PROCEEDINGS OF THE CALIFORNIA ACADEMY OF SCIENCES
Fourth Series

Volume 59, Supplement I, No. 1, pp. 1–18, 9 figs. September 30, 2008

The Most Ancient Explorations of the Mediterranean

Marco Masseti
Department of Animal Biology and Genetics of the University of Florence, Laboratories of Anthropology and Ethnology, Palazzo Nonfinito Via del Proconsolo, 12 50122 Florence, Italy; Email: marco.masseti@unifi.it

"*…sailing the wine-dark sea to men of alien language…*"
(Homer, *The Odyssey*, I: 183)

When there were no geographical maps, when the marine routes were still uncertain, the ships unsafe and the oceans wild and dangerous, travelling was an epic endeavour. The explorers of antiquity almost always departed without knowing exactly where they were going, generally heading for exotic seascapes populated in their imagination by fabulous creatures (Fig. 1). The three books of the *Odyssey* between the ninth and the twelfth are considered to be the oldest of the poem. Here Odysseus recounts the vicissitudes of his travels before the council of the Phaeacians, King Alcinous and his wife, Arete. His account embodies perfectly the attitude of the man of the ancient world towards travel and exploration. These are adventures dominated by the Olympic and supernatural, where Odysseus and his companions find themselves tackling the most arduous exploits, in the cavern of Polyphemus, between the rock and the whirlpool of Scylla and Charybdis or before the enchanted palace of Circe. Together with the episodes of the cattle of Helios, the overhanging rocks, the winds of Aeolus and the Sirens, the adventures recounted by Odysseus undoubtedly have disparate origins in folklore and in the most ancient heroic cycles, such as that of the Argonauts (Codino 1974). Nevertheless, the journey that Homer's hero tells the king and queen of the Phaeacians about was undertaken in a relatively recent period, when the main sea routes of the Mediterranean were already known and codified, despite what the king of Ithaca wishes us to believe. Effectively, Homerian critics date the definitive version of the two epic poems — the *Iliad* and the *Odyssey* — to the seventh century BC. The same critics maintain that what are considered the most recent books of the *Odyssey*, in terms of language and style, describe a post-Mycenaean world coinciding with the centuries of darkness of the so-called Dark Age of Greece (1200–800 BC) (*cf.* James 1991). The routes along which Odysseus must have sailed had been mapped out many millennia earlier by intrepid sailors who explored the

FIGURE 1. The image of a striped dolphin, *Stenella ceruleoalba* (Mayen, 1833), in the decoration of a Late Helladic I blade referred to about 1500 BC (Athens, National Museum). This cetacean seems to be the species of dolphin most frequently represented in Aegean Bronze Age art.

Mediterranean in the hope of discovering new natural resources to be exploited and new lands to colonise.

Early Over-water Travels in the Mediterranean Basin

The Mediterranean basin is composed of unique geographical and cultural features. The current diversity of its vegetation and fauna is a result of the interaction of several factors, primarily the multiple biogeographical origins of the species, Quaternary climatic changes, which produced a repeated turnover of biota, and Late Pleistocene-Holocene human-induced modifications of habitat, including hunting and the introduction of exotic species (Masseti 1998 and 2002).

Civilisations have been present continuously in this region for over 10,000 years, modifying entire landscapes, disrupting or destroying the majority of native biocenoses, and introducing many new species. There is possibly no other place in the world that has been so intensively influenced by human activity over a prolonged period. Virtually no ecosystems have been left untouched. More specifically, since pre-Neolithic and early Neolithic times, the human settlers of the Mediterranean basin brought about a radical turnover between ancient and modern faunas and floras, introducing a variety of allochthonous taxa. It now appears sufficiently plausible that, up to the Late Pleistocene-early Holocene, this basin increasingly represented less a barrier than a bridge (Uerpmann 1979; Lewthaite 1987; Binder 1989; Guilaine 1994; Orliac 1997), in a relatively short time promoting and multiplying the circulation of ideas, merchandise, faunal and botanical elements and human groups, which spread into new and different environments and, over time and in different ways, became grafted onto the authochtonous substratum (Masseti and Vianello 1991; Masseti 1998). The available archaeological documentation, based on still quite fragmentary evidence, tends to indicate that the first relocations by sea in the Mediterranean basin were already carried out by Mesolithic hunter-gatherers (Jacobsen 1976; Perlès 1979; Cherry 1981 1990 and 1992; Simmons 1991). Evidence from the islands of Corsica (Camps 1988; Vigne and Desse-Berset 1995), Milos in the Western Cycladic Archipelago (Perlés 1979; Renfrew and Aspinall 1990), possibly Kythnos (Cherry 1979), and Cyprus (Simmons 1988 and 1991) indicate an improved seafaring capability. In fact, from the late Mesolithic onwards, the Mediterranean Sea can be considered as a preferential route for the exploration and subsequent colonisation of its coastlines and islands (*cf.* Payne 1975; Perlés 1979; Shackleton et al. 1984; Fedele 1988; Pennacchioni 1996). Furthermore, inasmuch as the exploitation of natural resources of the Mediterranean basin was an uninterrupted process beginning in prehistoric periods and lasting until historical times, in the vast majority of cases it is impossible to reconstruct the natural ecosystems of the past that have been destroyed, and hence lost for millennia (Masseti 2002b).

Islands are more likely to offer unequivocal evidence of the alterations made by man to the original ecosystems. Indeed, it is on the islands that the impact of extraneous elements on the unspoilt ecological system can be identified and the chronology calculated with considerable precision because of the evidence left and the relative rapidity of the consequences produced. In general, evidence for human activity on the Mediterranean islands prior to the Neolithic is limited (Cherry 1981). This is not to say that the islands had not been previously discovered, or at least previously visited. Evidence from the Franchthi Cave, in the eastern Peloponnese, for example, demonstrates clearly that the island of Milos was exploited as a source of obsidian in Early Mesolithic times (*c.* 13,000 BP) (Perlés 1979 and 2001), but there is no evidence for permanent settlement on this island before the Neolithic (Cherry 1981) (Fig. 2).

It is clear that the movement of a raw material, such as the Milosian obsidian, can only have been accomplished by over-water travel. Thus, this evidence from Franchthi also suggests that Mesolithic human groups in the Mediterranean were capable of undertaking regular, long-distance

sea voyages and of vessels capable of making such crossings (Perlés 1979).

The "true" Mediterranean islands (Vigne 1999), that is those which can be compared to "oceanic islands", are the preferred basis for considerations on prehistoric navigation. Although varying greatly in their geological histories, none of these islands were joined to the nearest land-masses during the regressions of the sea level (between 120 and 150 m) during any of the Pleistocene glacial episodes (Van Andel 1989, 1990). Thus, such marine crossings must have presented real difficulties and involved many days travel. In order to reach these islands, more or less distant, but all visible from the mainland in favourable weather conditions, man had to devise technical expedients, such as the construction of vessels that could be adequately managed over the course of these long sea journeys. As observed by Perlès (2001), many of the crude stone tools of the Aegean Mesolithic hunter-gatherers were in fact used to work the fibres necessary to manufacture nets, baskets, and boats (Vaughan 1990). The latter could have consisted of reed boats, such as the "papyrella", which was reconstructed several years ago and used to collect obsidian from Sounion to Milos (Tzalas 1995). This papyrella, based on a Corfiote's model, proved its seaworthiness, but it also confirmed the need for developed nautical skills, which the intensive fishing of tuna, barracudas and groupers had already suggested (Jacobsen 1993).

FIGURE 2. Located in the Western Cycladic Archipelago, the island of Milos (Greece) was exploited as a source of obsidian in Mesolithic times (*c.* 13,000 BP), but there is no evidence for permanent settlement on this island before the Neolithic.

These considerations are, however, based solely on an indirect approach to the prehistoric navigation of the Mediterranean inasmuch as underwater archaeology has not yet discovered any vessels dating to before the Bronze Age. The most ancient vessel known to date is the wreck of *Dokos* (Saronic Gulf), dating to the Early Helladic (2500 BC) (Papathanassopoulos 1977), whereas possibly the most famous is the wreck of *Uluburun* dating to the Late Bronze Age (1300 BC) (Bass *et al*. 1989; Pulak 1996 and 1997). The collections of the Goulandris Museum of Athens also comprise a Minoan fictile model of a vessel, referred to approximately 2160/1970–1700/1650 BC (Mitsotakis Coll. cat. no 91) (Fig. 3). There are also several known exemplars of Mesolithic pirogues in northern Europe and in temperate Europe (see for example Mordant and Mordant 1992), but the only tangible evidence of Neolithic vessels are the monoxyle boat of Bercy (5th millennium BC), the two models reproduced in terracotta, the monoxyle pirogue of the Lake of Bracciano, close to Rome (Fugazzola Delpino and Mineo 1995), and the rare finds of the Spanish site of La Draga (5th millennium) (Bosch y Lloret, Chinchilla Sanchez, and Tarrus y Galter 2000). Despite its undeniable value for a knowledge of river and lake navigation and its potential for cultural exchange, nevertheless this documentation does not provide a clear account of Neolithic techniques of naval construction.

FIGURE 3: The collections of the Goulandris Museum of Athens also comprise a Minoan fictile model of a vessel, from early 2nd millennium BC (Mitsotakis Coll. cat. no 91).

The existence of authentic vessels sailing the open sea, however, emerged clearly in

many parts of the world in the wake of the late Palaeolithic. According to the most ancient archaeological evidence, the human presence in Australia dates to over 40,000 years ago (Vinton Kirch 1997; Allen et al. 1998; Johnstone 1988; Bowler et al. 2003). On the other hand, it would appear that the fishermen and hunter-gatherers of the Mediterranean demonstrated a tendency towards maritime navigation much later (Cucchi and Vigne 2006). Recent research into the pre-Neolithic populations of the large islands of the Mediterranean has demonstrated that most of the islands were not explored until around the ninth millennium BC (Vigne 2000). Apart from the case of the Milosian obsidian found at Franchthi, the most ancient documented pre-Neolithic human presence is represented by the site of Akrotiri-*Aetokremnos* in Cyprus, dating to around the end of the tenth millennium BC (Simmons 1991 and 1999). This is followed by that of Corsica and Sardinia, both of which were explored at about the same time, around the eighth millennium BC (Masseti and Vianello 1991; Vigne and Desse-Berset 1995; Tozzi 1996; Vigne et al. 1996). This first phase in the conquest of the islands was implemented by small groups of nomadic hunter-gatherers (Mesolithic) who frequented the coasts of the islands in the course of seasonal forays (Masseti and Darlas 1999; Costa et al. 2003).

Late Quaternary Island Ecosystems and Man

"*A sea change into something rich and strange. What potions have I drunk of Syren tears?*"
(W. Shakespeare, *Sonnet* 119)

Now, let's attempt to penetrate the densely tangled vegetation of the jungles of endemic evergreen oaks that must have covered most of the "true" Mediterranean islands before any explorer set foot on them (Fig. 4). The atmosphere is worthy of the opening of the most exciting adventure story. Breathing the salty tang of the breeze rolling in off the sea, its surface as smooth as a pane of diaphanous glass, we cannot resist the desire to probe with the eyes of the imagination the lush vegetation that cloaks the island hills, seeking to imagine the secret lair of aberrant beasts, and monstrous, primitive and immortal creatures. Thus what comes to mind is the ancestral memory of the totemic god, of the primordial unconscious archetype relegated, since time immemorial, to the most isolated and lonely place in the world and to the innermost depths of our being. The "true" islands of the Mediterranean were inhabited by extraordinary creatures that could have proved to be intriguing aberrations from what we would have expected of our ancestors.

In some respects, in the light of palaeontological and zooarchaeological evidence, late Quaternary island ecosystems were in fact quite different from adjacent continental ecosystems: the existence of endemic animal species is perhaps the most obvious example of this. Several of the fossil faunas of the Mediterranean islands differed considerably from contemporary continental faunas and were characterised by a very low taxonomic diversity. Examples from the Balearics, Corsica and Sardinia, the Tuscan Archipelago, Sicily, Malta, Crete, many Aegean islands, and Cyprus are significant (Fig. 5). Each of these mammalian compositions, even though they were represented by only a few taxa, were repeated (monotonously) on most of the islands. Nevertheless, they displayed peculiar endemic elements that differed greatly from one island to another.

The most common trends of endemisation are the decrease in the size of macromammals, such as proboscideans and artiodactyls, and the increase in the size of micromammals, such as insectivores and rodents. These modifications are generally assumed to be primarily a consequence of the genetic isolation from continental populations, a quantitative and qualitative reduction in food supply, alteration of intraspecific competition, the absence of large carnivores and, in so far as the micromammals are concerned, endothermic adaptations (Masseti and Mazza 1996). They may in fact be the necessary result of a tendency towards a redefinition of ecological equilibria under very

peculiar environmental conditions (*cf*. MacArthur and Wilson 1967; Blondel and Vigne 1993). The endemisation of island faunas is in fact the result of a normal and repetitive reorganisation of a few, unbalanced faunal entities distributed in restricted areas with limited resources (Masseti and Mazza 1996). The majority of the endemic oligotypic associations and/or single species provided by the Mediterranean islands apparently vanished prior to any evidence of permanent human occupation (Masseti and Darlas 1999). Most of the islands were not occupied by hunter-gatherer groups, though this is not to say that the islands had not already been discovered. On the island of Kythnos in the Western Cyclades, for example, no details have emerged about any possible cultural association for a ^{14}C-dated Pleistocene fossil dwarf elephant site. The same is true of the Charkadio Cave on the island of Tilos (Dodecanese), where the age of the deposits containing dwarf elephant remains ranges from very late Pleistocene to early Holocene (Theodorou 1983; Bachmayer et al. 1984).

On the other hand, as already observed, only on the island of Cyprus have the excavations of the oldest site of Akrotiri-*Aetokremnos* brought to light the clear conjunction of cultural material and huge quantities of bone from the extinct endemic fauna (Simmons 1988, 1989, 1991). Associated with this site is a huge faunal assemblage, which consists of endemic mammalian species thought to have become extinct during the Pleistocene, prior to the arrival of humans on the island. From this Cypriot faunal assemblage over 250,000 pieces of bone have been retrieved. About 95% of the osteological material is referable to the endemic pygmy hippopotamus, *Phanorious minor* (Desharest, 1822) (Simmons 1991), that was even smaller and more slender than the extant Liberian hippo, *Hexaprotodon liberiensis* (Morton, 1849) (Boekschoten and Sondaar 1972) (Fig. 6). Simmons (1991) estimates that a minimum of 200 individuals of this taxon were represented among the fossil remains of *Aetokremnos*. And, although approximately 20% of the

FIGURE 4: Dense jungles of the evergreen endemic golden oak, *Quercus alnifolia* Poech, 1842, must have occurred on the island of Cyprus before any explorer set foot on it (photo Marco Masseti).

FIGURE 5: The archaeological exploration of cave sites on the island of Majorca (Balearic Islands, Spain) provided several remains of an endemic, highly specialised caprine, *Myotragus balearicus* Bate, 1909, which survived until the time of the importation of livestock from abroad (courtesy Museo Arqueológico Nacional, Madrid).

bone was burned and almost none articulated, yet no clearly butchered bone was identified (Simmons 1991). Hippopotami were no by means the only item reported from the site. The pygmy endemic elephant, *Elephas cypriotes* Bate 1903, was also represented by at least three sub-adult individuals. Over 20,000 individual marine invertebrates were also recovered. Additionally, a variety of birds and limited amounts of fish and reptile remains were represented (Simmons 1991).

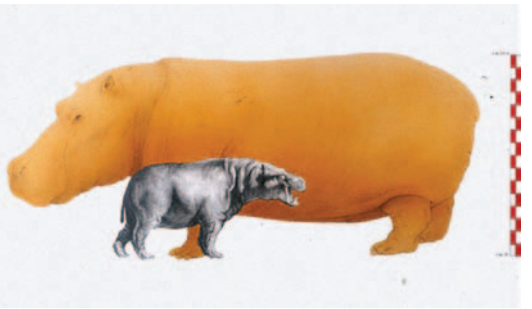

FIGURE 6. Artist's reconstruction of the extinct pygmy hippopotamus *Phanorious minor* (Desmarest, 1822) of Late Pleistocene Cyprus, adapted from the specimen in the London Natural History Museum and compared to the size of the extant *Hippopotamus amphibius* L., 1758 (drawing by Alessandro Mangione and Marco Masseti).

The assemblage of chipped stone artefacts of Akrotiri could generally fit within either Natufian or early pre-pottery Neolithic contexts from the Levant (Simmons 1991). A consistent group of a dozen ^{14}C dates (shell, bone, charcoal), arguing in favour of an 11th millennium b.p. occupation, with a weighted average of 10,030 ± 35 BP, sets the findings of Akrotiri-*Aetokremnos* only a few centuries before the earliest record now available for the pre-pottery Neolithic period, recently discovered at Shillourokambos and dated to the first half of the end of the 9th millennium (see Guilane et al. 1996, 2000; Briois et al. 1997). However, that of Akrotiri appears to represent a relatively short-lived occupation, and there is certainly no evidence for continuity between the hunter-gatherer and the successive pre-pottery Neolithic cultural contexts (Cherry 1992). Akrotiri-*Aetokremnos* has implications for early seafaring technology and, more importantly, for the adaptive strategies practised by these early Mediterranean colonists. In fact, Cyprus has never been connected to the mainland (Hadjisterkotis and Masala 1995), so human settlement must have taken place through the use of relatively efficient seafaring craft. Equally interesting is the association of cultural materials with extinct late Pleistocene vertebrates. *Aetokremnos* appears, in fact, to represent one of the few good examples of a late Pleistocene/early Holocene cultural adaptation directly associated with the extinction of an endemic vertebrate fauna. In the light of all this, Cyprus is the first Mediterranean island where some of the endemic vertebrates do appear to have been wiped out by human hunting.

As we have seen, maritime technology and navigation knowledge were probably not significant barriers to the exploration of the Mediterranean islands by early Mesolithic human groups, but there is no evidence for permanent settlement before the early Neolithic. On Crete too, and on other islands, there is no convincing evidence for pre-Neolithic human settlement, though negative evidence is not conclusive. The endemic animals of these islands are believed to have been largely rendered extinct between the end of the Pleistocene and the advent of human colonisation (Lax and Strasser 1992). But any overlap between the endemic Pleistocene fauna of Crete and human occupation of the island cannot be supported by archaeological data, despite considerable efforts to uncover a pre-Neolithic occupation (Cherry 1992; Patton 1996). According to the 'theory of island biogeography', outlined by MacArthur and Wilson (1967), island environments should be characterised by reduced biodiversity, to which animal populations, like human communities, would have to adapt. Thus, it has been suggested that the extinction of the insular endemics may have been more related to their inability to adapt further in the face of a basically unfavourable environment than to the hunting abilities of pre-Neolithic man. In any case, this is probably more true of small and remote islets than of islands such as Crete or Cyprus, still characterised by a great variety of natural resources. In the light of the archaeological evidence, therefore, one might conclude that

the impact of hunter-gatherer communities on the ecology of Mediterranean islands appears to have been relatively limited. Nevertheless, as hypothesised by Rackham and Moody (1996), if Early Mesolithic voyages to Milos for obsidian were combined with hunting trips to Crete or to other islands, most of the endemic mammals could have disappeared before there was any settlement that left an archaeological record (Masseti and Darlas 1999).

Neolithic Navigation

The earliest important navigation in the Mediterranean must undeniably have commenced in the Neolithic period, because, apart from the Balearics (Schüle 1993; Ramis et al. 2002; Alcover 2004), this was the era in which the Mediterranean islands were truly colonised and populated (Cherry 1990; Camps 1998; Vigne 1999). The island of Cyprus was the first to be colonised by a peasant community at the end of the ninth millennium BC (Guilaine et al. 2000; Peltenburg et al. 2000; Guilaine and Le Brun 2003). The Neolithic settlement of the islands cannot be explained as the result of a merely casual maritime dispersal of the hunter-gatherers but appears much more plausibly a movement of intentional and planned colonisation (Perlès 2001). The cases of the Neolithic settlement of Crete and Cyprus support this hypothesis. In both cases the colonisation was accompanied by the transfer of the continental ecological appurtenances, made up of cultivars and domestic animals, the wild progenitors of which did not exist on the islands (Broodbank and Strasser 1991; Masseti 1998; Vigne and Buitenhuis 1999; Willcox 2001). Therefore, it is not simply a question of the transfer of knowledge of agricultural practices and breeding, but also of the physical transportation of the animals themselves. The human group and the related domestic animals that were moved by sea had to be sufficiently important and balanced to establish a vital population of men and beasts so that the agrarian way of life could be reproduced in a new territory. This ecological and cultural transplantation could not have been the result of casual maritime prospecting but only the outcome of an expedition, or a series of expeditions, planned and prepared with a specific objective, the colonisation of an island.

The colonisation of insular environments in the Neolithic could be set in relation to a radical change in naval technology. If we assume that this took place in one voyage, the Neolithic colonisation of an island such as Crete would have demanded a founding event involving a significant human group (about forty individuals) and a load amounting to several tons in weight (animals, reserves of grain, drinking water, etc) (Broodbank and Strasser 1991). Migratory phenomena of this kind imply a change in the construction techniques of the vessels. The craft used by the societies of hunter-gatherers of the late Palaeolithic are known to have been light, manageable, and easy to transport (Johnstone 1988), whereas the vessels of the Neolithic colonies must have been considerably larger and with a greater draught. The Neolithic colonists introduced not only domestic livestock (goats, sheep, oxen, pigs) onto various islands, but also game (red deer, fallow deer, hares and foxes) for hunting, always an activity of considerable importance in Neolithic societies (Masseti 1998; Vigne et al. 2000). Whatever the status (wild, tamed or domestic) of the animals introduced, they were certainly embarked live (*cf.* Masseti 1998). For this purpose, it is highly probable that the Neolithic colonists selected young exemplars rather than adults, considering that a pair of reproducing adult bovines has an average weight of 1200 kg. Therefore, the Neolithicisation of the large Mediterranean islands, such as Cyprus, Crete, or Corsica, most likely entailed the construction of much larger vessels (3 or 4 metres long) and with a greater draught than the Mesolithic pirogues (Vigne and Cucchi 2005).

An Image of North Africa from the 2nd Millennium BC

We have seen how the contacts among the human populations of the Mediterranean basin commenced in very ancient times. This is a phenomenon that is well documented, on an archaeological basis, for the Neolithic chronologies, but it appears more evanescent and discontinuous for the Chalcolithic period and that of the Early Bronze Age. Later, in the Late Aegean Bronze Age, we can observe a veritable mercantile hegemony of this culture in the eastern Mediterranean. Minoan centres were active on Crete, Santorini, Rhodes, and Cyprus (Karageorghis and Stampolidis 1997; Marketou 1998, 2006; Stampolidis *et al*. 1998; Niemeier 1998), and luxury commodities were regularly traded between the opposite shores of the eastern Mediterranean basin: among the southern Balkan Peninsula, Egypt, the Levant and Asia Minor (*cf*. Vivian Davies and Schofield 1995; Masseti 2003a, 2003b). From the 16th century on there was also a systematic, regular and organised frequentation of the western Mediterranean by sailors of Mycenaean culture originating from the Aegean area.

However, the first accounts of the most ancient Mediterranean explorations did not emerge until the Middle and Late Bronze Age. In most cases these were not written documents, such as the contemporary reports of the Egyptian expeditions conducted to the south of the first cataract, in the Red Sea, or in search of the legendary land of Punt, but were rather artistic representations. Possibly the most ancient of such reports is that comprised in the decoration of the wall-paintings of the so-called West House (Ditike Oikia) of the prehistoric settlement of Akrotiri, on the island of Santorini (Aegean Sea, Greece). The artefact has been dated in the first half of the 2nd millennium, because the eruption of the island is considered to have occurred around 1645 BC. (Hammer et al. 1987). As noted by various authors (Cameron 1968, Masseti 1980, 1984, 1997, 2000, 2003a; Marinatos 1984 and 1987; Immerwahr 1990; Vanschoonwinkel 1990 and 1996; Doumas 1992; Yannouli and Trantalidou 1999; Trantalidou 2000), the naturalistic illustrations of the Aegean landscape by the local artists of the 2nd millennium BC are a form of realistic representation, portraying certain aspects of the natural environment that were familiar to the painters. Other artistic productions of the Aegean Bronze Age culture, however, provide a different perception of natural subjects, which have been depicted as if the artist did not have sufficient knowledge of the scenes he was asked to portray by his patrons (Masseti, 2000 and 2003c). This may be the case of the illustrations of exotic habitats extraneous to the ancient Aegean natural world of the so-called "West House" miniature. In fact, these images constitute a miniature frieze portraying the glory of Minoan sea power, with scenes of sea-faring, towns, battles, and exotic landscapes (Athens, National Museum*)* (Televantou 1990; Doumas 1992). According to one interpretation, warships attended by sporting dolphins sail in triumph past what is thought to be the Libyan coast of Africa (*cf*. Marinatos 1974; Stucchi 1976). In fact, the subtropical landscape depicted in this scene is characterised by elements unusual to the natural environment of the South-Aegean islands. In a riparian setting with palms and other exotic trees, aquatic birds, and wild mammals are depicted in the eternal struggle for survival. The scene does not include humans. Part of the picture is dedicated to the representation of a spotted carnivore stalking a pair of aquatic birds, described by Marinatos (1974) as "ibis or flamingo" on account of their curved beaks (Fig. 7). Doumas (1992) identified them as wild ducks. The two birds, together with another in flight further to the left, share the form of the family Anatidae, but look more like geese than ducks. These goose-like birds have a long neck, short legs and squat body, and might resemble Egyptian geese, *Alopochen aegyptiacus* (L. 1766). On taxonomical grounds, however, it is impossible to refer them to any precise genus or species, because of the morphological inaccuracy of their representation. The same unrealistic mode of depiction also characterises the stalking carnivore, which might be generically referred to

FIGURE 7. Detail of the "North-African landscape" from the miniature frieze of the so-called "West House", Akrotiri (island of Santorini, Greece) (Late Minoan IA, about 1550 B.C., Athens, National Museum) (from Doumas 1992).

a felid species of unknown identification. It can be assumed that, rather than portraits of biological elements known to the artists, both the depicted birds and the spotted carnivore represent free elaborations of iconographic models that were perhaps not of Aegean Bronze Age origin (Masseti 1997). This scene appears to derive its inspiration from model books of contemporary Egyptian art, where wetland hunting scenes were a popular painting theme (*cf.* Vanschoonwinkel 1990). Effectively, there is evidence of cultural contacts between Egypt and the Minoan world since the Cretan pre-palatial Early Bronze Age and the Egyptian Early Dynastic, Old Kingdom and First Intermediate Period (*c.* 3000–1900 BC) (Bietak 1995; Warren 1995). Among the principal examples of this Egyptian iconographic tradition, we might mention the wall-paintings in the tomb of Khnumhotep III at Beni Hasan (*c.* 1900 BC), or from the Theban tomb of Nebamun (*c*. 1450 BC, London, British Museum). Iconographic elements imported from Egypt also probably inform other Minoan artistic productions, such as the decoration of the dagger blade inlaid with a "Nilotic scene" from the Mycenae shaft grave V, which is also considered a Cretan work (Late Minoan IA, c. 1550–1500 BC, Athens, National Museum). Whatever its source of inspiration, the "subtropical landscape" of the Theran "West House" miniature appears to portray a natural environment completely unknown to the Minoan artist, who reproduced the exotic North-African landscape purely on the basis of descriptions made by visitors, integrated into his work through iconographic expedients taken from the foreign artistic tradition (Masseti 1997).

The Wanderings of Odysseus. Concluding Remarks

"*Then you will reach the island Thrinakria, where are pastured the cattle and the fat sheep of the sun god, Helios, seven herds of oxen, and as many beautiful sheepflocks, and fifty to each herd. There is no giving birth among them, nor do they ever die away, and their shepherdesses are gods, nymphs with sweet hair…*"
(Homer, *The Odyssey*, XII: 130)

Effectively, from the Chalcolithic and the Aegean Early Bronze Age the first legendary references of the Greek literary tradition are backed up by material archaeological evidence (De Juliis

1998). Thus, having seen the very ancient beginnings of the exploration of the Mediterranean by the first human groups — as documented to date — we can now return to consider the wanderings of Odysseus from which we started at the beginning of this paper. We left Odysseus in the palace of the king of the Phaeacians, recounting all his adventures — the Lotus eaters, the Cyclops, the descent to the underworld and the rest — in a sort of sacred interval of recreation, of incipient reintegration into the world of men (*cf*. Kirk 1980). In this way, Homer casts around a dense web of information that appears to indicate that the hero has gone beyond the confines of the real world (Heubeck 1981). Apropos this aspect, the world of Odysseus' wanderings has generated considerable controversy (Lattimore 1991), leading to the adoption of two diametric standpoints. One view holds that places such as the land of the Lotus eaters, the isle of Circe, Scheria (the home of the Phaeacians), and so forth, may represent real places in the Mediterranean, or beyond, or at least some of them may. The other maintains that all such places are imaginary. Both views appear to be extreme, but it is difficult to find a middle ground. There is, for example, a strong and apparently early tradition that places Polyphemos and the Cyclops in Sicily. Writing at the end of the fifth century BC, Thucydides, one of the most important historians of classical antiquity, also refers to legends about Cyclops. But, nothing in the text of the *Odyssey* indicates that the Cyclops lived in Sicily or, in fact, on an island at all (Lattimore 1991). This poem, as it has come down to us, could not have been completed much before the end of the eight century BC. The traditional foundation dates for many Greek cities in the western world are earlier than that. Sicilian Naxos is said to have been settled in 735 B.C., Syracuse and Korkyra in 734, and half a dozen others before 700. Nor should we forget that the earliest frequentation of these territories by peoples of Helladic origin — Mycenaeans — is, as we have seen, documented starting from the 16th century BC (*cf*. De Juliis 1998). Thus, by the time of the completion of the *Odyssey*, the western Mediterranean as far as Sicily was not only well explored, but pretty well settled with Greek colonies, colonies just as Hellenic, or almost, as their parent cities in ancient Greece. How could such a place belong simultaneously to the known world and the wondrous world of Odysseus's wanderings? Only, one might say, by embedding features conceived very early in the process of accumulation and ignoring later phases (Lattimore 1991). The wanderings of Odysseus are a brilliant series of adventures linked and fused by characters. They are nothing more than combinations. They are made by the imagination, and are in part sheer fancy. Sailors' stories can involve monsters and enchanted places, as well as authentic reports, and probably contain bits and pieces of solid unassimilated facts. There is some evidence, for example, that could to some extent support a Sicilian geographic origin for the myth of the Cyclops. The legendary belief that these monstrous creatures inhabited the caves of eastern Sicily could have been generated by certain real circumstances. In fact, when around the 8th century BC (Buchner 1994) the first Greek colonisers reached Sicily and began to set up permanent settlements there, the endemic dwarf mammals had already been extinct for a long time, but the osteological remains were still to be found in the caves, often easily accessible. The remains of the elephants must have attracted even greater interest than the others, favouring the birth of the legends about the Cyclops (Azzaroli 1971). The rear limb bones were in fact easily mistaken for *ossa di giganti* (= "the bones of giants"). But what must have been even more amazing to the first Aegean explorers of Sicily were the other anatomical portions of these proboscideans. In the cranium, in fact, the large hollow of the nostrils set in the middle of the forehead was mistaken for an orbit. In elephants, the true orbits are broadly open at the sides and communicate with the temporal fossa, and probably passed practically unobserved. It's not difficult to imagine how the presence of the broad cavity of the nostrils could have been at the origin of the invention of the monstrous offspring of the sea god, Poseidon, provided with a single eye set in the middle of the forehead (Masseti 1992). These legends about the giants persisted at length. Many centuries later, the Italian poet Gio-

vanni Boccaccio, for example, referred to having seen two teeth and several bones of a "giant" in a church in Erice (Trapani) (*cf*. Azzaroli 1971; Mannino 2002). Very similar was the name used in 1647, at the start of the palaeontological exploration of the Mediterranean islands, by Giovanni Francesco Abela, archaeologist and commander of the Knights of Malta, to refer to the large bones of four-legged creatures he had discovered on Malta: "*Ma finalmente, che maggior testimonianza possiamo noi desiderare nell'habitazione qui de'Ciclopi, senza bisogno d'andarla, mendicando dalle autorità de' Scrittori antichi, involte nell'oscurità dei tempi, che quella ne rendano l'ossa Gigantee ritrovate in Malta, e i sepolcri loro cavati e intagliati nella rocca viva, che ben spesso si scoprono di smisurata grandezza*..." ("But finally, what greater evidence could we desire of the fact that the Cyclops lived here, without having to go and seek it out from the authorities of the ancient writers, shrouded in the mystery of time, than that of the gigantic bones discovered in Malta, and the sepulchres themselves carved and hewn out of the living rock, which are frequently discovered to be of an immense size…") (Abela 1647. *Libro II. De Vari Nomi dell'Isola e de' sui primi Abitatori. Notizia I*: 147–148). It seems that dwarf elephants became extinct on Malta and Sicily many thousands of years ago (Symeonidis and Theodorou 1981; Bada et al. 1991; Masseti 1993; Burgio 1997). But some proboscideans of small size survived on other of the Mediterranean islands up to much later times. As already noted, in the particular case of Tilos, in the Dodecanese Archipelago (Eastern Aegean Sea), the upper levels of the cave of Charkadio, located approximately in the centre of the island, provided a number of dwarf elephant remains (Fig. 8). These animals have been described by Symeonidis et al. (1973), and Theodorou (1983 and 1988) as belonging to the genus *Elephas* — the same as the extant Asiatic proboscidean — but are still specifically unnamed (Alcover et al. 1998). Recently, skeletal remains have been used for DNA analysis, also revealing a relationship to recent Asiatic elephants (Theodorou and Symeonidis 2001). Previously referred to as two distinct forms, the Tilian elephants are now considered as belonging to a single species with marked dimorphism. This form, however, has been only recently specifically described as *Elephas tiliensis* by Theodorou, Symeonidis, and Stathopoulou (2007), previously described from Sicily and Malta (Vaufrey 1929; Ambrosetti 1968). The proboscidean of Tilos is slightly larger than the Sicilian pygmy elephant, whilst the age of the deposits of the discovery site range from the very late Pleistocene to the Holocene (Symeonidis et al. 1973; Bachmayer and Symeonidis 1975; Bachmayer et al. 1976; Dermitzakis and Sondaar 1978; Theodorou 1983, 1988). Two dates were in fact obtained through the radio-carbon dating of the elephant bones. Surprisingly, some of these remains are considered to be very recent, between 7.090 ± 680 and 4.390 ± 600 bp (Bachmayer and Symeonidis 1975; Bachmayer et al. 1976). According to Symeonidis (1972) and Theodorou and Agiadi (2001), it appears that the species first appeared in the sediment of the Charkadio Cave about 45,000 years BP and became extinct almost 4,000–3,500 years ago. Relating to different parts of the cave, the more recent of these datings appear to prove the simultaneous existence of the Tilian elephants and post-Palaeolithic man (Bachmayer and Symeonidis 1975; Bachmayer et al. 1976,

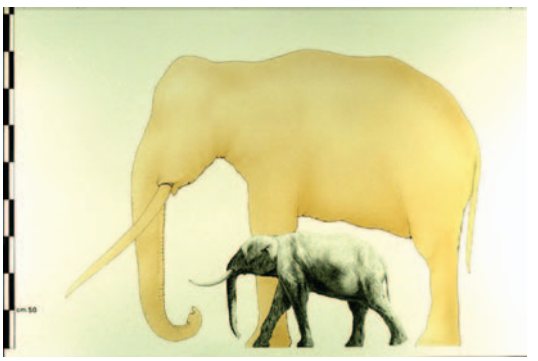

FIGURE 8. Artist's reconstruction of the extinct dwarf elephant, *Elephas tiliensis* Theodorou, Symeonidis, and Stathopoulou, 2007, of Late Pleistocene-Holocene Tilos, adapted from the osteological material in the Museum of Megalochorio (Tilos, Greece), and compared to the size of its supposed ancestor *E. antiquus* Falconer and Cautley, 1847 (drawing by Alessando Mangione and Marco Masseti).

Bachmayer et al. 1984; Theodorou and Symeonidis, 2001). Furthermore, if such dating is reliable, we can presume that this taxon survived at least until the Late Aegean Bronze Age, when a dwarf elephant may have been exported to Egypt as a costly gift for the pharaoh (Masseti 2001). This is not to say that the live pygmy proboscidean depicted in the tomb of Rekh-mi-Re, vizier of Thutmosis III and Amenhotep II (from about 1470 to 1445 BC) at Thebes (Egypt), is definitely the portrait of a Tilos elephant that was actually captured by the Aegean Bronze Age rulers of the island (Fig. 9). It may, instead, have been a dwarf representative of the genus *Elephas* which survived on some Eastern Mediterranean islands during the period of Minoan-Mycenean control (Masseti 2001 and 2003a).

FIGURE 9. The ideal reconstruction of the extinct Tilian elephant compared to the detail of the wall-paintings of the 18th Egyptian Dynasty tomb of Rekh-mi-Re at Thebes, showing a small-sized elephant borne by the Syrian tributaries (drawings by Alessando Mangione and Marco Masseti).

To return to the journey of Odysseus: according to Lattimore (1991), the lands of the wanderings of the lord of Ithaca appear to have a similar status to their inhabitants. They too are of this world and of human stature, rather than of Olympus and the Olympians. Yet they are not quite of this world either. They are people with attributes unlike any people we shall ever meet, and as suggested by Strabo (*Geography* i.2.15), live in places where, after Odysseus, no one will ever go. Hence we can understand how the "Land of the Dead" is described not as an underworld but as a far shore, with certain landmarks possibly borrowed from actual places in the real Mediterranean world.

ACKNOWLEDGEMENTS

I should like to express my appreciation and gratitude to Josè Antoni Alcover, Institut Mediterrani d'Estudis avancats de les illes Balears and Joan Mayol Serra, Govern de les Illes Balears; Augusto Azzaroli, Department of Earth Sciences, University of Florence; Andreas Darlas and Katerina Trantalidou, Ephorate of Paleoanthropology and Speleology (Athens); Simon J.M. Davis, Instituto Português d'Arquelogia (Lisbon); Toula Marketou, 22nd Ephorate of Dodecanese (Rhodes, Greece); and Jean-Denis Vigne, Muséum national d'Histoire naturelle (Paris), for the enjoyable and stimulating discussions on the prehistory of the Mediterranean region.

REFERENCES

ABELA, G.F. 1647. Della Descrittione di Malta Isola nel Mare Siciliano, con le sue antichità, ed altre notizie. *Libro I. Della Fertilità di Malta. Notizia XII*: 134, Malta. Ms. n. cat. 664.e.1. British Library, London, UK.

ALCOVER, J.A. 2004. Disentangling the Balearic first settlement issues. *Endins* 26:143–156.

ALCOVER, J.A., X. CAMPILLO, M. MACIAS, AND A. SANS. 1998. Mammal Species of the World: Additional data on Insular Mammals. *American Museum Novitates* (3248):1–29.

ALLEN, J., C. GOLDEN, R. JONES, AND J.P. WHITE. 1998. Pleistocene dates for the human occupation of New Ireland, Melanesia. *Nature* 331:707–709.

AMBROSETTI, P. 1968. The Pleistocene dwarf elephants of Spinagallo (Siracusa, South-Eastern Sicily). *Geologica Romana* 1:217–229.

AZZAROLI, A. 1971. Il significato delle faune insulari quaternarie. *Le Scienz* 30:66–75.

BACHMAYER, F., AND N. SYMEONIDIS. 1975. Eigenartige Abspaltungen von Stosszähnen der Zwergelefanten aus der Höhle "Charkadio" auf der Insel Tilos — Artefakte?. *Annales géologiques des pays hélleniques* 26:320–323.

Bachmayer, F., N. Symeonidis, R. Seeman, and H. Zapfe. 1976. Die Ausgrabungen in der Zwergelefanten "Charkadio" auf der Insel Tilos (Dodekanes, Griechenland) in den Jahren 1974 und 1975. *Annales des Naturhistorischen Museum Wien* 80:113–144.

Bachmayer, F., N. Symeonidis, and H. Zapfe. 1984. Die Ausgrabungen in der Zwergelefantenhöhle der Insel Tilos (Dodekanes, Griechenland) in Jahr 1983. *Sitzungen Österreichische Akademie der Wissenschaften, Mathematik -naturwissenschaften Klasse*, Abt. 1, 193(6–10):321–328.

Bada, J.L., G. Belluomini, L. Bonfiglio, M. Branca, E. Burgio, and L. Delitala. 1991. Isoleucine epimerization ages of Quaternari mammals from Sicily. *Il Quaternario* 4 (1a):49–54.

Bass, G.F., C. Pulak, D. Collon, and J. Weinstein. 1989. The Bronze Age shipwreck at Ulu Burun: 1986 campaign. *American Journal of Archaeology* 93:1–29.

Bietak, M. 1995. Connections between Egypt and the Minoan world. New results from Tell El-Dab'a/Avaris. Pages 19–28 *in* W. Vivian Davies and L. Schofield, eds., *Egypt, the Aegean and the Levant. Interconnections in the Second Millennium BC*. British Museum Press, London, UK.

Binder, D. 1989. Aspects de la néolithisation dans les aires padane, provençale et ligure. Pages 199–226 *in* O. Aurenche and J. Cauvin, eds., *Néolithisation*. British Archaeological Report, International Series, no. 516.

Blondel, J., and J.-D. Vigne. 1993. Space, time, and man as determinants of diversity of birds and mammals in the Mediterranean region Pages 135–146 *in* R.E. Ricklefs and D. Schluter, eds., *Species Diversity in Ecological Communities*. The University of Chicago Press, Chigaco, Illinois, USA and London, UK.

Boekschoten, G.J., and P.J. Sondaar. 1972. On the fossil mammalia of Cyprus. *Koninklijke Nederlandse Akademie Wetenschappen. Proceedings*, Ser. B, 75:306–338.

Bosch i lloret, A., J. Chinchilla Sanchez, and J. Tarrus i Galter, eds. 2000. *El Poblat lacustre neolitic de La Draga*: *excavacions de 1900 a 1998*. Monografies del GASC edition. Museu d'arqueologia de Catalunya, Centre d'arqueologia subaquàtica de Catalunya, Girona, Spain. 248 pp.

Bowler, J.M., H. Johnston, J.M. Olley, J.R. Prescott, R.G. Roberts, W. Shawcross, and N.A. Spooner. 2003. New ages for human occupation and climatic change at Lake Mungo, Australia. *Nature* 421:837–840.

Briois, F., B. Gratuze, and J. Guilaine. 1997. Obsidiennes du site néolithique précéramique de Shillourokambos (Chypre). *Paléorient* 23/1:95–112.

Broodbank, C., and T.F. Strasser. 1991. Migrant farmers and the Neolithic colonization of Crete. *Antiquity* 65:233–45.

Buchner, G. 1994. Pithecusae nell'VIII sec. a.C.: crocevia del mondo antico. Pages 13–25 *in* G. Buchner and C., Gialanella, eds., *Museo Archeologico di Pithecusae, Isola d'Ischia*. Ministero per i Beni Culturali e Ambientali/Istituto Poligrafico e Zecca dello Stato, Roma, Italia.

Burgio, E. 1997. Le attuali conoscenze sui mammiferi terrestri quaternary della Sicilia. Pages 62–71 *in* S. Tusa, ed., *Prima Sicvilia. Alle origini della società siciliana*. Regione Siciliana/Ediprint, Palermo, Italia.

Cameron, M.A.S. 1968. Unpublished Paintings from the "House of the Frescoes" at Knossos. *The Annual of the British School of Archaeology at Athens* 63:1–31.

Camps, G. 1988. *Préhistoire d'un île*. Editions Errance, Paris, France. 284 pp.

Cherry, J.F. 1979. our problems in Cycladic prehistory. Pages 22–47 *in* J.L. Davis and J.F. Cherry, eds., *Papers in Cycladic Prehistory*. University of California, Los Angeles, Institute of Archaeology, Monograph 14.

Cherry, J.F. 1981. Pattern and process in the earliest colonization of the Mediterranean islands. *Proceedings of the Prehistoric Society* 47:41–68.

Cherry, J.F. 1990. The first colonization of the Mediterranean islands: A review of recent research. *Journal of Mediterranean Archaeology* 3:145–221.

Cherry J.F. 1992. Palaeolithic Sardinians? Some Questions of Evidence and Method. Pages 28–39 *in* R.H. Tykot and T.E. Andrews, eds., *Sardinia in the Mediterranean: A Footprint in the Sea*. Sheffield Academic Press, Sheffield, UK.

Codino F. 1974. Introduzione. Pages vii–xxxiii *in* G. Tonna, ed., *Odissea*. Grazanti editore, Milano, Italia.

Costa, L.J., J.-D. Vigne, H. Bocherens, N. Desse-Berset, C. Heinz, F. de Lanfranchi, J. Magdeleine, M.-P. Ruas, S. Thiébault, and C. Tozzi. 2003. Early settlement on Tyrrhenian islands (8th millennium cal.

BC): Mesolithic adaptation to local resources in Corsica and Northern Sardinia. Pages 3–10 *in* L. Larsson, H. Kindgre, K. Knutsson, D. Loeffler, and A. Åkerlund, eds., *Mesolithic on the Mour* Proceedings of the International Conference UISPP, Meso2000; Stockholm, Sept. 2000. Oxbow Books, Oxford, UK.

Cucchi, T., and J.-D. Vigne. 2006. Origin and diffusion of the house mouse in the Mediterranean. *Human Evolution* 21(2):95–106.

De Juliis, E.M. 1998. I navigatori micenei. Pages 29–36 *in* R. Cassano, ed., *Andra per mare. Puglia e Mediterraneo tra mito e storia*. Consorzio IDRIA7Mario Adda Editore, Bari, Italia.

Dermitzakis, M.D., and P.Y. Sondaar. 1978. The importance of fossil mammals in reconstructing paleogeography with special reference to the Pleistocene Aegean archipelago. *Annales Géologiques des Pays Helléniques* 29:808–840.

Doumas, C. 1992. *The Wall-paintings of Thera*. The Thera Foundation Petros M. Nomikos, Athens, Greece. 191 pp.

Fedele, F. 1988. Malta: origini e sviluppo del popolamento preistorico. Pages 51–90 *in* A. Fradkin Anati and E. Anati, eds., *Missione a Malta.* Jaca Book, Milano, Italia.

Fugazzola Delpino, M.A. and M. Mineo. 1995. La piroga neolitica del lago di Bracciano ("La Marmotta 1"). *Bullettino di Paletnologia Italiana* 86:197–266.

Guilaine, J. 1994. La Mer Partagée. *La Méditerranée Avant l'Écriture* (*7000–2000 avant Jesus-Christ*). Hachette, Paris, France. 456 pp.

Guilaine, J., and A. Le Brun, eds. 2003. Le Néolithique de Chypre (Actes Coll. Int. Nicosie, 17–19 mai 2001). Vol. suppl. 43. *Bulletin de Correspondances Helleniques.* 232 pp.

Guilane, J., F. Briois, J. Coularou, J.-D. Vigne, and I. Carrére 1996. Shillourokambos et les debuts du Neolithique à Chypre. *Espacia, Tiempo y Forma, Serie I, Prehistoria y Arquelogia* 9:159–171.

Guilaine, J., F. Briois, J.-D. Vigne, and I. Carrére. 2000. Découverte d'un Néolithique précéramique ancien chypriote (fin 9°, début 8° millénaires cal. BC), apparenté au PPNB ancien/moyen du Levant nord. *Comptes Rendus de l'Academie Sciences de Paris, Sciences de la Terre et des Planèts* 330:75–82.

Hadjisterkotis, E., and B. Masala. 1995. Vertebrate extinction in Mediterranean islets: an example from Cyprus. *Biogeographia* 18(1996):691–699.

Hammer, C.U., H.B. Clausen, W.L. Friedrich, and H. Tauber. 1987. The Minoan eruption of Santorini in Greece dated to 1645 BC? *Nature* 328:517–518.

Heubeck, A. 1981. Interpretazione dell'Odissea. Pages vii–xlii *in* G.A. Privitera, ed., *Omero, Odissea*. Arnoldo Mondatori Editore, Milano, Italia.

Immerwahr S.A. 1990. Swallows and Dolphins at Akrotiri: Some Thoughs on the Relationship of Vase-Painting to Wall-Painting. Pages 237–244 *in* D.A. Hardy, ed., *Thera and the Aegean world III*, Vol. I The Thera Foundation, London, UK.

Jacobsen, T.W. 1976. 17.000 anni di preistoria greca. *Le Scienze* 98:68–81.

Jacobsen, T.W. 1993. Maritime mobility in the Prehistoric Aegean. Paper presented at the XXth Meeting on Maritime Archaeology, Nafplion, Greece. 23 pp.

James, P. 1991. *Centuries of Darkness*. Jonathan Cape, London, UK. 434 pp.

Johnstone, P. 1988. *The Sea-craft of Prehistory*. Routledge, London, UK and New York, New York, USA. 184 pp.

Karageorghis, V., and N.C. Stampolidis, eds. 1998. Eastern Mediterranean. Cyprus-Dodecanese-Crete. 16th–6th cent. B.C. University of Crete and the A.G. Leventis Foundation, Athens, Greece. 313 pp.

Kirk, G.S. 1980. Introduction. Pages vii–xx *in* W. Sherwing, ed., *Homer. The Odyssey*. Oxford University Press, Oxford, UK/New York, New York, USA.

Lattimore, R. 1991. *The Odyssey of Homer*. HarperCollins Publishers, New York, New York, USA. 374 pp.

Lax, E., and T.F. Strasser. 1992. Early Holocene Extinctions on Crete: The Search for the Cause. *Journal of Mediterranean Archaeology* 5(2):203–224.

Lewthaite, J. 1987. Three steps to leaven: applicazione del modello di disponibilità al Neolitico italiano. *Atti della XXVI Riun. Scient. I.I.P.P.* "*Il Neolitico in Italia*", Firenze, 7–10 November 1985:89–102.

MacArthur, R.H., and E.O. Wilson. 1967. *The Theory of Island Biogeography*. Princeton University Press, Princeton, New Jersey, USA. 203 pp.

Mannino, G. 2002. *Termini Imerese nella prehistoria*. Editrice GASM, Termini Imerese. 204 pp.

MARKETOU, T. 1998. Excavations at Trianda (Ialysos) on Rhodes: new evidence for the Late Bronze Age I period. *Rendiconti dell'Academia nazionale dei Lincei, Classe di scienze morali, storiche e filosofiche*, ser. 9, 9:39–82.

MARKETOU, T., 2006. Late Bronze Age IA/IB imitations of Cipriote ceramics. The evidence from Trianda (Ialysos). Pages 455–469 *in* E. Czerny, I. Hein, H. Hunger, D. Melman, and A. Schwab, eds., *Timelines. Studies in Honour of Manfred Bietak*, vol. II. *Orientalia Lovaniensia Analecta* 149.

MARINATOS, N. 1984. *Art and Religion in Thera. Reconstructing a Bronze Age Society*. D. and I. Mathioulakis, Athens, Greece. 128 pp.

MARINATOS, N. 1987. An Offering of Saffron to the Minoan Goddess of Nature: The Role of the Monkey and the Importance of Saffron. Pages 123–132 *in* T. Linders and G. Nordquist, eds., *Gifts to the God*. Proceedings of Uppsala Symposium 1985 (Boreas 15). *Acta Universitatis Uppsaliensis.*

MARINATOS, S. 1974. *Excavations at Thera VI* (*1872 season*). Athens, Greece. 60 pp.

MASSETI, M. 1980. Le scimmie azzurre. La fauna etiopica degli affreschi minoici di Santorino (Thera). *Mondo archeologico* 51:32–37.

MASSETI, M. 1984. Antilopi o gazzelle sugli affreschi di Akrotiri? *Archeologia Viva* 7/8:26–27.

MASSETI, M. 1992. Fauna insulare. Alle origini del mito. *Ali Natura* 3:54–59.

MASSETI, M. 1993. On the Pleistocene occurrence of *Elephas* (*Paleoloxodon*) *antiquus* in the Tuscan archipelago, Northern Tyrrhenian Sea (Italy). *Hystrix*, (n.s.), 5(1–2):101–105.

MASSETI, M. 1997. Representation of birds in Minoan art. *International Journal of Osteoarchaeology* 7:354–363.

MASSETI, M. 1998. Holocene endemic and anthropogenous wild animals of the Mediterranean islands. *Anthropozoologica* 28:3–20.

MASSETI, M., 2000. Did the study of ethology begin in Crete 4000 years ago? *Ethology Ecology and Evolution* 1(12):89–96.

MASSETI, M., 2001. Did endemic dwarf elephants survive on Mediterranean islands up to protohistorical times? Pages 402–406 *in* G. Cavaretta, P. Gioia, M. Mussi, and M.R. Palombo, eds., *Proceedings of the 1st International Congress "The Land of the Elephants"*. Università degli Studi di Roma "La Sapienza", Roma, Italia.

MASSETI, M. 2002a. *Uomini e* (*non solo*) *topi. Gli animali domestici e la fauna antropocora*. Università degli Studi di Firenze: Firenze University Press, Firenza, Italia. 337 pp.

MASSETI, M., 2002b. The non-flying terrestrial mammals of the Mediterranean islands: an example of the role of the biological invasion of alienm species in the homogenisation of biodiversity. *Contributions to the "Workshop on Invasive Alien Species on European Islands and Evolutionary Isolated Ecosystems and Group of Experts on Invasive Alien Species". Horta, Azores* (*Portugal*) (*10-12 October 2002*). Council of Europe, Strasbourg. T-PVS/IAS (2002) 2:4–6.

MASSETI, M., 2003a. Holocene endemic and non endemic mammals of the Aegean islands. *In* E. Kotjabopoulou, Y. Hamilakis, P. Halstead, C. Gamble, and P. Elefanti (a cura di): Zooarchaeology in Greece. Recent advances. *British School at Athens Studies* 9:47–57.

MASSETI, M., 2003b. Exploitation of fauna in the Near East during ancient historical times: observations on the mammalian species represented in Assyrian art. Pages 375–390 *in* C. Albore Livadie and F. Ortolani, eds., *Variazioni climatico-ambientali e impatto sull'uomo nell'area circum-mediterranea durante l'Olocene*. Centro Universitario Europeo per i Beni Culturali, Ravello. Edipuglia, Bari, Italia.

MASSETI, M., 2003c. Taxonomic and behavioural aspects of the representation of mammals in Aegean Bronze Age art.) *In* E. Kotjabopoulou, Y. Hamilakis, P. Halstead, C. Gamble, and P. Elefanti (a cura di): Zooarchaeology in Greece. Recent advances. *British School at Athens Studies* 9:267–275.

MASSETI, M., AND A. DARLAS. 1999. Pre-Neolithic man and other mammals on the Eastern Mediterranean islands. *Arkeos* 5:189–204.

MASSETI, M., AND P. MAZZA. 1996. Is there any paleontological "treatment" for the "insular syndrome"? *Vie Milieu* 46(3/4):355–363.

MASSETI, M., AND F. VIANELLO. 1991. Importazioni preistoriche di mammiferi alloctoni nelle isole del Mar Tirreno centro-settentrionale. *Rivista di Scienze Preistoriche* XLIII(1–2):275–292.

MORDANT, C., AND D. MORDANT. 1992. Noyen-sur-Seine: a Mesolithic waterside settlement. Pages 55–64 *in*

B. Coles, ed., *The Wetland Revolution in Prehistory*. Prehistoric Society Warp, Exeter, UK.

Niemeier, W.-D. 1998. The Minoans in the South-Eastern Aegean and Cyprus. Pages 29–45 *in* V. Karageorghis and N. Stampolidis, eds., *Eastern Mediterranean: Cyprus-Dodecanese-Crte 16th-6th cent. B.C.* University of Crete/A.G.Leventis Foundation, Athens, Greece.

Orliac, M. 1997. L'homme marin. Pages 39–53 *in* J.-D. Vigne, ed., *Îles. Vivre entre ciel et mer*. Éditions Nathan et Muséum national d'Histoire naturelle, Paris, France.

Papathanassopoulos, G. 1977. Early Helladic shipwreck at Dokos. *American Association of Archaeology* 9:17–23.

Patton, M. 1996. *Islands in Time*. Routledge, London, UK. 213 pp.

Payne, S. 1975. Faunal change at Franchthi Cave from 20,000 B.C. to 3,000 B.C. Pages 120–131 *in* A.T. Clason, ed., *Archaeozoological Studies*. North Holland Publishing, Amsterdam, Netherlands and New York, New York, USA.

Peltenburg, E., S. Colledge, P. Croft, A. Jackson, C. McCartney, and M.A. Murray. 2000. Agro-pastoralist colonization of Cyprus in the 10th millennium BP: initial assessments. *Antiquity* 74:844–853.

Pennacchioni, M. 1996. Correnti marine di superficie e navigazione durante il Neolitico. *Abstracts of the sections of the XIII International Congress of Prehistoric and Protohistoric Sciences*. Abaco, Forlì: 257–258.

Perlès, C. 1979. Des navigateurs méditerranéens il y a 10,000 ans. *La Recherche* 10:82–83.

Perlès, C. 2001. *The Early Neolithic in Greece. The First Farming Communities in Europe*. Cambridge University Press, New York, New York, USA. 356 pp.

Pulak, C. 1996. A Dendrochronological Dating of the *Uluburun* Ship. *INA Quarterly* 23:12–13.

Pulak, C. 1997. The *Uluburun* shipwreck. Pages 233–262 *in* S. Swiny, R.L. Holfelder, and H.W. Swiny, eds., *Res Maritimae: Cyprus and the Eastern Mediterranean from Prehistory to Late Antiquity* (Nicosia, Cyprus 18–21 October 1994). ASOR Archaeological Reports 4.

Rackham, O., and J. Moody. 1996. *The Making of the Cretan Landscape*. Manchester University Press, Manchester, UK and New York, New York, USA. 237 pp.

Ramis, D., J.A. Alcover, J. Coll, and M. Trias. 2002. The Chronology of the first settlement of the Balearic Islands. *Journal of Mediterranean Archaeology* 15:3–24.

Renfrew, C., and A.A. Aspinall. 1990. Aegean obsidian and Franchthi Cave, Pages 257–270 *in* C. Perlès, ed, *Les Industries Lithiques Tailées de Franchthi* (*Argolide, Grèce*), Tome 2. *Les industries lithiques du Mésolithique et du Néolithique initial*. Indiana University Press, Bloomington and Indianapolis, Indiana, USA.

Shackleton, J.C., T.H. Van Andel, and C.N. Runnels. 1984. Costal Palaeogeography of the Central and Western Mediterranean during the last 125,000 years and its Archaeological Implications. *Journal of Field Archaeology* 11:307–314.

Schüle W. 1993. Mammals, vegetation and the initial human settlement for the Mediterranean islands: a palaeontological approach. *Journal of Biogeograhy* 20:399–412.

Simmons, A.H. 1988. Extinct pygmy hippopotamus and early man in Cyprus. *Nature* 333:554–557.

Simmons, A.H. 1989. Preliminary report on the 1988 season at Akrotiri *Aetokremnos*, Cyprus. *Reports of the Department of Antiquities, Cyprus* 1989:1–5.

Simmons, A.H. 1991. Humans, island colonization and Pleistocene extinctions in the Mediterranean: the view from Akrotiri *Aetokremnos*, Cyprus. *Antiquity*, 249:857–869.

Simmons, A.H., ed. 1999. *Faunal Extinction in an Island Society. Pygmy Hippopotamus Hunters of Cyprus*. Klumer Academic/Plenum publishers, New York, New York, USA. 384 pp.

Stampolidis, N.C., A. Karetsou, and A. Kanta, eds. 1998. *Eastern Mediterranean. Cyprus-Dodecanese-Crete. 16th-6th cent. B.C*. University of Crete/Ministry of Culture, XXIII EPCA, Heraklion, Greece. 178 pp.

Stathopoulou, E.T., and G.E. Theodorou. 2001. Observations on the diagenesis of dwarf elephant skeletal remains from the island of Tilos (Dodekanese, Greece). Pages 557–562 *in* G. Cavaretta, P. Gioia, M. Mussi, and M.R. Palombo, eds., *Proceedings of the 1st International Congress "The Land of the Elephants"*. Università degli Studi di Roma "La Sapienza", Roma, Italia.

Stucchi, S. 1976. Il Giardino delle Esperidi e le tappe della conoscenza greca della costa cirenaica. *Quaderni di Archeologia lybica* 8:115–147.

Symeonidis, N.K 1972. Die Entdeckung von Zwergelefanten in der Höhle "Charkadio" auf der Insel Tilos

(Dodekanes, Griechenland). *Annales géologiques des pays hélleniques* 24:445–461.

SYMEONIDIS, N.K., F. BACHMAYER, AND H. ZAPFE. 1973. Grabungen in der Zwergelefanten-Höhle Charkadio auf der Insel Tilos (Dodekanes, Griechenland). *Annalen des Naturhistorisches Museum in Wien* 77:133–139.

SYMEONIDIS, N.K., AND G.E. THEODOROU. 1981. New findings of fossil elephants on Crete island. *Annales géologique des pays helléniques* 31:113–129.

TELEVANTOU, C.A. 1990. New Light on the West House Wall-Paintings. *TAW III* 1:309–326.

THEODOROU, G.E. 1983. *Die fossilen Zwergelefanetn der Höhle "Charkadio" auf der Insel Tilos, Dodekanes*. Dissertation. University of Athens, Athens, Greece. 231 pp.

THEODOROU, G.E. 1988. Environmental factors affecting the evolution of island endemics: the Tilos example from Greece. *Modern Geology* 13:183–188.

THEODOROU, G.E., AND K. AGIADI. 2001. Observations on the microstructure of fossil tusks from the Charkadio cave (Tilos, Dodekanese, Greece). Pages 563–567 *in* G. Cavaretta, P. Gioia, M. Mussi, and M.R. Palombo, eds., *Proceedings of the 1st International Congress* "*The Land of the Elephants*". Università degli Studi di Roma "La Sapienza", Roma, Italia.

THEODOROU, G.E., AND N.K. SYMEONIDIS. 2001. The excavations of the last ten years at Charkadio cave on Tilos island, Dodekanese, Greece. Pages 514–518 *in* G. Cavaretta, P. Gioia, M. Mussi, and M.R. Palombo, eds., *Proceedings of the 1st International Congress* "*The Land of the Elephants*". Università degli Studi di Roma "La Sapienza", Roma, Italia.

THEODOROU, G.E., AND N.K. SYMEONIDIS, AND E. STATHOPOULOU. 2007. *Elephas tiliensis* n. sp. from Tilos Island (Dodecanese, Greece). *Hellenic Journal of Geosciences* 42:19–32.

TOZZI, C. 1996. L'abri prénéolithique de Porto Leccio (Sardaigne septentrionale). Actes des 3e journées universitaires corses de Nice (19–20 mai 1995), Université de Nice 1996:11–16.

TRANTALIDOU, K. 2000. Animal bones and animal representations at late Bronze Age Akrotiri. Pages 709–734 *in* S. Sherratt, ed., *The Wall Paintings of Thera*. Thera Foundations-Petros M. Nomikos and The Thera Foundation, Athens, Greece.

TZALAS, H. 1995. On the obsidian trail. With a papyrus craft in the Cyclades. Pages 441–469 in *Trophis III. 3rd International Symposium on Ship Construction in Antiquity, Athens 1989*. Hellenic Institute for the Preservation of Nautical Traditions, Athens, Greece.

UERPMANN, H.-P. 1979. *Probleme des Neolithisierung des Mittelmeersraumen.* Beihefte Tübingen Atlas Vorderes Orient Reihe. B28. Reichert, Wiesbaden, Germany. 184 pp.

VAN ANDEL, T.H. 1989. Late Quaternary Sea-Level Changes and Archaeology. *Antiquity* 63:733–745.

VAN ANDEL, T.H. 1990. Addendum to "Late Quaternary Sea-Level Changes and Archaeology". *Antiquity* 64:151–152.

VANSCHOONWINKEL, J. 1990. Animal Representations in Theran and Other Aegean Arts. Pages 252–266 *in* D.A. Hardy, ed., *Thera and the Aegean World III*. The Thera Foundation, London, UK.

VANSCHOONWINKEL, J. 1996. Les Animaux dans l'art minoen. Pages 351–412 *in* D.S. Reese, ed., *Pleistocene and Holocene Fauna of Crete and Its First Settlers*. Prehistory Press, Madison, Wisconsin, USA.

VAUFREY, R. 1929. Les elephants nains des Iles Mediterraneennes et al question des isthmes pleistocenes. *Archives de l'Institut de Paleontologie Humaine, Memoire* 6:1–220.

VIGNE, J.-D. 1999. The large "true" Mediterranean as a model for the Holocene human impact on the European vertebrate fauna? Recent data and new reflections. Pages 295–322 *in* N. Benecke, ed., *The Holocene History of the European Vertebrate Fauna. Modern Aspects of Research* (Workshop, 6th–9th April 1998, Berlin). Deutsches Archaologisches Institut, Eurasian-Abteilung, Berlin, Germany.

VIGNE, J.-D. 2000. Les chasseurs préhistoriques dans les îles méditerranéennes. *Pour la Science* Dossier Hors-Série, "la valse des espèces":132–137.

VIGNE, J.D., AND H. BUITENHUIS. 1999. Les premiers pas de la domestication animale à l'Ouest de l'Euphrate: Chypre et l'Anatolie centrale. *Paléorient* 25:49–62.

VIGNE, J.-D., AND T. CUCCHI. 2005. Premières navigations au Proche-Orient: les informations indirectes de Chypre. *Paléorient* 31:195–204.

VIGNE, J.-D., AND N. DESSE-BERSET. 1995. The exploitation of animal resources in the Mediterranean Islands during the Pre-Neolithic: the example of Corsica. Pages 309–318 *in* A. Fischer, ed., *Man and Sea in the*

Mesolithic. Oxbow Books, Oxford, UK.

VIGNE, J.-D., V. BOURDILLAT, J. ANDRÉ, J.E. BROCHIER, B.T. MAI, J. CUISIN, H. DAVID, N. DESSE-BERSET, C. HEINZ, F. DE LANFRANCHI, M.-P. RUAS, S. THIÉBAULT, AND C. TOZZI. 1996. Nouvelles données sur le Prénéolithique corse: premiers résultats de la fouille de l'abri du Monte Leone (Bonifacio, Corse-du-sud). Production et identité culturelle. Actualité de la recherche. *Rencontre méridionales de la préhistoire récente., Antibes* 1996:251–260.

VIGNE, J.-D., I. CARRERE, J.F. SALIEGE, A. PERSON, H. BOCHERENS, J. GUILAINE, AND F. BRIOIS. 2000. Predomestic cattle, sheep, goat and pig dring the late 9th and the 8th millenium cal. BC on Cyprus: preliminary results of Shillourokombos (Parekklisha, Limassol). Pages 52–75 *in* M. Mashkour, A.M. Choyke, and H. Buitenhuis, eds., *Archaeozoology of the Near East IV roc. 4th International Symposium on the Archaeozoology of Southwestern Asia and Adjacent Areas* (*ASWA. Paris juin 1998*). Archaeological Research and Consultancy (Publicaties 32), Groningen, Netherlands.

VINTON KIRCH, P. 1997. *The Lapita peoples. Ancestors of the Oceanic World. The Peoples of South-East Asia and The Pacific*. Blackwell, Oxford, UK. 348 pp.

VIVIAN DAVIES, W., AND L. SCHOFIELD, EDS. 1995. *Egypt, the Aegean and the Levant. Interconnections in the Second Millennium BC*. The Trustees of the British Museum, London, UK. 156 pp., 32 pls.

WARREN, P. 1995. Minoan Crete and pharaonic Egypt. Pages 1–18 *in* W. Vivian Davies and L. Schofield, eds., *Egypt, the Aegean and the Levant, Interconnections in the Second Millennium BC*. The Trustees of the British Museum, London, UK.

WILLCOX, . 2001. Présence des céréales dans le Néolithique précéramique de Shillourokombos à Chypre: résultats de campagne 1999. *Paléorient* 26.1:129–135.

YANNOULI, E., AND K. TRANTALIDOU. 1999. The fallow deer (*Dama dama* Linnaeus, 1758): Archaeological presence and representation in Greece. Pages 247–281 *in* N. Benecke, ed., *The Holocene History of the European Vertebrate Fauna. Modern Aspects of Research*. Verlag Marie Leidorf GmbH, Rahden/Westf., Germany.