significant proportion of genetic material to the present-day Sardinian mtDNA reached the island sometime between 9,000 and 7,000 years ago. Their ancestors had taken refuge in the Italian Peninsula during the LGM and then moved in the Post-Glacial to Sardinia after spending some time in the south of France. Archaeological research should strive to work out independently the chronology of this sequence of events in the history of human population biology.

There is little evidence for pre-Neolithic sites on any of the other islands in the Central Mediterranean. This would include the three islands of some size in the vicinity of Sicily: Malta, Pantelleria and Lipari (Dawson, 2014). Malta, as in the case of other smaller islands in the Central Mediterranean that already happened to be isolated from the mainland prior to the Post-Glacial sea level rise, was only occupied during the Neolithic period (Bonanno, 2011). Pantelleria and Lipari, which are volcanic islands with sources of workable obsidian, may have been visited from time to time during the Mesolithic period. In the case of Pantelleria, ephemeral human presence has been hypothesized on the basis of the typology of the undated surface scatters of lithics recovered at Punta Fram (Nicoletti, 2012). Again, few of the lithics appear to be diagnostic. Moreover, it has recently been hypothesized that Pantelleria was reached by 7700 years ago (or even before) on the basis of lithic industries found at Cala Tramontana between 18 and 21 metres of depth (Abelli *et al.*, in press). The lithics in question are typologically not diagnostic, but the depth of their find spot could imply a date from 7700 to 9600 years ago, provided the calculations of relative sea level change (which exclude possible vertical movements) are correct. Only radiocarbon dates on organic remains from this submerged site, and potentially associated to the lithics, will allow us to substantiate this claim. The possibility of pre-Neolithic visits to Lipari has been put forward on the basis of a single find of obsidian (characterized as coming from Lipari) recovered from a Mesolithic layer at Perriere Sottano on Sicily (Aranguren and Revedin, 1996). On the other hand, it is entirely possible that the small piece of obsidian may have moved down from above in the stratigraphic sequence due to the operation of taphonomic processes at the site. And there is also the case of the piece of obsidian that comes ostensibly from one of the Late Epigravettian levels at Arma dello Stefanin in Liguria (Leale Anfossi, 1972). However, it too is considered by many scholars to be an anomaly that is not in stratigraphic context. No other piece of obsidian has ever been found at an Upper Palaeolithiic site or a Mesolithic site in the region of Liguria in Northern Italy. And the site is located at a considerable distance from the nearest

source of workable obsidian: that is, Monte Arci on the island of Sardinia. More recently, the excavations at Grotta d'Oriente on the small island of Favignana located just off the west coast of Sicily have produced two pieces of obsidian that appear to be quite promising (Lo Vetro and Martini, 2012; Martini *et al.*, 2012). They both come from the same context (layer 6), which is carbon dated to the years between ca. 9.000 and 8,500 cal BP. In other words, assuming that the two small pieces of obsidian occur *in situ*, as the excavators claim they should date to the late Mesolithic. Another question of major interest concerns how the two pieces managed to move from sources of obsidian near Sicily (either Lipari or else Pantelleria) through an exchange network to their resting places at Grotta d'Oriente. The excavation of layer 6 at the site also brought to light chipped stone tools attributed to the Castelnovian tradition (the late Mesolithic industry in Italy). In addition, layer 5, the stratigraphic unit just above layer 6, produced six bone fragments that belong to domestic fauna (Lo Vetro and Martini, 2012). These faunal remains are thought to have come from animals recently introduced from outside of Sicily – either just before or else at more or less the same time as the start of the Neolithic at Grotta dell'Uzzo (Mannino *et al.*, 2007). All of this would seem to fit in quite well with the recent hypothesis that pre-Neolithic visits were made to the island of Pantelleria (Nicoletti, 2012). However, one of the main points to make here, when it comes to the question of pre-Neolithic voyaging in the Central Mediterranean, is another one: the thin nature of the evidence. Even if we are prepared to assume that all of the pieces of obsidian recovered from Mesolithic contexts on Sicily (including the nearby island of Favignana) do occur *in situ*, there are just three of them so far.

POSSIBLE CONNECTIONS BETWEEN THE NORTH AND SOUTH SHORES OF THE CENTRAL MEDITERRANEAN IN THE TIME JUST BEFORE THE NEOLITHIC

The purpose of this section is to turn to a recent development of some interest in the study of pre-Neolithic voyaging in the Central Mediterranean. It concerns the possibility of movement between the north shore and the south shores in the time immediately before the Neolithic period. Previously, the focus of this article has been on finding out how far back in time we can trace pre-Neolithic voyaging in our part of the Mediterranean. Now the plan is to take a different track and consider, for the sake of completeness, what may have started happening in the last chapter of pre-Neolithic voyaging in the Central Mediterranean. In brief, is there good evidence for movements over the sea in a north-south direction – "across the pond" – in the time just before the Neolithic transition? For the most part, we are dealing with new ideas and work in progress. It is too soon to come up with final answers. In his contribution to the proceedings, Zilhao also writes about what is coming to light on the southern shore of the Mediterranean, taking a more critical view of the evidence that is currently available on the grounds of taphonomy. My aim here is simply to offer a brief overview on what is proposed in the recent literature. One of the complications to bear in mind is that the evidence used in making some of the arguments may actually date to the Neolithic period. In other words, it is beyond the scope and purpose of this article: the question of pre-Neolithic voyaging. As mentioned above, it is important not to conflate the nature of voyaging in the Neolithic period with the character of voyaging in the time before the Neolithic. In a given region of the Mediterranean, they might represent quite different cultural traditions. Each of them should be studied in proper context and its own terms.

Up until the last decade or so, comparatively little was known about the early Holocene prehistory of coastal areas in the southern Mediterranean. This was due, in part, to sea-level rise, which contributed to the submergence of pre-Neolithic sites situated on or near the coast, and also to a lack of interest in conducting fieldwork at sites that date to the time before the Neolithic. The fact that North Africa has remained essentially *terra incognita* has implications not only for the study of the origins of voyaging in the central and western parts of the Mediterranean but also for our understanding of the processes that were involved in the spread of early farming across the Mediterranean (e.g., Zeder, 2008). In the last

few years, knowledge of the situation there has begun to change as a consequence of fieldwork conducted in Tunisia (Mulazzani, 2013) and genetic studies with implications for the Maghreb in a wider sense (e.g., Cherni *et al.*, 2009; Ottoni *et al.*, 2010; Pereira *et al.*, 2010). In short, new and intriguing evidence is starting to emerge. For example, at Hergla in Tunisia, the hunter-gatherers who camped at the site known as SHM-1 on the Halk el Menjel lagoon during the early Holocene subsisted mainly on hunting herbivores such as hartebeest (*Alcelaphus buselaphus*) and gazelles (*Gazella* spp.) and on gathering terrestrial foods (Aouadi *et al.*, 2013; Mannino and Richards, 2013). At the same time, marine molluscs and fish from the lagoon were a supplementary source of food in a broad diet (Mannino and Mazzanti, 2013; Vorenger, 2013). These foragers produced the so-called Upper Capsian techno-complex, an industry of Mesolithic age that included bladelets made by means of a pressure-based technique (Belhouchet *et al.*, 2014). In the Maghreb, the production of such bladelets may date to the end of the first half of the 9th millennium cal BP (that is, ca. 8,000 cal BP or the time of the first arrival of the Neolithic in Italy) at Late Capsian and what are sometimes called 'Neolithicisized' Capsian sites. However, such bladelets are not present in Typical Capsian assemblages. Two hypotheses have been put forward to explain the emergence of the new lithic tradition in Tunisia (Belhouchet *et al.*, 2014:13): (1) the pressure-based production of bladelets was invented locally by Upper Capsian foragers themselves (possibly as an adaptation to the climate event that occurred around 8,200 cal BP, which caused a marked increase in aridity) and (2) adoption by technological transfer with hunter-gatherers who lived on the northern Mediterranean shores.

The roughly coeval occurrence of similar lithic reduction traditions, including the pressure technique, at the sites of Franchthi Cave in Greece, Grotta dell'Uzzo in Sicily and Latronico in Italy (Binder *et al.*, 2012), as well as a westward trend in the appearance of this technique around the Mediterranean, have led Belhouchet and co-workers (2014) to favor the second hypothesis. However, the absence of obsidian from Melos at the site known as SHM-1 constitutes a problem for their interpretation (this raw material is common in 9th millennium cal BP contexts at the Franchthi Cave; recall that the start of the Neolithic there is now carbon dated to ca. 8,700 cal BP; Perlès *et al.*, 2013). While Belhouchet and co-authors (2014) suggest that the spread of this technology may have taken place along the North African coast, they acknowledge that the second hypothesis would benefit from better evidence for an east-to-west trend in the transmission of the bladelet technology. As mentioned above, Binder and co-workers (2012) had previously begun to pick up on a spatial trend in lithic traditions in the Mediterranean during the 9th millennium cal BP – one running from the east (the Levant in a fully Neolithic context) to the west (the Iberian Peninsula in a Mesolithic context). They suggest that the presence of a shared technology over such a large area implies, at some level, the existence of contacts between the central and western parts of the Mediterranean (Italy, France and Spain) and the Eastern Mediterranean (the Levant or else the Maghreb). They down play the first of these two possible connections with the east by saying: " the probability for any connection between the Western Mediterranean blade and trapeze complex and the Eastern Neolithic package is weak and should require a new look at … the Greek lithic assemblages" (Binder *et al.*, 2012:213). They go on to suggest that a link between 'Castelnovian-like' industries and the Upper Capsian techno-complexes is the more likely explanation for the presence of pressure-knapping techniques in Italy, France and Spain.

If this is the case, then it raises the possibility of contacts between opposite shores of the central-western Mediterranean and the idea of north-south sea-crossings, which may have begun at the latest in the mid 9th millennium cal BP. On African soil, the earliest evidence for such contacts is now linked with the pieces of obsidian from Pantelleria found at SHM-1; they came to light in a deposit that could date as early as ca. 8,200 cal BP (Mulazzani *et al.*, 2010). Inconsistencies in some of the dates at the site (Saliège *et al.*, 2013) and also questions about the site's taphonomy (that is, the possibility that the obsidian pieces are not *in situ*; see Zilhão in this issue) mean that the claim for obsidian in Tunisia at this early date may be problematic. Accordingly, more work needs to be done in order to sort out this question.

On the other hand, the recovery of two pieces of obsidian from a late Mesolithic context on Favignana (mentioned above; assuming again that they occur in stratigraphic context) suggests that, not long before that time, foragers may have been making voyages of some distance out to islands such as Lipari and Pantelleria with known sources of obsidian (Martini *et al.*, 2012). Obsidian from Pantelleria has also been recovered from Neolithic layers at the Grotta dell'Uzzo (Francaviglia and Piperno, 1987): in layers that formed slightly later than the local appearance of the pressure-knapping industries in a so-called "Castelnovian-like" tradition (Collina, 2012). The possibility that this technology reached northwestern Sicily around the same time as obsidian made its appearance at SHM-1 is consonant with the idea that technological transfers between Upper Capsian groups (with the pressure technology) and hunter-gatherers to the north (or alternatively first farmers there) may have taken place in the Central Mediterranean (Binder *et al.*, 2012). In addition, the evidence from fieldwork on Favignana (Lo Vetro and Martini, 2012; Martini *et al.*, 2012) and Pantelleria (Nicoletti, 2012) may even provide support for the notion of contact between Sicily and Tunisia at some time during the course of the 9th millennium cal BP. On the archaeological side, there are, of course, many loose ends that still need to be worked out.

Some clues indicating the direction of such possible trans-Mediterranean connections are beginning to emerge from studies of the genetics of humans and other animals. On the North African shore, the haplogroup known as U6 expanded to a lesser extent (~3-fold) and also earlier (ca. 22,000 cal BP) than its sister clade (U5) on the opposite (northern) side of the Mediterranean (Pereira *et al.*, 2010). This expansion coincides with the beginning of the Iberomaurisian culture in the Maghreb, and it can be associated with a proposed demic diffusion of modern humans out of Southwestern Asia. In this respect, what is observed in the archaeological record for the Upper Palaeolithic (Kozłowski, 2005) is compatible with what the genetic evidence has to say. In contrast, other clades of this haplogroup (U) do not support the idea of contact between populations of hunter-gatherers on the opposite (north-south) sides of the Mediterranean. In short, the other clades of U provide no support for trans-Mediterranean voyaging around the time of the LGM. The genetic evidence for other haplogroups (H1, H3, V) suggests that human groups spread in the opposite direction: that is, into North Africa from the Iberian Peninsula during the Late Glacial or else the Post Glacial, including the early Holocene (Cherni *et al.*, 2009; Ottoni *et al.*, 2010). In turn, this would imply, at the very least, the crossing of the Strait of Gibraltar at that time (whichever it is), if not more ambitious and perilous maritime voyages. On the whole, the archaeological and genetic data that have come in so far suggest that hunter-gatherers in the Northern Mediterranean were somewhat more active in going to sea than their counterparts in North Africa. In the long run, it will take more refined chronologies on both sides of the pond to develop a better knowledge of the timing of such pulses of maritime activity in the Central and Western Mediterranean.

SUMMARY

The purpose of this article is to take stock of what is currently known about going to sea by those who lived on the basis of hunting and gathering or foraging in the Central Mediterranean. This takes us back to the time before the Neolithic period. Once agro-pastoralism makes its appearance on the scene as a new way of life, voyaging is something that has been documented in the literature since the 1980s by study of the circulation and exchange of obsidian. In contrast, the question of pre-Neolithic voyaging has only become a topic of major research interest in recent years. In this review, attention has focused on what we can learn from the study of islands in the Central Mediterranean and, in particular, on Sicily, the large island that stands at a short distance – less than 4 km at the closes point on the Strait of Messina – from the west coast of Calabria on the Italian Peninsula. This short distance has led to high expectations with regard to what we should find on the island of Sicily: namely that, since it has long been standing there in full view, crossings from the mainland to the far side of the Strait of Messina could have been made to Sicily not only in the time just before the Neolithic period (that is, the

Mesolithic period and the final years of the Upper Palaeolithic) but at various times that go much further back in the Palaeolithic. But were such early crossings actually made? As we have seen above, the archaeological evidence that has come to light on Sicily so far does not seem to support this view. If anything, it may provide support for just the opposite view. Moreover, a good case can now be made for a land bridge that connected the mainland with the island at the Late Glacial Maximum. Indeed, it would have offered at the time (ca. 21,500 to 20,000 cal BP) a much easier way to reach Sicily than by crossing the Strait of Messina in a small boat. All of this, in turn, gives rise to what I have called the Sicilian Paradox – and along with it the need to rethink some of the ideas put forward in the recent literature on early voyaging in the Mediterranean. In other words, pre-Neolithic voyaging (on a regular basis and not just rare or accidental crossings of the open sea) may not have had the considerable time depth that some authors are optimistically pushing for (e.g., Broodbank, 2013; Knapp, 2013).

The plan is to keep the final section of this article quite short. The aim here is simply to summarize what we have learned to date and to say a few brief words about the research that needs to be done. At the present time, we are still at an early stage in the investigation of pre-Neolithic voyaging in the Central Mediterranean. Today we are not in a good position to draw final conclusions on the basis of the evidence that is currently available. Much work remains to be done in the Central Mediterranean on a range of fronts. For example, following the lead of recent fieldwork on Cyprus, it would be useful to carry out a new cycle of surveys on the coasts of Sicily in which a more pro-active approach is taken to the discovery of sites that date to the time before the Neolithic. There is a good chance that survey work of this kind will lead to a new and different picture when it comes to coastal foragers. In addition, we need to learn more about the submerged prehistory of early sites on the island. And this would hold not only for Sicily but for the other islands in the Central Mediterranean as well. Given the trends in sea-level rise during the late Pleistocene and early Holocene, many of the sites frequented by coastal foragers find themselves in a submerged position at the present time. In addition, it will be important to run more and better radiocarbon dates and to conduct further studies of diet based on the isotope analysis of samples of human bone. In light of where we stand at this time, what one is setting out to do in a review of this kind has less to do with drawing firm conclusions and more to do with formulating the basic questions that we need to explore.

There are only a small number of islands in the Central Mediterranean that have produced reliable evidence for a site going back to the time before the Neolithic. On the island of Malta, for instance, there is still no site of Mesolithic or Palaeolithic age. In the case of Pantelleria, scatters of lithics have been collected from the surface at Punta Fram, which is claimed to be a pre-Neolithic site, but the lithics are not very diagnostic. And no other pre-Neolithic site has apparently been found on Pantelleria so far. Nor has the much-studied island of Lipari produced a pre-Neolithic site. In short, when it comes to sites older than the Neolithic, the archaeological record is quite thin – except for the larger islands. Turning first to Corsica and Sardinia, the pair of "true" islands off the west coast of Italy, there is good evidence on both of them for sites older than the Neolithic. On the other hand, the dates obtained for sites that are considered to be reliable ones go back only to around 10,000 years ago (that is, we are dealing with radiocarbon dates that fall in the early Holocene). In contrast with the situation on Cyprus, where pre-Neolithic voyaging can now be traced back to the time of the Younger Dryas (see various contributions in volume 10 of *Eurasian Prehistory*), Corsica and Sardinia have yet to produce a good site that dates to that time. The implication here is that, in terms of "true" islands, there is a time lag between the advent of voyaging to Cyprus in the Eastern Mediterranean and when this begins to happen in the case of both Corsica and Sardinia in the Central Mediterranean. The time delay appears to be on the order of 2,000 years or the equivalent of approximately 80 human generations. Of course, on Corsica and Sardinia, several claims have been made for sites that go back to the Palaeolithic period, as we have seen above. But none of the sites put forward so far is entirely convincing in the eyes of the author (the same position is held by Vigne, 2013). And if we look out in the

opposite direction to the west, the time delay with respect to Cyprus in the Eastern Mediterranean becomes an even wider one in terms of the time when human presence is first attested reliably on the "true" island of Majorca. Thus, in terms of the big picture of island archaeology, there is an east-to-west trend in the time when voyaging forages first began to reach, on a regular basis, the respective "true" islands in the Mediterranean Sea. A major difference between the Eastern Mediterranean and the Central Mediterranean is also observed in the case of obsidian. In the Central Mediterranean, only three pieces of obsidian have been recovered from two pre-Neolithic sites so far, and material appears to come from contexts that are not older in age than 9,000 cal BP (corresponding to 7,000 cal BC). By that time, obsidian had already been making its way to Cyprus from sources in Anatolia for 1,750 years, and the difference in time is even greater in the case of the obsidian story in the Aegean basin (see the contribution by Ammerman in this issue). So we are again dealing with a time delay of some length – more than 2,000 years in the case of the oldest obsidian in the Aegean basin – between the two parts of the Mediterranean. On the basis of these two lines of evidence, it is reasonable to think that pre-Neolithic voyaging was older in the Eastern Mediterranean than it was in the Central Mediterranean

This brings us to Sicily – an island of special interest for several reasons. As explained above, the earliest undisputed evidence for *Homo sapiens* on the island comes from Grotta dell'Aqcua Fitusa, and it has been carbon dated (at oldest) to about 17,500 cal BP. This is a *terminus ante quem* for the presence of hunters and gatherers on Sicily. This site is, of course, older than any of the pre-Neolithic sites on the island of Cyprus. However, in light of the new evidence for a land bridge at the time of the LGM, the hunter-gatherers who lived at Grotta dell'Acqua Fitusa were, in all likelihood, the descendants of those who had walked over the land bridge when the island was still connected with the mainland. In other words, one cannot make the argument that people who were the ancestors of those who camped at a site such as Grotta dell'Acqua Fitusa had to cross the Strait of Messina by boat in order to get to Sicily (on the form of the argument that one uses in trying to make the inference for voyaging on the basis of island archaeology, see Appendix B in Ammerman, 2013a). The land bridge – even if it existed for only a comparatively short span of time (at least from ca. 21,500 cal BP until ca 20,000 cal BP) – completely changes the game in terms of the logic of the argument for voyaging. In short, Sicily was not always an island. This part of the argument is now gone. It is no longer necessary to see voyaging as the only way to explain how people reached the island.

The situation at the Strait of Messina calls out for our attention in another way as well. Today as in the remote past (at those times whenever there was no land bridge), crossing the Strait of Messina involves making a local trip in coastal waters and not a voyage in the strict sense of the term (that is, a trip over a fair distance on the open sea as "voyaging" is defined by Ammerman, 2013a; see also Vigne, 2013). Thus, even if it were possible to make a good argument that people had to use a boat in order to make the short trip from the mainland to Sicily (by making the traditional assumption that there was never a land bridge between the two), what the forager in a boat was actually doing on the Strait of Messina was making a local trip in coastal waters and not a voyage as such. It might be possible to refer to such a trip as "going to sea" in a loose sense of the term – if not voyaging itself – but it clearly did not involve spending a sustained length of time on the open sea. Of course, making a trip across the Strait of Messina in a small boat was far from a run-of-the-mill undertaking. There were, as mentioned before, notable challenges and risks involved in crossing the narrow, dynamic body of water between Calabria and Sicily (Antonioli *et al*., in press).

Finally, the Strait of Messina constitutes the *mise en scéne* of the Sicilian Paradox. It will be recalled that Australia was inhabited by AMH who reached the island by boat around 50,000 years ago, while no one seems to have made it to Sicily at that time (Tusa, 1999; Antonioli *et al.*, in press). In addition, we know that not long before then, Neanderthals were living at Archi on the Calabrian side of the Strait of Messina (Ascenzi and Segre, 1971). From there, Sicily looms large, occupying the whole horizon. But, to the best of our knowledge, Neanderthals, for

one reason or another, did not choose to cross over to the island (Tusa, 1999; Mussi, 2001). The evidence reviewed above suggests that anatomically modern humans associated with the Uluzzian, Aurignacian and Gravettian cultures did not make the crossing either. On the other hand, Sicily was reached around the time of the LGM when a land bridge linked this place with the Italian Peninsula, and hunter-gatherers, no doubt, continued to live on the island for many years afterwards. It is in this context that the Strait of Messina makes us reflect on the puzzle summarized in the phrase "why so near and yet so far," which we do not have the time or space here to discuss in all of its depth and complexity. This will have to be done elsewhere and not in the proceedings of the Wenner Gren Workshop. To the best of the author's knowledge, only two claims for sea-crossings by early AMH have been put forward in the Central Mediterranean. The first one, according to which the site of Fontana Nuova on Sicily provides proof that Aurignacian groups crossed the Straits of Messina (Chilardi *et al.*, 1996), should be rejected for the reasons given before. A second and more recent hypothesis suggests that Uluzzian groups may have reached southeastern Italy from Greece by crossing the Otranto channel, which separates the heel of Italy from the Balkan Peninsula (Moroni *et al.*, 2013). This idea was only advanced in a tentative way by its proponents, and the most parsimonious route taken by such early AMH to reach the southern part of the Italian Peninsula is likely to have been along the Adriatic coast (at that time much less effort was called for than today, since the northern part of the sea was still land; van Andel, 1989; see Fig. 1). Future investigations on both sides of the Adriatic may help in working out the route actually taken by the Uluzzian people. Thus, no claim of early Upper Palaeolithic voyaging stands up to close scrutiny, and it is still too soon to come up with a good explanation for the Sicilian Paradox. What we do know today is that the paradox serves as a warning not to assume that what is happening at the centre of the Mediterranean will match up with technological developments that took place in other parts of the world and that do provide evidence for sea-crossings at an early time (for example, the crossing to Australia and also the crossing of the Red Sea at the Strait of Bab-el-Mandeb around 60,000 cal BP; Lambeck *et al.*, 2011). And the Mesolithic period itself on Sicily offers its own latter-day variation on the paradox: namely, the occurrence of just three pieces of obsidian at pre-Neolithic sites on Sicily and the satellite island of Favignana. In a context where voyaging is actively taking place, as it presumably was by the 9th millennium cal BP, one might expect to observe much more obsidian than this at the pre-Neolithic sites on Sicily. In any event, fieldwork to be conducted on the island in the years to come will, no doubt, shed new light on this latest wrinkle in the Sicilian Paradox.

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