The Austronesian impact on the coast of East Africa

Roger Blench
Kay Williamson Educational Foundation
8, Guest Road
Cambridge CB1 2AL
United Kingdom
Voice/ Fax. 0044-(0)1223-560687
Mobile worldwide (00-44)-(0)7967-696804
E-mail R.Blench@odi.org.uk
http://www.rogerblench.info/RBOP.htm

1. Introduction

Despite the presence of undoubted Austronesian speakers on the island of Madagascar, the Austronesian world is very much characterised by the Pacific and the dramatic narrative of its settlement. Although there is credible evidence for the presence of Austronesians in India (Mahdi 1999), Japan (Habu 2007), in the Arabian Gulf and in North, Central and South America[1] the present-day absence of Austronesian speakers has tended to relegate these remarkable voyages to footnotes. Similarly, the movement of Austronesian navigators across the Indian Ocean still excites little comment, in part because archaeologists and prehistorians tend to keep to their appointed spheres. As a consequence, standard texts still repeat an increasingly outdated narrative.

Recent research has altered existing perspectives on the settlement of the East African coast and Madagascar (Adelaar 2006, in press; Blench 2007, in press; Walsh 2007; Beaujard 2007a,b). It now seems likely that;

a) Madagascar was first settled, not by Austronesians, but by hunter-gatherers migrating from the East African mainland prior to 300 BC.
b) Madagascar was also reached by Graeco-Roman trading ships, who may have been trading tortoiseshell with the resident foragers and were responsible for the translocation of commensal murids
c) There was regular contact between island SE Asia and the East African coast prior to 0 AD by an unknown people using outriggers and trading in spices
d) After a gap, precursors of the modern Malay established a 'raiding and trading' culture based in settlements along the East African coast from the 5th century onwards
e) Malay ships had crews of non-maritime origin from the Barito-speaking area of SE Borneo who were effectively enserfed
f) The Malay settlements on the East African coast transported captured mainland African populations from the Sabaki-speaking area to Madagascar, primarily for agricultural labour, between the 5th and 7th centuries AD
g) That other SE Asian island peoples may also have followed these established trade routes to East Africa, accounting for a residue of non-Malay Austronesian items in the Malagasy lexicon
h) That the Malay impact on Barito society was indirectly responsible for the evolution of the Samalic peoples, the 'sea nomads' of the region between Borneo and the SW Philippines
i) That similarly, on the East African coast, the transfer of nautical technology to coastal Iron Age cultivators stimulated the development of Swahili maritime culture
j) That the expansion of Arab shipping in the Indian Ocean from the 10th century onwards obscured the Austronesian origins of local seafaring through the replacement of boat types and maritime terminology
k) Finally, if the Indian Ocean was criss-crossed by experienced Austronesian navigators from an early period, then settlement would be expected on many Indian Ocean islands. Although most islands were apparently unoccupied at first European contact, they may still have been reached by Austronesians and that more extensive archaeology will reveal this

A story this complex can only be summarised in the present synthesis[2], which aims to direct the reader to places where the argument is made more fully and only present detail in areas so far not covered in material published or in print.

2. The earliest settlement of Madagascar

Archaeology in Madagascar has so far uncovered no site earlier than the 5th century AD and even that is a single date that has not been replicated (Dewar 1996, 1997)[3]. It is generally assumed that these early sites represent primary incursions by trans-Oceanic populations from insular SE Asia. But evidence from palaeozoogeography suggests a very different pattern for the primary settlement of Madagascar (Blench 2007). As long ago as 1991, a modified hippo-bone from Ambolisatra on the SW coast of Madagascar was dated to 1970±90 yr BP, implying pre-Austronesian human activity (MacPhee & Burney 1991). Since then, identifications of bones with similar cutmarks have increased exponentially. Perez et al. (2005) state, 'In total, 10 of the 28 specimens of extinct lemurs that we examined microscopically, and 77 of the 269 specimens of extant lemurs, show definitive signs of butchery in the form of cut and/or chop marks'. Godfrey & Jungers (2003) illustrate the cut-marks on an undated left distal humerus of the extinct lemur *Palaeopropithecus ingens* from the site of Taolambiby in SW Madagascar. In the case of a right proximal radius of *Palaeopropithecus ingens* that had conspicuous butchery marks, ' collagen extracted from this bone yielded an age of 2,325±43 years BP'[4]. A caveat that must be entered is that the bones are from existing collections, not stratified sites, and some are clearly the result of blows from metal (i.e. iron) implements and are therefore almost certainly post-Austronesian[5]. At this point it is difficult to imagine what other explanation could account for these finds, apart from human settlement of Madagascar significantly earlier than previous dates derived from archaeology. Lemuroid families became extinct either through habitat destruction or human predation and particular families were presumably lost preferentially because they were easiest to kill.

Burney (Box 5 in Godfrey & Jungers 2003) summarises the sequence of extinction as it now appears. Following the initial arrival of humans, large herbivores were intensively hunted, reducing their density and leading to an increase in plant biomass. This increased the incidence of fires (and hunters may also have intentionally set fires to drive animals into the open as they do all over Africa today). This would reduce the diversity of habitats, in particular extending anthropic grasslands, hence a catastrophic loss of megafauna.

Part of the evidence for vegetation change is the earliest occurrence of *Cannabis/Humulus* pollen in the central highlands at Tritrivakely, at an interpolated age of 2200 cal yr BP (Burney 1987a). More directly linked to extinctions is a decline in incidence of the spores of the coprophilous fungus *Sporormiella*, a proxy for megafaunal density (Burney et al. 2003). The most secure date for this change is 1720±40 yr BP (230-410 cal yr AD) but a less certain earlier date of 1990±50 yr BP (100 cal yr BC–110 cal yr AD) has been recorded. These events precede a rise of microscopic carbon particles, a sign of extensive, possibly anthropic, fires. The hypothesis that the present vegetation of central Madagascar evolved from setting fires goes back to Humbert (1927) although at that time it was impossible to set a credible date for these events. The most reasonable interpretation of this phenomenon is that early human settlement and intensive hunting led to higher densities of biomass, thereby increasing the likelihood of natural fires. However, people probably also set fires in highland areas, thereby creating a characteristic upland derived savanna and destroying specialised lemur habitats, combined with selective predation of megafauna. All indications are that this process began in the southwest of Madagascar and spread northwards over several centuries.

Vegetational change, faunal extinctions and numerous bones with cutmarks all point to the presence of low-density hunter-gatherers from about 4-300 BC onwards. Evidence for anthropic murid introductions also suggest outside contact prior to established Austronesian settlement. If so, then Madagascar may have been first colonised by low-density foraging populations, similar to the modern-day Hadza of Tanzania, who crossed from modern-day Mozambique. Beginning in the southwest, they would have rapidly eliminated many species of large lemur, and begun the process of habitat conversion in the highlands. Upon the arrival of Austronesian colonists, they were largely assimilated, surviving as the residual hunter-gatherers, now known as the Mikea or Vazimba. The absence of direct archaeological

evidence is striking and it is argued that their tool-kit would have been difficult to recognise in standard assemblages.

3. Rats, mice and Graeco-Roman contact

Records of the East African coast exist dating from the classical period, although these are often difficult to interpret. The main sources are; the *Periplus of the Erythraean Sea* (Casson 1989), the *Natural History* of Pliny (Rackham 1942), *On the Erythrean Sea* by Agatharchides of Cnidus (Burstein 1989) and the *Geography* of Claudius Ptolemaeus (Stevenson 1932). Needless to say, the dating of these is controversial (Mathew 1975) but the scholarly consensus would order them as follows (Table 1):

Table 1. Classical sources for the Indian Ocean

Book	Date	Source
On the Erythrean Sea	< 100 BC	Burstein (1989)
Natural History	AD 77	Rackham (1942)
Periplus	AD 120-130	Casson (1989)
Geography	AD 150	Stevenson (1932)

The *Periplus of the Erythraean Sea* (Casson 1989), a first century seaman's guide to the East African coast, may suggest Graeco-Roman mariners or their contacts had some knowledge of Madagascar, which perhaps makes an appearance in the text as the 'Great Island of Menuthias', a source of 'mountain tortoises'. For the author of the *Periplus*, Menuthias has 'no wild animals' except crocodiles and is inhabited by people who use dugouts and sewn boats and who catch fish in wicker traps. Menuthias was said to be some 300 *stades* from the mainland (a Ptolemaic *stade* was 222 m and this distance would then be ca. 67 km). The distance from Madagascar to the mainland at the closest point is 400 km, somewhat further, making the Pemba-Zanzibar archipelago another equally likely possibility. Casson (1989:140) argues strongly for Pemba or Zanzibar; the rivers point to Zanzibar and the 'crocodiles' might be monitor lizards, although Madagascar has both crocodiles and large tortoises. Beyond Menuthias is the port of Rhapta, named for its sewn boats and its 'big-bodied men, tillers of the soil (*oratoi*[6])'. The identity of these communities is a puzzle; evidence for agriculture in this region at this early date remains controversial. Rhapta might be in the region of Dar-es-Salaam or further south, depending on the identification of Menuthias.

The Geography of Ptolemy was probably first compiled around AD 150, but was added to in successive centuries as new data became available. The text that has come down thus probably represents the geographical knowledge of Byzantium in the 4th century. For Ptolemy, Menuthias is certainly Madagascar, since it was east of Prason [=Delgado?], a promontory south of Rhapton, itself south of Rhapta (Freeman-Greville 1962:4). An intriguing, but difficult to confirm reference is the voyage of Yamboulos, recounted by Diodorus Siculus, writing in the mid-first century BC (Stechow 1944). Yamboulos was a Greek or Nabateian spice-trader who was captured in Somalia and transported to a certain large island off the coast of East Africa.

Archaeology has now provided evidence confirming that the maritime cultures of the Mediterranean were reaching the East African islands during the era of the texts. Juma (1996) reported finds of late Roman pottery on Zanzibar and Chami (1999a,b) recorded Roman beads in the Rufiji Delta. A possible proxy for Graeco-Roman contact is a change in the zoogeography of Madagascar, the spread of Eurasian commensal murids. Both *Rattus rattus* and *Mus musculus* are common on the island today and have penetrated even remote forest areas, where they are able to out-compete endemic small mammals (Ganzhorn 2003). Hingston et al. (2005) reconstruct the process of colonization of southern Madagascar. They observe that the closest relatives of the specimens they studied are the rats of the Indian subcontinent, but that more sampling is required to draw any definitive conclusions. Vasey[7] & Burney (2007) show that between 2480 and 1760 BP at Andrahomana Cave (in the southeast) proportions of endemic mammals such as *Macrotarsomys petteri* in bone assemblages decrease dramatically while both *Rattus rattus* and *Mus musculus* rise sharply. Although there has been 'some stratigraphic mixing, a clear pattern of faunal turnover still emerges'. They claim that 'data presented here show that these taxa were introduced prehistorically by the earliest human settlers' but this is unlikely. A probable source would be

either the Graeco-Roman traders or other players in the Arabian end of the Indian Ocean network, who were certainly active during this period. It is even possible such ships were trading with the resident populations rather than picking up turtles directly. Another relevant species is the Asian house shrew, *Suncus murinus* (Hutterer & Trainier 1990). Endemic in South Asia as far west as Pakistan, it now occurs throughout Madagascar and the Indian Ocean islands. The extent of its embedding in the fauna in remote areas in Madagascar suggests an ancient introduction, but further evidence from stratified sites is crucial to identifying dates and sources.

4. Early Austronesian contacts with the East African coast

4.1 Textual evidence

The literature on the earliest Austronesian contacts with the East African coast has been somewhat confused by conflation with the evidence for later settlement of Madagascar. But it is now clear that these are two quite separate events. The East African coast may have been visited by Austronesian mariners from an early period, probably prior to 0 AD (Adelaar 2006; Blench 1996, in press b; Beaujard 2007a). Pliny (natural History, Book XII: cap. 42) describes the Troglodytae, who buy cinnamon from their neighbours and 'carry it over vast tracts of sea, upon rafts' [a reasonable approximation for an outrigger]. Moreover, 'they choose the winter season, about the time of the equinox, for their voyage, for then a south easterly wind is blowing; these winds guide them in a straight course from gulf to gulf', a description of the use of the equatorial counter-current for seasonal travel. There is no direct archaeological evidence for these early period contacts, but other indications are highly suggestive. These draw from textual, maritime technology, plant and animal transfers, disease and other aspects of material culture.

4.2 Disease

4.2.1 General

Populations isolated one another for long periods usually develop immunities to particular diseases and become carriers of subclinical pathogens. When they encounter wholly unfamiliar populations, disease transfers can often have disastrous consequences. The most well-known of these stories is the impact of European voyages on the New World; although syphilis may have been carried to Europe, the ultimate losers were Amerindian populations whose elevated mortality was the result of their lack of resistance of a spectrum of pathogens. Indeed this has been the theme of a popular book, *Guns, germs and steel* (Diamond 1997). If Austronesians reached the East African coast, then it is probable that similar disease exchanges occurred, and indeed we have evidence for this. It seems that African malaria reached SE Asia at an early period, and by return elephantiasis spread through Central Africa.

4.2.2 Malaria

African malaria would have made a marked impact on incoming voyagers from SE Asia. The indigenous malaria in Southeast Asia, *Plasmodium vivax*, was probably introduced to New Guinea before the end of the Pleistocene (Groube 1993:168, 171). However, African malaria, *P. falciparum*, is more virulent than that transmitted by *P. vivax* and the resultant illness, although non-relapsing, is often fatal. As the parasite cannot survive within its host beyond the duration of its initial infection, it requires large host populations moving rapidly for successful migration. When African malaria *was* carried across the Indian Ocean its impact on island populations with limited resistance was very serious. There is some evidence in the archaeological record for demographic lacunae which might well represent the impact of incoming *P. falciparum* in the islands of SE Asia and the Pacific.

Malaria would have been equally serious for those arriving on the coast with the intention of remaining for a protracted period. Europeans in West Africa stayed offshore for three centuries after trade first began, only venturing inland when quinine came into use in the middle of the nineteenth century. Presumably any attempt to settle in East Africa would have been similarly lethal in the first phase. So the early wave of Austronesians must soon have learnt to limit their time onshore. The settlement of

Madagascar, with its disease-free highland areas, may well have been stimulated by high morbidity on the coast.

4.2.3 Elephantiasis

Elephantiasis, or lymphatic filariasis, is an extremely visible condition which originated in the Pacific or the insular SE Asia. The thread-like, parasitic filarial worms *Wuchereria bancrofti* and *Brugia malayi* that cause lymphatic filariasis live almost exclusively in humans. Elephantiasis is, however, widespread in Africa and must have been brought a long time ago, because of its distribution and 'embeddedness'. Laurence (1968) notes 'this infection is placed in the area of evolution of the Malay-Polynesian-Malagasy [Austronesian] language-group and it is conceivable that the disease was introduced into Africa by movements of people belonging to the same linguistic group'. Elephantiasis *must* be transmitted by movements of infected people. As it happens, there is at least one piece of archaeological evidence attesting to its antiquity in West Africa, a Nok terracotta (Fagg 1977: pl. 121). Fagg (p. 11) notes other statues with possible representations of the disease and Hoeppli (1969) gives some more recent examples in African bronzes and terracottas. The Nok culture is typically dated within a 'window' of 500 BC - AD 500. For elephantiasis to have moved across the continent in this way must have taken some centuries, pointing to a likely introduction in East Africa prior to 0 AD.

4.3 Plant transfers

4.3.1 From SE Asia to Africa

There are at least three staple food-crops in Africa that are considered to come from SE Asia and the Pacific (Blench 1996).

Plantains	*Musa paradisiaca*
Water-yam	*Dioscorea esculenta*
Taro	*Colocasia esculenta*

These are deeply embedded in African staple ecologies and are very unlikely to be recent introductions (Blench in press, b). Indeed, phytolith evidence for cultivated Musaceae goes back to the first millennium BC in the forest of Southern Cameroon (Mbida et al. 2000, 2001). On the East African coast, there is some evidence that Austronesian banana names were actually borrowed into Tanzanian languages. For example, the Shambala and Bondei languages of the coastal region have *(hu)ti* for cooking bananas which may well relate to proto-Malayo-Polynesian **punti* and Malagasy *fontsy* (Beaujard 2003). The presence of a wild seeding diploid (AA) banana on Pemba island is another clear anthropic introduction from insular SE Asia, although it is impossible to date (Williams 1949:373; Simmonds 1966).

Taro and water-yam are similarly important in many parts of humid Africa, although no immediate date can be attached to their transmission (Blench 1996). However, it is likely that all three plants were brought to the East African coast directly, prior to 0 AD. They were adopted by cultivators who then transmitted them westwards across the continent.

4.3.2 From Africa to SE Asia

Crops known to have been transported in the opposite direction to Asia are much scarcer, but there is one very well-documented case, that of the winged bean, *Psophocarpus tetranoglobus* (L.) DC. The winged bean is so well embedded in the agriculture of SE Asia and New Guinea that earlier writers situated its domestication in this region and evolved a series of unlikely hypotheses to account for the absence of wild relatives. However, Harder & Smartt (1992) have argued conclusively for its domestication in east-central Africa, although no dates have yet been attached to its movement across the Indian Ocean. Another possible candidate is the African yam bean*, Sphenostylis stenocarpa* (Hochst. ex A. Rich.) Harms). This was domesticated in tropical Africa but seems to have made its way early to SE Asia and India, where it is widely cultivated (Potter 1992; Potter & Doyle 1992).

4.4 Animal transfers: the goat

The translocation of both wild animals and livestock is well-known from the Austronesian colonisation of the Pacific. Blench (in press, a) has canvassed the possibility of a goat breed being carried from East Africa to SE Asia. The Austronesian terms **kambiŋ* or **kandiŋ* for goat are common in the Philippines, Borneo and Malaysia. **kambiŋ* was probably borrowed from Malay, but the source of **kandiŋ* is undetermined (Blust 2002:104). Goats were introduced in the Austronesian region during its expansion, perhaps from South India. The Malagasy and Comorien terms for goat seem all to be drawn from Swahili or other Coastal Bantu languages. The term *bengi*, which appears both in Malagasy dialects and Comorien, has no obvious coastal origin and probably originally meant 'kid'. It resembles Malay *kambiŋ* and when it is remembered that Malagasy typically erodes from the front, the Malay word becomes a possible source for *bengi*.

The other Austronesian root for 'goat' is **kandiŋ*. Blust (2002:104-5) says;

> The introduction of domesticated goats clearly postdates the Austronesian settlement of insular Southeast Asia, but it is difficult to make a more precise statement… reflexes of **kandiŋ*, which are distributed from Itbayaten in the northernmost Philippines (*kadiñ*), through Pangasinan in north-central Luzon and Bikol in southeast Luzon (both *kandíŋ*), to Kayan and Kenyah in central Borneo (*kadiŋ*), but do not occur in Malay or any other language that functioned as a lingua franca over wide areas of insular Southeast Asia .

A strikingly similar form occurs on the East African coast[8]. The forms in the Bantu languages are as follows;

male goat (n.): *-*ndenge* (9/10)	
Rabai	*ndenge* (9/10) 'he-goat'; *kadenge* (12/13) ~ *kidenge* (7/8) (diminutive)
Kamba	*nthenge* (9/10) 'male goat'; *kathenge* (12/13) 'small male goat' [A];
Pare	*ndhenge* ~ *nzenge* (9/10) 'he-goat'; *kandhenge* ~ *kanzenge* (12/13) 'young he-goat' [N].

The phonology of this word and its absence from Giriama (and other Northern Mijikenda) suggest that it may be a relatively recent loan into Southern Mijikenda from Daiso or Kamba. Although this cannot be conclusive, the absence of a clear etymology for **kandiŋ* in Austronesian and its occurrence in regions related to the hypothetical origin of Malagasy make it possible that goats (or words for them) were transported across the Indian Ocean. The absence of such a form on Madagascar would then be evidence for a direct East Africa-SE connection.

4.4.2 Chickens

Chickens are now know to have three centres of domestication, India, China and island SE Asia (Han Jianlin p.c.)[1]. African chickens in Ethiopia and across a wide zone of West Africa descend from the Indian breeds. However, many of the chickens of Eastern and Southern Africa are derived from island SE Asia and were *not* introduced via any identified intermediary location. Whether these were brought to Madagascar and transmitted onwards to the mainland is as yet unclear. However, Malagasy terms are borrowed from terms in the Bantu languages of the coast [and indeed across the Bantu domain] *not* Austronesian. So it is likely that the chicken was established on the coast by the time Madagascar was settled.

5. The Malay settlement of the East African coast and Madagascar

5.1 Textual evidence

Although Malagasy is an accepted member of Austronesian, its precise genesis has been much debated. It is generally considered to belong genetically to the Barito languages, today spoken in SE Kalimantan (Dahl 1951, 1991; Hudson 1976; Simon 1988). However, it has clearly undergone considerable influence

[1] This section has been completely rewritten in the light of as yet unpublished research by ILRI, based on a sample of >500 chickens worldwide, presented by Han Jianlin at the SAFA meeting in Frankfurt, September 2008.

from Malay (Adelaar 1989, 1996, 1995a, 1995b, 2006, in press). A clue to the process of transformation of Barito into present-day Malagasy is the presence of Malay terms for cardinal directions[9] and other nautical terms (Adelaar 1996; Beaujard 2003). This suggests either that the Barito travelled in Malay ships as crew or perhaps a separate migration of a Malay-speaking population, a possibility considered by Beaujard (2003). Whether the Barito were crew by their own choice or were enserfed in some way remains to be determined. However, their previously non-sea-going culture suggests the latter, as does the presence of various socially sensitive Malay loanwords in Malagasy, arguing that the Barito were the in control of the migration process (Adelaar p.c.).

A likely corollary of this is that Malay ships were not simply sailing to Madagascar but were participating in an active 'raiding and trading' culture all along the East African Coast. Medieval Arab sources point to the possibility that there were semi-permanent Indonesian trading outposts on the coast. Ferrand (1907) was the first writer to propose SE Asian identities for the islands mentioned in the Arab geographers. We know, for example, that the East African coast was considered important enough for the 'Waqwaq' raiders and traders from Sumatra to mount a raid on Qanbalu [an island on the coast as yet unidentified[10]] in AD 945 (as recounted by Buzurg ibn Shahriyar in the *Book of the Wonders of India* (Freeman-Grenville 1981). The Waqwaq seem also to have settled on the Sofala coast, where al-Mas'udi mentions them in the early 10th century (Freeman-Grenville 1962:14). Early sources suggest that the coastal Bantu did not develop seagoing vessels for long-distance trade until quite late. Al-Idrisi, writing in 1154 AD, says;

> The Zenjs [the people of the East African coast south of Cape Guardafui] have no ships for voyaging. . . . The people of the isles of Ziibag [here Ziibag =Western Indonesia] come to the country of the Zenjs in large and in small ships. They trade with them and export the Zenj merchandise, for they understand each other's language.
>
> (Al-Idrisi; ed. Ferrand)

As Hornell (1936) observed, the statement that the Indonesians understood the language of Zenj only makes sense if we assume there were Austronesian-speaking settlements on the coast, not merely on Madagascar.

Another piece of evidence comes from an unlikely source; the large canoes of Lake Victoria. Hornell (1928) undertook a detailed description of these canoes and showed that in a number of details of construction they closely resemble the 'small coasting vessels' of Java and Madura. His conclusions are worth quoting in detail.

> In view of these facts and of a number of other considerations, prominent among which is the fact that the common fishing canoe of the east coast of Africa, from Mozambique to Somaliland, though differing in details, is unquestionably derived from the same type as the outriggers of Madagascar, and that this type is known nowhere else than in Java, I can come to no other conclusion than that Indonesian settlements at one time existed upon the east coast of Africa at the time of the Indonesian colonization of Madagascar; further that the origin of the canoes, equally with the double outriggers of the coast, is to be traced to Indonesian culture exercised upon the Bantu tribes of this region by Javanese settlements along the coast-settlements subsequently obliterated in the same way as was that of the Portuguese at Mombasa in the seventeenth century.
>
> Hornell (1928:3)

Another curious piece of evidence occurs in Swahili oral traditions recorded early in the twentieth century by Gray (1954). These talk of a 'cruel' people known as the Wadiba, who built quadrilateral houses and were associated with the introduction of the coconut palm. They are later supplanted by the Wadebuli whose identification is not clear but may well be pre-Omani traders. It is at least possible that the Wadiba are Indonesians and that they were responsible for the introduction of the coconut and its distinctive methods of processing, characteristic of the East African coast today.

5.2 Material culture transfers

Examples of transfers of material culture from SE Asia to Madagascar are numerous as patterns of social organisation and aspects of religion. Traces of the Indonesian settlement on the mainland are far less numerous as they have often been overwritten by the subsequent spread of Arab culture. This section summaries a few intriguing and controversial cases, which also suggest that influences spread across the Indian Ocean in both directions.

5.2.1 Xylophones

The origin and spread of the xylophone has been subject to considerable discussion, not all of it well founded (e.g. Jones 1971; Blench 1982). The short version is as follows;

1. Xylophones occur with any significant time-depth in only two regions of the world, sub-Saharan Africa and insular SE Asia. All other occurrences (e.g. in Eurasia and the New World) are recent spreads.
2. There are striking similarities in the tuning of xylophones in Africa and SE Asia, where equiheptatonic scales occur
3. Claims the xylophones could have been brought from SE Asia to Africa are falsified by the occurrence of all stages in the evolution of the xylophone in Africa. Such intermediate stages are conspicuously absent in SE Asia where the first representations of frame-xylophones (at Borobudur) are already complete in design
4. It is therefore more likely that the xylophone was carried from Africa to SE Asia, probably by the 'Zenj' enslaved by Malay raiders on the East African Coast in the 7-12th centuries

5.2.2 Other musical instruments

Grottanelli (1947:173) first pointed to the distribution of transversely-blown conches which occur only in some Pacific islands and East Africa. Since end-blown conches are widespread throughout the region, this is suggestive but not conclusive. The flat-bar stick-zither, *sese*, occurring in both East Africa and Madagascar similarly originates in the Indonesian islands (Kaudern 1927; Sachs 1936; Blench 1984, 1996).

5.2.3 Crossbow traps

Lagercrantz (1950:112) discusses the distribution of cross-bow traps in Africa. Figure 1 shows a typical cross-bow trap from the coast of Tanzania, although they are also found on Zanzibar and along the East coast of Madagascar. Cross-bow traps are found in large parts of Asia, but particularly in mainland and island SE Asia (Mérite 1942).

<<Figure 1. about here >>
Caption: Ruvuma crossbow-trap from Tanzania

6. The transport of mainland populations to Madagascar

In addition to Austronesian inherited vocabulary, Malagasy has a considerable number of terms of demonstrably Bantu origin, but their exact source within the Bantu domain has never been properly identified. The most comprehensive attempt to consider this issue is Beaujard (1998), whose rich dictionary of Tanala contains many etymological speculations. Recent observations on the historical origins of Malagasy make it possible to develop a more definite model for the origin of Bantu loanwords. Blench (in press, a) focuses on the terminology for domestic and translocated animals, and considers some other areas of vocabulary in less detail. Another element in the Malagasy lexicon is the development of vocabulary to reflect a wholly unfamiliar natural environment. Walsh (2007) has recently studied the Malagasy terms for wild animals and it appears that the great majority also derive, not from Austronesian, but from Bantu languages. As with livestock names, almost all are from Swahili and languages of the Sabaki group, not from the Bantu languages nearest to Madagascar, those in Mozambique.

Swahili is the dominant language today along the coast facing Madagascar is down as far as Mozambique, with a variety of Bantu languages related to it in the immediate interior (e.g. Rzewski 1979). Even within Mozambique, an isolated language such as Ekoti appears to originate from settlements of pre-Swahili speakers (Schadeberg & Mucanheia 2000). Swahili is part of larger group of coastal lects often referred to as 'Sabaki' and Nurse and Hinnebusch (1993) contains both a history of Swahili and a lexicon of 'proto-Sabaki' reconstructions. Since Bantu loans into Malagasy often retain linguistic features that have disappeared or been transformed in modern lects, these reconstructed forms provide stratigraphic insights into the history of borrowing. Of the offshore islands, the most important are the Comores. Despite their relative proximity to Madagascar, the Comores do not seem to have been settled until the 9-10th centuries (Allibert & Verin 1996). Nonetheless, once begun, this process seems to have been strongly linked to the trade between the coast and Madagascar and there has clearly been lexical flow between the Malagasy.

This is somewhat contrary to expectation. Historical accounts of the formation of the Malagasy population, such as Kent (1970) point to intensive interaction with Mozambique coastal peoples. However, it seems that the earlier interaction of Malay/Barito crews with their coastal interlocutors must have been much more than casual trade. To explain the dominance of Sabaki languages in the Malagasy lexicon and the rich borrowings in the field of flora and fauna, it must be that substantial numbers of coastal Bantu were carried to Madagascar, and were primary observers of the natural world. This might be because they were engaged to herd livestock or were captured and set to work to produce food. Whatever the explanation, this points to intensive interactions between the Malay/Barito and the precursors of the Swahili *prior* on the coast to the settlement of Madagascar proper. The discovery of an increasing number of Malay nautical terms borrowed into Swahili (Walsh and Blench forthcoming) independently suggests external influences played an important role in the evolution of Swahili maritime culture.

7. In the footsteps of the Malays

If earlier Austronesian voyagers of unknown affiliation and Malays could reach East Africa and Madagascar, then presumably other maritime peoples from SE Asia could also make the same journey. Beaujard (2003) in particular has argued for 'waves' of settlement. The Malagasy language might be expected to testify to this nexus of interaction through loanwords and etymologies within key areas of its vocabulary. Malagasy is divided into numerous dialects, the most important of which are Merina, Tanala, Betsileo, Tandroy, Antankarana, Tsimehety and Sakalava. These have a large amount of common core vocabulary, but also a significant corpus of 'rogue' lexemes whose source is yet to be identified. The origin of these may be the language of the pre-existing Mikea groups or in the coastal Sabaki languages (cf. Simon 1988 for early pointers in this direction). Apart from its core Barito/Malay lexicon, Malagasy has picked up substantial amounts of Malay from different eras and areas (Banjar and Sumatra), Javanese and South Sulawesi languages (Beaujard 1998, 2003). Beaujard attempts to establish a stratification of Austronesian arrivals in Madagascar through loanwords, although his attempts have met with some scepticism, from Adelaar (2006, in press), for example. Table 2 gives some examples of Beaujard's proposed loans into Malagasy from SE Sulawesi and the Philippines languages;

Table 2. Possible later Austronesian loans into Malagasy

Proposed source	Gloss	Malagasy	Possible Austronesian cognates
Sulawesi	female genitals	*falo*	Kaili *palo* buttocks, anus
	earth spirits	*-lampo*	Sulawesi *rampo* forest spirits
	spade, spoon	*sotro*	Mandar *sodo'* spade, Toraja *saʔdan*
	hill	*tanety*	Bugis *tanete* upland Toraja *tanete* hill
	liana, vine	*vahy*	Mandar *uake* root, Toraja *waka* liana
Philippines	lablab bean	*antaka*	*antak* is widespread for various *Vigna* spp.
	cultivated field	*saha, saka*	Tagalog *saka* field

Source: Beaujard (2003)

Numbers of non-Malay/Barito etymologies remain small and hardly support the notion of 'waves' as opposed to occasional interactions. However, the lexicology and etymological analysis of Malagasy dialects is only beginning and it may well be that further examples will be brought to light.

8. The impact of the Malay on Sabaki coastal culture

The Swahili peoples are presently identified by their maritime culture and this is usually assumed to derive from Omani sources (Horton & Middleton 2000; Whitehouse 2001). The Swahili, especially Zanzibaris, like to trace their ancestry to Oman, which functions as prestige origin for cultural traits. But indirect evidence points to contact with Java as a major stimulus to nautical evolution along the East African coast. Walsh & Blench (forthcoming) identify Malay nautical and other cultural terms borrowed into Swahili. But equally striking is the temporal coincidence. We know from the testimony of Al-Idrisi quoted earlier the Zenj had no ocean-going ships as late as the early 12th century, but that they were in intensive contact with Sumatra. It therefore seems credible that the initial transformation of the Swahili from land-based cultivators to seafarers can be attributed to the Malay contact. Curiously, enough a parallel evolution occurred in China; as Manguin (1980:274) points out, China only began to build an oceangoing navy after contact with large SE Asian vessels in the 8th and 9th centuries.

Subsequently, nautical technology on the coast seems to have undergone a revolution, due to the influence of Arab and Indian commerce and the rapid adoption of new craft. Jewell (1976) describes the many ship types on the waterfront at Mombasa, which in the 1960s were still undertaking a circular voyage between the Gulf of Aden, the west coast of India, Nossi Bé in NW Madagascar and the Comores and on to East Africa. When Vasco da Gama arrived, all these ships were constructed entirely without nails, an ancient practice characteristic of the entire Indian Ocean region. At any rate, from this period onwards, the expansion of commerce stimulated the development of shipyards all along the coast and the virtual replacement of whatever older shipping forms were in use, with the exception of the *mtepe* or 'sewn boat' (Hornell 1941). As a consequence, it has become difficult to reconstruct older Austronesian maritime influence, even as the disappearance of dhows in the years since Jewell's book was published have made much more recent trade patterns less researchable.

9. Islands in the stream

Recent research points ever more strongly to early and persistent Austronesian contacts across the Indian Ocean, both via outriggers as part of the spice trade and with the rigid ships of the Malay sea-borne empire. The later rise of Arab shipping has largely obscured this narrative in the broader history of the region and had a negative impact on archaeological survey. One of the more curious aspects of the archaeology of trans-Indian Ocean voyaging is that there is so little evidence for Austronesian (or other) incursions on the intermediate islands. The ability of Austronesian navigators to find very small islands in large expanses of open ocean is well documented, yet it seems that almost all the Indian Ocean islands were uninhabited during the first period of European contact. Anderson (2002) in a survey of Pacific islands in remote Oceania found no less than thirty which were apparently reached by Austronesian navigators but were devoid of inhabitants during the period of European exploration[11]. Explanations are various; typhoons, disease, lack of sustainable food and water supplies are all probable causes. The situation may be replicated in the Indian Ocean; Mauritius or the Seychelles may have been reached, but then abandoned again for a variety of reasons. Indeed, the computer simulation of trans-Indian Ocean voyages by Fitzpatrick & Callaghan (2008) suggests that it is very unlikely the voyagers did not touch the intervening islands. One reason for their abandonment may have been the lack of easily exploitable food resources. It is notable that European sailors tended to rapidly consume any readily caught resource (e.g. the dodo) and bring in and release often destructive species such as the goat in order to ensure future food supplies. In the case of the Maldives, no Austronesian language is spoken there today. However, as both Hornell (1920: 230) and Manguin (1985:12) argue, constructional techniques in boatbuilding point unambiguously to early Austronesian contact.

It seems increasingly likely that the lack of evidence for Austronesian landings is an artefact of the patchy archaeology. Creating a checklist of possible landing sites or failed colonisation attempts may help to recover this intriguing period. Table 3 is intended to highlight the extremely uneven record of

archaeology in this region and to establish the parameters of a programme to put their settlement and colonisation on a sounder footing. Mitchell (2004) has surveyed existing knowledge of the prehistory of Africa's offshore islands and this summary is indebted to his results for the relevant ones.

Table 3. Possible Indian Ocean sites for Austronesian and other settlement

Name	Possible AN contact	Possible other contact
Eastern Indian Ocean		
Andaman Islands	Yes	Numerous
Ashmore & Cartier Islands	Yes	Unlikely
Christmas Island	Yes but negative survey	Unlikely
Cocos & Keeling Islands	Yes	Unlikely
Dirk Hartog Island	Yes	Unlikely
Houtman Abrolhos	Yes	Unlikely
Langkawi Islands	Currently settled by Austronesian speakers	Numerous
Mentawai Islands	Currently settled by Austronesian speakers	Numerous
Mergui Archipelago	Currently settled by Austronesian speakers	Numerous
Nias Island	Currently settled by Austronesian speakers	Numerous
Nicobar Islands	Yes. Currently settled by Austroasiatic speakers	Numerous
Penang	Currently settled by Austronesian speakers	Numerous
Phi Phi Islands	Yes. Currently settled by Thai speakers	Numerous
Phuket	Yes. Currently settled by Thai speakers	Numerous
Simeulue Island	Currently settled by Austronesian speakers	Numerous
Weh Island	Currently settled by Austronesian speakers	Numerous
Sri Lanka	Yes	Numerous
Western Indian Ocean		
Agalega	Yes	Arabs ?
Albatros Island	Yes	Arabs ?
Aldabra	Yes	Arabs ?
Bassas da India	No	No
Bazaruto Archipelago	Yes	Arabs ?
Cargados Carajos	Yes	Arabs ?
Chagos Archipelago	Yes	Arabs ?
Comoros	Currently part-settled by Austronesian speakers	Numerous
Diego Garcia	Yes	Arabs ?
Europa Island	No	Doubtful
Glorioso Islands	Yes	Doubtful
Juan de Nova Island	Yes	Doubtful
Lakshadweep Archipelago	Yes	Numerous
Lamu Archipelago	Yes	Numerous
Madagascar	Currently settled by Austronesian speakers	Numerous
Mafia Island	Yes	Numerous
Maldives	Yes	Numerous
Mauritius	Yes	Numerous
Mayotte	Yes	Numerous
Pate	Yes	Numerous
Pemba	Yes	Numerous
Quirimbas Archipelago	Doubtful	Numerous
Réunion	Yes	? Arabs
Rodrigues	Yes	? Arabs
Seychelles	Yes	? Arabs
Shanga	Yes	Numerous

Name	Possible AN contact	Possible other contact
Socotra Islands	?	Numerous
Tromelin Island	?	Doubtful
Zanzibar	Yes	Numerous

The Southern Indian Ocean islands consist of Amsterdam Island, Crozet Islands, Heard Island, Kerguelen Islands, Marion Island, McDonald Islands, Prince Edward Islands and Saint-Paul Island. These are generally extremely cold and windswept and although Austronesian settlement is not impossible, it seems extremely unlikely.

10. Synthesis and conclusions

An accumulation of evidence suggests that there were direct Austronesian contacts with the East African coast prior to 0 AD unconnected with the settlement of Madagascar. This includes textual sources, maritime technology, plant and animal transfers, disease and other aspects of material culture. If we accept Pliny's account, then these were direct voyages by outrigger that brought spices and took back Graeco-Roman manufactures, making use of the equatorial counter-current.

This should be distinguished from later contact with the coast, initiated from the Malay-speaking area which probably begins from the 6th century onwards. Despite the absence of Austronesian-speaking populations on the mainland today, it is likely that a trading and raiding culture existed between the 6th and 12th centuries. It would have been responsible for the transport of the Barito and Sabaki-speaking peoples to Madagascar, originating the complex culture that exists there today.

In archaeology, you find what you seek, and evidence for the Austronesian crossings of the Indian Ocean has hardly been sought. Further work should uncover evidence for both settlements on the East African mainland and traces of temporary landings on the many intervening islands apparently unoccupied at first European contact.

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[1] Contact between Polynesia and the Americas remains controversial. For California see Jones & Klar (2005), Klar & Jones 2005, Anderson 2006 and response Jones and Klar 2006. For Central America, see Baudouin & Lebrun (2008). For South America, see Storey et al. (2007) and response Gongora et al. (2008).

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[3] Recent unconfirmed reports of stone tools occurring in a cave site in the northwest (Dewar p.c.) may be the archaeological breakthrough required to demonstrate this conclusively.

[4] Taolambiby is an inland site, so if this is acknowledged as evidence for human settlement, this must have been still earlier.

[5] Although if iron-working Bantu-speakers were on the coast around 0 AD and there was some flow of trade across the Mozambique channel it is conceivable that small quantities of iron tools were reaching Madagascar at this early period.

[6] This translation has been questioned by Horton (1990) and Wrigley (1997) and depends on an emendation to *aratoi*, literally 'ploughers'.

[7] Thanks to Natalie Vasey who forwarded a poster version of this presentation and corrected my summary of it.

[8] Martin Walsh kindly compiled this list for me.

[9] Albeit turned around 90º

[10] Though Mack (this volume) suggests the Comoros, somewhat at odds with the references to the Waqwaq in Sofala

[11] These were approximately: 5 in the Pitcairn-Henderson Islands region, 8 in the NZ region, 1 in New Caledonia, 1 in Tonga, 3 in the Cooks-Societies,8-9 in the Equatorial islands region, 4 in Hawaii.