# Chapter 18
# Archaeological, Linguistic and Historical Sources on Ancient Seafaring: A Multidisciplinary Approach to the Study of Early Maritime Contact and Exchange in the Arabian Peninsula

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## Introduction

The Arabian subcontinent sits at a critical juncture in the Old World, surrounded to the west, north and east respectively by the African landmass, the Levant (with the European world beyond it), and the Asian continent. While its ancient and historical development has certainly been shaped by this positioning relative to the great continents, however, Arabia is equally defined by its near circumspection by the sea, which wraps itself around some 80% of its perimeter, and has served as both barrier and bridge to the surrounding regions since the emergence of modern humans out of Africa at ca. 80–60 ka (Petraglia and Alsharekh, 2003; Petraglia et al., 2007; Bailey, 2009). An increasing weight of evidence suggests that the three main bodies of water that surround Arabia – the Red Sea, the Persian Gulf and the Arabian Sea – not only offered a rich resource base for thousands of years of human occupation in the subcontinent, but also witnessed some of the world's earliest seafaring and maritime exchange activities. Evidence for maritime contact over long distances is for this arena also amongst the oldest in the world. At the same time, the sea has also sometimes served to distance Arabia from her neighbors, helping to shape a distinctive trajectory within the subcontinent.

The Arabian peninsula's unique maritime position and relationship with the sea obviously deserve close investigation. And in the past few decades, research into Arabia's prehistoric and subsequent maritime activities and seafaring contact with other regions has certainly intensified. While it is true that evidence for many relevant areas remains patchy – for example, for much of the littoral region of the Red Sea, for the Horn of Africa, for significant parts of the southern Arabian peninsular coast, and for the littoral regions of Iran and Pakistan – it is also true that many inroads have been made, particularly on the Arabian side of the Gulf and the Gulf of Oman, in recent years. Increasing evidence from inland regions of the subcontinent also adds to the emerging picture. What still remains to be done, however, is to examine the diverse early maritime activities evident in different parts of the subcontinent and its neighboring regions, and to link them together into a syncretic framework – to examine Arabia and its developments as part of the wider pre- and protohistory of the Arabian Sea. The regional specialization that has to some degree prevented such a development is of course understandable in light of the detailed and intensive research still required in many of these understudied regions. But the paucity of studies on the subcontinent's overall maritime development is likely also a reflection of a general terrestrial bias that often precludes the kind of maritime-oriented analysis that led Braudel so successfully to link diverse regions through a study of the people of the Mediterranean Sea (Braudel, 1995).

While many challenges face any attempt to create a pre- and protohistory of the northern Arabian Sea at this point in time, we nonetheless feel that such an enterprise is now essential. It is required if scholars are to endeavor to appreciate better the important and diverse roles of maritime activities in human societies (Erlandson, 2001; Cooney, 2003; Bailey, 2004). It is also necessary if researchers are going to properly resolve the question of how some very long distance biological, material, and linguistic translocations in the prehistoric Indian Ocean actually transpired (e.g., Meyer et al., 1991; Blench, 1996, 2003; Mbida et al., 2000; Fuller,

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2003a; Magnavita, 2006; Zeder, 2006; Adelaar, 2009; Cleuziou and Tosi, 1989, 2007; Sauer, 1952). Arabia has undoubtedly long been a key maritime player in the Old World and in the Arabian Sea in particular. This role is clear from Pre-classical times, when the "Incense Road" connected Egypt and the Levant to western Arabia (Yemen), and the Sabaean Lane placed Arabia at the heart of a network of Indian Ocean trade routes (Groom, 2002). Such trade links were well-established and travelled by the time that Greco-Roman sailors began to add their own vessels to the Indian Ocean network in the last centuries BC, as recorded in the first century AD *Periplus Maris Erythraei* (Miller, 1968; Casson, 1989; Ray, 1998; Cappers, 2006). Many maritime routes of trade and contact had significant antiquity by the time they were recorded in Classical sources, and Arabia's position as a central node within them makes detailed consideration of its prehistoric, proto-historic and Classical period maritime activities, contacts, exchange links and trade networks essential.

In this chapter we will look at the emergence and intensification of Arabia's maritime orientation, and summarize a chronology for maritime development across the peninsula as a whole. In doing so, we will develop a number of key themes, having to do with trade, the spread of domesticates, and also contact between ethnolinguistic communities in the Arabian region. We will consider the development of Arabian maritime activity through a number of phases, starting in the Early to Mid-Holocene period with evidence for the first intensively coastally focused communities and the beginnings of maritime trade and seafaring. We will then address the emergence of the first state-level societies in the region, and the role played by Arabian communities in the expansion and intensification of maritime trade during the early Bronze Age, and subsequently the shifts in contact and trade patterns that take place in the middle then late Bronze Age and early Iron Age. We will also address the dispersal of domesticates into the Arabian subcontinent, focusing in particular on those that were likely introduced wholly or partly by sea routes, and their implications for our understanding of maritime activities and patterns of contact. Finally, we also turn to the evidence of language, both in Classical texts and in the present-day distribution of languages in and around the subcontinent. We thus take a multidisciplinary approach, that draws together archaeology with the findings of the archaeological and environmental sciences, Classical studies and historical linguistics.

One of the other key themes that will constitute a focus here is the role of small-scale societies in both the emergence of maritime contact and exchange, and the later more systematic and regular Bronze Age trade that developed in the Red Sea, the Gulf and the Arabian Sea. There has been, as Mark Horton has observed, not only a tendency to focus on textual evidence for trade in the Indian Ocean, but also a marked bias towards looking at the trade activities of the larger, state-level societies (Horton, 1997). This is perhaps understandable in light of the generally broader variety of evidence ancient states are able to bring to the table – not only historical records, but also greater concentrations of goods, better preservation, depictions of maritime activities in art and iconography, and both longer-term and larger-scale excavation all contribute to a greater wealth of evidence. As we will aim to show, however, there is increasing evidence for both local processes and indigenous communities in early maritime contact and exchange – including contact over long distances.

As researchers whose regional foci have been on the regions adjacent to Arabia – Africa and the Indian subcontinent[1] – our interest in Arabia was initially driven by the need to know more about what separated these two areas, within the context of a wider study into prehistoric patterns of trade and contact in the Indian Ocean. It has rapidly become obvious to each of us that Arabia has a fascinating record that is interesting not just for what it can tell us about wider Indian Ocean connections and exchange patterns, but also for its own sake. We wish to acknowledge the myriad of researchers whose studies we have drawn upon here, and in particular the important syntheses of Cleuziou and Tosi (1989 and 2007) and Potts (1990). We also emphasize that what we have outlined here should be considered a preliminary sketch whose details – and in some cases even broad outlines – will need subsequent further working out. A general comparative chronology for the Arabian peninsula and adjacent regions, which may offer useful reference to the reader is provided in Fig. 1[2]. This provides a summary of the various cultural phases by region for a significant part of the Old World, and indicates the wide geographical and chronological scale at which we have considered Arabia's ancient maritime past in this chapter.

## Physical Geography and Paleoecology

Geography is always a key element in the internal evolution and external relations of past societies. As a peninsula with water on three sides, that is separated by the vast Arabian

[1]Details of this work can be found in published articles by Boivin, Fuller and Blench (e.g., Blench, 1996, 1997, 1999, 2003, 2006, 2007b; Fuller, 1998, 1999, 2002, 2003a, 2004, 2005, 2006, 2007b; Blench and MacDonald, 2000; Boivin, 2000, 2004a, 2004b, 2007; Boivin et al., 2007, 2008; Fuller et al., 2001, 2007).

[2]A generally accepted chronological framework remains to be achieved (note the absence of a chart in reviews by Potts, 1990, 1997), and thorough review of the radiometric evidence for the Arabian peninsula is beyond the scope of the present chapter. As noted by Cleuziou (2002) there are chronological discrepancies that derive from matching radiocarbon evidence with historical chronologies, and for the latter there are both short and long chronologies that must be contended with.

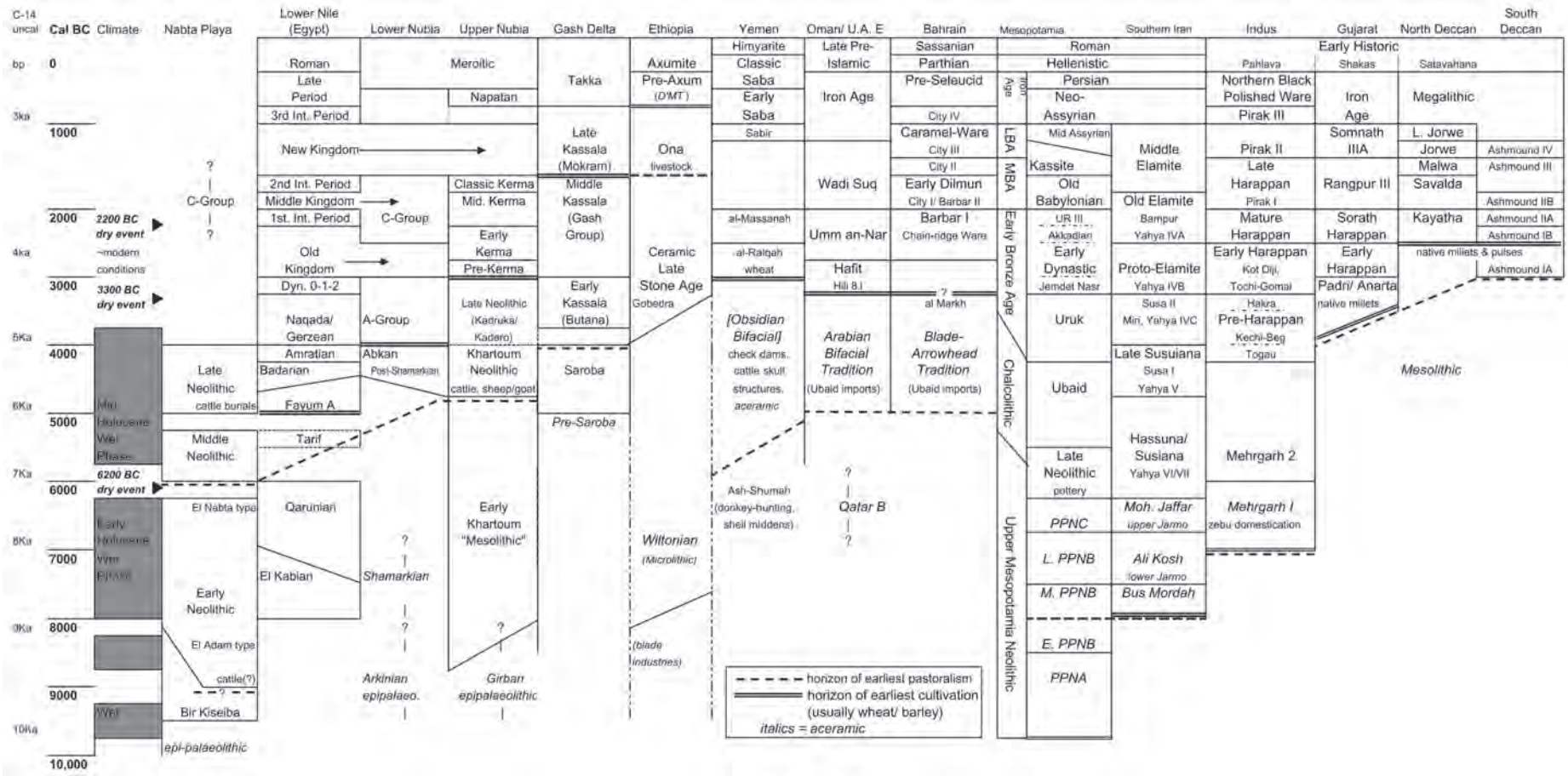


**Fig. 1** A general comparative chronology for the Arabian peninsula and adjacent regions. Inferred horizons for the beginnings of pastoralism and plant cultivation are indicated. Divisions between phases and correlations are approximate only; the precise chronology in many regions is open for debate

desert from the populous lands of the 'Fertile Crescent' to the north, including Mesopotamia and the Levant, it is perhaps unsurprising that Arabia should have developed a maritime focus. Another key geographical factor that also impacted the emergence of cultural and maritime patterns in the peninsula is the distribution, both spatially and seasonally, of fresh water, informed by monsoon rainfall patterns, topography and the distribution of rivers and springs.

The wind patterns and currents that are in large part driven by the Indian Ocean monsoon cycle are critical to the issue of maritime contact and trade in the Arabian Sea. In general terms, the Indian Ocean monsoon phenomenon is the result of the differential warming of air over land and sea (Webster and Yang, 1992; Schott and McCreary, 2001; Mitchell, 2005). In the northern summer, from June to September, land warms faster than the ocean, causing Eurasian continental air masses to rise. This creates a low pressure zone, that results in a steady wind blowing toward the land, bringing the moist near-surface air over the oceans with it. The Earth's axial rotation deflects this air such that it blows from the southwest. In the winter, the situation reverses, and the wind blows from the northeast (retreating monsoon). The result is that sailors aware of this consistent pattern could use the monsoon winds to propel their ships from the Red Sea eastwards in the Indian Ocean in the summer, and then back again in the winter. Pliny, in his *Natural History*, described how sailors exploited this pattern of winds in his description of the spice trade (Miller, 1968).

In general, surface water currents reflect those of wind direction, and the broad patterns are highlighted in Fig. 2. Intimately connected to the monsoon is the Somali current, which carries water north and east along the Somali coast in summer, and reverses this current in the winter. As the Arabian peninsula became part of ever wider interaction zones, the main east–west Indian Ocean currents that reversed direction every 6 months became increasingly relevant by enabling return voyages between Africa/Yemen and India or Southeast Asia beyond. Monsoon currents also cause regions of coastal ocean upwelling (Fig. 2), making certain coastal areas biotically rich, and providing for rich fishing. These are focused near the tip of the Horn of Africa, and along the eastern Yemeni and Omani coasts (Schott and McCreary, 2001: Fig. 8).

In the Red Sea, the wind pattern divides the sea into two main zones, making it very easy to sail out of the Red Sea southwards for most of the year, and correspondingly difficult to sail northwards up it (Facey, 2004). Journeys north of the line roughly between modern-day Jiddah and Aydhab would have been both dangerous and tedious, and it is this fact that likely led to the gradual southward creep of many Red Sea ports over time. Thus the Romans developed the ports of Myos Hormos and Berenice, both quite a way down

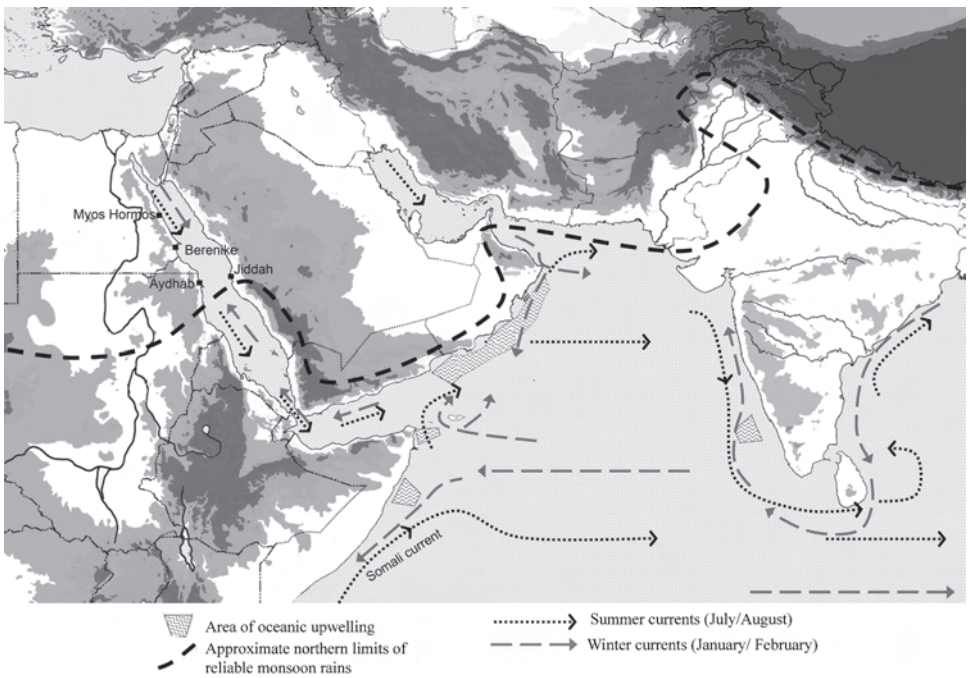


**Fig. 2** Arabian peninsula, wind patterns, and broad climatic division of monsoonal region. *Arrows* indicate the major current directions in the summer (*black dotted lines*) and winter (*grey long dashed lines*) (based on Schott and McCreary, 2001; Facey, 2004; Mitchell, 2005). Major summer ocean upwelling regions indicated. Approximate northern limited of significant monsoon rainfall, in which some summer dry cropping is possible, indicated by *thick black dashed line*

the coast from Suez and served by well-maintained routes from the Nile Valley as a means to get around these challenging winds (Facey, 2004: 11).

Rivers are also important from the point of view of how they structure the distribution of neighboring foci of civilization. As observed by Facey (2004), major rivers with associated civilizations (i.e., the Indus and Mesopotamia) flowed into the Gulf, giving these civilizations a more immediate and direct orientation toward the Arabian Sea. By contrast, Egypt and the highland civilization of Ethiopia were separated from the sea by hills and desert, as the Blue Nile and Lower Nile flowed northwards to the Mediterranean. River systems have also been important for enabling the spread of crops. Thus, as we discuss later, boats bringing crops from Africa eastwards would have found riverine communities of farmers ready to try new seeds in South Asia, whereas farming on the northeast African coast was focused on rivers far inland. This contrast may in part help to explain why there seem to have been many more crops that spread early on from Africa and became established in South Asia, rather than vice-versa (Blench, 2003).

Human occupation and maritime activity on the Arabian peninsula have also been shaped by climatic and ecological change. In particular, monsoon intensity has changed in the past, altering summer insolation over Eurasia, linked to orbital precession (Kutzbach, 1981; Ruddiman, 2006). Useful datasets from which to infer climatic changes come from lakes and paleolakes in Arabia and the Qunf Cave stalagmite in southwest Oman (Lézine et al., 1998, 2007; Fleitman et al., 2003; Parker et al., 2004, 2006a, 2006b). These in turn can be correlated with the general patterns recorded in East African lakes (Gasse, 2000), the Eastern Sahara (Hassan, 1997), lakes in the Thar Desert in northwestern India, and Arabian sea sediments that relate to the Indus river discharge (for a recent review of these and other South Asian datasets, see Madella and Fuller, 2006). The correlations between a selection of these sources are shown in Fig. 3, and the location of the sites are plotted in Fig. 4. In broad terms, we see that after the return to glacial-like conditions during the Younger Dryas, during which time deserts were drier, the Early and Middle Holocene period was characterised by higher water/rainfall levels from ca. 9000 BC to 2500 BC, although this was punctuated by numerous dry episodes. The impact of higher rainfall would have been most dramatic in the desert and semi-desert regions, like those in the Sahara and most of the Arabian peninsula. In the Eastern Sahara, for example, increases in rainfall of 150–200 mm, linked to northward shifts in latitudinal vegetation belts of as much as 600 km, are inferred (Neumann, 1989; Hassan, 1997). This increase shifted the transition from savannah to desert (the boundary of monsoon climate, as indicated in Fig. 2) from the central Sudan to southwestern Egypt, allowing colonization of the southern Sahara by groups of hunter-gatherer-fishers of the early ceramic horizon. Similar changes occurred in Arabia, with evidence for human settlement associated with paleolakes of inner Arabia (McClure, 1976; Masry, 1997; Lézine et al., 1998), and rich settlement evidence associated with the wadi systems of interior Yemen, such as Wadi Sana (McCorriston and Martin, 2009). The richer vegetation of the semi-desert and savannah interior of Early to Mid-Holocene Arabia supported a more diverse and extensive fauna that could in turn support hunters, as well as good habitat for cattle and caprine herding, which began sometime after 6000 BC (see below).

Nevertheless, the Early and Mid Holocene were punctuated by dry episodes when the desert would have expanded. The first focused on ca. 6800 BC, and is particularly marked in the Al-Hawa data from Yemen (see Fig. 3). This arid event appears merged with the later dry event of 6200–6000 BC in the East Africa datasets, but it is clear from the Thar and Arabian evidence that there was a recovery of rainfall in between. The major dry episode of 6200–6000 BC now appears to have been a more or less global climatic event, reflected also in the Greenland ice-cores, as well as East African and South Asian datasets (Alley et al., 1997; Gasse, 2000; Alley and Ágústdóttir, 2005; Madella and Fuller, 2006; Kobashi et al., 2007). In the Al-Hawa data, for example, lower lake levels are reached closer to 5900 BC, a time when Hassan (1997) infers a peak in aridity for the Egyptian desert. There seems little basis to conclude, as Potts (2008) does, that Arabia was significantly more attractive for human settlement than the Levant or Mesopotamia during this arid interval.

During the subsequent mid-Holocene there were additional dry episodes, in particular at 4300 BC, perhaps 3300/3200 BC and the late third millennium (the 2200 BC event). Of particular relevance to eastern Arabia is a more localized dry phase from 3800 BC. Evidence from northern Oman, United Arab Emirates and the An-Nafud region beginning around this time suggests a particularly marked period of aridity and decline in settlement evidence, which has been called the "Dark Millennium" (Uerpmann, 2003). This period was first postulated on the basis of the poor evidence for human occupation, except for a few seasonal coastal sites, during this post-Ubaid period (Potts, 1993; Uerpmann, 2003). The recent paleoenvironmental reconstruction from the Awafi paleolake in United Arab Emirates indicates two peaks in aridity, at ca. 3900 BC and 3200 BC (Parker et al., 2006). While these downward trends are evident in the Qunf speleothem (see Fig. 3), it is also clear that this period is not recorded as arid further afield in East Africa or South Asia, nor probably in southwest Arabia. The impact of vegetation in eastern Arabia is suggested by first a sharp decline in woody vegetation followed by its near disappearance, as inferred from Awafi phytoliths ratios (Parker et al. 2004). The absence of paleolake stands in An-Nafud at this

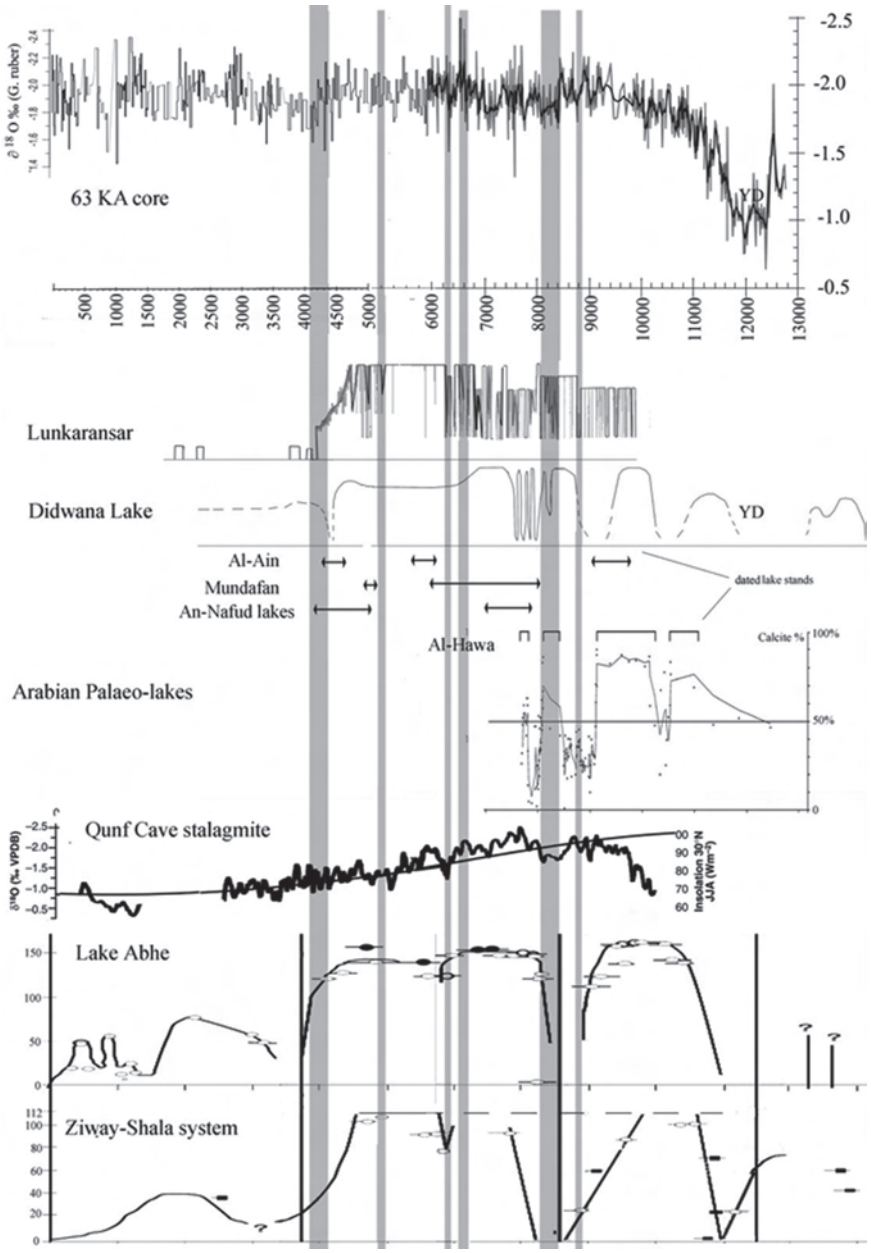


**Fig. 3** Correlation of paleoclimatic proxies for the Arabian peninsula, northwestern South Asia and East Africa. From *top* to *bottom*: O-18 isotopic variation from Pakistan continental margin, core 63 KA (after Staubwasser et al., 2002, 2003); lake level data from Lunkaransar (after Enzel et al., 1999); lake levels from Didwana lake (after Wasson et al., 1984); dated high lake stands from selected Arabian paleolakes (after Lézine et al., 1998); lake level proxy calcite data from Al-Hawa paleolake, Yemen (after Lézine et al., 2007); O-18 isotopic record from the Qunf Cave stalagmite (after Fleitman et al., 2003); lake level data from Abhe and Ziway Shala in Ethiopia (after Gasse, 2000)

time suggests aridity was particularly marked in northern and eastern Arabia.

Agriculture and thus much Holocene occupation in the Arabian peninsula has been shaped by environmental and hydrological conditions. For most of the peninsula, rainfall has been insufficient to support agriculture directly. However, subsurface water reservoirs (aquifers), which are slowly topped up by rains, provide water at natural seepages, which form oases, and can be tapped by wells (Edens, 1993; Blau, 1999). Much traditional oasis agriculture is thus based on tapping these below ground sources, and advances in the methods for doing so have been important to the development of agriculture in the subcontinent. Of particular importance was the development of *falaj* (or *qanat*) irrigation systems by the early Iron Age (see discussion below). In some mountain areas, however, sufficient water can be derived from run-off of the limited rains, derived from the summer monsoon. Thus two regimes, of aquifers and run-off, define

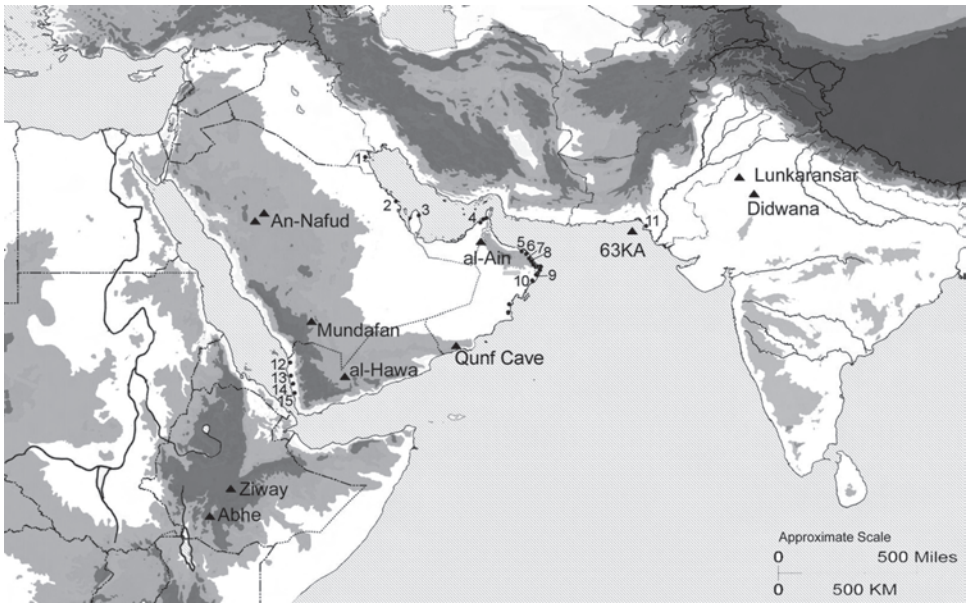


**Fig. 4** Map showing the distribution of major paleoclimatic datasets discussed in the text (indicated by *triangles*; see also Fig. 3, above), and the general distribution of Mid-Holocene shell midden sites (indicated by *circles*). Sites with chronometric evidence (see Fig. 5) are numbered: 1. H3; Kuwait; 2. Dosariyah, Saudi Arabia; 3. Khor D & Khor FB, Qatar; 4. ar-Ramlah 6 (RA 6), UAE; 5. Ras al-Hamrah sites and Saruq, Oman; 6. Wadi Wuttaya (WW), Oman; 7. Bandar Khayran, Oman; 8. Daghmar, Oman; 9. Suwayh (SWY-11), Oman; 10. SAQ-1, Oman; 11. Daun-1, Pakistan; 12. Jizan area shell middens; 13. Wadi Sardud; 14. Hodeidah area shell middens; 15. Ash-Shumah, Yemen

the potential centers of agriculture in Arabia. In the Gulf, the two Bronze Age civilizations can be related to development of each of these (Edens, 1993), with *Dilmun* (Bahrain and adjacent) focused on aquifers and oases, while *Magan* (Oman and adjacent) drew upon run-off. The proximity of these centers of potential agriculture to the Gulf may help to account for the early extensive development of maritime trade along the eastern peninsular littoral. Meanwhile, in interior Yemen, zones of both these types were important in the economy of the classic Sabaean civilization (Robin, 2002; Wilkinson, 2002). However, in contrast to the situation the Gulf side, in Yemen these agricultural zones were on the inside of the mountains, oriented towards the desert.

In addition to seeing important climatic alterations, the Early and Mid-Holocene was also a period of major coastline change, with sea levels rising at the end of the Late Pleistocene glacial melt. In the relatively shallow Gulf, sea-level rise had dramatic consequences (Lambeck, 1996), with sea-levels reaching modern levels at 5400 BC, and their highest point at 5000 BC, creating what we now recognize as the Gulf (see Fig. 5). Rising sea levels had less impact on the Red Sea, which is based on a much deeper rift (part of the African rift valley tectonic fault complex). From the point of view of human populations in Arabia, the rising sea-levels, which subsequently fell slightly over the mid-Holocene, together with the aridification of the inland deserts, meant that populations would have become increasingly restricted to a narrow coastal zone near the modern coastline. Sea level rise can also be expected to have had a taphonomic effect on sites (Bailey, 2004). It may explain why evidence is basically lacking for coastal occupation in the Pleistocene and Early Holocene prior to the dry event of ca. 6200–6000 BC. Other taphonomic factors active in the Arabian Sea and its subsidiary water bodies include coastal sedimentation, river shift, Late Holocene sea level fall, erosion, and tectonic activity (Shroder, 1993; Chandramohan et al., 2001; Mathur et al., 2004; Sanil Kumar et al., 2006; Gaur and Sundaresh, 2007; Shajan et al., 2008).

## The First Ichthyophagi and the Emergence of Seafaring

The earliest evidence for maritime activity in the Arabian peninsula occurs in the form of shell middens, which appear roughly simultaneously at sites around the peninsular littoral in the seventh millennium BC (Fig. 5), and indicate the presence of 'Ichthyophagi' (primitive 'Fish-Eaters', as described in Classical sources like the *Periplus of the Erythraean Sea* [see also Biagi et al., 1984; Horton, 1997; Beech, 2004]). Shell midden and coastal sites like Suwayh (SWY-11) and Wati Wuttaya (WW), an inland site with shells, both in the Gulf of Oman, have dates that calibrate back to 5900 BC (Biagi, 1994, 2006; Biagi and Nisbet, 2006). Sites like Ras al-Hamra (RH-7) and Dosariyah, in Saudi Arabia, begin in the mid sixth millennium BC, suggesting a later emergence for maritime exploitation to the north. These eastern littoral

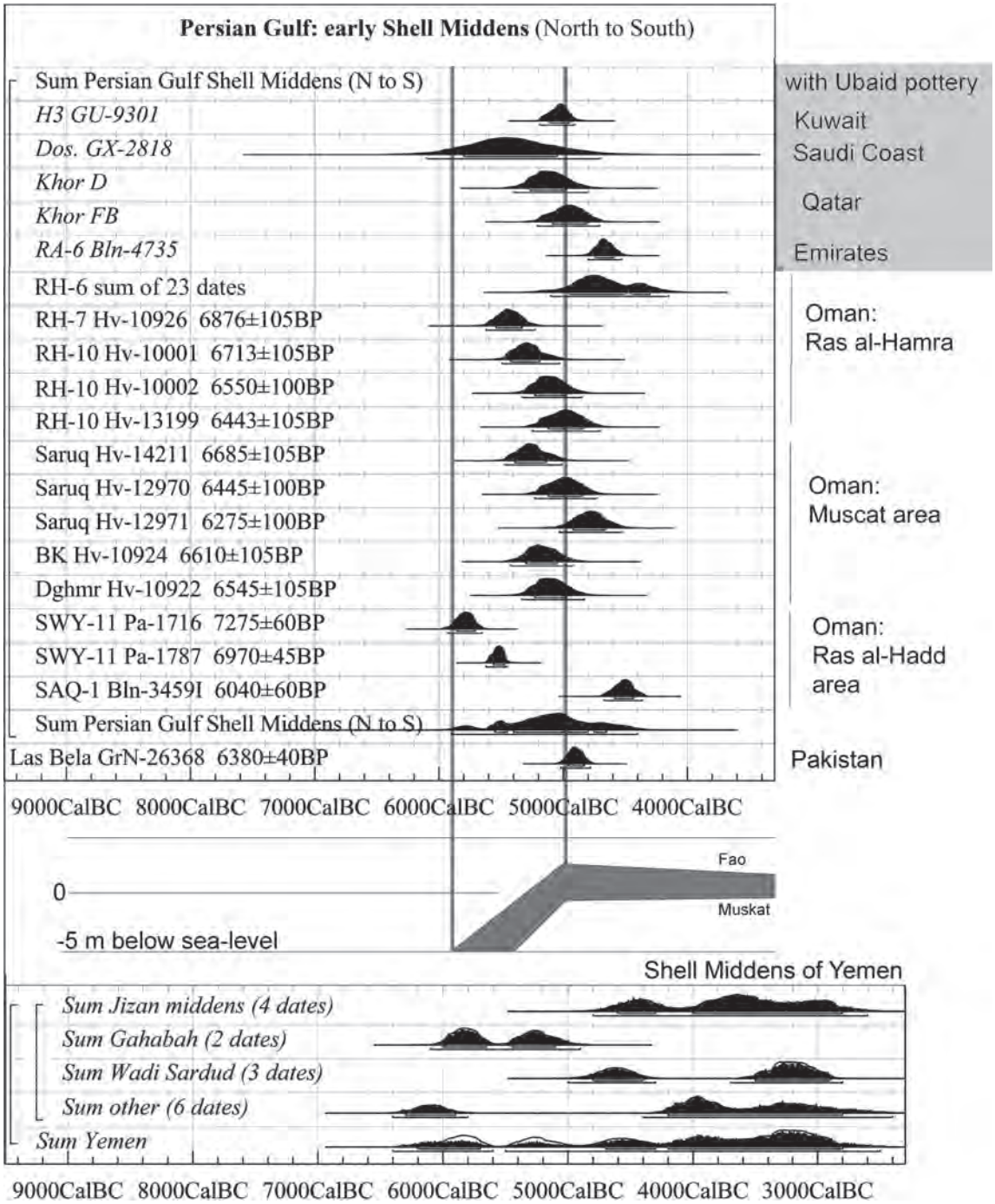


**Fig. 5** The probability distribution of calendrical ages of representative early Arabian shell middens (>6000bp) compared with Persian Gulf sea level rise (after Lambeck 1996, converted to a calibrated time scale: the gray curve indicates inferred variation in sea level rise between Fao and Muscat). As almost all dates were on shells, fishbones (and some charcoal may derive from mangrove), marine reservoir corrections were used, with ΔR derived from the Queens University Belfast database (http://intcal.qub.ac.uk/marine/). For Persian Gulf dates, ΔR = 230 ± 65, was derived from 3 datasets (map # 256, 581, 584), while for Red Sea dates, ΔR = 188 ± 73, was derived from 7 datasets (map # 253, 582–3, 585–7). Calibrations were performed with OxCal 3.10 (Bronk Ramsey 2005). Dates for RH5 from Biagi and Nisbet 1992; other Persian Gulf dates from Biagi 1994; 2006. Data on Yemen shell middens from Edens and Wilkinson (1998) or Durrani (2005). For locations of sites, see Figure 4

sites have a significant food-producing component, with evidence for both sheep/goat and cattle bones consistently found from the earliest strata (Biagi et al., 1984; Biagi, 2006; Potts, 2008).

In the Red Sea, sites bearing Arabian Bifacial Tradition technology dating back to the late seventh millennium BC have been found on the Tihama plain, and are also frequently associated with shell middens (Tosi, 1985, 1986a; Edens and

Wilkinson, 1998; Phillips, 1998; Cattani and Bökönyi, 2002; Durrani, 2005; Khalidi, 2007; Munro and Wilkinson, 2007). Few have been excavated, but it has been suggested that the decrease in bifacial elements in the lithic toolkit may mark a distinctive coastal adaptation (Uerpmann, 1992). Sites are frequently 5–10 km inland, and associated with exploitation of mangrove environments. As on the eastern Arabian coast, the sense is of a variety of diverse economic strategies, focused on shellfish gathering and also fishing, but also incorporating hunting activities (at Ash Shumah, hunted wild donkeys make up around 90% of the faunal assemblage [Cattani and Bökönyi, 2002]). As on the eastern Arabian littoral, domesticates are present from an early date (the sixth and perhaps also seventh millennia), and indicate a mixed and by no means strictly hunting and gathering lifestyle. Shell midden dates continue up to the later fourth millennium BC and beyond, indicating a fairly stable economic system based on a mixture of hunting, herding and shell fish collection.

The earliest evidence for seafaring activity in the peninsula also appears roughly simultaneously in the Gulf and Red Sea, some thousand years later, in the sixth millennium BC. Such evidence also attests the first movements of material objects across the sea, probably as a result of local and regional exchange activity. Evidence for maritime exchange is better for the Gulf than the Red Sea, and may indicate more active exchange networks in this geographically more favorable arena (although patterns of archaeological focus are also certainly relevant). The evidence in the Gulf is in the form of Ubaid pottery, from Mesopotamia, which is introduced in the late sixth millennium BC onto Neolithic sites of the Arabian Bifacial Tradition (Oates et al., 1977; Potts, 1990; Roaf and Galbraith, 1994). Ubaid pottery has now been found at over 60 Arabian Neolithic sites (Carter, 2006), usually but not always located on the coast (as well as a number of off-shore islands – for example, Dalma and Bahrain), from Ras al-Sabiyah in the north to the approach of the Straits of Hormuz in the south (Phillips 2002; Fig. 6). While a number of earlier interpretations of the Ubaid pottery – which archaeometric analyses demonstrate was manufactured in Mesopotamia (Oates et al., 1977; Roaf and Galbraith, 1994) – read it as an indication of Mesopotamian contact with Gulf inhabitants, or even the remnants of Mesopotamian maritime expeditions (e.g., Oates et al., 1977; Potts, 1990;

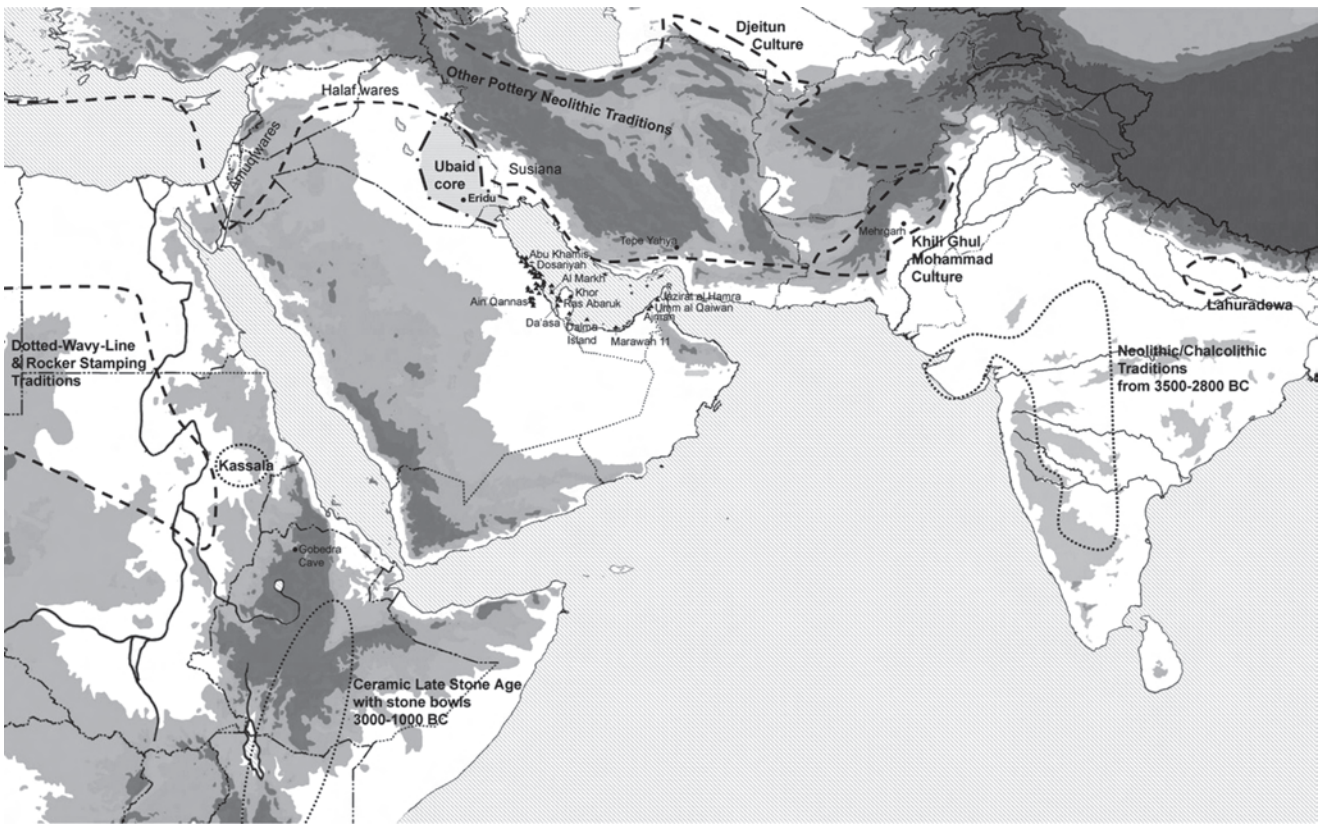


**Fig. 6** Finds of Ubaid ceramics in the Gulf (after Crawford, 1998; Carter, 2006), in relation to the core range of Ubaid pottery in Mesopotamia and other early ceramic traditions. The *dashed line* indicates the extent of early ceramic traditions of ca. 6000 BC prior to the development of Ubaid. *Dotted areas* indicate important regional developments where ceramics were later, beginning between 3500 and 2500 BC (East African stone bowl traditions: Barnett, 1999; South Asian traditions: Fuller, 2006; Sahara-Sudan traditions: Jesse, 2003; Kasalla: Sadr, 1991)

Lawler, 2002), increasing evidence suggests a potentially more active role for Arabian Neolithic peoples in moving the ceramics (Roaf and Galbraith, 1994; Vogt, 1994; Kallweit, 2002; Cleuziou, 2003; Carter, 2006). Robert Carter has emphasized that the Ubaid pottery is an intrusive element on sites whose material culture is otherwise overwhelmingly Neolithic and Arabian (Carter, 2006; see also Roaf and Galbraith), and suggestive of mixed hunting-gathering, fishing and pastoral activities (Beech, 2002, 2003, 2004; Kallweit, 2002; Beech and al-Husaini M, 2005). Burial patterns at the site of UAQ-2 on the UAE shoreline, where a cemetery with Ubaid ceramics appears to be that of a local population (Phillips, 2002), emphasize the indigenous flavor of Ubaid-related sites in the Gulf (see also Vogt, 1994). Carter has drawn upon available evidence to suggest the operation of local exchange networks in which Ubaid ceramics featured as prestige goods, possibly exchanged in ceremonial contexts that played an important role in the negotiation of power and status within and between groups (Carter, 2006).

Also circulated and exchanged in the Gulf's Neolithic maritime exchange economy were items like bitumen beads, stone and stone artifacts (especially flint and obsidian), and probably also pearls, shell and mother of pearl jewellery and beads, ochre and a wide range of perishable goods (e.g., hides, fish [both fresh and dried], and livestock, including cattle) (Flavin and Shepherd, 1994; Beech, 2002, 2004; Phillips, 2002; Beech and al-Husaini M, 2005; Connan et al., 2005; Carter, 2006). Some sites, like H3 in Kuwait, also show evidence for some degree of craft specialization (Beech and al-Husaini M, 2005), and increasing degrees of sedentism are suggested by various lines of evidence, including more substantial structures, seen most notably at the island site of Marawah in the UAE (Anonymous, 2004; Beech et al., 2005) and at H3 (Carter and Crawford, 2003). Maritime movement was apparently by reed-built boat. Excavations at H3 have unearthed evidence of what may well be the world's earliest boat remains (Lawler, 2002), consisting of over 50 pieces of bituminous amalgam, mostly with reed-impressions and/or barnacle encrustations (Carter, 2006). These accompany a ceramic model of a reed-bundle boat and, especially notable, a painted disc depicting a sailing boat, demonstrating employment of the sail by the Ubaid 3 period.

In the Red Sea meanwhile, initial evidence for seafaring activity comes primarily from source studies of obsidian artifacts (Francaviglia, 1989; Zarins, 1990, 1996; Khalidi, 2009). Obsidian first appears on Tihama sites beginning in the sixth millennium BC, and indicates direct or indirect contact with source traps in the central or southern highlands of Yemen, and/or the Horn of Africa beginning at this time. Preliminary source studies suggest that much of the Tihama obsidian may have come from the Eritrean/Ethiopian highlands (Zarins, 1990, 1996). The impression of a maritime origin is strengthened by recent coastal survey indicating that obsidian densities are highest at sites right on the coastline and decrease at sites along the river deltas leading to the coastal interior (Durrani, 2005; Khalidi, 2007, 2009).

There are probably parallels between trade in exotic Mesopotamian ceramics in the Gulf and the putative trade in exotic obsidians in southwestern Arabia. As Carter argued for the Ubaid ceramics, these materials likely featured as prestige goods whose acquisition and redistribution conferred status in the context of gradually emerging hierarchies. Both intra-group (gender, age) and inter-group (lineage, kin-group) differences may have been increasingly articulated. In Oman, such processes perhaps climaxed in the highly visible Hafit-type cairn burials of the late 4th millennium BC (Cleuziou and Tosi, 1997). Fourth millennium BC communities in Oman used boats to fish large deep water species like tuna and jacks (Beech, 2004; Biagi and Nisbet, 2006), and appear to have led a more sedentary than mobile existence – they were probably seasonally sedentary (Charpentier, 1996, 2002; Uerpmann, 2003; Biagi and Nisbet, 2006). In the Red Sea, increasing complexity and intensification in exchange in prestige goods is most visible with the Egyptians, who began to participate in obsidian trade in the Predynastic period (5000–3100 BC), when silver, lapis lazuli, turquoise, galena, malachite, svenite, specular iron and 'resins', as well, undoubtedly, as perishable items, were also traded, possibly via Red Sea routes (Zarins, 1989, 1996). Maritime trade appears to date back to the Naqada I period (ca. 4000–3500 BC), and to have become well established by the Naqada II period (3500–3200 BC). Obsidian objects are initially small – simple blades and flakes, or beads, for example – and unlikely to have been the focus of trade. The Egyptians travelled to the Red Sea via the Wadi Hammamat, a desert corridor where depictions of ships have been identified. The boats – perhaps papyrus or reed, but according to Ward probably already wooden sewn types (Ward, 2006) – were dismantled and dragged overland to the coast. Based on the evidence already outlined for obsidian trade networks in the southern Red Sea, it is likely that the Egyptians were simply tapping into an existing exchange network (Zarins, 1996) and that trade over long distances was still indirect (Burstein, 2002; Kitchen, 2002).

## Expansion and Intensification of Maritime Contact and Exchange in the Early Bronze Age (ca. 3500–2000 BC)

In the mid-fourth millennium BC, the emergence of the first major state-level civilizations of the Old World in a number of regions bordering the Arabian peninsula impacted upon the development of maritime activity in the region (see Fig. 7).

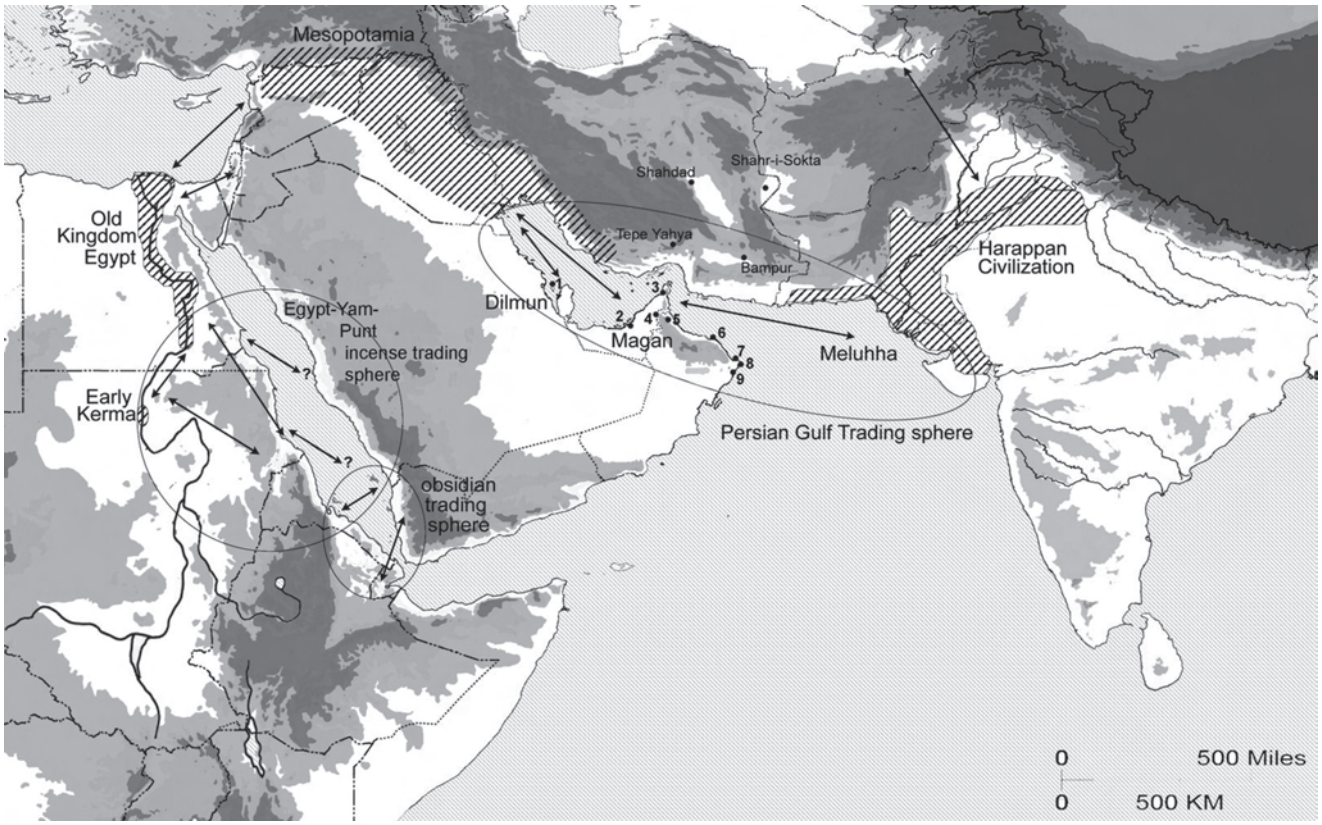


**Fig. 7** Third millennium trading spheres map with selected sites indicated: 1. Barbar; 2. Umm-an-Nar; 3. Tall Abraq; 4. Hili; 5. Wadi Suq; 6. Ras al-Hamra; 7. Ras al-Hadd; 8. Ras al-Jinz; 9. as-Suwayh

In Arabia, we also track the emergence of more intensive agricultural production and new modes of social organization at this time. Linked to this are signs of both increasingly intensive, and increasingly far-reaching maritime trade activities. While the urbanized states are clearly major players in this trade, there are also, as we shall see, intriguing indications that coastal communities and local merchants had an important role to play. In addition, date palm-focused oasis settlements, together with donkeys for transport, likely supported increased movement through the interior, and to and from the coast, beginning at this time.

The Red Sea at the outset of the Bronze Age is dominated by the Egyptian record, which now provides more direct evidence on maritime activities in the region, in the form of iconographic and textual records, as well as actual preserved boat remains. The middle of the fourth millennium BC probably saw the Egyptians shift from reed or papyrus to wooden boats for Red Sea transport, as well as the introduction of a form of the sail by the Late Predynastic period, ca. 3100 BC (Stieglitz, 1984; Fabre, 2005: 89; Ward, 2006). Egyptian rulers continued to promote long-distance trade for prestige and political purposes (Zarins, 1996) and large watercraft appear to have had a key role to play in social competition. Spectacular wooden boat burials are found in Egyptian funerary contexts from the First Dynasty (ca. 3000 BC), and their prestige value likely derived from the resources, technical skill and craft specialists necessary to build them, and their important role in acquiring exotic goods and controlling regional exchange networks (Arnold, 1995; Ward, 2006). Improvements in wood sources, building techniques and sail rigging all appear to have contributed to the construction of larger boats increasingly well suited to the open sea in the third millennium BC (Faulkner, 1941; Fabre, 2005: 89–92). It is probably no coincidence that it is in this period, during the reign of Sahure, that the first sea voyage to *Punt* is recorded (Faulkner, 1941; Kitchen, 1993; Harvey, 2003).

The Egyptians referred to *Punt* as a 'mining region' and imported a variety of products from it, including incense (frankincense or myrrh), electrum, staves (wood, perhaps ebony), pygmies, and probably slaves, as well as exotic animals and leopard skins (Lucas, 1930, 1937; Dixon, 1969; Kitchen, 1993; Phillips, 1997; Meeks, 2003). The location of *Punt* has long been a source of debate, and is directly relevant to discerning patterns of maritime trade and exchange in the Red Sea region. Most scholars are agreed that *Punt* lay

southwards and was reached by the Red Sea, and that it was the main source of incense. The current orthodoxy of Egyptological opinion is generally that *Punt* was situated in eastern Sudan and northern Eritrea (Kitchen, 1993, 2002; Mitchell, 2005: 78). In the second millennium BC mortuary temple of Queen Hatshepsut, who boasted about the expedition she sent to *Punt*, the presence in relief frescoes of stilted huts, as well as animals like the giraffe and the rhinoceros, has been taken to support an African location. An alternate theory situates *Punt* along the eastern side of the Red Sea, in Arabia and Yemen (Meeks, 2003).

While many have seen textual records of contact with *Punt*, and archaeological finds of exotica, as an indication that Egypt itself was an active maritime player in the Red Sea, it is also possible that Egypt's role has been overemphasized relative to that of the smaller scale communities in the Red Sea region. Both Burstein and Kitchen have argued convincingly that Egypt in fact undertook relatively limited forays into the Red Sea, and that local trade networks were responsible for much of the movement of goods seen in the archaeological record (Burstein, 2002; Kitchen, 2002). Depictions like that of two 18th Dynasty Theban officials, which show Egyptians meeting laden animal skin boats with triangular sails from the Land of *Punt* somewhere in a desert, suggest that peoples living along the southern Red Sea were regularly involved in moving commodities (Bradbury, 1996; Meeks, 2003: 61–63; Mitchell, 2005: 79). While significantly-sized watercraft are clearly present and important in Egypt from the very start of the Dynastic period, we have seen that their value was partly symbolic (Fabre, 2005; Ward, 2006), suggesting both their control by elites and the relative expense and rarity of expeditions like that undertaken by Hatshepsut. This scenario of indirect trade would seem to be supported by archaeological evidence for more intensive exchange across the Red Sea, between small-scale societies, beginning in the third millennium BC (Khalidi, 2007, 2009). Such regional exchange by local maritime-oriented communities may have increased in scale not only to meet the demands of increasingly powerful elites of Egypt, but also the needs of the increasingly hierarchical societies emerging in the hilly interior of Yemen, where terrace systems and possibly megaliths began to be constructed by this period (Edens and Wilkinson, 1998).

Seafaring and maritime exchange also intensify in the Gulf during the early Bronze Age, and move out into the wider Arabian Sea (Oppenheim, 1954; Lamberg-Karlovsky, 1972; Edens, 1993; Possehl, 1996; Ratnagar, 2001, 2004; Ray, 2003), although here too the activities of smaller-scale societies must also be taken into account. Third millennium BC Mesopotamian textual records clearly identify sea trade with and between the regions of *Dilmun*, *Magan* (*Makkan*) and *Meluhha*, linked through descriptions and archaeological finds to the real regions of present-day Bahrain (and/or variously Falaika and the eastern Arabian littoral), the Oman peninsula, and the Indus Valley and Gujarat, respectively. These extended sea routes were complemented by riverine and overland routes that connected the coastal sites and ports to a rich array of inland sites both close to and far from the coast, and contributed to the formation of what Possehl has referred to as a Middle Asian Interaction Sphere (Possehl, 1996, 2002, 2007).

Overall, as Edens has outlined, trade in the eastern Arabian peninsular region in the first half of the third millennium BC was relatively small in bulk and centered on a variety of luxuries (Edens, 1992). For example, small quantities of Mesopotamian pottery and other small finds made their way to Arabian grave and settlement sites (During Caspers, 1971; Edens, 1992; Potts, 1993; Vogt, 1996), and Harappan small finds, shell from India, as well as perhaps cardamom from the Nilgiris reached Mesopotamia by this time (Ratnagar, 2004; Keay, 2006). During this period, copper nonetheless emerged already as a key traded item in the Gulf. Arabian oasis settlements like Hili engaged in the production and exchange of copper (Cleuziou, 1996). Coastal Arabian communities at this time – as at Ras al-Jins, Ras al-Hadd, and Ras Shiyah, for example – also began to import and use copper, as well, apparently, as sesame oil and minor quantities of exotic Mesopotamian pottery (Potts, 1993; Cleuziou, 1996). They also began to catch more deep-water species of fish (Beech, 2004), possibly indicating greater maritime proficiency. Cleuziou hypothesizes that the fish that they continued to process in various ways now began to see production for larger scale export (Cleuziou, 1996). Such communities also produced a range of raw materials (like shell and fertilizer, the latter vital to palm-grove cultivation) and goods (jewellery, beads, fish hooks, khol containers, etc.) that were traded both locally and further afield (Charpentier, 1996, 2002). Interaction with southeastern Iran is hinted at by ceramic and copper production parallels that indicate technological borrowings (Cleuziou, 1996; Cleuziou and Méry, 2002). South Asian materials are also attested on Oman sites, reinforcing the impression that maritime trade with the still emergent Indus Valley civilization began at an earlier date than we currently have good evidence for (During Caspers, 1979; Parpola, 1977; Cleuziou, 1992; Ratnagar, 2004). Nonetheless, during this period, trade between Oman and Mesopotamia appears to have been mediated via Dilmun (Edens, 1992; Cleuziou and Méry, 2002), which now moved towards urbanism and statehood (Cleuziou, 1996).

The second half of the third millennium saw many important changes to trade and its socio-political context, following the emergence, by 2750 BC, of the Umm an-Nar cultural entity in Oman (Tosi, 1986b; Cleuziou, 1996; Cleuziou and Méry, 2002) and the Mature Harappan in the Indus valley (Possehl, 2002). After a gradual intensification of trade (Edens, 1992; Vogt, 1996), with *Dilmun* continuing to act as

an intermediary, we see evidence for the emergence of direct contacts between the main trade participants (Edens, 1992). This is subsequently and famously reflected in Sargon of Akkad's (2334–2270 BC) boast that he has moored in his harbor ships from or destined for *Meluhha*, *Makkan* and *Dilmun* (Oppenheim, 1954). A lesser known late Sargonic tablet (datable to ca. 2200 BC) also mentions a man with an Akkadian name entitled "the holder of a *Meluhha* ship", while an Akkadian cylinder seal bears the inscription "Su-ilisu, *Meluhha* interpreter" (Parpola, 1977). Indus seals begin to appear in the Mesopotamian archaeological record at this time (Parpola, 1977; Possehl, 2002). Ratnagar notes the paucity of material evidence for any Mesopotamian presence in Oman during this period, however, despite the military incursions by Akkadian kings (Ratnagar, 2004). Mesopotamian pottery is evidently no longer desired by Oman communities for use in burial contexts after around 2600 BC, and the subsequent use of Mesopotamian jars at coastal settlements only continues until the beginning of the Akkadian period (Cleuziou and Méry, 2002).

Coastal societies in Oman were nonetheless heavily dependent on trade in the second half of the third millennium BC (Cleuziou, 1996; Cleuziou and Tosi, 1994, 1997). During the Umm an-Nar period, Oman seems to have been very strongly linked to southeastern Iran and to the Indus Valley (Edens, 1993; Potts, 1994; Vogt, 1996; Cleuziou and Méry, 2002). Items of supposed Harappan provenience or inspiration, meanwhile, are found from all over the Oman peninsula, and include a wide range of items, suggesting the import into *Magan* of both basic commodities and luxury items (Vogt, 1996). Along with carnelian (some etched), combs, shell and shell objects, metal and metal objects, seals, and weights of more or less clear Harappan provenience (Edens, 1993; Possehl, 1996; Ratnagar, 2004; Vogt, 1996), there is also a rich testimony of ceramic sherds, in particular of the widely distributed Indus black-slipped ware (Cleuziou, 1992; Potts, 1993, 1994; Vogt, 1996; Cleuziou and Méry, 2002). The potsherds of this black-slipped ware belong to a highly standardized category of large-volumed vessels that appear to be storage jars. The black-slipped jars are more common on the coast than the interior, and particularly on the coast of Oman rather than the Gulf (Cleuziou and Méry, 2002). Their mineralogy supports an Indus origin (Cleuziou and Méry, 2002).

Trade in the final centuries of the third millennium BC saw an important shift from the predominantly luxury-oriented system that probably extended back several millennia, to a mixed trade that began to include necessities (Edens, 1992). Trade also became less direct at this time, with significantly less evidence for first-hand interaction between Mesopotamia and India. Ur III documents from the site of Ur record the activities of seafaring merchants who took textiles, wool, leather, sesame oil and barley to *Magan*, which seemed to develop as a primary trading center (Oppenheim, 1954). Mesopotamian ceramics and other artifacts are found in Oman from this time period, though primarily on the coast (Vogt, 1996). The focus of Mesopotamian merchants seems to have been on obtaining copper, which came to be used for increasingly utilitarian purposes during the Akkadian period and after (Edens, 1992). Available evidence suggests that Oman's interaction and trade with the Harappan civilization increased in the last few centuries of the third millennium BC (Vogt, 1996). At this time, the evidence for direct contact with the Harappan culture is better than for the subsequent period, though it is focused on coastal sites (Edens, 1993). Charpentier has argued that coastal communities played an intermediary role between inland and Indus civilization populations, acquiring and supplying goods to both parties (Charpentier, 1996).

## Disruption, Transformation and Intensification of Trading Spheres in the Middle and Late Bronze Age (2000–ca. 1200 BC)

The Early to Middle Bronze Age transition represents a period of political instability and upheaval across much of the area under consideration here. This is seen in Egypt (Baines and Malek, 1980; Connah, 2005), southwest Asia (Matthews, 2005), and the Indus (Possehl, 2002). Some so-called peripheral zones like Arabia also exhibit changes, highlighting their close relations with 'cores'. In Oman, for example, there is an abrupt shift from the Umm an-Nar to the Wadi-Suq cultural phase (Cleuziou, 1996; Potts, 1997). The broader regional trend towards instability corresponds to a period of climatic shifts towards drier and more volatile conditions in the region, starting with the 2200 BC event (Weiss et al., 1993; Staubwasser et al., 2002; Staubwasser and Weiss, 2007). The extent to which this 2200 BC event was a prime-mover of cultural change probably varied significantly from region to region, however, and it is clear that events were neither perfectly synchronous nor uniformly destabilizing across the area, with some regions seeing growth and trends towards increased stability. In Bahrain, for example, stability continued, with *Dilmun* emerging as a state by the end of the third millennium BC, and experiencing the "culmination of trends in population growth and urbanization" (Edens, 1992: 94).

Evidence for continuity of maritime activities is variable around the Arabian peninsular littoral; there are indications that trade and exchange patterns continued in some areas, but altered significantly or reduced drastically in intensity over time in others. The evidence continues to be stronger during this period for the Gulf side of the peninsula than the Red Sea side. There we find continued signs of regular, albeit

altered, trade at the beginning of this period. In the Wadi Suq period, the Harappan evidence for the eastern Arabian wider region shifts from Oman to Bahrain, for example. Harappan or Harappan-style material culture falls off rapidly in Omani assemblages at this time, and is replaced by imports mediated through Barbar or Kassite Bahrain (Vogt, 1996). Thus *Dilmun* appears to have supplanted *Magan* as a trade entrepot (though see Potts, 1993), and to have monopolized Harappan trade with Mesopotamia, a fact corroborated by Mesopotamian textual sources (Oppenheim, 1954). In both Mesopotamia and Bahrain, trade shifted to the hands of private entrepreneurs (Oppenheim, 1954; Matthews, 2005), and the risks it involved likely made it the prerogative of a very small, elite, component of society. The Harappan relationship with *Dilmun* seems, not surprisingly, to have been different than its relationship to neighboring *Magan*. It led not to the import of large quantities of Harappan goods, but rather to the incorporation of Harappan administrative and ideological frameworks. Thus when sealing procedures were implemented, it was the stamp seal of the Indus Valley, rather than the cylinder seal of Mesopotamia that was adopted (Eidem and Højlund, 1993; Vogt, 1996; though the influence may also be from the round stamp seals of Iran). The Indus weight system was also used, and later became known to the Mesopotamians as the "standard of *Dilmun*" (Vogt, 1996).

Evidence for Harappan trade continues into the Late Harappan period, as evidenced by both archaeological finds and textual sources like the Mari letters (Carter, 2001; Warburton, 2007). As discussed below, and indicated by ceramic parallels (Potts, 1994; Carter, 2001) trade was during this period with the Late Harappan communities of Gujarat rather than the now disintegrated society of the Indus valley proper. But after the first quarter of the second millennium BC, trade in the Gulf region diminished greatly in volume and probably geographic scope, even if signs of contact remained for some time (Potts, 1994). *Dilmun* lost contact with the mining centers of *Magan* (Oppenheim, 1954), and copper seems to have entered Mesopotamia from the north (Edens, 1992; Warburton, 2007). *Dilmun* similarly lost contact with the regions that supplied it with stone and timber, and essentially reverted to being an island famous for its dates and sweet water (Oppenheim, 1954). Interruptions of archaeological sequences for at least several centuries suggest regional social disintegration in the Gulf (Edens, 1992). The relationship between the end of the early *Dilmun* civilization and the final disappearance of the Harappan civilization remains to be clarified (Carter, 2001)

In Western Arabia, there is also evidence for changes in patterns of maritime contact and trade, coinciding in particular with lapses in Egypt's power. The first such lapse occurred in the First Intermediate Period, when Egypt entered a period of instability and regionalism. Subsequently, however, Egypt resumed its Red Sea trade during the Middle Kingdom period, sending fresh expeditions to Punt via Hammamat and the Port of Mersa Guweisis, to bypass the now powerful kingdom of Kush on the Nile (Kitchen, 2002). Excavations at Mersa Guweisis have yielded remains of expedition ships, as well as a few exotic ceramics from the Tihama and remains of African ebony (Bard et al., 2007). After a second lapse in power during the Second Intermediate Period, leading for a time to a fully independent Kush, a reunited and resurgent Egypt projected her rule south during the New Kingdom Period, and evidence for trade again increases (Kitchen, 2002). The first visual glimpses of trade with Punt are also seen through Queen Hatshepsut's record of her expedition (Phillips, 1997), discussed earlier. The expedition was explicitly undertaken to cut out middlemen in the southern Nubian trade, via the Nile (Kitchen, 2005). After this, maritime trade in the Red Sea became so habitual that kings ceased to boast about it, and it is generally only referred to in passing (Kitchen, 2005). Around 1200 BC, the first pepper appears in the Egyptian record, positively identified from the dried fruits in the nostrils of the mummy of Ramses II (Plu, 1985). This is the first indication of possible contact between Egypt and India, though by what route remains unclear.

Further south in the Red Sea, contact also continues, and intensifies, perhaps partly in response to disruptions in the north. The middle and perhaps early part of the second millennium BC is linked by a number of researchers to the emergence of shared ceramic affinities across the southern part of the Red Sea. Variably referred to as the Afro-Tihama culture (Kitchen, 2002), Afro-Arabian cultural complex (Fattovich, 1997), or Tihama cultural complex (Fattovich, 1999), this sphere of interaction perhaps represents an intensification of an earlier engagement traced through shared lithic sources and techniques by scholars like Zarins, Khalidi and Crassard. Sites from Sihi to Subr (Sabir) along the west and southern coasts of Arabia (de Moulins et al., 2003; Durrani, 2005: 62–67), for example, exhibit pottery that is seen to have parallels with older C-group and Kerma cultures of the Middle Nile (Phillips, 1998; Kitchen, 2002). The Sabir culture itself, which began in the early second millennium BC, was clearly a sea-oriented coastal culture (Ray, 2003: 84). The recently discovered Bronze Age megalithic site of al-Midamman in Yemen, which seems to span the late third to early first millennium BC, has also been argued to have parallels not only with the Sabir culture, but also with material on the African side (Giumlia-Mair et al., 2002; Keall, 2004). However, caution is warranted as most material culture, and particularly ceramic comparisons have been made at a very general rather than typologically specific level, and further research is needed (Durrani, 2005: 107–112). Nevertheless, in general, we can infer close contacts with Africa, which were to intensify in the first millennium BC and are presumably connected with the ethnolinguistic relationships described below. These trans-Red Sea exchanges are regarded, albeit controversially, as one of the

key catalysts in the emergence of complex societies in Eritrea and Ethiopia (Phillipson, 1998: 41–49; cf. Durrani, 2005: 114–125; Curtis, 2008).

## Transport Innovations and the Emergence of Pan-Arabian and Arabian Sea Trade in the Iron Age

The Bronze/Iron Age transition in the Arabian peninsula saw a number of important changes to trade patterns. These took place within the context of important socio-cultural, technological and economic changes in the peninsula and surrounding region. In the western part of the peninsula, at the same time that Egyptian power and Red Sea navigation simultaneously fell into decline (Fattovich, 2005), a number of prosperous trading kingdoms arose. These included the 'incense kingdoms' of Sabaea, Qataban, Hadhramaut and Ma'in in Arabia, the Ethiopian state of Axum, and to the northeast of the Red Sea, the kingdom of Nabataea, with Petra as its capital (see Scarre, 1988). These kingdoms owed their emergence in part to a transport revolution brought about by the domestication and spread of the dromedary camel. While dromedaries were presumably wild in Arabia, and are known to have been hunted during the Bronze Age (Uerpmann and Uerpmann, 2002), it is only in the Late Bronze Age and the start of the Iron Age that they become attested in adjacent regions and can be argued to be domesticated. Camels not only greatly enhanced overland trade within Arabia and to adjoining land areas, especially in incense, but may also have helped to promote further competitive development of maritime trade. It has certainly been argued that contact across the southern part of the Red Sea, between Africa and southern Arabia, further intensified at this time, and some have even seen the Eritrean pre-Aksumite kingdom of Da'amat as a Sabaean colonization (Kitchen, 2002; Fattovich, 2005). While linguistic, epigraphic and monumental evidence have all been called on to support such claims, they remain controversial (e.g., Schmidt and Curtis, 2001).

In the eastern Arabian peninsula, the early Iron Age saw the revitalization of trade after a period of relative isolation (Magee and Carter, 1999). While a significant level of regionalism suggests that regional interaction was still limited, it is nonetheless clear that relatively intensive exchange was being undertaken, involving trade with the Elamites, Iran and perhaps Central Asia (Magee and Carter, 1999). From ca. 1000 BC, there is an explosion in settlements in the record, and fortification appears (Potts, 2001; Magee, 2004), changes which may probably be linked to the emergence of *falaj* (*qanat*) irrigation and the impact of the camel (Magee, 2004). A pendant from Tell Abraq of this period has been argued to carry the earliest depiction of a lateen sail, otherwise not depicted in the region until the Sasanian period and absent in the Mediterranean until 900 AD (Potts, 2001); the image is very stylised, however, and confirmation must await further evidence.

Another transport revolution during this period likely involved the first regular use of the monsoon winds for long-distance sea transport between India and Arabia. It became possible for Indian goods to reach Egypt and the eastern Mediterranean basin entirely by sea, as well as by the millennia old river and caravan routes running through Mesopotamia and Syria (Burstein, 2002). This period accordingly witnessed the beginning of the Asian spice trade. Black pepper, from its limited source area in south India, was especially prominent in this trade, as suggested by Roman era records both written and archaeological (Miller, 1968; Cappers, 2006). Also important at this time was the emergence of local textile production in the Arabian peninsula, which might also be expected to have contributed to intensifying trade. On the one hand, local production would have highlighted regional differences in quality and design, creating new complex demands for different textiles within local systems of social signification. In addition, it can be suggested to have promoted further diversification in trade towards other high value commodities such as spices. The extent to which different trade strategies in this period were developed by different communities around the Arabia peninsula, and how this laid the foundation for the later development of trade in spices and textiles, deserves further study.

## The Dispersal of Domesticates into Arabia: Implications for Maritime Contact and Exchange

The arrival of domesticated plants and animals in the Arabian subcontinent naturally greatly impacted on cultural and economic developments in the region. Not only did domesticated species provide the basis for new types of societies in Arabia, they also catalysed new patterns of contact, trade and exchange. Domesticates moved into Arabia by both maritime and land routes, and accordingly hold clues to maritime routes of contact and trade. The earliest arrival of domesticates into Arabia appears to have been primarily by land, however. Livestock seem, on present evidence, to have spread initially in the absence of plant-based agriculture in Arabia (Edens and Wilkinson, 1998; Uerpmann et al., 2000; see also McCorriston and Martin, 2009; Uerpmann et al., 2009), much as was the case in Saharan and East Sudanic Africa (Marshall and Hildebrand, 2002; Garcea, 2004), as well as parts of savannah India (Fuller, 2006: 58). Secure finds of domesticated cattle generally coincide with the arrival of

sheep and goat, and occur at roughly the same time in eastern and western Arabia, after ca. 6000 BC, making it likely that domesticated cattle were ultimately introduced from the Near East rather than Africa. The sheep/goat/cattle triad appeared at roughly the same time in Egypt and western Arabia, suggesting parallel processes of dispersal, moving from the Levant through the Sinai region. This suggests a hunter-forager-herder economy in Arabia, as in the Sahara, but with possible precursors in the Pre-Pottery Neolithic C period of desert margins of eastern Jordan (Martin, 2000; Wengrow, 2006: 25).

The earliest field crops in Arabia were the cereals wheat and barley, which also originated in the Near East (Zohary and Hopf, 2000), although they may not have arrived in Arabia until the fourth millennium BC. The earliest hard archaeobotanical evidence for these cereals dates from ca. 3000 BC, both in Yemen, at al-Raqlah, Hayt al-Suad and Jubabat al-Juruf (see Costantini 1990; de Moulins et al., 2003; Ekstrom and Edens, 2003), and in the United Arab Emirates, as at Hili (see Cleuziou and Costantini, 1980; Tengberg, 2003). These cereals were accompanied by the Near Eastern pulses, pea and lentil. While these continued to be the dominant cereals, and important pulses, through prehistory and historical times, there is an intriguing difference between western and eastern Arabia that suggests agricultural interaction spheres focused on the Gulf and the Red Sea, respectively. Sites on the eastern side of the peninsula more often have evidence for free-threshing wheat, likely bread wheat (*Triticum aestivum*), which was also the most common wheat in the Indus region beyond. By contrast, sites in Yemen sites have more often produced the glume wheat emmer (*Triticum diococcum*), which was also the wheat that dominated ancient Egypt (Murray, 2000), Nubia (Fuller, 2004) and the limited archaeobotanical record for Ethiopia (Boardman, 2000) and Eritrea (D'Andrea et al., 2008). Maritime activities may have been responsible for introducing these Near Eastern crops (and others such as chickpea, grasspea and flax) as well as sheep and goat into the Ethiopian highlands, where they have been the basis of a plow based agricultural system throughout history.[3] The association of this agriculture with speakers of Ethiosemitic languages may be indicative of a prehistoric agricultural system-language co-dispersal from Arabia across the Red Sea (see below).

Maritime activities are meanwhile very clearly implicated in the transfers of domesticates between East Africa and South Asia, although the potential role of Arabia in these remains unclear. The question of how precisely African crops, such as sorghum, pearl millet, finger millet, hyacinth bean and cowpea, reached India by around 2000 BC is one of the major outstanding questions of archaeobotanical research, and has been a recurrent focus of discussion and debate (e.g., Possehl, 1986, 1996; Weber, 1998; Mehra, 1999; Fuller, 2003a; Misra and Kajale, 2003; Tengberg, 2003; Potts, 1990). Early reports of domesticated sorghum from Arabia are botanically problematic (Rowley-Conwy et al., 1997; Fuller, 2002: 281–282; Tengberg, 2003), and this species should probably not be regarded as an important contributor to prehistoric subsistence in Oman or Yemen. As summarized in Table 1, none of the other African crops have yet been found in Arabia for this time period (de Moulins et al., 2003; Tengberg, 2003). The African crops are, however, unambiguously in Gujarat and Baluchistan in the second millennium BC, suggesting that Gujarat maritime contacts were by this period no longer only with Oman and Dilmun but also extended westwards around Arabia towards Yemen and Africa. At present count, some 33 archaeological sites in South Asia dating from the Middle Bronze Age (ca. 2000 BC) through the Iron Age (to ca. 300 BC) have evidence for crops of African origin for which botanical identity is acceptable (data augmented from Fuller, 2003a; with Chanchala 2002; Saraswat and Pokharia, 2003; Saraswat, 2004, 2005; Cooke et al., 2005). It is likely that the lack of farming communities on the coastal rim of Arabia (in contrast to coastal Gujarat) had a major role to play in the failure of the African crops to transfer to Arabia in the Bronze Age.

Moving in counterflow from Asia to Africa, in this case via Arabia, were the Asian common millet *Panicum milaceum* and zebu cattle. *Panicum miliaceum* was an early crop in China, from ca. 6000 BC, but it is first found in southern Asia and Arabia in the third or early second millennium BC. In northwestern South Asia is appears ca. 1900 BC, with evidence for other crops and artifacts that suggest diffusion from East Asia (cf. Fuller, 2006: 36). Somewhat earlier third millennium BC dates for *Panicum* occur on the Arabian peninsula (Costantini, 1990; Ekstrom and Edens, 2003) and at Tepe Yahya in southern Iran (Costantini and Biasini, 1985), suggesting that the start of this line of contact was across the Gulf already in the later third millennium BC and thence to Yemen. The continuation of this line of diffusion to Africa is indicated by evidence for *Panicum miliaceum* in Nubia at Ukma from the Kerma period (Van Zeist, 1987). The other domesticate which moved between the Indian subcontinent and Africa, probably via Arabian maritime links, was the South Asia-derived zebu cattle (*Bos indicus*). Zebu genetic data show a pattern of inter-regional introgression in which eastern and southern Africa, together with the Arabian peninsula near Africa, show a genetic cline, especially in Y-chromosome data, that indicates much higher zebu bull input than is the case for Mesopotamia and more northerly

[3] Nevertheless, there appears to have been at least one local parallel domestication, in the case of the Ethiopian Pea (*Pisum abyssinicum*), which was likely native to Ethiopia, or perhaps Yemen (Butler, 2003; Kosterin and Bogdanova, 2008).

**Table 1** Selected crops of African, South Asian and East Asia origin cultivated in Arabia. Local Arabic names from Mason (1946) or Varisco (1994)

| Crop, with common names in English and Arabic | Region of origin and earliest evidence there | Cultivation in Arabia, historical evidence |
|---|---|---|
| *Sorghum bicolor*, Sorghum, *dhura*; in Socotra: *makedhīra*, for the grain: *habb, ta`am* | Eastern Sudanic savanna zone, by third millennium BC(?) (Fuller, 2003a) | ?Hili, Oman; ?Yemen finds, all botanically dubious; wild sorghum at Sabir, ca. 900 BC; Medieval staple in Yemen with numerous varieties (Varisco, 1994) |
| *Pennisetum glaucum*, Pearl millet, *dukhn* (but see also, *Panicum miliaceum*) | West Africa Sahel, by mid third millennium BC (Fuller, 2007a; Finucane et al., 2008) | *Dukhn* cultivated in Medieval Yemen (Varisco, 1994: 167) |
| *Eleusine coracana*, Finger millet, *keneb* sometimes *dukhn* | Ethiopia, by late second millennium BC(?) (Fuller, 2003a) | |
| *Eragrostis tef*, Tef, *tahaf* | Ethiopia and Eritrea, by later first millennium BC (Boardman, 2000; D'Andrea et al., 2008) | Hajar Bin Humeid, first millennium BC; Cultivated in present day in Arabia |
| *Panicum miliaceum*, Broomcorn millet, *dukhn* (sometimes), bakūr, siyal | China by ca. 6000 BC (Crawford, 2006) | Yemen by late third millennium BC |
| *Setaria italica*, Foxtail millet, *msebeli* or *keneb* (but see also *Eleusine coracana*) | China by ca. 6000 BC (Crawford, 2006) | Cultivated in present day in Arabia |
| *Vigna unguiculata*, Cowpea, *lūbiyā', dijr/dujr* | West Africa, Ghana by 1700 BC (D'Andrea et al., 2007); has spread to India also at this time (Fuller, 2003a) | Medieval Yemen (Varisco, 1994: 190) |
| *Lablab purpureus*, Hyacinth bean, *hurtimān, kishd* | East Africa, by early second millennium BC; in India by 1700 BC; south India by 1600 BC (Fuller, 2003a; Fuller et al., 2007) | Medieval Yemen (Varisco, 1994: 189) |
| *Vigna radiata*, Mungbean, *qusheri* | India: northwest and south, by late third millennium BC (Fuller and Harvey, 2006) | Cultivated in present day in Arabia |
| *Vigna mungo*, Urd bean, black gram, *māsh, dizur awad* | India: Gujarat/northern peninsula by 2500 BC (Fuller and Harvey, 2006); Eastern and Southern India, by 1400 BC (Fuller and Harvey, 2006) | Medieval Yemen (Varisco, 1994: 181) |
| *Cajanus cajan*, Pigeon pea, *qishta,* at Aden: *turai* | | Cultivated in present day in Arabia |
| *Sesamum indicum*, Sesame, *simsim, juljul/jiljil* | Pakistan, by Harappan times (2500 BC) (Fuller, 2003b) | First millennium BC Yemen (Sabir, Hajar Bin Humeid); cultivated in Yemeni mountains in Medieval times (Varisco, 1994: 195) |
| *Gossypium arboreum,* Tree cotton, *qutun,* '*otb* | Pakistan, by 5000 BC (Moulherat et al., 2002; Fuller, 2008) | On Bahrain (*Tylos*) according to Theophrastus, ca. 350 BC |
| *Musa sapientum,* Bananas | New Guinea/ Indonesia, by 4000 BC (De Langhe and De Maret, 1999; Kennedy, 2008); Indus Valley by 2000 BC (Fuller and Madella, 2001). | Cultivated in Dhofar and foothills in Medieval times (Varisco, 1994: 190) |
| *Areca catechu*, Betel-nut, areca-nut, *faufal* | Mainland/ Island Southeast Asia, by 2000 BC(?) | Cultivated in Yemen and Batinah of Oman (Mason, 1946: 594); *Piper betle* is also found cultivated occasionally |
| *Cocos nucifera*, Coconut, *jauz hindi* ("Indian walnut"), *jauz narjīl* | Island Southeast Asia | Cultivated in coastal gardens of Aden area (Mason, 1946: 594) |

areas (Zeder, 2006). While translocated crops were presumably not themselves the commodities of trade, but moved in boats as food for long voyages, with leftovers used for planting, zebu cattle, on the other hand, moved as bulls (see MacHugh et al., 1997; Loftus and Cunningham, 2000), were presumably rare commodities of high value. Archaeozoological evidence for *Bos indicus* has been reported from Tell Abraq by the Wadi Suq period and possibly in the Umm an-Nar phase (Uerpmann, 2001). A recent review for Africa suggests no major influx of zebu, but rather occasional occurrences in Africa, based mainly on depictions rather than osteological evidence, and probably indicating rare imports. These occur in Egypt beginning between 2000 and 1500 BC, in Niger in the second millennium BC and in the Chad Basin in the first millennium BC (Magnavita, 2006). Recent archaeological evidence from the poorly studied Horn suggests that

zebu was present there by at least the first millennium BC (Schmidt and Curtis, 2001).

Beyond those crops for which there is archaeobotanical evidence, are many others that moved between East Africa, Arabia and South Asia, highlighting the recurrent role of maritime contacts in the spread of crops (see, e.g., Engels and Hawkes, 1991; Blench, 2003). A selection of the various crops that have been introduced into Arabia is provided in Table 1. Meanwhile, two other animal domesticates deserve mention due to their importance in the overland trade that complemented maritime systems of commerce and social exchange, namely donkeys and camels. The donkey is evidenced in wild form at Early Holocene sites in Yemen and Oman (Edens and Wilkinson, 1998: 67; Uerpmann et al., 2000; Cattani and Bökönyi, 2002; see also McCorriston and Martin, 2009), but does not appear to have been locally domesticated. Based on modern genetic data, donkeys appear to have been domesticated twice, from the two disjunct wild populations, the Nubian and Somali subspecies (Vilà et al., 2006). Historical linguistics also suggests more than one origin (Blench, 2000). The earliest archaeozoological evidence for donkeys that were probably domesticated comes from the Late Neolithic and Predynastic of Egypt, from sites such as Maadi (ca. 4500 BC) and Hieronkopolis (ca. 3500 BC). Figurines indicate that donkeys were by this time being used as pack animals and were presumably important in trade between urban Mesopotamia and the emerging Egyptian state (Wengrow, 2006). Donkey trade can be inferred to have moved southwards as well towards sources of incense in Yemen and/or Ethiopia (Wengrow, 2006). Another species of interest is the camel, which is presumably native to the Arabian peninsula. Its domestication, perhaps in the Late Bronze Age (late second millennium BC), and spread, by the early Iron Age (Zeuner, 1963; Köhler-Rollefson, 1996), would have had a major impact on trade by making cross-desert travel easier, thereby increasing connectedness across the region, including in seasons when ocean currents and winds were unfavorable.

Overall then, the pattern of domesticate dispersals into and around Arabia suggests that maritime processes had an important role to play in moving domesticated plants and animals. From the Middle Bronze Age, there is clear evidence for the movement of species between lands as far as South Asia and Africa, and this gradually expanding network of contacts and trade routes helped to make the subsistence and farming systems of Arabia an ever more diverse mosaic. The transport of crop plants and animals probably involved significant transport by boat around the coasts of Arabia. While maritime Gujarat was almost certainly involved in some of these translocations, it is also very likely that Arabian seafarers had an important role to play. As we have seen, sea-capable and trade-oriented societies of various types had clearly emerged on the Arabian littoral by the time that these translocations began to take place. When the crop translocations between Africa and South Asia occur, for example, there is clear evidence that Oman had already adopted the use of plank-built wooden boats (Cleuziou and Tosi, 1997). While their role is often overlooked, it is very likely that small-scale coastal communities also played a dynamic role in the intensive trade systems that developed in the Bronze Age (Charpentier, 1996; Cleuziou, 2003).

## Greco-Roman Period Trade, and the Classical Records

The last centuries BC and first centuries AD saw the arrival onto the Arabian scene of a number of new powers, including the Greeks, Romans and Sassanians. The period witnessed radical transformations in maritime activity and trade, with the emergence of new greatly expanded trading spheres and regular, long-distance maritime travel in the wider Indian Ocean. Increased use of shipping along the Red Sea tipped the balance of power and prosperity in southern Arabia in favor of those states with control of the major ports, such as Qana, Muza and Eden, and the East African kingdom of Axum accordingly thrived (see Scarre, 1988). Classical sources from this time begin to offer new insights into maritime experience and the voyages undertaken and places seen by maritime explorers and traders. We outline a selection of these with the aim of highlighting the utility of further integration of these sources with archaeological and other findings pertaining to maritime activity and trade by and with Arabians, and in the wider region.

One of the earliest Classical records is a story in Herodotos (ca. 500 BC), Book IV, 44, of the voyages of Scylax of Caryanda, who was sent by the Persian emperor Darius to find the mouth of the Indus. Records of this journey are also preserved by Hecataeus of Miletus[4] (ca. 550–ca. 476 BC), who mentions an encounter with the land of Maka (Oman) and the Farasan islands (possibly Socotra and the Kurya-Murya islands). This is the first historical record of coasting around the Arabian peninsula, although the Gulf seems to have remained the most popular route between India and the Mediterranean for another few centuries (Keay, 2006). After this, we have Theophrastus correctly identifying Saba, Hadramaut and Qataban among the incense producing regions of Arabia (Keay, 2006). Thereafter, more intimate knowledge of the Arabian peninsula by the Classical world had to await Ptolemaic initiative. The Ptolemies resumed the

[4] Hecataeus is said to have compiled a *Ges Periodos* ('World Survey'), but his work only survives in some 374 fragments, quoted in the Ethnika of Stephanus of Byzantium (sixth century AD).

Pharaonic hunt for exotica, and revived the commercial enterprise of rulers like Hatshepsut, opening trading stations down the Red Sea (Keay, 2006: 48). The Ptolemaic merchant fleet explored the Arabian and Ethiopian coastlines, and vividly, if not always accurately, described the tribes they encountered, including the Ichthyophagi (Keay, 2006: 49). They referred to western Arabia as 'Eudaimon Arabia', the Greek form of 'Arabia Felix' or 'Fortunate Arabia' – described by Agatharchides, writing in the second century BC, as bearing "most of the products considered valuable by us" (Keay, 2006: 51). Interestingly, Agatharchides also describes 'white cattle' and 'walled cities' on what is probably the island of Socotra, where ships from the port that Alexander built on the Indus River (Patala, near the Pakistani city of Hyderabad) are encountered, as well as others from Persia and Arabia (Keay, 2006: 52). These vessels may already have carried the lateen sail (Keay, 2006: 55), as also discussed above.

Another intriguing, but difficult to interpret reference occurs in Diodorus Siculus (first century BC). He recounts the story of Yambulos, a Nabataean spice-merchant who travelled through Arabia in search of spices and was captured by pirates, probably in what is now northern Somalia. He was sent by them in a small boat and after 4 months reached a huge island of 'happy and wise' people where there were giant but harmless snakes (Kobishchanow, 1965). Stechow argued that this was an early record of a visit to Madagascar (Stechow, 1944) and certainly evidence from translocated murids is beginning to suggest Greco-Roman contact at about this period (Blench, 2007a). Nonetheless, the story contains clear mythic elements and is too imprecise to more than hint at early Mediterranean presence in the Arabian Sea. As the Sabaean kingdom in southern Arabia collapsed, however, to be replaced by the Himyarite kingdom in the late second century BC, and Arab power in the southern Red Sea weakened, direct contact between Ptolemaic Egypt and India became possible. Discovery by Classical sailors of the monsoon winds in the first century BC subsequently led to major changes in the scale, organization and conduct of Indian Ocean trade, including an increase in the scale and value of trade to a level clearly beyond that of a limited trade in 'luxuries', and the emergence of more common direct contact between India and the Mediterranean through the Red Sea (Burstein, 2002). From this period onwards, Classical references multiply as the Greco-Roman quest for spices and aromatics expanded, and Beeston (1979) summarizes the Classical evidence for the routes to South Arabia, which encompassed both coastal and inland routes. In 24 BC the Romans sent a (failed) naval expedition to try and capture the source areas of frankincense and myrrh. Strabo and Ptolemy reflect the expansion of geographical knowledge as trade to Arabia and India increased. Faller presents a detailed examination of the sources for routes and knowledge of Taprobane (Sri Lanka) based on movement down the Red Sea and the Persian Gulf (Faller, 2000). Pliny is able to recount details of the spice-trade in the Horn of Africa, and Theophrastus the properties of its medical plants. The *Periplus*, a first century seaman's guide to the East African coast and other areas of the Indian Ocean, records ports in Arabia, India, and Africa as far south as modern-day Tanzania.

The Red Sea continued to be the Classical world's most important entry into the spice route for several centuries, especially as hostilities between Rome and the Parthian and then Sassanid rulers of Persia made the Gulf route unsafe (Keay, 2006: 15). In the fourth century BC, however, the situation was reversed, as Mediterranean power transferred from Rome to Constantinople, shifting the spice route north to the Gulf (Keay, 2006). Two later travellers and historians from the sixth century AD provide important records of the Indian Ocean trade as it pertained to Arabia at that time. Procopius, the prolific Byzantine historian, describes in the *De bello persico* (after 550 AD) the trade between the Ethiopian kingdom of Axum and South Arabia based around the port of Adulis. He notes the use of ships without nails and recounts a complex story of how the Ethiopian kingdom tried to outflank Persian control of the silk trade with India. Cosmas Indicopleustes [whose name means 'India sea-voyager'] published his *Christian topography* in 550 AD (Winstedt, 1909), recounting a voyage to the Malabar coast in the 520s. Cosmas similarly describes the trade between Adulis and India, mounted by Ethiopians in their own vessels. These and earlier Classical sources hold an important key to understanding the place of Arabia in wider Indian Ocean maritime trade developments.

## Ethnolinguistic Geography and Historical Linguistics

The linguistic geography of the Arabian peninsula and adjacent area also provides some intriguing clues to early settlement patterns and population movements in the region, as well as, possibly, to maritime migrations. Today, the languages of the Arabian peninsula are wholly drawn from the Semitic branch of the Afroasiatic phylum (see Fig. 8). Essentially, the pattern is that Arabic dominates most of the land area, but all along the southern coast in the Hadramaut and Oman as well as on the island of Socotra, a set of archaic and rather diverse Semitic languages, are spoken, the so-called 'South Semitic' branch (Fig. 9; Johnstone, 1977, 1981, 1987; Simeone-Semelle, 1991). Most linguists consider that these languages would formerly have been much more widespread in the peninsula prior to the expansion of Islam and consequently Arabic in the seventh century. Epigraphic materials survive in the so-called 'Sabaean' languages which are

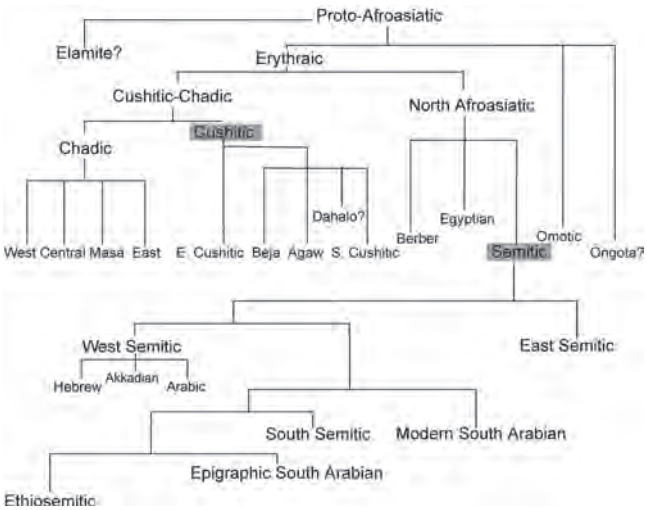


**Fig. 8** Afroasiatic classification (modified from Blench, 2006). *Highlighted branches* are those that occur on either side of the Red Sea

generally considered ancestral to modern South Semitic (Beeston, 1981; Korotayev, 1995). These include Sabaean, Minaean and Qatabanian inscriptions and are generally dated to between the eighth century BC and the sixth century AD (Versteegh, 2000). However, the assumption is that these languages were spoken much earlier still as their closest relatives outside Africa are the 'West Semitic' languages, which include both Arabic and Hebrew, but also all the epigraphic languages of the Near East, such as Akkadian.

The ultimate homeland of Afroasiatic is Africa and most probably Ethiopia, where its most diverse branches, Omotic and Cushitic, are spoken. Despite its aura of antiquity, Semitic is a relatively late branching from Afroasiatic, as testified by the relative closeness of all Semitic languages. As a consequence, the dominance of Semitic in the Arabian peninsula is comparatively recent. It must be the case that other quite different languages were spoken prior to Semiticisation several thousand years ago. There is no evidence as to the

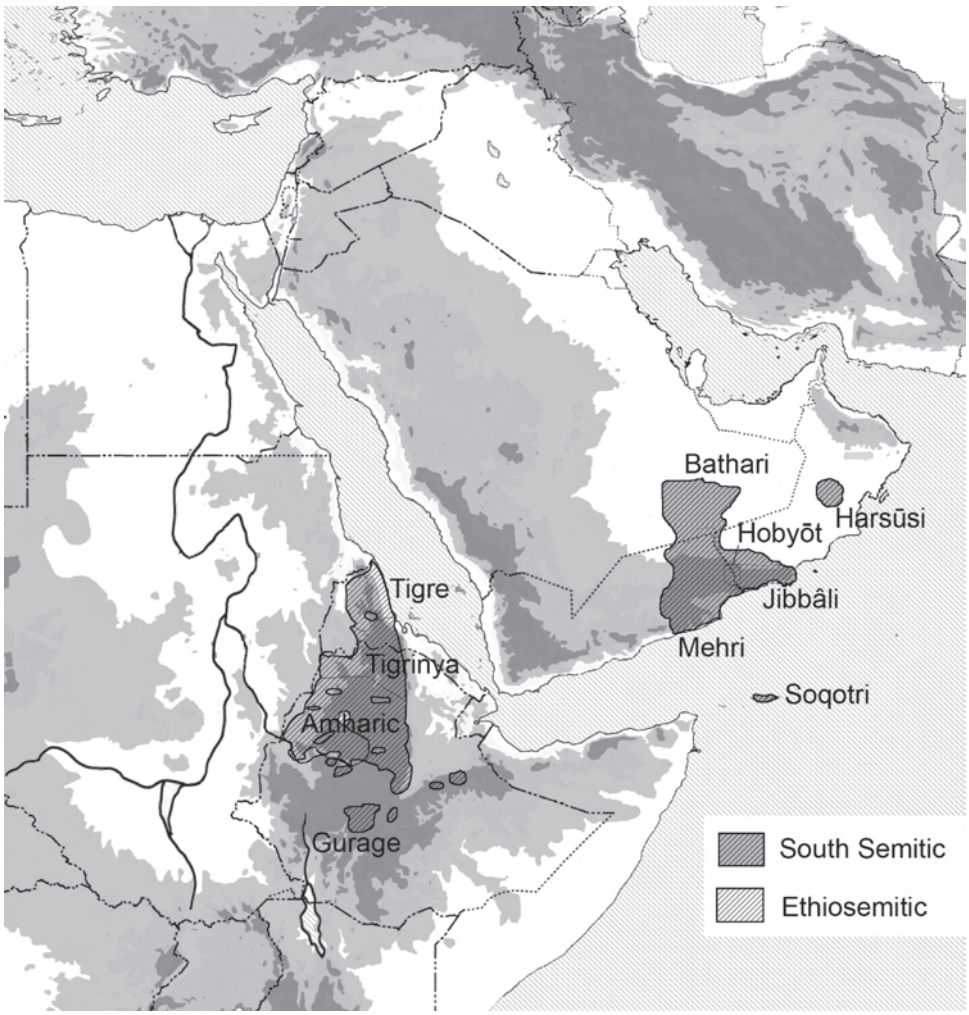


**Fig. 9** Distribution of South Semitic and Ethiosemitic languages in Arabia and Africa

nature of these languages or their affiliation; although such a major cultural transformation must have left traces in regional archaeology, no proposals have been made as to the 'signal' of the Semitic expansion.

Across the Red Sea, in Ethiopia and the Horn of Africa, the pattern of languages is quite different. With limited exceptions in the west and north of Ethiopia, all the languages spoken are also Afroasiatic. However, the dominant branches are Cushitic and Omotic, much more internally diverse subgroups of considerable antiquity. Figure 8 shows the internal classification of the Afroasiatic phylum and the highlighted fill indicates the branches that occur on either side of the Red Sea. The pattern of Semitic in Ethiopia represents something of a puzzle. The highlands and northeast are dominated by an extensive group of languages usually called 'Ethiosemitic' and including well-known languages such as Tigrinya and Amharic. Comparisons between South Semitic and Ethiosemitic suggest that the Ethiopian languages are a branch of the epigraphic languages of South Arabia, and that it is therefore likely that the ancestors of the Amhara migrated back across the Red Sea within the last few millennia. Bender argues that the South Arabian languages share a number of innovations with Ethiosemitic (Bender, 1970). There are also significant bodies of oral tradition; the story of King Solomon and the Queen of Sheba [from Yemen] is virtually an Ethiopian national myth and artifacts in Axum have South Arabian inscriptions.

This hypothesis is also suggested by linguistic geography; Ethiosemitic forms a coherent territorial bloc imposed upon and acting to fragment the *in situ* Cushitic and Omotic languages in the highlands from the northeast. This migration was potentially driven by the development of an innovative type of agriculture: the seasonal cultivation of cereals based on the plow. Ethiopia has a characteristic plow, an ard which fractures and disturbs the soil, which was perhaps introduced following the migrations of Ethiosemitic speakers across from Arabia. McCann points out that rock-drawings in Eritrea point to the use of the plow as early as 500 BC and that it shows similarities to implements in South Arabia (McCann, 1995: 40). Historical evidence points to a north-south spread of Semitic in Ethiopia. The Amharic term for plow, *maräša*, has been borrowed into all the main languages of Ethiopia. Barnett canvasses the idea of introductions of the plow from Arabia or Egypt 3,000–4,000 BP (Barnett, 1999: 24), but the linguistic evidence suggests a more recent date.

Almost all classifications of Ethiosemitic languages treat them as a single branch. However, in the south, there is a distinctive subgroup, the Gurage cluster, which is significantly more diverse than all the other Ethiosemitic languages (Leslau, 1979). It used to be thought that Ethiosemitic was a single subgroup, but more recently its internal diversity has led scholars to question this. It may be that the origin of the Gurage languages is different, either they are a core Semitic group that stayed behind after the break-up of North Afroasiatic or they represent an earlier and different migration from Arabia. Features that the Gurage languages have in common with the Amharic group would thus be the result of long interaction rather than direct genetic affiliation.

The implications of this overall linguistic geographical pattern are as follows: the Semitic languages are likely to have expanded southwards into the Arabian peninsula from the Near East. This expansion is likely to have had both a maritime, coastal component and an overland component, perhaps based on livestock. As we have indicated, the early Sabaeans developed an elaborate literate culture and were in intensive contact with the Ethiopian coast through interactions across the Red Sea. At some point, it appears that there was a significant population migration from Arabia, presumably in the region of modern-day Eritrea, which transformed the economy of highland Ethiopia. Cultural contacts across the Red Sea seem to have stimulated the development of an indigenous maritime trading culture reaching as far as India, whose members acted independently as brokers in the aromatics trade.

## Concluding Remarks

We have attempted, in this chapter, to take a very broad approach to maritime prehistory in the Arabian subcontinent, drawing together the findings of diverse scholars, regions, time periods and disciplines. Such a broad brush approach obviously comes with caveats, and omissions, oversights and errors are not unlikely in the preceding discussion. Nonetheless, this approach has also been useful in providing a general synthesis and overview of developments pertaining to maritime subsistence, seafaring and trade in and around the Arabian subcontinent. It has highlighted in particular important similarities and differences between the western and eastern littorals of the peninsula, and their maritime trajectories. Our broad summary also, by tracing developments and transformations across a wider area than is often addressed, enables firmer placement of the subcontinent's trajectory within the wider Indian Ocean framework. Such steps are necessary for resolving the still unclear question, alluded to in the introduction, and in parts of this chapter, of how the earliest translocations of crops, animals and material culture in the Indian Ocean were effected.

The data presented here offer further support to arguments that effective maritime proficiency and regular, even long-distance maritime trade in the Indian Ocean significantly predated the Greco-Roman sea adventures and commercial activities so evident in the wealth of Classical period texts. The Arabian data not only highlight the emergence of extremely early seafaring and maritime trade activities in the

Red Sea, the Gulf and the Arabian Sea, but also emphasize the problematic nature of the kind of core-periphery models that reliance on textual sources can often encourage. Small-scale fishing, trading and coastal-dwelling communities were clearly not only responsible for the early emergence of seafaring and maritime trade in the region, but also had a significant role to play in maritime activities even after the arrival on the scene of the large Bronze Age states. Thus, it begins to look increasingly likely that the sometimes impressive, and even spectacular translocations across the Arabian Sea and the wider Indian Ocean that we find evidenced in the archaeological, linguistic and genetic records are at least partly attributable to the activities of relatively small-scale societies. What should not be overlooked, however, is the large-sized ambitions that likely attended such activity; social competition, personal achievement, elite political manoeuvring and prestige good economies have undoubtedly played as much a role in deep water seafaring and maritime trade for small-scale societies as large ones throughout human history.

The maritime pre- and protohistory of the Arabian subcontinent has been greatly clarified by intensive archaeological survey and excavation in the region over the past few decades. While many questions have been answered, however, many more remain and other new ones have emerged. The challenge of addressing these certainly lies partially in continued archaeological endeavors in the peninsula and surrounding regions. However, it is also increasingly clear that new disciplines, like molecular genetics, and emerging syntheses, like that between archaeology, genetics and historical linguistics, offer new ways of addressing the questions that archaeologists and others want to answer. Our chapter has attempted to make some preliminary headway with such an interdisciplinary approach, but due to limitations of time and space has elected not to consider the genetics literature, except in passing, in this particular discussion. Animal, plant and human genetic data nonetheless have their own insights to offer to the developments, patterns and questions we have addressed here. The challenges of more multidisciplinary approaches are many, but the effectiveness of such multi-stranded methodologies is being increasingly demonstrated, and we see the future of Arabian archaeology in this direction. It is our hope that the synthesis offered here, and the emerging multidisciplinary paradigm it suggests, will help to provide a base from which such exciting new studies may be undertaken in the years ahead.

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