

MADAGASCAR AND INDONESIA: NEW EVIDENCE FROM ARCHAEOLOGY AND LINGUISTICS

Pierre Vérin* and Henry Wright**

*Université Française du Pacifique, B.P. 4635, 98713 Papeete, French Polynesia

**University of Michigan Museum of Anthropology, Ann Arbor, Michigan 48104, USA

This session has clearly shown that linguistic evidence has occupied a privileged position in our search for knowledge of the Indo-Pacific past. Early European voyagers, such as Bougainville, published lexical appendices in their reports. The similarities of Polynesian and Indonesian languages were noticed at a very early stage. As we shall see, this early use of linguistic record may be useful, but can also be misleading if one forgets the disjunction which often prevails between language, human biology and material culture.

THE AUSTRONESIAN HERITAGE OF MALAGASY CULTURE

Such a situation where linguistics provides hints for the explanation of culture history is not unique in the Austronesian world. In 1614, Father Luis Mariano (1904), a Portuguese Jesuit, remarked upon the existence of two languages in use along the Northwest coast of Madagascar. Traders coming from the southern shores of Africa spoke Swahili, but the natives made use of "the bouque language, totally different from Kafir language but very similar to Malay". Mariano adds "This is a rather conspicuous evidence that these early inhabitants came from the port of Melaka."

The ties with Southeast Asia were first noted when it became obvious that Malagasy was an Indonesian language of the Austronesian family, a discovery reported at the beginning of the seventeenth century by Frederick van Houtman (1603) who recognized similarities with Malay. Almost half a century ago, Otto Dahl (1951, 1977) pointed out the affinities between Maanyan, a Barito language from southwestern Borneo, and Malagasy. The Barito and the Malagasy subgroups display a high common retention in vocabulary and grammar (though one should not exclude the possibility that future comparative studies may reveal a closer linguistic relative). Lexicostatistics shows that almost 90% of the basic Malagasy vo-

cabulary is Indonesian and the highest percentage of common retention is between Maanyan and Malagasy (Vérin, Kottak and Gorlin 1970, but cf. Gueunier 1988). Recently, Adelaar (1989, 1996) has argued that there was a definite influence of Old Javanese and Malay on the Proto-Malagasy language, an influence which probably dates back to the time of the Srivijaya Empire. More intriguing is the Kota Kapur inscription found on Bangka island off the southeast coast of Sumatra, written in AD 680 and bearing a text in a language which could be ancestral to both modern Maanyan and modern Malagasy. It is perhaps relevant that the Lom people living in northern Bangka speak a language which displays similarities with both Barito and Malagasy.

Even though many problems remain to be resolved regarding the date of the departure of the Indonesian ancestors of the Malagasy and even of the precise location of their region of origin, one may reasonably suspect that they left Southeast Asia at a time when the area was beginning to experience Hindu cultural influences. The words from Sanskrit origin which exist in Malagasy could have been acquired then. There is good evidence that this process of hinduization had begun in Indonesia by the fourth century AD, but it may have begun even earlier. Also, such influence was unevenly distributed within Indonesia and southeast Asia generally, and we must consider the possibility that the ancestors of the Malagasy emigrated from an isolated part of the far-flung Indonesian archipelago, one having little Hindu influence, sometime after the fourth century. We must also keep in mind that continued contact with Indonesia, bringing new people, new language features, and new technologies, is possible (Adelaar 1989, 1996).

Because of our insufficient knowledge of the pottery unearthed in Borneo, Java and Sumatra and dating between the beginning of the Christian era and AD 1000, it is at present impossible to trace any Malagasy pottery styles back to ancestral Indonesian pottery. In addition, it

is notable that the earliest-known ceramics from Madagascar are coarse with simple shapes and have little if any decoration, as we will discuss in the next section. It is possible that the first emigrants from southeast Asia were not themselves potters and had only a general idea of how to form and fire vessels from clay. Their pots might have been modeled on vessels of wood, gourd, carved stone, or metal rather than on those of some established ceramic tradition.

It is notable that the Malagasy word *tefy* (verb *manefy*) is derived from **tempa*, a proto-Indonesian word which connotes not only pottery-making but also the forging of iron. Both operations involve shaping (with the hand or with the hammer). This suggests that the early Indonesian people who came to Madagascar knew both pottery and iron. However, we have good reasons to believe that iron was especially important then because most of the words relating to it are Austronesian (e.g. *landaizana*, anvil; *tafoforana*, the double piston bellows [as opposed to the goat skin bellows universal on the African continent] and of course *ivy*, iron) (Deschamps 1965; Radimilahy 1988). This contrasts with related classes of words, for example those relating to pottery, which appear to be derived from words in the Bantu languages.

Ethnographic traits observable in Madagascar and widespread in Indonesia have been often reported. Among material elements which we can identify through etymology and material culture comparisons (besides iron-making already mentioned) are features of domestic dwellings and their construction, words concerning the dugout sailing canoe with outrigger, types of mats, and hunting and fishing tools and methods. Among musical instruments, the flute, *sodina*, and the tube zither, *valiha*, are definitely derived from Southeast Asia. The Malagasy terminology and techniques for slash and burn agriculture bear strong similarities to their counterparts in Indonesia and this has led some comparativists to think that the first emigrants to Madagascar were swidden cultivators. Among the terms considered as having an Indonesian origin we may mention *tetika* and *tavy*, deforestation; *ava*, weeding; *fary*, sugar cane; *fontsy*, ravenala, a tree similar in appearance to the banana; *ovy*, yam; *voanio*, coconut, and also probably the word for rice, *vary*. Yams (*Dioscorea* sp.), bananas (*Musa* sp.), taro (*Colocasia* sp.) and East Asian rice (*Oryza sativa*) were imported to the east coast of Africa, and became widely distributed throughout the sub-Saharan regions. Also, the Malagasy implements for pounding rice and certain techniques connected with rice preparation and cooking have Indonesian parallels. Solheim (1965) has suggested that the Malagasy newcomers had a way of life similar to the present day Iban of Borneo.

There is continuing discussion about the importance of the contribution of the ancestral Indonesian cultures to Malagasy religion and social organization. Some agree-

ment exists about the identification of the *foko* as a basic social unit of some Malagasy and Indonesian societies. Beliefs about the ancestors, the use of upright stones, and the practice of secondary mortuary rituals are also generally considered to be a heritage from South East Asia. Ferrand pointed to a connection between the word for deity, *Zanahary*, and similar morphemes in Malay and Cham.

One of the most intriguing aspects of the early history of Madagascar is the heterogeneous aspect of the biological phenotypes of the inhabitants, some showing Southeast Asian features and others showing definitely African features. It is also intriguing that the Malagasy speak an Indonesian language, but one which shows evidence of an early interaction between Malagasy and a Bantu language of the Sabaki group (Dahl 1988, Nurse 1993). Current historical linguistic study dates the emplacement of Bantu speakers in eastern Africa early in the first millennium BC and on the coast at least by the end of that millennium (Ehret 1998, Schoenbrun 1994). That this Afro-Austronesian synthesis took place in the formative period during the first millennium is supported by archaeological evidence. The earliest-known ceramics on the northwest coast, which date to the eleventh or twelfth centuries AD (Radimilahy 1998), have parallels with the Dembeni Ware of the Comoros (Allibert 1989; Wright 1984) and with those the Kilwa II style from the East African coast (Chittick 1974, 1984; Horton 1996a, 1996b). East African Bantu from the coast sailed to the Comoros a least by the eighth to tenth centuries AD (Wright 1993) and they must have been in protracted contact with the early Austronesian sailors at or before that time. However, nobody knows whether these two components arrived in Madagascar simultaneously. We can only say that contacts existed at least by the end of the first millennium AD. The shared maritime way-of-life perhaps contributed to the choice of Austronesian as a *lingua franca* after a bilingual period.

BACKGROUND FOR INTERPRETING THE AUSTRONESIAN MIGRATION: THE INDIAN OCEAN CONTEXT

Since scholars have been unable to correlate the pottery sequences of the first millennium AD from the Indonesian archipelago with the discoveries of both local and imported ceramics unearthed in Madagascar, we have tended to focus on linguistic and ethnographic comparisons. But we can also utilize what is known from history and archaeology about the context and the chronology of early trade and voyages in the Indian Ocean.

One may well ask why such a large and naturally well-endowed island was among the last major land masses to be occupied by human beings. Later Stone Age peoples, probably with dugout canoes, lived on the eastern coasts of Africa (only 350 km from Madagascar) for tens of

thousands of years. In addition, there is evidence of fisherfolk with sophisticated marine technologies along the coasts of Arabia as early as 6000 BC (Tosi and Costa 1989). We cannot rule out the possibility that from time to time people drifted to Madagascar, and may have left a few early sites. However, we believe that the major contribution of African peoples to the Malagasy universe took place much later.

The earliest people known to have sailed the Indian Ocean were mariners of the Bronze Age. Mesopotamians had long fished and traded along the shores of the Persian Gulf (Oates et al. 1977). By 2200 BC South Asian mariners undertook regular voyages from the Indus Valley to Mesopotamia and to the Horn of Oman with its rich copper resources, a voyage across the open sea of about 400 km (Ratnagar 1981; Cleuziou and Tosi 1994). Mariners with such ships could easily have explored farther south along the coasts of Arabia and Africa. Indeed, there is one piece of archaeological evidence that such voyages took place. Recent chemical analysis of a pendant found in Iraq near modern Baghdad in a grave of about 2200 BC indicates that it was formed from a tree gum or 'copal' probably derived from the genus *Trachylobium*, which is found today only in Zanzibar and Madagascar (Meyer, Todd and Beck 1991). The distribution of this tree 4000 years ago is not yet known, however, and it could have occurred farther north along the coast of Africa. Also, there is a possibility that small amounts of gum were traded north towards the Horn of Africa. However, this occurrence is suggestive of maritime contacts between the Bronze Age civilizations of West and South Asia and the southwestern Indian Ocean.

The early Mesopotamians and the Indus Valley peoples were not the only Bronze Age sailors on the Indian Ocean. The people of the Nile were constructing substantial sailing ships by 2500 BC (Lipke 1984). There were Egyptian ships sailing in the Red Sea during the earlier second millennium BC (Kitchen 1993). There were regular royal expeditions seeking incense and other valuable items, probably from as far as the Horn of Africa. There is no evidence yet that Bronze Age Egyptian ships sailed along the coasts of Africa, but they certainly had the means to do so.

Whatever the extent of occasional earlier contacts between the lands bordering the Indian Ocean, a regular trade certainly developed with the rise of empires and monetized economies after 600 BC. It is in the context of this world-girdling trading system that we believe Madagascar was first colonized. There are scattered references to the Indian Ocean in the works of Hellenistic writers, and we are fortunate to have a merchant's handbook of about AD 70 for Red Sea, East African, Arabian, and South Asian ports, the *Periplus Maris Erythraei* (Casson 1989). This source gives us invaluable details on the mechanics of the trade which took advantage of the seasonal

reversal of the monsoons to move goods between the South Asian and Mediterranean worlds. It is through archaeology, however, that we are beginning to establish the full extent of this system throughout the Indian Ocean, even in Southeast Asia, regarding which the known written sources are few.

On the Indian Ocean coast of the Horn of Africa, in what is now Somalia, are the sites of Ras Hafun, certainly elements of what the author of the *Periplus* termed the *emporium* of *Opone*, where it states that merchants sought spices, slaves and tortoise shell. Given the location, it is also likely that they beached their ships here to await beneficial winds. Test excavations made at this location indicate that there were two sites (Smith and Wright 1988). One was a smaller beach camp, only 0.12 hectares, used from about 150 BC up until the beginning of our era. It has evidence of a small structure, perhaps for storage, and hearths. Here classical mariners discarded ceramics from Ptolemaic and early Roman Egypt, similar to those from Quseir al-Qadim (Whitcomb and Johnson 1982; perhaps the *Myos Hormos* of the *Periplus*) and South Asia, though surprisingly a majority appear to be Parthian types from the Persian Gulf. The other site was a larger beach camp of about 1.30 hectares, without evidence of structures but with some small ovens perhaps for making bread, used from about AD 100 until about 500. In the earlier layers, most of the discarded ceramics were from India or the Gulf, with few from Roman Egypt, while in the later layers, the discarded ceramics were primarily Sasanid types from the Gulf. These ceramics, broken in the course of preparing meals of bread, goat meat and fish, probably indicate the shifting importance of different ports of the Indian Ocean - Red Sea and Gulf ports in the time of the Ptolemaic and earlier Roman Empires, South Asian ports in the time of the later Roman Empire, and Persian ports just before the rise of Islam. Archaeologists working farther south on the coasts of what is now southern Somalia, Kenya and Tanzania have found sites from late in this period (Chami 1994, Juma 1996), and earlier sites are mentioned in the *Periplus*.

On the eastern or Coromandel Coast of India is the site of Arikamedu, probably the *emporium* of *Poduke* mentioned in the *Periplus*. Excavations of the town site, of which about five hectares have survived erosion by the river, revealed the footings of a substantial store house and of a building which may have been a workshop for dyeing fabrics (Casals 1949, Wheeler et al. 1946, Begley et al. 1996). Among the many pieces of local south Indian ceramics (including some of the same wares as those found at Quseir and Ras Hafun) were fragments of Roman amphora and fine red *sigillata* table wares dating between 100 BC and AD 200. Among the *amphorae* are those used for olive oil and fish sauce, types otherwise rare in India, which suggests that people of Mediterranean background eating a typical Graeco-Roman cuisine were resident at

Arikamedu. Also found were many fragments of glass and glass cullet (melted droplets discarded during the manufacturing process) indicating the manufacture of beads and other items. Many other sites of this period in Pakistan and India, some probably much larger and more cosmopolitan than Arikamedu, await future excavation and study.

The extent of this early Indian Ocean trade network into Southeast Asian waters remains poorly documented. Chinese sources describe embassies of the Han Dynasty to the flourishing state of Funan in the Mekong delta of Vietnam, and excavations at the site of Oc Eo, recently reopened, are revealing what must have been a major center, if not a capital, of this polity. Roman lamps, coins, seals and other items have been found. However, little has been published on recent archaeological research on this and related sites (Stark 1998). Much farther to the southeast, a surprising recent discovery has been made on the island of Bali (Ardika and Bellwood 1991). Here, test excavations have revealed a coastal site at Sembiran. Among the local ceramics are both red wares and moulded wares identical with some of the ceramics of Mediterranean affinity from Arikamedu.

What is the relevance of this vast maritime network - connecting Han China and the Roman Mediterranean and all the societies between - to the early settling of Madagascar? In the first place, among the commodities mentioned by the anonymous author of the *Periplus* are a number which can be found on Madagascar. Among these are tortoise scutes, pearls and gold. To these can be added chlorite schist (a stone similar to steatite), semi-precious stones, iron, timbers and tree gums, all of which became important later. Perhaps also the eggs of Madagascar's giant ratites were of interest. In the second place, it is clear that various nautical technologies capable of sustaining voyages were well-developed. In addition to the pegged, plank-built ships with fore-and-aft rigged square sails of the Mediterranean tradition (Casson 1984), there were several traditions of sewn plank ships and of surprisingly large dugout canoes with outriggers, both with various types of sails (Manguin 1985). It seems likely that Madagascar had been visited by ships from many other areas, and that reports of its varied coasts were widespread in the ports of the Indian Ocean.

EARLY COMMUNITIES ON MADAGASCAR: NEW EVIDENCE OF PALEOECOLOGY AND ARCHAEOLOGY.

Palaeoecological research provides new information concerning the date of early human intrusions into Madagascar. Scholars have long discussed the implications of deforestation (Burney 1987a, 1987b; Chauvet 1965; Kochlin 1965; Mahé 1965) and extinction of animals such as the giant lemurs *Hadropithecus* and *Archaeolemur*, the pygmy hippopotamus, and the giant flightless birds *Aepy-*

ornis and *Mullerornis*. (Battistini and Vérin 1967, 1972, Dewar 1984, 1986, 1996, Richard and Dewar 1991, Walker 1967). There is, however, new evidence of the direct impact of humans.

At the beginning of the twentieth century, Alfred Grandidier found the bone of a hippopotamus cut by a metal tool near the coast 25 km north of Tulear at Ambolisatra. The early researchers, however, had no means of rejecting the possibility that the bone was carved long after the hippopotamus died, and they had no way of precisely dating the find. The specimen rested for decades in the Museum d'Histoire Naturelle in Paris. Recently this bone has been re-analyzed (MacPhee and Burney 1991). Radiocarbon dating of protein molecules from the bone with the nuclear accelerator techniques developed in the 1980s suggests that the hippo was killed sometime between 30 BC and AD 210. Studies with the scanning electron microscope indicate that it was indeed cut when still fresh.

Researchers returned to the site, which local people now call Andolononby, to remove samples for dating and for quantitative faunal and floral analyses (Burney 1993). They found six meters of well-stratified sediments. Radiocarbon dating indicates that the site was established as a pond behind the coastal dunes about 3000 BC. Until about 1000 BC, the pollen indicates that the area was one of dry deciduous forest, which now occurs in higher and more humid regions 40 km to the northeast of the site, and many pygmy hippopotamuses died in the area. After 1000 BC the vegetation characteristic of the spiny desert of the far south; developed, and the quantity of hippo bones declined, indicating increased aridity. Sometime between 60 BC and AD 380 there was a rapid decline in the pollen of trees, an increase in the pollen of grasses, much charcoal from increased burning of the environment, and a further decrease in the number of large mammal bone fragments. It seems likely that people visited this part of the arid southwestern coast, burned the woodlands, and further diminished the herds of hippopotamus. Whether this was a purely, local event or a process widespread at this time is a question which can only be answered by interdisciplinary studies of other sites.

There are, fortunately, other indications of early hunters from sites on the southwest and west coast. There is the tooth of an extinct giant lemur, a form of aye-aye (*Daubentonia*), drilled for use as an ornament (MacPhee and Raholimavo 1988). From a pond site at Lamboharana, near the coast about 140 km to the north of Tulear, there is another cut hippo femur, whose protein has produced a date indicating that the animal was killed between AD 220 and 440 (MacPhee and Burney 1991). A few uncut hippo bones have also been dated by conventional radiocarbon techniques and the latest of these, recovered from only 0.40 meters below the surface of the pond sediments sug-

gest the animal died sometime between AD 680 and 990 (Battistini and V erin 1971).

The available evidence from the southwest indicates that the region began to become more arid about 1000 BC, and the animal life of the area probably diminished in response to this change. In the first or second century AD, people arrived on the southwest coast, burned some coastal areas, butchered pygmy hippos and flightless birds, and carved some of the bones to make tools. Unfortunately, archaeologists have not yet found actual campsites of these early hunters which would provide evidence of technology, social organization and other aspects of their way of life. We therefore have no idea whether they were Africans, Indonesians, or Indian Ocean mariners from some other region. The hippopotamus survived at least until AD 700, and probably much later. However, when the larger animals became extinct, the early inhabitants of the southwest must have been forced to change their economy, focusing either on fishing, the hunting of smaller animals, herding, or horticulture (Battistini, V erin, and Rason 1963, V erin 1971).

Along the northeast coast of Madagascar, between the Bay of Antongil and Antseranana (Diego Suarez), sites with traces of early human settlements were first investigated by Battistini and V erin (1966; V erin 1975, 1986). Several sites have recently been dated between the sixth and the ninth centuries AD. In the rock shelters of Andavakoera near Antseranana, Dewar and Rakotovololona (1992; Dewar 1996, 1997) have found evidence of foragers consuming resources from the nearby coast while hunting lemurs and gathering forest resources beginning in the sixth to eighth centuries. On the island of Nosy Mangabe in the Bay of Antongil, Wright found stratified deposits probably washed from swidden fields with evidence of the smelting of iron and the use of basins of chlorite schist and globular vessels of a coarse ceramic decorated with arcuate imprints, beginning in the eighth century (Wright 1992). Sandrakatsy, twenty km up the Mananara River from the Bay of Antongil, is an early village site beginning in the eighth to ninth centuries (Wright and Fanony 1992). There is evidence of iron metallurgy and the manufacture and use of basins and globular vessels of both chlorite schist and coarse ceramics, also with arcuate impressions. Efforts to retrieve carbonized seeds and plant phytoliths failed to indicate what was being cultivated at these sites. East Asian rice is attested in the ninth century on the Comoros (Allibert 1989, Wright 1984), and must have been known in Madagascar, but it is possible that root crops such as yams and taro were also important. Also, no early human remains have been discovered so far at these sites, and therefore it is impossible to decide whether these early inhabitants were from African or Indonesian origin. The vessel styles, however, have few African parallels and may be Southeast Asian. Nevertheless, it is clear that villages were widespread along

the coast, and people were collecting resources in the forests during the eighth century AD, and probably earlier (Dewar and Wright 1993). Given the extensive evidence of early settlement, it is unfortunate that as yet there are no paleoecological studies of localities on the northeast coast which might give evidence of early human disturbance of the forest environments.

Palaeobotanical studies of lakes and peat bogs in the highlands of Madagascar indicate that major vegetation disturbances, probably due to extensive fires, have a long history, but changing fire regimes and introduced weeds beginning around AD 500 suggest human use of the interior (Burney 1987a, b, c; Dewar and Burney 1994; MacPhee, Burney, and Wells 1986). However, no archaeological sites in the interior of Madagascar have been firmly dated prior to AD 1200 (Rakotovololona 1994; Wright et al. 1992).

CONCLUSIONS

The diverse materials which we have attempted to present here enable us to redefine old problems, to take some new steps towards a solution of the enigma of Malagasy origins, and to point to areas where new research is needed. These can be summarized as follows:

1. The Malagasy people show a diversity of biological origins, predominantly Southeast Asian and African. Southeast Asian phenotypes are widespread in the Highlands. There is a necessity to determine the closest biological relatives of the Malagasy in Southeast Asia, if such is possible. Full exposition of the results of DNA studies will be of greatest interest.
2. All the inhabitants (except small Comorian- and Swahili-speaking communities in the Northwest) speak an Indonesian language which belongs to the Barito group and shows traces of an influence of Old Javanese. The Malagasy language, however, had some early interaction with Bantu languages. Further studies of the dialects Malagasy are needed.
3. The itinerary of the early migrants between Indonesia and Madagascar is not well known. It is possible that they could have come in contact with South Asia on the way. The correlation of the earliest ceramic and stone vessel styles of Madagascar with those from Indonesia and South Asia should clarify this issue.
4. The intrusion of people into an untouched environment led to major changes of the flora and fauna. Absolute dating of sites with evidence of changing vegetation and predation upon Madagascar's megafauna suggests that people had arrived on the west and southwest coasts by at least the second century AD, but we do not know if they were among the ancestors of the Malagasy. Similar paleoecological studies in other coastal area will doubtless be rewarding.

5. A formative phase of Malagasy culture has been documented on the northeast coast of Madagascar between the fourth and eighth centuries AD. It was characterized by the exploitation of forest resources and the possible development of swidden agriculture, perhaps using such Southeast Asian plants as rice, yams, taro and bananas. Maritime patterns may have been shared with African immigrants who adopted the Proto-Malagasy language. Further archaeological work on early sites, both in the northeast and elsewhere, is essential to document both the earliest Malagasy and their important contributions, particularly of domestic plants, to Africa.

ACKNOWLEDGEMENTS

The authors are indebted to Robert Dewar, Roger Green and Murray Gell-Mann for their careful reading of earlier drafts, and for their many suggestions. The authors take full responsibility for any errors.

REFERENCES

- Adelaar, K.A. 1989. Malay influence on Malagasy: Linguistic and culture historical implications. *Oceanic Linguistics* 28: 1-46.
- Adelaar, K.A. 1996. Malagasy culture history: some linguistic evidence. In Reade, J. (ed). *The Indian Ocean in Antiquity*, pp. 487-500. London: Kegan Paul and the British Museum.
- Allibert, C.I. 1989. Early settlement on the Comoro Archipelago. *National Geographic Research* 5: 392-393.
- Ardika, I.W., and P. Bellwood 1991. Sembiran: the beginnings of Indian contact with Bali. *Antiquity* 65: 221-232.
- Battistini, R. and P. Vérin 1966. Irodo et la tradition vohémarienne. *Revue de Madagascar* 36: 17-32.
- Battistini, R. and P. Vérin 1967. Ecologic changes in protohistoric Madagascar. In Martin, P.S. and H.E. Wright (eds), *Pleistocene Extinctions*, pp. 407-424. New Haven: Yale University Press.
- Battistini, R. and P. Vérin 1971. Témoignages archéologiques sur la cotes Vezo de l'embouchure de l'Onilahy à la Baie d'Assassins. *Taloha* 4: 51-63.
- Battistini, R. and P. Vérin 1972. Man and the environment in Madagascar. In Battistini, R. and Richard-Vindard, G. (eds), *Biogeography and Ecology in Madagascar*, pp. 311-337. The Hague: Junk.
- Battistini, R., P. Vérin and R. Rason 1963. Le site archéologique de Talaky (Madagascar). *Annales malgaches* 1: 111-142.
- Begley, V., P. Francis Jr., I. Mahadevana, K.V. Raman, S.E. Sidebotham, K.W. Slane and E.L. Will 1996. *The Ancient Port of Arikamedu: New Excavations and Researches 1989-92*, Vol I. Memoires Archéologique 22. Pondicherry: Ecole Française d'Extrême Orient.
- Burney, D.A. 1987a. Pre-settlement vegetation changes at Lake Tritrivakely, Madagascar. *Paleoecology of Africa* 18:357-381.
- Burney, D. A. 1987b. Late Quaternary stratigraphic charcoal records from Madagascar. *Quaternary Research* 28: 27-280.
- Burney, D.A. 1987c. Late Holocene vegetational change in central Madagascar. *Quaternary Research* 28: 130-143.
- Burney, D.A. 1993. Late Holocene environmental changes in arid southwestern Madagascar. *Quaternary Research* 40: 98-106)
- Casals, J.-M. 1949. *Fouilles de Virampatnam-Arikamedu*. Paris: Imprimerie Nationale.
- Casson, L. 1984. *Ancient Trade and Society*. Detroit: Wayne State University Press.
- Casson, L. 1989. *Perilplus Maris Erythraei*. Princeton: Princeton University Press.
- Chami, Felix 1994. *The Tanzanian Coast in the first millennium AD Studies in African Archaeology No. 7*. Uppsala: Societas Archaeologica Upsaliensis and the Department of Archaeology and Ancient History.
- Chauvet, B. 1965. The forests of Madagascar. In Richard-Vindard, G. and R. Battistini (eds), *The Biogeography and Ecology of Madagascar*, pp 191-200. The Hague: Junk.
- Chittick, H.N. 1974. *Kilwa: An Islamic Trading city on the East African Coast*. Memoir No. 5. Nairobi: British Institute of Archaeology and History in East Africa.
- Chittick, H.N. 1984. *Manda: Excavations at an Island Port on the Kenya Coast*. Memoir No. 9. Nairobi: The British Institute in Eastern Africa.
- Cleuziou, S. and M. Tosi 1994. Black boats of Magan. In Parpola, A. and P. Koskikallio (eds), *South Asian Archaeology 1993*, Vol. II, pp 745-761. Soumalaisen Tiedakatemian Toimituksia Series B, Tome 271. Helsinki: Soumalainen Tiedakatemia.
- Dahl, O.C. 1951. *Malgache et Maanyan: Une comparaison linguistique*. Oslo: Egede Institutett.
- Dahl, O.C. 1977. La subdivision de la faimille Barito et la place du Malgache. *Acta Orientalia* 38:77-134.
- Dahl, O.C. 1988. Bantu substratum in Malagasy. *Etudes Océan Indien* 9: 91- 132.
- Deschamps, H. 1965. *Histoire de Madagascar*. Paris: Editions Berger-Levrault.
- Dewar, R.E. 1984. Extinctions in Madagascar; the loss of the subfossil fauna. In Martin, P. and R. Klein (eds), *Quaternary Extinctions*, pp. 574-93. Tucson: University of Arizona Press.
- Dewar, R.E. 1986. Ecologie et extinctions des subfossiles de Madagascar (traduit par Pierre Vérin). *Taloha* 10:25-41.
- Dewar, R.E. 1996. The archaeology of the early colonization of Madagascar. In Reade, J. (ed). *The Indian Ocean in Antiquity*, pp. 471-486. London: Kegan Paul and the British Museum.
- Dewar, R.E. 1997. Were people responsible for the extinction of Madagascar's subfossils, and how will we ever know? In Goodman, S. and B. Patterson (eds), *Natural Change and Human Impact in Madagascar*, pp. 364-377. Washington D.C.: Smithsonian Institution Press.

- Dewar, R.E. and D.A. Burney 1994. Recent research in the paleoecology of the highlands of Madagascar and its implications for prehistory. *Taloha* 12: 79-87.
- Dewar, R.E. and H. S. Rakotovololona 1992. La chasse aux subfossiles: les preuves du XI^{eme} siècle au XIII^{eme} siècle. *Taloha* 11: 4-15.
- Dewar R.E. and H.T. Wright 1993. The culture history of Madagascar. *Journal of World Prehistory* 7: 417-466.
- Ehret, C. 1998. *An African Classical Age: Eastern and Southern Africa in World History: 1000 BC to AD 400*. Charlottesville: University of Virginia Press.
- Gueunier, N.J. 1988. Dialectologie et lexicostatistique: Cas du dialecte malgache de Mayotte (Comores). *Etudes Océan Indien* 9: 143-167.
- Horton, M. 1996a. *Shanga*. Memoir No.14. Nairobi: The British Institute in Eastern Africa.
- Horton, M. 1996b. Early maritime trade and settlement along the eastern coasts of Africa. In Reade, J. (ed). *The Indian Ocean in Antiquity*, pp. 439-460. London: Kegan Paul and the British Museum.
- Houtman van Goude, F. 1603. *Spraeckende woord-boeck in de Maleyische ende Madagascarsche Talen, met vele Arabische ende Turcsche woorden*. Amsterdam.
- Juma, A. 1996. The Swahili and the Mediterranean worlds: pottery of the Late Roman period from Zanzibar, Tanzania. *Antiquity* 70: 148-154.
- Kitchen, K.A. 1993. The Land of Punt. In Shaw, T., P. Sinclair, B. Andah, and A. Opkopo (eds), *The Archaeology of Africa: Food, Metals, Towns*, pp 587-608. New York: Routledge.
- Koechlin, J. 1965. Flora and Vegetation of Madagascar. In Richard-Vindard, G. and R. Battistini (eds), *The Biogeography and Ecology of Madagascar*, pp 145-190. The Hague: Junk.
- Lipke, P. 1984. *The Royal Ships of Cheops*. Oxford: British Archaeological Reports, International Series 225.
- MacPhee, R.D.E., D.A. Burney and N.A. Wells 1986. Early Holocene chronology and environment of Ampasambazimba, a Malagasy subfossil lemur site. *International Journal of Primatology* 6: 463-489.
- MacPhee, R.D.E. and D.A. Burney 1991. Dating of modified femora of extinct dwarf Hippopotamus from southern Madagascar: Implications for constraining human colonization and vertebrate extinction events. *Journal of Archaeological Science* 18: 695-706.
- MacPhee, R.D.E. and E. Raholimavo, E. 1988. Modified subfossil aye-aye incisors from southwestern Madagascar: species allocation and paleoecological significance. *Folia Primatologica* 51: 126-142.
- Mahé, J., 1965. The Malagasy Subfossils. In Richard-Vindard, G. and R. Battistini (eds), *The Biogeography and Ecology of Madagascar*, pp 339-366. The Hague: Junk.
- Manguin, P.-Y. 1985. Research on the ships of Srivajaya (and of 1st millennium AD Southeast Asia) - Preliminary Report. *Final Report, SPAFA Consultative Workshop on Archaeological and Environmental Studies in Srivijaya*. Bangkok: SPAFA.
- Mariano, L. 1904. Relation du voyage de découverte fait à l'île Saint Laurent dans les années 1613-1614. In Grandidier, A., and Grandidier, G. (eds), *Collection des ouvrages anciens concernant Madagascar*, Vol. 11, pp. 1-64. Paris.
- Meyer, C., J.M. Todd and K. Beck 1991. From Zanzibar to Zagros: a copal pendant from Eshnunna. *Journal of Near Eastern Studies* 50/4: 289-298.
- Nurse, D. 1993. *Swahili and Sabaki: a Linguistic History*. Berkeley: University of California Press.
- Oates, J., T. E. Davidson, D. Kamilli, and H. McKerrel 1977. The seafaring merchants of Ur. *Antiquity* 51: 221-231.
- Radimilahy, C. 1988. L'ancienne métallurgie du fer à Madagascar. *Cambridge Monographs in African Archaeology* 28, BAR International Series 422. Oxford: British Archaeological Reports.
- Radimilahy, C. 1998. *Mahilaka: archaeological studies of an early port in northwestern Madagascar*. Studies in African Archaeology No. 15. Uppsala: Societas Archaeologica Upsaliensis and Department of Archaeology and Ancient History.
- Rakotovololona, H.S. 1994. Ankadivory: témoin d'un culture de l'Imerina ancien. *Taloha* 12: 7-24.
- Ratnagar, S. 1981. *Encounters: the Westerly Trade of the Harappa Civilization*. Oxford: Oxford University Press.
- Richard, A.F. and R.E. Dewar 1991. Lemur ecology. *Annual Review of Ecology and Systematics* 22:145-175.
- Schoenbrun, D. 1994. Great Lakes Bantu: classification and settlement chronology. *SUGIA: Sprache und Geschichte in Afrika* 14: 1-62.
- Solheim, W. 1965. Indonesian culture and Malagasy origins, *Taloha* 1: 33-41.
- Smith, M. and H. T. Wright 1988. The ceramics from Ras Hafun in Somalia: notes on a Classical maritime site. *Azania* 33: 115-141.
- Stark, M. 1998. The transition to history in the Mekong Delta: a view from Cambodia. *International Journal of Historical Anthropology* 2/3: 175-204.
- Tosi, M. and P. Costa 1989. *Oman Studies: Papers on the Archaeology and History of Oman*. Serie orientale Roma 63. Roma: Istituto Italiano per il Medio ed Estremo Oriente.
- Vérin, P. 1971. Les anciens habitats de Rezoky et Asambalahy. *Taloha* 4:29-45.
- Vérin, P. 1975. *Les échelles anciennes du commerce sur les côtes nord de Madagascar*. Lille: Service de Reproduction des thèses.
- Vérin, P. 1986. *The History of Civilization in North Madagascar*. Rotterdam: Balkema.
- Vérin, P., C. Kottak and P. Gorlin, 1970. The glottochronology of Malagasy speech communities. *Oceanic Linguistics* 8:26-81.
- Walker, A. 1967. Patterns of extinction among the subfossil Madagascar lemuroids. In Martin, P.S. and Wright, H.E. (eds), *Pleistocene Extinctions*, pp 425-432. New Haven: Yale University Press

VÉRIN AND WRIGHT, MADAGASCAR AND INDONESIA

- Wheeler, R.E.M., A. Ghosh and K. Deva 1946. Arikamedu: an Indo-Roman Trading Station on the East Coast of India. *Ancient India* 2: 17-124
- Whitcomb, D. and J. Johnson 1982. *Quseir al-Qadim 1980: Preliminary report*. Malibu: Undena Press.
- Wright, H.T. 1984. Early seafarers of the Comoros Islands: the Dembeni Phase of the IXth to Xth Centuries AD *Azania* 19: 13-59.
- Wright, H.T. 1992. Early human impact on a forest in northeastern Madagascar: Note on an archaeological sounding on Nosy Mangabe. Mss. on file, Ann Arbor: Museum of Anthropology, University of Michigan.
- Wright, H.T. 1993. Trade and politics on the eastern littoral of Africa: AD 800-1300. In T. Shaw, T., P. Sinclair, B. Andah and A. Opkopo (eds), *The Archaeology of Africa: Food, Metals, Towns*, pp 658-672. London: Routledge.
- Wright, H.T. and Fulgence Fanony 1992. L'évolution des systèmes d'occupation des sols dans la vallée de la rivière Mananara au Nord-Est de Madagascar. *Taloha* 11:16-64.
- Wright, H.T., R. Andrianaivoarivony, I. Bailiff, D. Burney, R. Dewar, H. Haas, V. Raharijaona, H.S. Rakotovololona, and D. Rasamuel 1992. Datation absolu de sites archéologiques de centre de Madagascar: présentations de déterminations. *Taloha* 11:121-146.