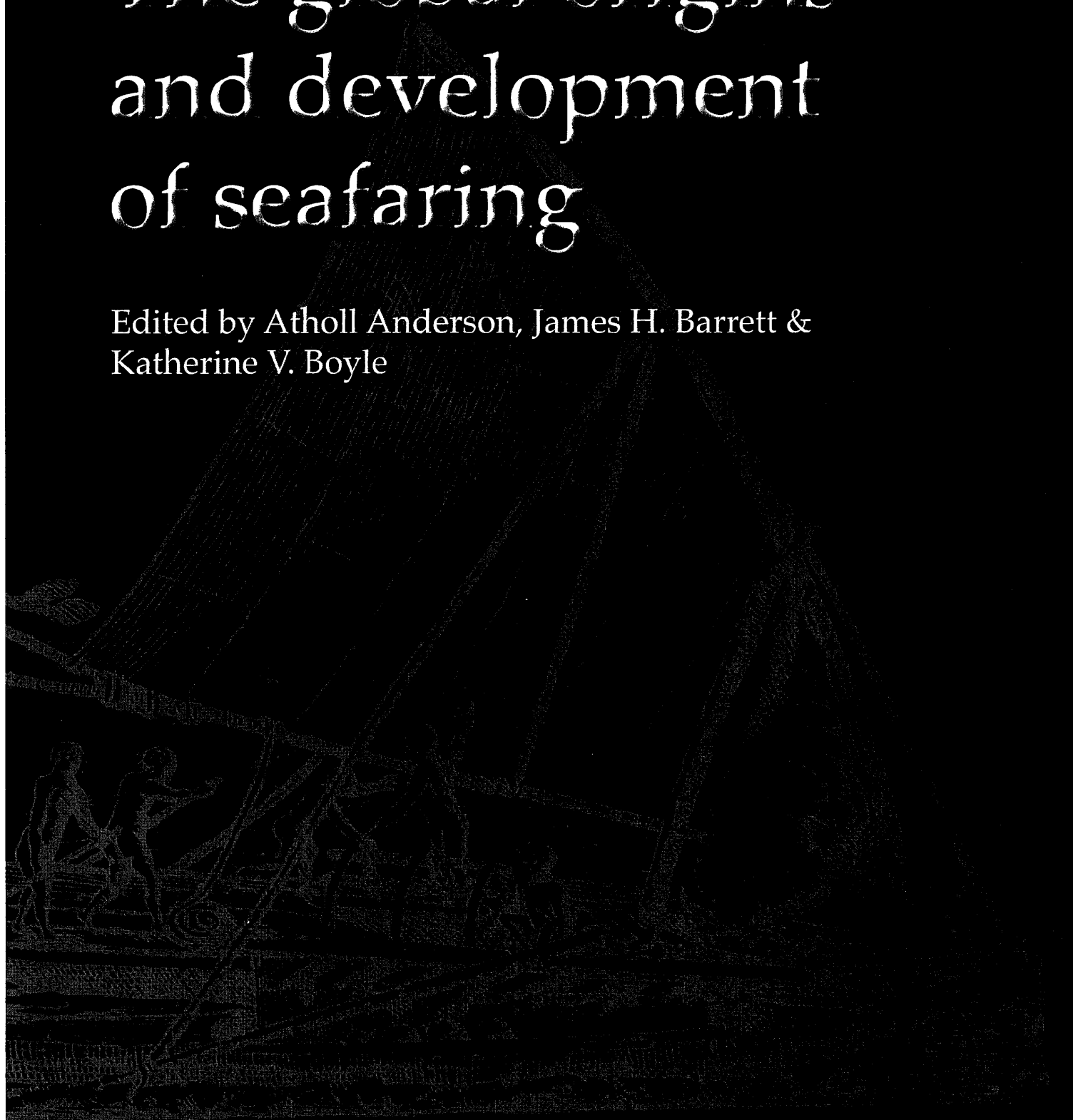




McDONALD INSTITUTE MONOGRAPHS

The global origins and development of seafaring

Edited by Atholl Anderson, James H. Barrett &
Katherine V. Boyle





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Chapter 24

Histories of Global Seafaring: a Discussion

James H. Barrett & Atholl Anderson

This has been a book about similarities and convergences, about 'big history' and comparatively understudied cultural revolutions. It has also been a book about people. Around the world and over millennia, in countless situations, there were people gazing at the sea and the land, judging the advantage that lay in their juxtaposition. They were specific people, at given times and places, motivated by the dialectic of habitus and agency, making small decisions with unpredictable consequences. Consequently, this is also a book about specific differences and particularity compared to similarity and generality. In his introduction, Anderson (Chapter 1) acknowledged the importance of local variability, but necessarily and appropriately focused upon the broader picture, the perspective of global seafaring that provided the impetus for the conference. Here we return, metaphorically, to the felled oak, linden, cedar or bamboo, seeing not the forest in which it stands, but the individually contingent sequences of events, the histories, that did or did not lead to open-sea voyages of unprecedented scale and consequence. Seafaring in prehistory was indeed a global phenomenon, but it was constituted at a human level by activities on small and intimate scales and we should now like to focus somewhat more on the latter in reflecting on the volume as a whole.

We touch on five themes that pervade the preceding chapters: time, the crew, the land, the sea and the vessel with its cargo. In doing so we can acknowledge concurrently that interpretational gulfs remain between some of the contributions to the volume, based on differences in the data considered and the theoretical perspectives adopted. The debates are welcome as a spur to more research and greater insight. Our purpose is to recognize the complexity of efforts to understand seafaring on a global scale over the entire human seaborne journey.

Time

To start at the beginning,¹ the critical debate regarding the peopling of Sahul (Pleistocene Australia-New Guinea) prior to or at about 40,000 BP is central to an understanding of when, how and under what circumstances the earliest open-sea passages occurred. There is no easy consensus. Not only is there a major difference between the 'long' (c. 50,000–65,000 BP) and 'short' (c. 40,000–47,000 BP) chronologies (cf. O'Connor Chapter 4; O'Connell *et al.* Chapter 5), but, equally critically, the question remains whether the millennia that may be represented by either chronology allow differentiation of intentionality from accident. Other large-scale oceanic movements in the Pacific — such as the Lapita expansion of the late second millennium BC (Allaby *et al.* Chapter 11) or the more recent settlement of East Polynesia (Irwin Chapter 10) — unfolded on centennial timescales. Even for the latter of these, between AD 700 and 1000, and recent evidence suggests the latter figure rather than the former (Anderson & Sinoto 2002), the question of cultural versus environmental causation is not resolved (Anderson *et al.* 2006; Irwin Chapter 10; see below).

Time, in its various incarnations, is also central to the thread of behavioural ecology that runs through many contributions (Anderson Chapter 1; O'Connell *et al.* Chapter 5; Fitzhugh & Kennett Chapter 6; Keegan Chapter 13; Broodbank Chapter 20). Here generalizing models convert absolute time into typological time (*sensu* Lucas 2005) — the equivalent of Fabian's (1983) typological analogies — to provide a frame of reference for the interpretation of case studies ranging from the Pacific to (in passing) the Mediterranean. The relative merits of such an approach are dependent on the goals and theoretical paradigms of author and audience, but the empirical support for maritime resource depression models, as proposed by O'Connell *et al.*, is

equivocal. They are supported by large-scale studies of the 'shifting baseline', although in those the significant change is historical rather than prehistorical (Pinnegar & Engelhard 2008), and, of course, there are many small-scale cases where the resource depression model is supported. However, recent archaeological case studies and discussion suggest that, even on some small islands in the Pacific, maritime resource exploitation patterns were stable and sustainable over millennia, or there was fishing up the trophic levels, indicating a significant intervention of human decision making in the prevention of substantial resource deterioration in prehistory (Erlandson *et al.* 2009; Des Lauriers 2009; Jones 2009). These results suggest that fundamental assumptions about the applicability of human behavioural ecology in such contexts need to be revisited (Anderson 2009a). In addition, in the particular case of the western Pacific, Summerhayes *et al.* (2009) point out that there were more choices than simply to move from one depleted coastal area or island to another. Archaeological remains indicate that the option of moving inland had been taken up in the New Guinea islands more than 40,000 years ago.

From a perspective of historical particularism, it is equally appropriate to query the universality of the materialist assumptions underlying optimal-foraging theory and its intellectual offspring. Humans occasionally choose to subject themselves and others to unpredictable hardship — for reasons ranging from the (literally or figuratively) mercenary to the metaphysical. Witness the Anglo-Saxon poem *The Seafarer* which begins by cataloguing the tangible miseries of ship-board life before going on to express the irresistible lure of the 'whale's road' (Crossley-Holland 1982, 53–6). Or consider the eremitical *peregrini*, who travelled from Ireland to seek the islands of the North Atlantic for spiritual rather than political or economic gain (Dumville 2002). More generally, post-colonial archaeologists have questioned the historical pedigree of generalizing models of all kinds, and of those with an evolutionary subtext in particular, as the ideological replication of western structures of domination (e.g. Given 2004; Gosden 2004, 18–20; Rainbird 2007, 39–42).

Caveats like these are essential if the global study of seafaring is to reach beyond the general to the particular (cf. Flatman 2003). However, they need not undermine the value of a comparative approach — or the possibility of cross-cultural convergences (Fleming 2008, 18). To quote one recent archaeological study of (typically sea-borne) colonialism 'local differences and contradictions within colonial aims can be best brought out in a broad comparative framework ... nothing can be understood fully on its own' (Gosden

2004, 20). Moreover, returning to the examples above, the status attached to high-risk seafaring articulated in Helms's (1988) *Ulysses' Sail* would probably have been understood by both the Anglo-Saxon author of *The Seafarer* and eighth-century Irish monks in contexts such as the Faroe Islands — not to mention Viking Age Scandinavian warlords (Jesch 2001, 266–9) — despite their very different life-histories. It would certainly have been familiar to prehistoric Polynesians whose traditions accord the highest respect for deep-sea explorers, from Maui who is the central figure of Polynesian mythology through to the captains of historical voyaging canoes, almost all of whom became the founding fathers of new colonies. The navigator too held high status, reflected in his title, Tahuna or Kahuna (= learned). In fact long-range voyaging and discovery of new islands was probably, in itself, an aspect of status competition in Polynesian society (Thomas 2001).

Nevertheless, in the current context, it is important to acknowledge the central methodological problem that generalizing models (underpinned by typological time) exist to overcome — the scarcity or absence of evidence in real time of how prehistoric maritime activities were scheduled, carried out, and influenced culture and environment. Generally speaking, the issue covaries in significance with the depth of time. Thus the structure and chronology of this book move from issues such as climatic and coastline change, the availability of resource patches or prevailing winds in deep prehistory to considerations of power, cosmology and mentality closer to the present. Yet the greater diversity and abundance of evidence for recent periods — especially when written records become available — cannot resolve the question of whether they represent simply a widened span of visibility on largely unchanging modes of behaviour and understanding or the development of new ways of thinking and acting (Driscoll 1988; Champion 1990). In the case of ship technologies and their capabilities the assumption that there was a Holocene 'sea-change' is well justified (e.g. Anderson Chapter 1; McGrail Chapter 8). However, in the case of motivations to go to sea, which clearly ebbed and flowed even in recent contexts, we are on troubled waters. For example, there was a lengthy gap between the *adventus Saxonum* of the fifth century and the Viking Age, and the standstill of 1500 years or more in the advance of Polynesian colonization from the western to the eastern archipelagos remains a puzzle.

Sixteen years ago, John Barrett (1994, 97) warned that we should not *assume* the minds of prehistoric Britons contained extensive mental maps. However, that was before isotopic studies of travellers such

as the Amesbury Archer (Parker Pearson *et al.* 2007, 635–6; Chenery 2008), the enormous impact of DNA research (e.g. Oppenheimer 2007; Allaby *et al.* Chapter 11) and the relatively recent archaeological awareness of network theory (e.g. Malkin 2003; Sindbæk 2007). Indeed the interactive reach across the sea in the past is often surprising. In the North Atlantic the Vikings are the supreme example, but even in the fourth century the leaders of the emerging Picts, not a conspicuously maritime people, had sufficient diplomatic contact across the North Sea to involve Franks, Saxons and others in their revolt against Rome (Fraser 2009, 56). Thus, it is now clear that many individuals in later prehistory and protohistory occupied large worlds on both land and sea. Given the highly mobile lifestyle that can be inferred for some prehistoric hunter-gathers (e.g. Woodman & McCarthy 2003) these 'large worlds' may have been equally extensive in deep time.

The circumstances that led to the episodic maritime florescences charted in this volume should therefore include the decisions of informed (if sometimes misinformed) actors at all periods. Moreover, stochastic eventualities can have a disproportionately large, and potentially terminal, impact on the demographic success of colonial endeavours when population sizes are small (Moore 2001). Even when demography is not the question, the outcome of many individual choices is difficult to predict and earlier decisions in the chain of history can have disproportionate long-term impacts — the so-called 'tyranny of small decisions' (Odum 1982) or, in the context of Chaos Theory, the butterfly effect (cf. Keegan 2004). In other words, deep time (when populations were small) will have been subject more often to historical contingency than the recent past — despite the fact that archaeological uses of generalizing models often imply the reverse. This issue has not gone unnoticed in the present volume (e.g. Erlandson, Chapter 2, regarding the impact of early human dispersal routes on the emergence of seafaring). Nevertheless, the relationship between absolute and typological time remains problematic.

The crew

People go to sea for many reasons, and sooner or later even the occasional seafarer will witness moments of both wretchedness and euphoria. Lengthy episodes of seasickness can be remarkably debilitating and, what is more, they can accelerate the onset of hypothermia and dehydration. Voyages in undecked vessels can be extremely uncomfortable (as described in *The Seafarer*, for example) and near-death experiences are seldom welcomed (cf. Barrett Chapter 23). Conversely, psy-

chological and physical responses to extreme and/or sublime seascapes and to the lure of landfalls in unknown seas should not be underestimated — particularly if coupled with acts of great endurance and the lure of the exotic (cf. Helms 1988). Thus seafaring is both its own incentive and its own disincentive — the 'Garden of Eden' or the 'Gates of Hell' to adopt Erlandson's (1994, 273; Chapter 2) terminology. Push and pull factors coupled with (or enacted through) historical contingency were thus required either to make it an all pervasive reality or to limit its appeal. It is, for example, no more self-evident that Britain was the destination of sea-borne colonists in the Migration Period than that coastal seafaring should subsequently decline to the extent that sea fishing was uncommon in Anglo-Saxon England before the end of the first millennium AD (Barrett *et al.* 2004), or that important coastal towns such as Scarborough should be founded after the Norman Conquest (Pearson 1999; Deckers forthcoming). Both seafaring and its absence require explanations that make sense in terms of human motivation as well as in more general contexts.

Non-trivial decisions were of course required at all stages of seafaring — be it the labour-intensive transformation of tree to hull or the passage itself. Why were the diverse decisions witnessed in the case studies of this volume made? Why was Remote Oceania colonized against the prevailing wind (Irwin Chapter 10), and was that by choice or chance? Why was Greenland, an undeniably extreme environment for European pastoralists, settled during decades of increased storminess (Dugmore *et al.* Chapter 17)? Why did Scandinavian seafarers (Crumlin-Pedersen Chapter 9) and western Mediterranean mariners (Broodbank Chapter 20) wait approximately a millennium before exchanging paddled or rowed vessels for sailing ships with which they must have been well acquainted? The latter remains an intriguing question for in other regions the uptake of new technology was often startlingly rapid. In Hawai'i, within ten years of European discovery, native canoes were sporting complex European sailing rigs — one recorded in 1789 had a full schooner rig with jib, foresail and main (Holmes 1993, 53), while in New Zealand the indigenous sail had almost disappeared within sixty years of European contact and canoes were under square sail or other introduced rigs, sometimes with auxiliary rowing instead of paddling. In addition, by 1830 many Maori had abandoned canoes in favour of the European whaleboat with its superior sailing and cargo capacity. On the other hand, some Pacific seafaring traditions remain almost unchanged from deep antiquity. In Taiwan, for example, small workboats and fishing craft, often motorized, are still made in

the ancient form of bamboo rafts with plastic drain pipes substituted for bamboo.

Perhaps some Polynesian voyages of discovery were made upwind to ensure the possibility of return voyages (Irwin Chapter 10) and thus the survival of social networks. However, many were in prevailing downwind conditions, as in trade winds towards Hawai'i, subtropical easterlies to New Zealand, and westerlies to the Chathams — and there is no archaeological evidence of return voyaging from the remote archipelagos like New Zealand, Hawai'i and Easter Island, despite some flawed claims to the contrary (Anderson 2008). Perhaps Greenland was colonized when it was because of the contingency of one person's exile, as claimed by later Icelandic sources (Arneborg 2003), or because of inaccurate expectations based on previous climatic conditions (Dugmore *et al.* Chapter 17). Perhaps the use of paddle and oar in the western Mediterranean and Scandinavia remained the most reliable way to maintain and transport raiding parties within the disciplined milieu of the chiefly warrior retinue (Westerdahl 1995; Crumlin-Pedersen Chapter 9; Broodbank Chapter 20). One would not, for example, want to lead a bored crew of violent young men on an uncomfortable trip across the North Sea! Rowing and paddling were also quite safe methods of propulsion in difficult, especially gusty, winds where sudden capsize was a threat. Given that a passage directly to windward meant sailing across the wind in tacks that required four times or more the distance to be covered as that made good towards the destination, rowing was often a preferred option, as amongst Shetland fishermen (cf. Heide 2006). Only when critical thresholds of distance and/or capacity were crossed did wind power acquire equal appeal for the patrons and craftspeople responsible for the remarkable vessels that both preceded and succeeded the watershed of sail. These few examples serve to illuminate how diverse the pathways to seafaring could be for (pre) historic actors.

The land

Seafaring obviously starts from the shore. Several papers in this volume discuss how the push factors of 'home', the pull of 'away' and the liminal zone of the shoreline have influenced its origins and development. Beginning at the water's edge, the special Holocene importance of littoral resources (as evidenced by shell middens, for example), which once were viewed as a pathway to social complexity, has been downplayed in this volume (e.g. Anderson Chapter 1; Erlandson Chapter 2). Instead its authors show an acute awareness that earlier shorelines are now flooded by eustatic

rises in sea level. Our understanding of Palaeolithic life on the water's edge is thus very incomplete. For the same reason, hypotheses regarding early human dispersal based on coastal movement remain difficult to evaluate (Bailey Chapter 3). Underwater archaeology may one day supply the answers, but we will need to be very lucky indeed.

Although the significance of coastal shell middens for understanding early Holocene prehistory has been somewhat eroded, the importance of the shoreline as a road to the sea remains paramount. Estuaries and archipelagos (combining abundant resources and sheltered conditions), and coastal maritime arteries such as that between Mesopotamia and Egypt, were important nurseries for seafaring (O'Connor Chapter 4; Crumlin-Pedersen Chapter 9; Broodbank Chapter 20; Cunliffe Chapter 21). The Nilotic pattern of seaward current and upriver winds — combined with the social milieu of an emerging state — may even have facilitated the world's first sailing vessels (Broodbank Chapter 20). A similar hypothesis has been proposed for the advent of sailing in western South America (Anderson *et al.* 2007).

Turning to pull factors, early seafarers sought out the essentials and desirables of their cultural contexts. These ranged from localized raw materials such as obsidian, in both the western Pacific (O'Connor Chapter 4) and the Mediterranean (Ammerman Chapter 7; Farr Chapter 14), to the superficially intangible. The spiritual hand that drew Irish hermits to North Atlantic islands was no less real, nor less potentially lethal, than the lure of plunder from Irish monasteries that inspired the crews of Norway's first sailing ships (Dumville 2002; Dugmore *et al.* Chapter 17; Barrett Chapter 23; cf. Westerdahl 2008 regarding the relationship between seafaring and magic in Iron Age Scandinavia). Mariners also had to know how to find what they sought, or be prepared to trust to luck. The inter-visibility of sequential destinations (e.g. the western Pacific and Mediterranean: Anderson Chapter 1; McGrail Chapter 8) and/or the creation of networks along which information regarding unseen places could flow (e.g. the Atlantic façade of Europe in the mid-first millennium BC, or Viking Age northern Europe: Sindbæk 2007; Cunliffe Chapter 21; Barrett Chapter 23) were important aids to mobility. Contexts with vast ratios of water to land, notably in Remote Oceania, the remote Indian Ocean (Anderson 2009b) and the central Atlantic were among the latest to be settled in world history (Anderson Chapter 1; Irwin Chapter 10).

Terrestrial push factors are more difficult to evaluate because of the methodological and theoretical complexities of reconstructing demography and

carrying capacity based on archaeological evidence (Keegan Chapter 13). Some evidence can be obtained from the study of abandoned islands, especially in cases where voluntary departure can be reasonably assumed. The distances and degree of maritime traffic involved in the Mediterranean make purposeful abandonment likely, and here, predictably, it is islands that are small, resource poor and isolated that were left — presumably for better opportunities elsewhere (Dawson Chapter 16). A similar scenario may apply to the abandonment of Norse Greenland, in the context of deteriorating sailing conditions, a collapse in demand for walrus ivory, a colonial monopoly on voyaging and a widespread contraction of settlement across Europe in the fourteenth to fifteenth centuries (Lynnerup 1996; Roesdahl 1998; Arneborg 2003; Dugmore *et al.* Chapter 17). The many 'mystery islands' of the Pacific, where the expanses of intervening ocean are enormous, may tell more diverse stories of abandonment or tragedy (Dawson Chapter 16), but taken as a whole the common factors of low survivability on them are narrowness of ecological opportunity and a high propensity to drought (Anderson 2002). Abandonment or severe decline following ecological degradation in some Pacific islands, notably Easter Island, has assumed a prominent role in the popularisation of archaeological studies of islands (e.g. Bahn & Flenley 1992; Diamond 2005), although the argument is sometimes open to debate (Anderson 2002; 2009a, 751–2, Hunt & Lipo 2009).

Of other aspects of potential environmental determinism aired in the volume perhaps the least debatable is the role played by the availability of crucial materials for seafaring. Were the early passages to Sahul facilitated in part by the availability of large bamboo with which seaworthy rafts could be built (Anderson Chapter 1)? The answer is almost certainly yes. Conversely, was Norse Greenland abandoned in part because the lack of easily accessible timber for shipbuilding made its population dependent on an increasingly indifferent Europe? Probably it was.

Another manifestation of 'push' in seafaring is almost literal. In the narratives of various maritime peoples, the Norse and Polynesians again being useful examples, the role of exile looms large (Coupland 1998; Anderson 2006). To some extent this is bound to be an *ex post facto* construction of the circumstances of colonization, particularly in the constant revision of oral traditions, but there can be no denying the frequency of maritime exile in historical evidence or its plausibility in older accounts. Penal colonies were established by colonial powers throughout the oceans in the eighteenth and nineteenth centuries and, indeed, ships were also used as prison hulks in the

process. The Polynesian traditions are replete with tales of exile, including this, recounted by Raymond Firth (1961, 139) of the exile of clan Nga Faea from Tikopia:

The women and children were in the canoes; many of the men swam alongside ... the canoes were decorated with bark-cloth streamers as if it were a gala ritual occasion. Wailing, the fold of Nga Faea abandoned the land, some of them supporting their chief on the deck of his vessel, holding him aloft in the gesture of supreme respect which the Tikopia pay to men of rank ... So they went from sight, to be lost forever from the knowledge of men.

Above all else the contributions in this volume illuminate how different the interface between land-based settlement and seafaring has been across time and space. The study of Holocene maritime movements in Near Oceania (including New Guinea, the Bismarcks and the Solomons) is particularly revealing (Allaby *et al.* Chapter 11). Austronesian-speaking peoples associated with the expansion of the Lapita cultural complex left a mosaic of cultural and biological outcomes in a linguistically and genetically 'Papuan' region. Islands once associated with Lapita culture were later occupied by genetically 'Papuan' groups speaking different (Austronesian or Papuan) languages, or by Polynesians who migrated west in the first millennium AD to the region their Lapita ancestors had passed through 2000 years earlier. Moreover, some peoples connected by the sea share more genetic similarity than they do with inland peoples of their individual islands. Overall, the 'genetic footprint' of Austronesian speakers was highly variable in Melanesia, despite their cultural impacts and continued movement into unoccupied eastern Melanesia, Polynesia and Micronesia. The Indian Ocean story of the last two millennia is equally complex (Blench Chapter 19), with Austronesian colonization of Madagascar a striking fact. In both cases we clearly see the potential for great variability in the divergence–convergence continuum through the sea-borne movement of culture, language and human beings.

The sea

Ocean and Sea exert their own tidal influence on the human mind, but they are also about much more than fear and longing. Depending on latitude, season and current, water temperatures induce the rapid onset of hypothermia or they do not. As noted by Anderson (Chapter 1), warm-water conditions had a profound impact on the potential for very early seafaring using wash-through rafts in the South Pacific. In northern latitudes, it is possible that open sea voyages of similar

scale were delayed until the availability of water-tight planked hulls with adequate freeboard (a product of metal tools) (McGrail Chapter 8; Crumlin-Pedersen Chapter 9). These environmental conditions did not go unnoticed. The Anglo-Saxon seafarer complains of his feet 'afflicted by cold, fettered in frost, frozen chains' and of the 'ice-cold wave' (Crossley-Holland 1982, 53). The problem may have been mitigated to some extent by the (hypothetical) early use of skin boats in the north, but the evidence of the boats will be hard to find.² Water temperatures also influenced the *need* for seafaring. Winter ice could provide an alternative means of seasonal transport in northern contexts such as the Baltic Sea region (Crumlin-Pedersen Chapter 9). On the rising coasts of northern Sweden can be found chiselled lists of the names of seal hunters who, for centuries past, came across the Bothnian ice each winter from the same Finnish villages.

Differences in winds and currents, across space and time, are also central to the course of seafaring globally. Was Remote Oceania settled against the prevailing wind for social reasons, facilitating return voyages, or merely by the enhanced probability of eastward landfall when prevailing winds reversed direction during El Niño episodes (Anderson *et al.* 2006; Irwin Chapter 10)? Were the Faroe Islands settled so late in the Holocene because return trips from Britain and Ireland would typically need to proceed via potentially hostile shores in Norway (Dugmore *et al.* Chapter 17)? The materiality of sailing conditions structured the practice of seafaring in direct, if rather fluid, ways.

Equally critical to life on the water is the weather (cf. Lamb 1991; Ingold 2007) — perhaps the greatest author of historical contingency. Three examples will be sufficient, one little known and two so familiar that we can easily forget their significance. Firstly, would the largely Scandinavian archipelago of Orkney have rapidly adopted Scottish material culture had the local elite not all drowned when returning by ship from Bergen in AD 1232 (Dasent 1894, 157–8; Crawford 1985, 33–4; Barrett forthcoming)? The previously semi-autonomous principality was subsequently ruled by a mainland Scottish dynasty (Thomson 1987, 82–3). On another canvas, world history may have unfolded very differently had Philip II of Spain's armada not been decimated by storms during return from its abortive invasion of England in AD 1588 (Wallerstein 1974, 210, 270), or had the 'divine wind' (hurricane or kamikaze) off Japan not destroyed the thirteenth-century invasion fleets of Kublai Khan. The problem of course is that events like these will rarely be evident from the archaeological record alone.

Lastly, the sea represents a cornucopia of resources. Even now, in the wake of well-documented

overfishing, fish provide approximately 15 per cent of the world's protein food (FAO Fisheries and Aquatic Department 2008). Marine resources have been considered as a lure for the coastal dispersal of *Homo sapiens* and their ancestors (Erlandson Chapter 2; Bailey Chapter 3), and for early seafaring in both the western Pacific (O'Connor Chapter 4; Habu Chapter 12) and Europe (Ammerman Chapter 7; Cunliffe Chapter 21). Nevertheless, the role of fishing in particular deserves more attention than has been possible in the present volume. This is not to say that fishing and seafaring are always correlated. It remains an open question whether the earliest finds of pelagic fish indicate seafaring or shore-based activity — particularly prior to the recent decimation of stocks (Anderson Chapter 1; O'Connor Chapter 4; cf. Pickard & Bonsall 2004; Ojaveer & MacKenzie 2007; Erlandson & Rick 2008, 10–11). Moreover, there are times and places when marine fish seem not to have been favoured resources — even in strongly maritime contexts (e.g. Barrett *et al.* 1999; Dobney & Ervynck 2007). Nevertheless, fishing has driven many of the world's maritime expansions in the historical period (in whole or in part) and presumably also did so in the distant past. Three examples will serve. The English fishery expanded from the North Sea (c. eleventh century), to Iceland (c. fifteenth century), to Newfoundland and the New World (late fifteenth and sixteenth centuries) — with significant long-term consequences for all involved (Starkey *et al.* 2000; Barrett *et al.* 2004). Similarly, the independence and growing world hegemony of the Netherlands in the late sixteenth and seventeenth centuries was significantly financed by the North Sea herring fishery — an issue that did not go unnoticed by contemporary Spanish and English commentators (Wallerstein 1980, 39; van Bochove 2009, 209; Sicking & van Vliet 2009, 355). In the Indian Ocean, the expansion of Indonesian fishing to northern Australia, particularly by Macassans in search of trepang (*bêche-de-mer*, sea cucumbers) from about the mid-seventeenth century had a profound affect upon Aboriginal material culture and social institutions (Clarke 2000). Other drivers, particularly warfare and exchange, also had a great influence on the elaboration of boats and seafaring, but even in these contexts the importance of fisheries as the training grounds for young mariners should not be overlooked (e.g. Jackson 2000, 47).

The vessel and its cargo

For most of prehistory, and history, it is reasonable to assume that boats were far more than the equivalent of cars on water. They figured in art, were themselves the subject of artistic investment, were surrounded

by ritual, and were themselves the objects of ritual. Boats were the difference between life and death — as sanctuaries on the sea, as transports of colonization, as tools of harvest and as instruments of lethal force. Much more than other aspects of material culture, boats were active forces in people's lives. For many ocean-goers they were home and habitus itself, for long periods, continuous or seasonal. Seafaring is ultimately about boats.

This is not to say that they were always imbued with equal meaning. Even in a context as reliant on seafaring as Scandinavia, ships shifted from objects of great artistic expression (in the Bronze and Iron Ages) to workmanlike products (in the Middle Ages) under the influence of commercialization (cf. Bill 1995; Crumlin-Pedersen Chapter 9). Globally, the details of boat (and raft) construction differed in time and space for all the obvious reasons: environmental, technological, cultural and contingent (McGrail Chapter 8). The big questions therefore derive from the apparent convergences. Like the remarkable synchronicity in the chronology of global agricultural origins (Barker 2006), it is the existence of a general pattern, rather than its absence, that requires special explanation (Anderson Chapter 1).

For the sake of discussion, boats can be classified as differing in five interrelated characteristics: seaworthiness, speed, range, capacity and cost. Based on the evidence of successful island colonizations, and in the minds of their users, even early boats were seaworthy and many may well have been fast, compared to land transport. Traditional kayaks, to adopt one potential analogue, could be paddled 50 miles a day under 'normal' conditions in Labrador (Taylor 1974, 39–40). This is faster than Carver's (1990) estimate for seventh-century AD rowing ships (c. 40 miles/day). Moreover, it is not hugely exceeded by his estimate for early medieval sailing vessels (c. 80 miles/day), and travel by sail could be much slower in unfavourable winds (e.g. Englert 2007, 123–5). Even at Carver's (1990, 121) suggested rowing speed, c. 40 miles per day, the journey time from Denmark to England, for example, could be only 9 days. In the Pacific, some early sailing vessels could make 4–6 knots over long distances in favourable conditions (100–140 miles per day), but data collected by Captain Cook on the mean speed of return passages between Tahiti and Tonga show an average daily run of 62 nautical miles, rather less than is often proposed today by Polynesian voyaging enthusiasts (Anderson 2008). But then, one might also ask whether prehistoric seafarers were always in a rush.

The most remarkable aspect of a comparative study of global seafaring is that vessels with both large capacities and long ranges, eventually facilitated by sail,

were developed so recently — in various millennia of the Holocene. Competitive raiding and warfare may have driven the elaboration of paddled and rowed vessels in many parts of the world (e.g. Crumlin-Pedersen Chapter 9; Fitzhugh & Kennett Chapter 6; Clark Chapter 18; Broodbank Chapter 20). As discussed above, however, the shift to sail in particular was probably about cargo in addition to people, with the likely exception of oceanic voyaging where inter-island distances are exceptionally large. Subsequently, sailing vessels could of course diverge into multiple specialised forms (e.g. Crumlin-Pedersen Chapter 9).

The explanations offered for this apparent revolution, like many regarding agricultural origins, focus on human responses to environmental change and/or economic intensification/extensification — often in the context of emerging hierarchies (e.g. Anderson Chapter 1; Fitzhugh & Kennett Chapter 6; Ammerman Chapter 7; Carter Chapter 15; Broodbank Chapter 20). As discussed by Broodbank (Chapter 20; cf. Sherratt & Sherratt 1991), however, it is worth considering the *capabilities* of aspiring despots in addition to their environmental contexts and their aims. Large vessels, with or without sails, required a surprisingly major investment in labour and raw materials (*capital*, in a pre-Capitalist use of the term). Broodbank refers to the Bronze Age in the Mediterranean, but the potential problem is universal. The building and equipping of ships in Viking Age Europe, for example, would have had an extensive impact on both the political economy and the landscape.³ An incipient hierarchy would need to be well established indeed, and to call on a large population, in order to successfully complete such major projects whatever their motivations and aspirations. Entrenched hierarchies and large populations concurrently created the level of demand that necessitated the seaborne transport of both people and bulky staple goods. When one adds the contingent flutter of a banner on a voyage up the Nile (to cite just one example, from Broodbank) the necessary and sufficient conditions would all be in place.

Several authors in this volume tentatively suggest that the sail may have then diffused, under its own power, from such an epicentre in the eastern Mediterranean or the Persian Gulf to most parts of the globe (e.g. Anderson Chapter 1; McGrail Chapter 8). The chronology of existing evidence is consistent with this interpretation. As the proponents of diffusion acknowledge, however, it is unlikely to apply to all times and places. McGrail (Chapter 8), for example, suggests that distinctive timbers from Peruvian graves of the late first millennium BC may indicate independently developed early forms of the South American sailing raft seen by Europeans in the sixteenth century.

The evidence, however, is certainly debatable (Anderson *et al.* 2007).

Epilogue

Archaeology often acquires the luxury of long-sightedness by ignoring the contingencies of history. History, for its part, typically gains the luxury of detail at the cost of a long-term perspective. The resulting tension within the 'historical' arts and sciences is played out in this volume at various scales. Yet, these differing perspectives are welcome. Seafaring, travelling upon and making a living from the sea (Anderson Chapter 1), is a dauntingly large and complex subject which needs consideration from every angle that scholarship can bring to it. In concluding, it is thus appropriate to call for a continuation of the journey, for a forward view and an increasingly interdisciplinary view. The global rise of seafaring in prehistory, in its many different ways, and the globalization of seafaring in colonial and post-colonial worlds, with their radical redistributions of resources, shifting hegemonies and sometimes catastrophic human and environmental costs, are related matters of undoubted importance to the deep history of people. Let the study of seafaring continue to connect past, present and future.

Notes

1. Excluding, for the moment, new discoveries of possible Palaeolithic tools in Crete (*Current World Archaeology* 2010, 11).
2. Although the remains of skin boats are unlikely to survive, kayaks and the larger umiaks were highly effective in the Arctic and a tradition of seaworthy skin boats is indirectly evidenced in Europe by the mid first millennium BC (McGrail Chapter 8; Cunliffe Chapter 21).
3. Recent experience building a replica of the eleventh-century Skuldelev-2 ship, built in Ireland and scuttled in Denmark, suggests that such an enterprise may have required approximately 50,000 person hours, 87 trees (for the ship, mast and oars), 130 tons of wood (for charcoal), three tons of iron ore (to make the 7000 iron rivets), 18 m³ of pine (for tar) and 200 kg of flax or wool for the sail (Croome 2005, 146; Bill *et al.* 2007, 49–51). Based on ethnohistoric analogy, the cost of producing the rigging and sail alone could equal that of the hull (Andersen 1995, 250).

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