

## The Culture History of Madagascar

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*Madagascar's culture is a unique fusion of elements drawn from the western, northern, and eastern shores of the Indian Ocean, and its past has fascinated many scholars, yet systematic archaeological research is relatively recent on the island. The oldest traces of visitors are from the first century AD. Coastal settlements, with clear evidence of ties to the western Indian Ocean trading network, were established in several places over the next millennium. Important environmental changes of both plant and animal communities are documented over this period, including the extinctions of almost all large animal species. Urban life in Madagascar began with the establishment of the entrepôt of Mahilaka on the northwest coast of the island in the twelfth century. At about the same time, communities with ties to the trade network were established around the island's coasts. From the fourteenth to the sixteenth century, social hierarchies developed in several regions of the island. During the succeeding two centuries, Madagascar saw the development of state polities.*

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**KEY WORDS:** Madagascar; prehistory; East Africa; Indian Ocean.

### INTRODUCTION

Madagascar has long fascinated archaeologists. However, surprisingly little archaeological research has been undertaken until recently. Its culture history offers an important comparative case for many important issues—the role and process of migrations in prehistory, the origins of states, over exploitation and “overkill” by foragers, and human agricultural impact on environments, among

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them. We have organized this review by temporal period and geography. At the end of each section, we identify prospects for future research. We begin by summarizing data from nonarchaeological sources that are relevant to the prehistory and present a brief history of archaeological research on the island.

### Language, Ethnology, and Biology

Historical, linguistic, genetic, and some archaeological evidence points to Southeast Asia, East Africa, South Asia, and the Near East as homelands for the people of Madagascar. It is not farfetched to describe the Malagasy as progeny of the Indian Ocean, since they have ancestors from all its shores, except Australia. While the traces of their ancestry have been long discussed, the evidence is incomplete and the patterns complex, and disentangling the problem has not been easy (Domenichini, 1981; Domenichini-Ramiaramanana, 1988; Vérin, 1981).

#### *Language*

In Madagascar today, there is a fundamental linguistic unity, with Malagasy, an Austronesian language, almost universally spoken. There are today two minor exceptions. There are a few bilingual villages along the west coast where Makoa, a Bantu language of Mozambique, is spoken by the families of recent immigrants (Gueunier, 1992); on the island of Nosy-Be, there are bilingual Swahili speakers. In 1613, however, Luis Mariano described two languages in Madagascar: an African language along the northwest coast and a language similar to Malay on other coasts and in the interior (Mariano, 1904). Robert Drury reported non-Malagasy speech communities along the west coast in the eighteenth century.

There is marked dialectical variation in Malagasy; Vérin *et al.* (1970) proposed 2000 years as the approximate span of time over which these dialects have been diverging, on the not very reliable basis of glottochronology. In addition, they interpreted their data as supporting a hypothesis of initial settlement in the north and subsequent migrations along the west and east coasts. Recently, it has been argued that the pattern they described was an artifact of sampling distribution, and that available data support no specific historical scenario of internal migrations (Gueunier, 1988).

The most closely related surviving languages to Malagasy are found in the Barito Valley of Borneo (Dahl, 1951, 1977). Dahl (1951) proposed A.D. 400 as an estimated date of departure of proto-Malagasy speakers from Indonesia, based on the limited number of Sanskrit loan words in Malagasy. Adelaar (1989) has argued in response that most of these Sanskrit loans were probably borrowed via Old Malay or Old Javanese, and not directly from an Indian language. He prefers to date the migration as seventh century or later. Both arguments depend,

however, upon the timing of Indian influence on the Indonesian region, which is now known to be much earlier than once supposed (Ardika and Bellwood, 1991).

A further complication is the great influence of a Bantu language or languages on Malagasy. This "Bantu substratum" is found in elements of phonology and morphology as well as in vocabulary (Dahl, 1988). It is not yet known when or how this influence occurred (Adelaar, 1989). It could have been when early Indonesians visited the coast of Africa, or if there were early Bantu speakers on Madagascar, it may have happened on the island after the Indonesians landed there. In addition, Adelaar (1989) has argued that Malagasy contains loan words from Malay and Javanese, including some which show the impact of the "Bantu substratum" and some which do not. This suggests that the Malagasy language remained in contact with eastern Indian Ocean languages for some time after it was established in the western Indian Ocean.

In sum, Malagasy is an Austronesian language that shows the effects of long contact with Bantu languages. Comparisons with languages of insular Southeast Asia have suggested to numerous scholars a span of divergence of 1000 to 2000 years.

#### *Population Genetics*

The phenotypic diversity of the Malagasy stands in contrast to their linguistic unity, although both point to a complex past. Some early scholars believed that the diversity of physical type, and especially of skin color, was due to the immigration of light-skinned Malays and dark-skinned Melanesians. Limited anthropometric and hematological research (cf. Pigache, 1970) indicates the following. (1) Gene frequencies are concordant with major migrations from central Indonesia and East Africa—there is no evidence for Melanesian immigrants. (2) Within all regions there is great diversity. This local diversity is evident in any Malagasy village, whether in the "Asian" highlands or along the "African" coasts. (3) African and Asian genes are not uniformly mixed—some local populations are more Asian in origin and others more African.

#### *Ethnology*

Many features of Malagasy culture and many crops and domesticated animals have been traced to homelands in Southeast Asia, Africa, the Near East, and India. Taken as a whole, the diversity of origins serves to remind us that Malagasy culture is a product of interaction throughout the Indian Ocean, and not exclusively a marriage of Southeast Asian and African origins. Moreover, patterns in the material culture do not map on to other cultural markers. For example, the outrigger canoe, of undoubted Indonesian origin, is today mostly found along the western coast—which is conversely often said to be the region to show the strongest African influence. Unfortunately, in no case is the ar-

chaeological record yet sufficiently clear that we can trace a specific item to its homeland. For example, while it is widely assumed that cattle pastoralism in Madagascar is an introduction from East Africa, archaeological studies have yet to link bovinds recovered to particular regional breeds.

The diversity of cultures contributing to the formation of Malagasy culture is probably important in explaining the tremendous human ecological and economic diversity on the island. Presented with an island of enormous environmental variety, Malagasy settlers in each region could select appropriate domesticates and agricultural techniques from the full range available in the lands bordering the Indian Ocean.

### Archaeological Research in Madagascar

Historical traditions are important to all Malagasy groups, and material testimony of the past in the form of tombs, former villages and *vatolahy*—"male stones" or menhirs—are often pointed out as evidence supporting these traditions. Thus, it is not surprising that the first recorded archaeological observations were made by the Merina historian Raombana, private secretary to Queen Ranavalona I, about 1835. Trained in England, Raombana visited Fanongoavana, a site traditionally as the residence of one of the early chiefs of Imerina, and reported still-useful observations on the ruined house platforms (Raombana, 1980, pp. 59–60; Rasamuel, 1984b).

Systematic archaeology began at the University of Madagascar under the direction of Pierre Vérin in 1966, first at the "Laboratoire d'Archéologie," then at the "Centre d'Art et d'Archéologie" (the teaching unit) and at the "Musée d'Art et d'Archéologie" (the research and curation unit). Vérin began his work at a time when absolute dating techniques were unreliable and relatively expensive. He therefore chose to focus the university's projects on the coastal seaports which had quantities of artifacts, primarily ceramics, imported from the Near and Far East and chronologically well understood from studies in those regions. Excavations on these sites would allow the dating of local ceramic styles, which could then be used to date sites in the interior. In fact, Vérin also learned much about the coastal ports in their own right, and has written two monographs on the archaeology and history of the Islamized peoples of the coasts of northern Madagascar (Vérin, 1975, 1986). Vérin also encouraged work on other broadly archaeological issues. Among these were dating the subfossil fauna and investigating the role of the early Malagasy in the extinction of the larger forms (Battistini and Vérin, 1972) and dialect diversification on Madagascar (Vérin *et al.*, 1970). Finally, Vérin, the staff of the Musée, and many students undertook a number of small salvage excavations near Antananarivo in the central highlands (e.g., Arnaud, 1970; Mantaux and Vérin, 1969; Mille, 1971). This work near the capital culminated in the air photo survey of Adrien Mille, which

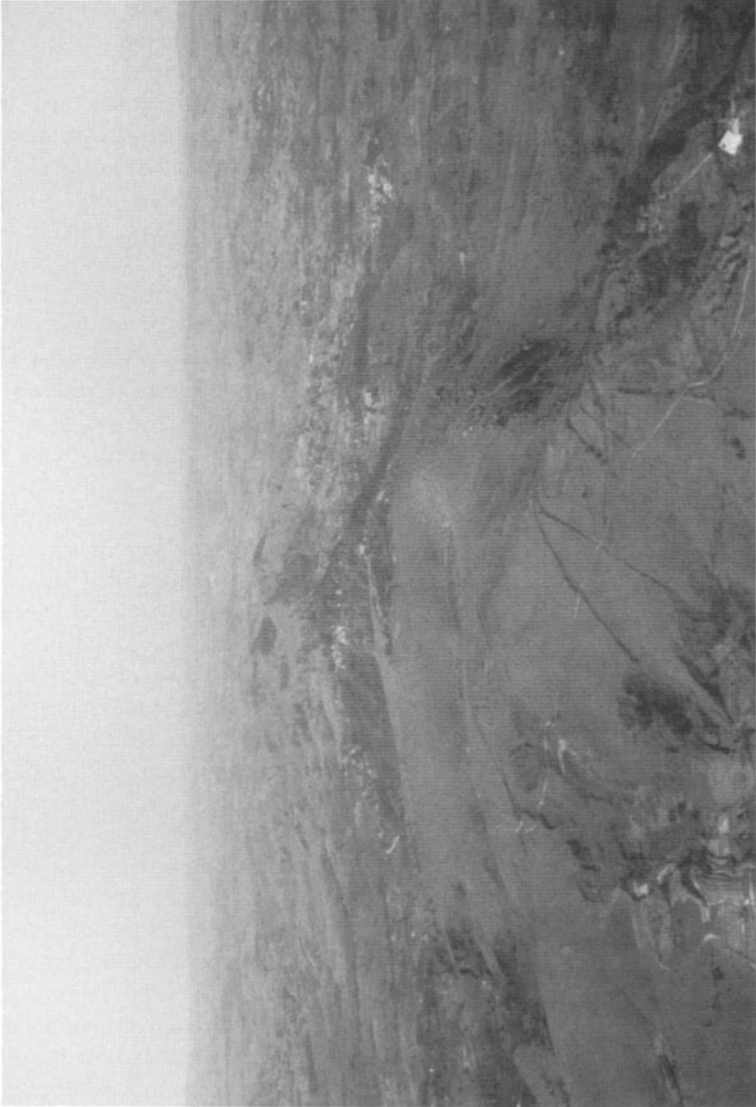
recorded more than 16,000 fortified sites (Fig. 1) in an area centered on Antananarivo measuring 100 by 110 km (Mille, 1970). It was clear that these sites were not all contemporary, but in the 1960s there was no way to date them.

A method for dating such sites was developed in 1975, using a ceramic chronology for the Imerina from the Musée collections (Wright, 1979). Three small tracts were examined on foot in an effort to record all habitation sites, and the collected local ceramics were dated using the ceramic chronology (Wright and Kus, 1976, 1979; Kus and Wright, 1986). This technique was subsequently applied in adjacent areas (Rasamuel, 1979; Rafolo, 1986; Raharijaona, 1986, 1989), in the arid far south (Emphoux, 1979; Heurtebize, 1986; Parker Pearson, 1992), and in the Anosy region of the southeast (Wright *et al.*, 1993b). Heavy vegetation cover on the east coast makes such an approach difficult, but minimally, the range in types and sizes of occupations can be determined for each period, and some idea of relative changes in density can be gained (Wright and Fanony, 1992; Dewar and Rakotovololona, 1992). Building on the solid accomplishments of Vérin's team, intensive survey techniques have recently been extended to the northwest coast (Wright *et al.*, 1993a). The semiarid west and southwest coasts still lack intensive surveys, as does a very long stretch of the humid east coast.

Another area of rapid methodological development has been that of excavation techniques. Vérin established commendable standards of stratigraphic excavation, 1-m<sup>2</sup> horizontal control and screening of all deposits. Broad horizontal excavation was introduced by Rasamuel (1984b) in his innovative study of Fanongavana. Rafolo (1985) adapted Harris matrices to cope with the stratigraphic complexities revealed by such excavations at Lohavohitra. Rakotovololona (1989, 1993) and Radimilahy (1993) have both conducted preliminary sampling of microrefuse and chemical markers using coring devices. The former has used probability sampling for the placement of excavation units in the early highland village of Ankadivory.

Much progress has been made in improved absolute dating in recent years. Multiple C-14 and thermoluminescence measurements have been made on samples from single contexts, and many more absolute dates are available (cf. Wright *et al.*, 1992). However, the recency and rapidity of cultural processes on Madagascar demand chronologies more precise than those presently available.

Regional survey and intensive excavations have raised questions about past human ecology which require the integration of archaeological and natural science research. A dating program on the bones of Madagascar's subfossil megafauna, initiated by Battistini and Vérin (1967; cf. Dewar, 1984) with encouragement from Paul S. Martin, suggested a connection between their extinction and human arrival. As a part of a program funded by the U.S. National Science Foundation, paleontologists Ross MacPhee and Martine Vuillaume-



**Fig. 1.** Oblique aerial photograph of three Imerina hillforts: Amboatany, Mangabe, and Ambohimanga.

Randriamanantena, paleoecologist David Burney, geologist Neil Wells, and archaeologist Robert Dewar cooperated in the restudy of a number of subfossil sites (MacPhee *et al.*, 1985; MacPhee and Burney, 1991; Burney *et al.*, 1993) and the discovery and excavation of forest forager campsites in the far north of Madagascar (Dewar and Rakotovololona, 1992). More recent faunal samples from food refuse on archaeological sites have been studied with archaeozoological techniques (Rasamuel, 1984a; Rafolo, 1985–1986). Similarly, detailed studies of carbonized plant remains from archaeological sites studied with archaeobotanical techniques have begun (Wetterstrom and Wright, 1992). Much, however, remains to be done.

## THE EARLY PERIOD

### The Natural History of Holocene Madagascar

Madagascar's Holocene natural history has been portrayed as a one-act morality play: a paradise of wonders destroyed by the cupidity and folly of men. The island is imagined to have been very slowly changing through the hundred million years since its separation from the African continent, with its tranquility shattered by the first human settlers. In this view, presettlement Madagascar was essentially static, and all of the changes of the Holocene are attributable to human intervention. Recent work has rendered this view untenable. Madagascar has always been changing, and its Holocene ecological history complex, and not all Holocene change was due to human activity. We briefly review the island's environmental and biotic diversity, the Holocene faunal changes and the paleoecological data bearing on the island's changing plant communities.

#### *Environmental Diversity*

Along the thousand-mile length of Madagascar a spine of mountains runs parallel to the east coast. The taller mountains have elevations over 2600 m. The descent to the east is steep and rapid; the rolling central highlands descend slowly to the west. Except for the south, Madagascar falls within the southern tropics and is subject to the annual monsoon cycle of the Indian Ocean. The moist winds of the austral summer mark the rainy season. The rains fall heaviest along the windward east coast, and the east also receives some rain in the drier months. The north is wetter than the south, so that there is a gradient in rainfall from the very humid northeast coast to the arid southwest (Fig. 2). Thus, while there is relatively little seasonal variation in temperature, there is great regional variety in the amount and seasonality of rainfall, and in mean annual temperature. Topographic and climatic diversity is matched by a diversity of natural communities. Coastal communities range from humid evergreen forests of the

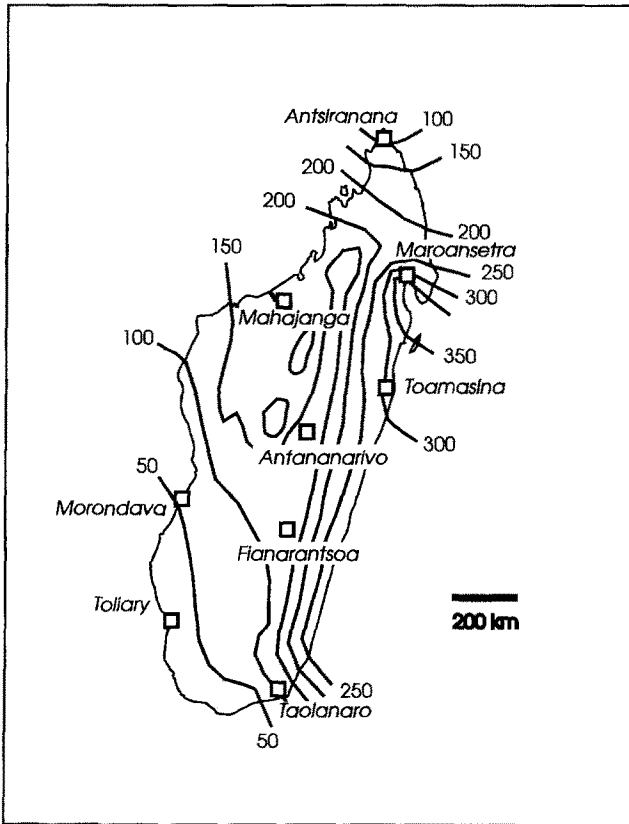


Fig. 2. Madagascar: Mean annual rainfall with modern cities. The colonial names were often different: Antsiranana = Diego-Suarez, Mahajanga = Majunga, Toamasina = Tamatave, Antananarivo = Tananarive, Toliary = Tulcar, and Taolagnaro = Fort Dauphin.

northeast to dry, spiny forests in the southwest. Levels of endemism are high, and the forests are as diverse in species as any other forests in the world (Gentry, 1988). The interior is today largely covered by grasslands and savanna.

#### Fauna

The early Holocene fauna of Madagascar was as remarkable for the kinds of animals that were not present as for the species that were. There were no ungulates, except hippopotamus and possibly bush pigs (*Potamochoerus porcus*). Among the carnivores, none weighed more than about 20 kg, and all were viverrids; there were no canids or felids. The nonflying mammalian fauna was completed by an array of at least 44 species of primates, ranging in size from



0.05 to 200 kg (Richard and Dewar, 1991), 10 species of rodents, and 20 endemic insectivore species. These were joined by reptiles, especially tortoises, with some as large as those that survive in the Galapagos and on Aldabra. Finally, the birds included the elephant birds, ponderous ostrich-like ratites, of which the largest species (*Aepyornis maximus*) weighed about 500 kg.

Over the course of the Holocene, and in some instances only over the last 1500 years, the largest animals disappeared, including the elephant birds, giant tortoises, and hippos, and all lemur species weighing more than about 6 kg (Dewar, 1984; Burney *et al.*, 1993; Richard and Dewar, 1991). There may have been extinctions of smaller taxa, but past collections may have been biased against small forms. There have certainly been severe reductions in the range of some smaller species; these are documented paleontologically, and also in collection records from the last century (e.g., Tattersall, 1982; Godfrey and Vuillaume-Randriamanantena, 1986).

Over the same time span, there have been numerous additions to the fauna, notably domesticated cattle, sheep, goats, and pigs, as well as the unintentionally introduced mice and rats. The bush pig certainly arrived from Africa during the Quaternary, but whether a human introduction or a natural migrant is unknown. Cattle were established in the south by the twelfth century at Andranosoa (see below).

### *Flora*

Research by David Burney has yielded the first direct evidence of Madagascar's plant communities during the late Quaternary (Burney, 1987a-c, 1988, 1993; Burney *et al.*, 1993; Matsumoto and Burney, 1993; Dewar and Burney, 1993). Many of his findings are of interest to archaeologists. First, he has shown that episodes of natural fires were relatively frequent through the latest Pleistocene and the Holocene, and are not per se a sign of human activity. Second, the central highlands were essentially sparsely wooded grassland and heath during the latest Pleistocene. From the Early Holocene until 1300 B.P., presumably because of climatic change, there was a slow increase in the proportion of woody taxa in the pollen rain. Third, even when woody taxa were most common, the pollen rain on the central highlands most closely resembled areas of modern northern Madagascar where forest, grassland, and wooded savanna exist close to one another. Fourth, cores from the southwest and from the northwest suggest that there was a period of reduced rainfall between about 3000 and 1000 years B.P. Finally, cores from the central highlands suggest that the woodland mosaic which had become established during the Holocene began to transform into the patterns seen today after about 1300 B.P. This transformation saw an increase in charcoal and grass pollen in the sediments and a reduction of the pollen of woody taxa that continued until the twentieth century.

### The History of Human Disturbance

Transformations of the natural vegetation that led directly to modern landscapes appear to begin around 1900 years ago in the southwest, 1300 years ago in the highlands, and at least 900 years ago in the northwest (Burney, 1987a, c, 1993; Matsumoto and Burney, 1993). In all three areas, increases in charcoal in lake sediments are associated with a reduction in pollen of woody species and an increase in the pollen of grasses and or weedy herbs. These trends intensified about 600 years ago in the central highlands and about 500 years ago in the northwest. While these changes began during a period of apparent aridity, it seems plausible that they were also in part of human cause in their early stages, and certainly so in their later stages. The precise nature of human activity responsible in each case and period is not clear. Certainly, some of the disturbance was due to land clearance for farmer's fields. It is also likely that fires set by pastoralists played a role. Finally, the replacement of the indigenous herbivores (elephant birds, giant lemurs, and tortoises) by introduced bovids (Dewar, 1984; Dewar and Rakotoarisoa, 1993) would likely have resulted in the fragmentation or elimination of previous existing natural communities.

There is little consensus on the reasons for the extinctions of the large animals, but it is likely that hunting, habitat loss, climatic change, and competition with newly introduced species all played a role. Indeed, each of these may have had different importance for each species. With the exception of climatic change, all are ultimately attributable to people, a causality given weight by the contemporaneity of the large animal extinctions and the expansion of human settlement.

### Archaeological Settlements of the First to the Tenth Centuries A.D.

#### *Andolonomby, Sarodrano, and the Southwest*

Madagascar's southwest coast is the location of a large number of primarily paleontological sites yielding the remains of extinct large animals (the "subfossils" of Madagascar). While some are natural accumulations, others have yielded evidence of human activity (Dewar, 1984), but sometimes because of postdepositional mixing. Bones and teeth of extinct species that show human modification while in a green state offer more sure evidence of human-subfossil contemporaneity (MacPhee and Raholimavo, 1988). From the southwestern coastal sites of Lamboharana and Ambolisatra (Fig. 3), MacPhee and Burney (1991) report the dating of three femora of extinct *Hippopotamus* that were clearly cut and hacked by metal tools. The bones were excavated at the turn of the century by Alfred Grandidier and rediscovered in the collections of the Muséum d'Histoire Naturel, Paris, by MacPhee. They obtained four dates; two of the same femur were widely divergent and regarded as unreliable. The

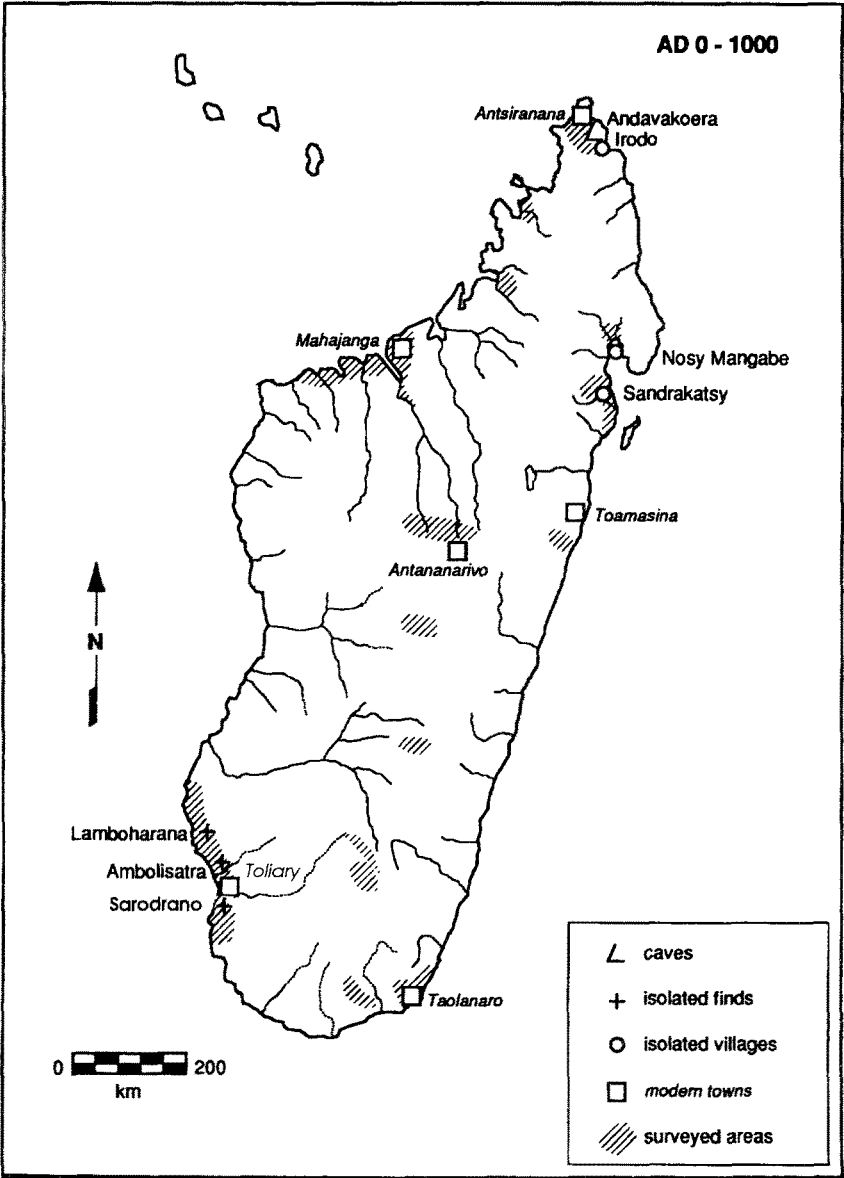


Fig. 3. Archaeological and paleontological sites discussed in the text dating from A.D. 1 to A.D. 1000.

remaining two dates, from Ambolisatra and Lamboharana, are  $1970 \pm 50$  (AA 2895) and  $1740 \pm 50$  (TO 1437), respectively. These calibrate to A.D. 80 ( $2 \sigma$  range 30 B.C.–A.D. 230) and A.D. 380 (A.D. 240–440). [All calibrations in this paper were done with Stuiver and Pearson's (1993) data set and Stuiver and Reimer's Calib 3.0 program; we used the recommended 40-year reduction for southern hemisphere dates, no lab error multiplier, and present  $2 \sigma$  ranges.] Although these dates need independent confirmation, they can be tentatively accepted as the oldest dated traces of human activity in Madagascar.

Both Lamboharana and Ambolisatra are within a few hundred meters of the sea coast, and each is in extensive ancient wetlands. The precise locations where Grandidier found the cutmarked bones are unknown. MacPhee and Burney have excavated in the vicinity of Ambolisatra, at Andolonomy (Burney, 1993). They found a pollen and faunal stratigraphy extending over the past 5000 years. The wetland had accumulated bones of extinct hippos in large numbers until about 3000 B.P. For the thousand years that followed, Burney detected floral changes suggesting aridification. At a level dated 1890 B.P.  $\pm 90$  years and calibrated to A.D. 150 and 190 (30 B.C.–A.D. 410), there is an abrupt increase in grasses, and dramatic decline in woody species, in association with a peak in charcoal present in the sediments. This transformation is attributed to human arrival, but the scale of changes, whether quite local or more broadly regional, is unclear. The combination of the paleoecological evidence and that of the dates on the modified hippo bones suggests, tentatively, two possible explanations: (1) human settlement of the southwest began during the first three centuries A.D. but archaeological occupations of that period have yet to be discovered and (2) nonresident visitors were hunting along Madagascar's coasts by this time.

Battistini and Vérin (1971) reported that they had recovered ceramics, fish bone, marine shell, and associated radiocarbon samples from three concentrations on the sand spit of Sarodrano along the southwest coast. The archaeological ceramics are similar to the ceramics in use today in Vezo villages. From one concentration they received a date of 1460 B.P.  $\pm 90$  years (Gak-928), which calibrates to A.D. 650 (A.D. 440–780). Battistini and Vérin (1971, p. 60) expressed frank reservations about the association of the modern-looking ceramics and a glass bead with this early date and suggested that the layer from which they were collected may have been mixed with older natural charcoal through dune deflation. They returned to Sarodrano to expand the excavations, only to discover that cyclone Dany had completely destroyed it in 1970. Subsequently, other archaeologists have visited Sarodrano, but no one has found any evidence for very early occupation.

#### *Andavakoera and the Far North*

In 1986, a team of Malagasy and American archaeologists and paleontologists discovered a large number of occupied rockshelters and small caves in the Gorge d'Andavakoera, about 9 km southeast of the city of Antsiranana

(Dewar and Rakotovololona, 1992; Dewar, 1993). The gorge, a high-walled canyon in heavily weathered limestone, is about 2.4 km long, and its two entrances are each located about 2.5 km from the shores of the Baie d'Antsirananana (Diego-Suarez Bay). Most of the archaeological materials are younger than the tenth century, and are discussed in the next section.

Excavations at the site of Lakaton'i Anja, however, have yielded two early radiocarbon dates, 1680 B.P.  $\pm$  65 years (Beta-29946/ETH-5408) on a cluster of small charcoal fragments and 1300 B.P.  $\pm$  80 years (Beta-18424) on a single piece of charcoal. These dates calibrate to A.D. 420 (2  $\sigma$  range, 250–590) and A.D. 780 (2  $\sigma$  range, A.D. 640–970).

Lakaton'i Anja is a large rockshelter, with approximately 125 m<sup>2</sup> of surface within the drip line. The sediments are silty sands. Throughout the archaeological levels of the site are quantities of faunal remains, including bone of mammals, reptiles, birds, fish, and marine shell. In all areas, the higher deposits include both earthenware sherds and imported *sgraffiato* wares of twelfth–fourteenth-century date. Below, there are deeper deposits without imported sherds, but with faunal remains and earthenware. The excavation terminated in sterile levels with neither artifacts nor fauna except terrestrial gastropods. Both of the early dates are from near the base of the archaeological deposits and are below the lower limit for *sgraffiato* sherds. The lower archaeological levels contained no diagnostic sherds and few artifacts, so it is not possible to discuss the culture–historic affinities.

Lakaton'i Anja, as all other sites in the Gorge so far examined, gives no evidence of long-term occupation. A high proportion of the fauna was brought to the cave from the coast: shellfish, sea urchin, marine fish, and sea turtle. Except on the surface there were no domesticates. These occupations are interpreted as short-term shelters by individuals exploiting a distinctive forest for its natural products (Dewar, 1993). Survey of the surrounding coastline has failed to reveal any trace of more permanent occupation in the first millennium.

#### *Nosy Mangabe and the Northeast*

Nosy Mangabe is a 520-ha island located about 4 km from the mainland in the northernmost reaches of the Bay of Antongil on the northeast coast. This steeply sloped island, which reaches 330 m above sea level, was visited regularly by European traders in the late sixteenth and early seventeenth centuries (Vérin, 1975, pp. 891–897). Today a nature reserve preserving very rare lowland humid forest, Nosy Mangabe shows archaeological traces of significant environmental change.

Surface survey and test excavations by several archaeologists have led to the discovery of archaeological deposits spanning the eighth through the early eighteenth centuries (Vérin, 1986, pp. 274–275; Wright, 1992). The second deepest layer in Wright's test pit dated 1250 B.P.  $\pm$  60 years (SMU-2501),

which calibrates to A.D. 820 and 840 (A.D. 670–980). Associated with this date were earthenware and chlorite schist sherds and iron slag. In the immediately superior layer, there is a thermoluminescence determination of A.D.  $950 \pm 160$  (A.D. 630–1270; Dur91TL15-2ASQi). The earthenware, chlorite schist, and slag continued into this layer, and there were sherds of Near Eastern “White Glazed Ware,” well known from ninth- and tenth-century deposits in the Comoros and along the East African coast (Wright, 1984; Chittick, 1984). The highest levels contained Dutch beads, a lead bullet, and quantities of Chinese ceramics (Vérin, 1986, p. 275).

Vérin (1975, p. 883) noted that the stratigraphic section suggested an increase in alluviation rate at the time of human settlement on the island and a return to a slower rate after abandonment, presumably during the early eighteenth century. Wright (1992) observed the same phenomena, and reports that the alluvium contained lenses of charcoal apparently from hillside fires above the site. Both authors attribute the depositional change to erosion following deforestation. Further research to clarify the extent and timing of human impact on this island, and on the surrounding mainland, is needed, but Nosy Mangabe at least was significantly altered by human occupation as early as the eighth century.

About 80 km due south of Nosy Mangabe is the modern city of Mananara, located at the mouth of the Mananara River. Here a team of archaeologists from the Centre d’Etudes et de Recherche Ethnologiques et Linguistiques of the Université de Toamasina has recovered an archaeological sequence from the late eighth to the twentieth century (Wright and Fanony, 1992). The earliest material is assigned to the Sandrakatsy Phase. During this phase, there was a small central village and a few small hamlets on terraces of the Mananara River and at the river’s mouth. These sites yielded evidence for iron smelting and the production of chlorite schist basins. Also found was an apparent necklace with beads of silver, gold, carnelian, and glass. The ceramic assemblage was small but includes crude earthenware basins and spherical, “hole-mouth” jars that are roughly similar to forms known elsewhere on Madagascar from the ninth to the twelfth centuries A.D. One pit filled with slag, chlorite-schist, and charcoal discovered at the type site has two C-14 dates: 1140 B.P.  $\pm 60$  years and 1240 B.P.  $\pm 50$  years (SMU 2076 and SMU 2359). These calibrate to A.D. 970 (A.D. 790–1030) and A.D. 870 (690–980); averaged together, they date the pit to A.D. 890 (A.D. 780–980). Taken as a whole, the evidence suggests that the Sandrakatsy phase in the Mananara valley lasted from the late eighth or early ninth through the twelfth centuries A.D.

### **Discussion: The First People to Land**

Traces of human occupation appear in the first millennium A.D. along the southwest, north, and eastern coasts. In the case of both Andolononby and Andavakoera, we have evidence only of transient visits, without associated long-

term occupations. At Nosy Mangabe we have an apparently continuous occupation dating to the late eighth century. This is also the age of the oldest known settlements on the Comoros Islands to the northwest of Madagascar (Allibert, 1989). At present, there is no direct evidence for occupation of the interior during the first millennium A.D. None of the material items are distinctive enough to trace more distant culture-historical links.

How and why Madagascar was settled remain open questions. Since Nosy Mangabe, as well as most sites of the next period, contains obvious tradewares, it seems clear that the island was long a part of a western Indian Ocean trade network (Verlinden, 1987). The ephemeral traces of activity in the southwest and the extreme north may themselves reflect brief visits to the island, and not a pattern of colonization. It is very possible that Madagascar was visited several times before a permanent residential base was established.

The paleoecological evidence of human impact on the environment in the southwest, northwest, and interior predates the oldest known occupations in those regions. To some extent, this gap may be bridged by the discovery of older human settlements, but it may also reflect the effects of the introduction of new species, intentional or not. Such introductions have had major effects, over short time spans, in many oceanic islands (cf. Atkinson, 1989). In such cases, the environmental changes may precede significant human colonization.

Archaeological research along Madagascar's coasts is limited to a few areas, and there are long stretches along both the east and the west coasts for which we have no data. Clear answers to our questions about the pattern and process of the first settlements will demand broader archaeological survey. In addition, we must hope that there will be continued collaboration between archaeologists and paleoecologists, so that the earliest phases of human environmental impact can be appreciated in more detail.

## THE MIDDLE PERIOD

### Settlements of the Eleventh to Mid-Fourteenth Centuries A.D.

#### *The Northwest: Mahilaka and Related Sites*

The area of the west coast with the most equitably distributed rainfall and the lushest forests is the region around the modern town of Ambanja including the Sambirano River valley and delta, the coasts of the Bay of Ampasindava, and the nearby islands such as Nosy Be. While we know little about its earlier history, it was a prosperous element in the greater Indian Ocean trade network in the twelfth-fourteenth centuries, with an extensive network of small villages and hamlets focused on the great Islamicized port at Mahilaka, the oldest known

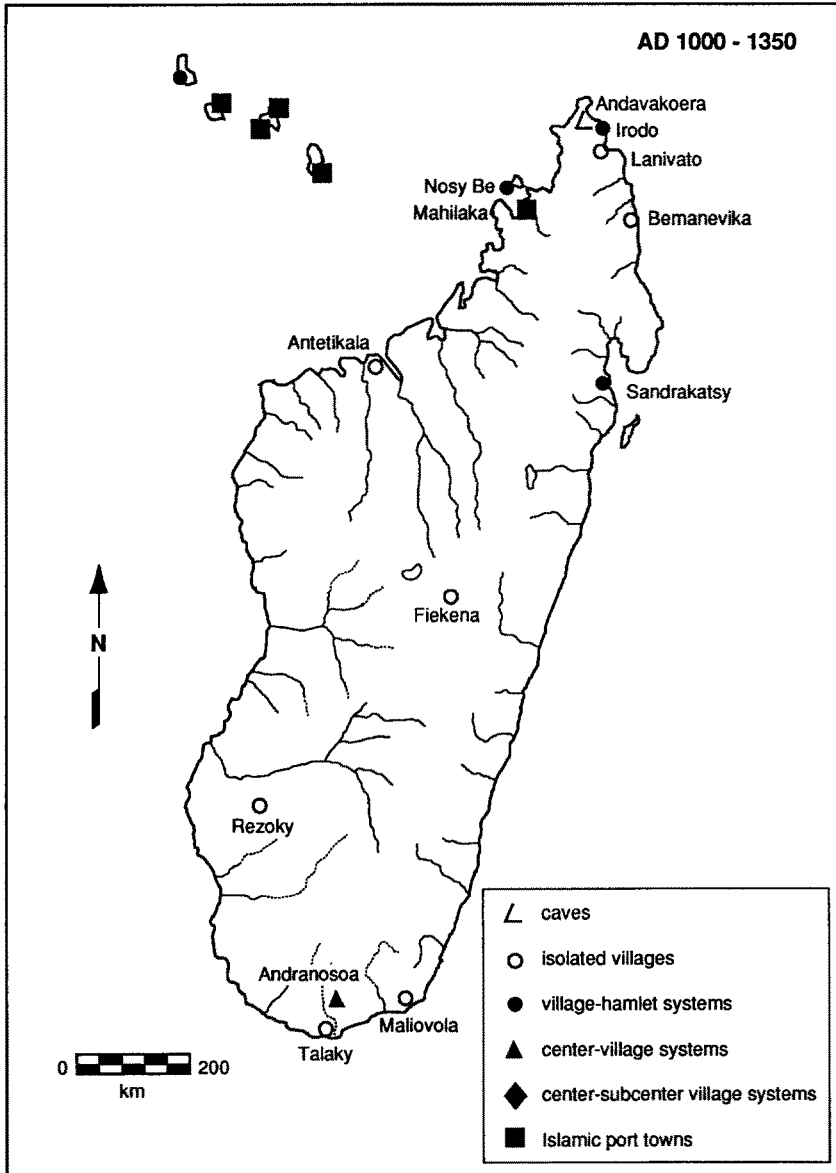


Fig. 4. Archaeological settlements discussed in the text dating from A.D. 1000 to A.D. 1350.



center on Madagascar (Fig. 4). Chantal Radimilahy (1990, 1993) is directing a major research project at Mahilaka and our understanding improves with each field season, but the results to date can be summarized.

Mahilaka and contemporary occupations in the region are distinguished by local ceramics with coarse inclusions and lightly burnished surfaces. The spherical or slightly out-turned jars have bands of zigzag incising, rectangular punctates, or shell impressions. Shallow bowls with exterior or interior thickened rims and carinated bowls often have red slips. Similar ceramics are found at contemporary sites throughout the far north of Madagascar and the Comoro Islands 320 km to the west. The ceramic assemblage is well dated by the occurrence of known Near Eastern and Far Eastern glazed ceramics in stratified contexts at Mahilaka. The oldest layers contain only Near Eastern *sgraffiato* and Far Eastern white porcelain of the twelfth and early thirteenth centuries. In more recent layers, *sgraffiatos* are replaced by the South Arabian black-on-yellow wares and classic Long Qan green glaze bowls, to be distinguished from other Far Eastern green glazed ceramics to which the term "celadon" has been indiscriminately applied. Finally, in the uppermost layers, probably deposited late in the fourteenth or early fifteenth century, Near Eastern monochrome green glazes imitating Far Eastern green glaze wares appear. These datings are supported by C-14 age determinations (Radimilahy, personal communication).

Mahilaka itself is a roughly rectangular town whose walls enclosed approximately 70 ha. The outer walls were 0.60 to 0.80 m thick at the base and are not likely to have been more than 2.5 m high. In the south central part of the town stands the ruin of a trapezoidal inner precinct enclosing 1.9 ha. Its walls are 0.60 to 1.05 m thick at the base and still reach a height of 3.7 m at one point (Vérin, 1986, pp. 145–150). There is little evidence of gates and no evidence of inner parapets. Within the inner precinct, there are internal dividing walls; one of the courts defined by these dividing walls contains masonry footings for rectangular buildings. There is no evident concentration of imported ceramics or other presumed valuables within or near the inner precinct. Just to the east are the foundations of a mosque 29.2 × 10.5 m with a deep rounded *mihrab* indicating the *qibla*, the direction of Mecca and the direction of prayer, to the north (Vérin, 1986, pp. 150–151). The mosque was once decorated with carved coral geometric ornament similar to contemporary fourteenth-century mosques in the Comoros (Knudstad, forthcoming) and East Africa. In the east end of the town are the foundations of a similar building, probably also a mosque, and there may well have been others. In addition to the mosques, there are the masonry footings of buildings with two to four rooms scattered throughout the town. One has been extensively excavated and was probably a residence (Radimilahy, personal communication). Excavations where masonry is not visible, both within the fortress and elsewhere in the central part of the town have revealed middens and areas of pits, isolated postholes, and sand lenses, perhaps

areas of repeated construction of impermanent structures. If this walled town had a low density of 50 people per ha, the population would have been about 3500 people; if the town had a high density of 250 people per ha, the population would have been about 17,500 people. The many samples of food remains collected from Mahilaka await analysis, but grains of rice, coconut shell fragments, cow bones, fish bone, and marine shell have been noted. Debris from iron-working appears to be ubiquitous, and magnetic surveying has yet to reveal specific areas for smelting or smithing. Southwest of the fortress, however, excavation revealed concentrations of glass fragments and cullet, indicating a specialized area where beads and small vessels were refashioned from broken glass items. In addition to the imported ceramics and glass noted above, metal products and cloth were probably imported. Chlorite schist, crystal quartz, and gold brought to Mahilaka from the northeast coast of Madagascar were reexported—perhaps along with locally exploited iron, wood, and tree gum—to East Africa and, probably, to the Near East or India.

Intensive survey in the immediate environs of Mahilaka has revealed several kinds of Mahilaka Phase sites. In the stream valley southwest of the town, two earthen dams had been built to contain reservoirs. Isolated Mahilaka Phase sherds could indicate meals or drinks they consumed in the fields or could indicate the fertilizing of crops with domestic garbage. Seven concentrations of sherds, each covering less than 0.5 ha, indicate two types of dependent occupations. Three are in or adjacent to the mangroves and have dense concentrations of shell, suggesting that they were used by fishing people. Four are inland, one being on the high ridge south of Mahilaka 180 m above sea level, and lack shell deposits. These may be satellite villages of agriculturalists.

Nosy Be is an island of about 280 km<sup>2</sup> off the mouth of the Bay of Ampasindava, 40 km north of Mahilaka. Survey on the western portion of Nosy Be, almost completely exposed by sugar cultivation, has revealed both villages of 1–2 ha and isolated sherds. No larger village or town site has been found. Coastal villages occur every 1–3 km and the two interior villages, both overlooking freshwater lakes in old volcanic craters, are 3 km apart. Test excavations on village sites have produced local ceramics indistinguishable from those of Mahilaka, shells from the lagoons and mangroves, fish bone, turtle bone, large mammal bone probably cow, medium mammal bone, probably sheep or goat, bones of *Tenrec ecaudatus* (a 1- to 3-kg endemic insectivore), and carbonized coconut shell. It seems likely that most of the island's coasts and interior were cultivated. Links between these villages and Mahilaka are indicated by a few sherds of imported *sgraffiato* bowls and chlorite schist vessels and crystal quartz flakes from the northeast coast of Madagascar.

Sometime around the end of the fourteenth century Mahilaka and its surrounding hamlets and the villages on Nosy Be were largely deserted. Whether people abandoned these areas because the focus of international relations shifted

elsewhere, for example, to Vohémar on the northeast coast, or because there were local problems, is unknown. Ongoing analysis of pollen samples from lakes on Nosy Be should document any local environmental problems (D. Burney, personal communication).

*The Far North: Andavakoera, Irodo, and Related Sites*

The extreme north of Madagascar has much less rainfall (ca. 915 mm/year at Antsiranana) than the Sambirano region, and it is less equably distributed through the year. The aridity is moderated by the perennial flow in the rivers that descend the north, east, and west slopes of 1475-m-high Montagne d'Ambre, which receives more than 2300 mm of rain each year (Nicoll and Langrand, 1989). Until late in the nineteenth century, this area had a relatively sparse population, primarily fishermen, sea turtle hunters, and pastoralists occupying small coastal villages.

The extreme north was poorly known to early European visitors, even though it lay midway between well-known trading centers on the northwest and northeast coasts. Archaeologically, it has been poorly known as well. The first archaeological site recorded for the area was Irodo (Battistini and Vérin, 1966; Vérin, 1986, pp. 142–145). Recently, a number of additional sites have been located near the modern city of Antsiranana, most of these being small rockshelters and caves in karstic landscape, with a somewhat special vegetation, only a few kilometers from the shore of the Baie d'Antsiranana. These offer a unique documentation of forest exploitation.

The greatest concentration of sites is in the Gorge d'Andavakoera (Dewar and Rakotovololona, 1992, 1993; Dewar, 1993), with more than 40 sites of the late eleventh to the early thirteenth centuries along the gorge's 2.4-km length. All of these sites are small, ranging from less than 10 to about 125 m<sup>2</sup> in surface area, almost all are in small caves or rockshelters, and all except two were apparently occupied for one or more brief periods. The two exceptions were caves with human skeletal remains and associated *sgraffiato* ceramics. Two radiocarbon dates suggest that Lakaton'i Anja, visited in the preceding period, was occupied again during the late tenth or early eleventh century, but the majority of the occupations, dated by imported ceramics, came during the twelfth and early thirteenth centuries.

The sites often yield few remains, but they offer a very consistent pattern. The most common artifacts are local earthenware sherds of jars and bowls, of paste and form nearly identical to materials from Mahilaka and from Irodo. In the upper levels there are frequent sherds of twelfth and early thirteenth century *sgraffiato* bowls, and less common Far Eastern white porcelains and green glaze stonewares, again of types familiar from Mahilaka, but no later imported ceramics have been recovered. Sherds of chlorite schist vessels and glass trade beads were likewise abundant. Fragments of iron were occasionally encoun-

tered, as were stone and coral net weights, and fragments of apparently imported glass vessels.

Preservation of organic remains is excellent, and again, the pattern in occupation layers is quite consistent: there are frequent marine shellfish, sea urchin spines, turtle carapace fragments, and fish bones, from apparently marine species; there are very few remains of domesticates; there are many bones of land animals, including many primates, tenrecs, tortoises, and birds. Amongst the primates and tortoises there are bones of now extinct species. The faunal remains are generally in a fragmentary state, but obvious cut and butchery marks are rare.

The overall pattern at the Andavakoera sites suggests short-term visits for exploitation of the gorge's forest by individuals bringing supplies from the coast. The full range of forest resources they sought floral is unknown.

The only nearby sites contemporary with those of Andavakoera are two small occupations near stream mouths—one about 3 km to the northwest and the other about 10 km north-northeast of the gorge. Both of these were less than 1 ha in size. After the gorge ceased to be used Lakatoniakanga, a rock-shelter about 21 km to the northeast became a campsite for foragers, but their material culture was purely local, without any indication of imported goods.

Irodo, located about 50 km southeast of the mouth of the Baie d'Antsirana, was first investigated by Battistini and Vérin (1966). About 25 km northwest of Irodo is the site of Lanivato, just north of the village of Ambolobozokely, first visited by Battistini (Vérin, 1986, p. 143). Each site is located behind protective offshore islands near the mouths of rivers draining the eastern slopes of the Montagne d'Ambre. Both have been recently revisited by a team from the Musée d'Art et d'Archéologie. At each site the bulk of the remains is found in active sand dunes, permitting little chronological precision, but equally in each case the remains parallel the beach for more than a kilometer. The local ceramics are coarse earthenware jars and carinated bowls and include red-slipped shallow bowls. The decorations on the earthenware are frequently parallel wavy lines just below the rim. These also appear in the Andavakoera and Lakatoniakanga collections but are rare in the collections at Mahilaka. Imported sherds are rare at each site, but they include a single sherd identified by Vérin as ninth-to-tenth-century "Sasano-Islamic" ware, late *sgraffiato*, some Far eastern green glaze stoneware, and a handful of later imports. Chlorite schist sherd fragments are common, usually pierced with a single hole, presumably for use as net weights. Iron implements and slag have also been recovered. Four C-14 dates have been reported from the vicinity of Irodo (Vérin, 1975; Dewar, 1984), but they all present interpretive problems. The only date from an excavated archaeological midden, 1090 B.P.  $\pm$  90 years (Gak-692), was obtained on the shell of a mangrove gastropod. It is unclear what the appropriate correction for marine

reservoir effect ought to be, but plausible estimates push the calibration of this date to the fourteenth century or younger.

Both sites were apparently occupied for long periods, probably most importantly during the twelfth through the fourteenth centuries, with smaller occupations earlier and later. In neither case is it likely that contemporary occupations were large, nor is there any indication of stone or masonry architecture.

#### *The Northeast: The Bay of Antongil*

The pattern established in earlier centuries continued in the forests of the northeast coast. The ceramic vessels have very coarse inclusions of rock and sand and very thick sides. To the spherical jars and open basins of earlier periods are added bowls with heavy thickened rims, similar to those of Mahilaka and Irodo. Lathe-turned cylindrical vessels of chlorite schist continue to be common. In the middle Mananara valley, a C-14 date from the village site of Sandrakatsy West was 1060 B.P.  $\pm$  70 years, which calibrates to A.D. 1020 (A.D. 890–1180), indicating that this region was occupied into the eleventh century (Wright and Fanony, 1992, pp. 25–37). Possibly some of the nearby field hamlets around the valley-bottom marshes and on the ridges also date to this period. On the nearby coast, near the mouth of the stream of Imorona, was a village stretching at least 80 m along the beach, but now largely washed away by the sea, and at least one nearby hamlet. The occupants of these sites were well situated to exploit swidden fields, swamp gardens, and the resources of the small estuaries and reefs. However, the rigors of erosion and tropical soil processes have left few opportunities to recover subsistence remains. None of these sites has produced definite evidence of exchange with other parts of Madagascar or with the trading centers overseas. The small size of the known villages and hamlets argues against large populations and any degree of social complexity.

#### *The Southeast: Maliovola and Related Sites in the Anosy*

The earliest known archaeological settlements in the southernmost forests of the East Coast probably date to the eleventh to thirteenth centuries A.D., though one site has produced a C-14 date in the ninth or tenth century (Rakotoarisoa, 1993; Wright *et al.*, 1993b). The Maliovola Phase ceramic assemblages, distinctive of sites of this period in the Efaho river valley just west of modern Fort Dauphin, has two distinct wares used for different shapes of vessels. A heavy ware with coarse inclusions of all types—sand, crushed rock, crushed graphite, or crushed potsherds—is used for restricted spherical vessels and large basins with flat bottoms, either of which could have horizontal lug handles. Some of the basins have horizontal incisions and graphite coatings, apparently mimicking chlorite schist basins common in the north. A fine ware with sand inclusions is used for shallow bowls, usually red-slipped but sometimes graphite coated and usually with interior horizontal channeling created by impressing

leaves of grass into the wet clay, a form of decoration with no known parallels. The settlements of the Maliovola Phase are in diverse locations. Three are linear scatters of shell, fish bone, and ceramics on the present beach. The largest, Mokala, covers about 1.5 ha, but there is no reason to assume this was fully inhabited at any one time. There is one site, Tsiandrora, on Pleistocene sand dunes overlooking the estuary of the Efaho. This occupational component is known only from two stratigraphic excavations through a 2 ha midden of the later thirteenth and fourteenth centuries, so its size cannot be precisely estimated. The excavation did reveal both fish and cow bone. Finally, there is one site, Maliovola, on a small river terrace 8 km from the sea. The terraces in this area could have been used for swidden cultivation, and marshy tributary valleys for swamp cultivation, but flotation samples at this and the other sites revealed no traces of cultigens, and from this region there is no pollen evidence to indicate land use practices. All of the Maliovola Phase sites had iron-slag. None had definite evidence of contacts with other areas of Madagascar or elsewhere. The apparent small size and number of the known settlements in this thoroughly surveyed valley suggest small populations with little social complexity.

*The Far South: The Manambovo Valley and the Southern Coast*

The Manambovo River drains into the Indian Ocean near Madagascar's southern extremity. This is one of the island's most arid regions, with about 350 to 750 mm of rainfall per year, and is largely covered by a xerophytic spiny bush-forest. This region is today the home of the Tandroy cattle herders, and it was a home for pastoralists in the twelfth and thirteenth century Andranosoa Phase as well.

About 470 km<sup>2</sup> of the upper Manambovo has been intensively surveyed by Georges Heurtebize (1986) and several sites have seen further research by teams from the Centre d'Art et d'Archéologie (Radimilahy, 1981; Emphoux, 1979, 1981). Heurtebize located two large sites and a number that are smaller and less well-defined. The best-known site is Andranosoa, which is located at the confluence of the Andranosoa and Manambovo Rivers and which has archaeological debris scattered over a 30-ha area stretching a linear kilometer, partly defined by dry-laid stone embankments. This site has two radiocarbon dates: 920 B.P.  $\pm$  90 years (Gif-4571) and 730 B.P.  $\pm$  90 years (Gif-4570), which calibrate to A.D. 1180 (A.D. 1000–1290) and A.D. 1300 (A.D. 1190–1430).

The inhabitants of Andranosoa were pastoralists and foragers. The excavation of a garbage pit revealed large quantities of sheep/goat bones, mainly from young animals (Rasamuel, 1984a). Cattle were present but in much smaller quantities. In addition to the domesticates, the pit contained the remains of an estimated 50 tenrecs and many fish bones. Finally, the pit contained a carapace fragment from a now-extinct giant land tortoise and teeth of the extinct *Hip-*

*popotamus lemerlei*, but the excavators cautiously refused to explain the presence of these subfossil remains.

The most characteristic local ceramics are large (about 50 cm in diameter), flat-based basins with outslipping walls and straight or slightly everted rims and spherical jars of coarse paste. These have modeled lugs just below the rim. There are smaller bowls, of finer paste, red-slipped and with graphite decoration. At the larger sites, marine shell, Near Eastern *sgraffiato* tradewares, Chinese stonewares, and Song white porcelain testify to connections elsewhere. At Andranosoa there is a localized concentration of iron, imported ceramics, and cattle bone that may indicate some differentiation in wealth amongst the residents. There is little evidence of occupation during the fourteenth century in this region, suggesting a period of population decline after the Andranosoa phase.

Near the mouth of the Manambovo, east of Cap Ste. Marie, lies the site of Talaky, excavated by a team led by Battistini and V erin (Battistini *et al.*, 1970). Talaky is located on a sandstone bench overlooking the littoral, and excavations yielded coarse paste ceramics, iron fishhooks and harpoons, and abundant marine shell and fish bone. No imported ceramics were found. The single radiocarbon date for the site ( $840 \pm 80$ —Gif-276) calibrates to A.D. 1250 (A.D. 1040–1380). Talaky is thus contemporaneous with the upstream Andranosoa phase sites and there are general similarities in the local ceramics. While Talaky has been proposed as a trading location (Domenichini-Ramiaramanana, 1988), the excavated materials, and especially the absence of tradeware, suggest that it was a simple fishing camp, and its relationship to the upstream villages is uncertain.

### *Fiekena in the Central Highlands*

The evidence of pollen of field weeds and charcoal from increased burning indicates that widespread cultivation began in the rolling hills and marshy valleys of the central highlands by at least the thirteenth century A.D. (Burney, 1987, p. 137). The archaeological record of village sites with Fiekena ceramic assemblages fully supports this paleobotanical evidence. These ceramics are now well defined as a result of the excavations of Rakotovololona (1989, 1993) at Ankadivory and well dated to thirteenth and fourteenth centuries A.D. by C-14, thermoluminescence, and imported items (Wright *et al.*, 1992, pp. 127–129). These ceramics differ from those of older and contemporary assemblages on the northwest, northeast, and southeast coasts discussed above and, thus, raise culture historical problems which cannot yet be resolved. The ceramics are relatively thin with a compacted surface. The jars were relatively small and spherical with a low neck. There is often a simple band of triangular imprints around the shoulder. The shallow hemispherical bowls have flattened bases or stand on a single low, roughly cylindrical foot. Most have a standardized decoration of

alternating rectangular panels and opposed triangular panels filled with triangular impressions filled with white pigment and most have fugitive graphite coatings.

The Fiekena Phase villages were established in smaller valleys of Imerina (Rakotovololona, 1989, 1993). Each village covers 1 to 2 ha surrounded by small oval or semioval ditches only a meter or two deep. Excavations at Ankadivory revealed no stockade, so it seems likely that the ditches were to control the movement of cattle. The small postholes of storage racks or small shelters, and the large postholes of substantial, probably rectangular, buildings were found within the area bounded by the ditches. Also enclosed were areas with possible cooking features, and others with small pits filled with prepared clay, probably related to pottery production. The large food storage pits common on later sites have not been found. There is no evident social differentiation within the settlements and no known tombs. Bone is poorly preserved at Ankadivory, but cows were definitely present. Flotation sampling has produced no rice, but the seeds of marsh plants—perhaps brought in with cattle fodder, cattle dung, or roofing material—indicate exploitation of valley bottom marshes (Wetterstrom and Wright, 1992). There is little iron slag on the larger village sites, but between the sites of Ankadivory and Fiekena on a knoll adjacent to a stream is a concentration of slag and Fiekena sherds, apparently an isolated iron working locality.

Fiekena sites have some sherds of heavy vessels with lugs and red-slipped bowls with grass impressions on the inside similar to those of Maliovola, so they must have had some exchange relations with communities of the southeast coast. The excavations at Ankadivory have produced ceramics imported from overseas, some Near Eastern *sgraffiato*, but mostly Far Eastern stone ware jar and green-glazed bowl fragments. The use of post construction and apparently of aboveground storage structures and the presence of ceramics of southeastern affinity suggest that these early cultivators of the central highlands came from the eastern forests. However, there are no local assemblages similar to Fiekena on the East Coast or anywhere else. There is a 980-km stretch along the east coast between Mananara and Fort Dauphin from which only a few isolated sites are yet known, but it is also possible that the distinctive ceramic styles of these early highland communities developed in highland Madagascar.

### Discussion: The Settling of Madagascar

The 350 years after A.D. 1000 saw human occupation along practically every well-surveyed stretch of Madagascar's coastline, as well as the first known permanent occupation of the central highlands. In addition, we have firm evidence for nearly all of the traditional economic pursuits of the Malagasy: the growing of rice, herding of bovinds, fishing, smelting of iron, and participation



in long distance trade. The settlements known for this period ranged from urban entrepôts to tiny hamlets.

The ceramics of the north, represented in Fig. 5 by samples from Mahilaka and Irodo, have spherical vessels with either wavy combing, zigzag incisions or punctates and shallow red-slipped bowls with thickened rims. The ceramics of the south, represented by Maliovoia and Andranosoa, have basins and spherical vessels with lugs and rare wavy combing and shallow red-slipped bowls with impressed or graphite pencil designs. Though distinctive, the northern and southern groups can be viewed as variations in a common tradition. The ceramics from Fiekena in the center stand in contrast to both the north and the south,

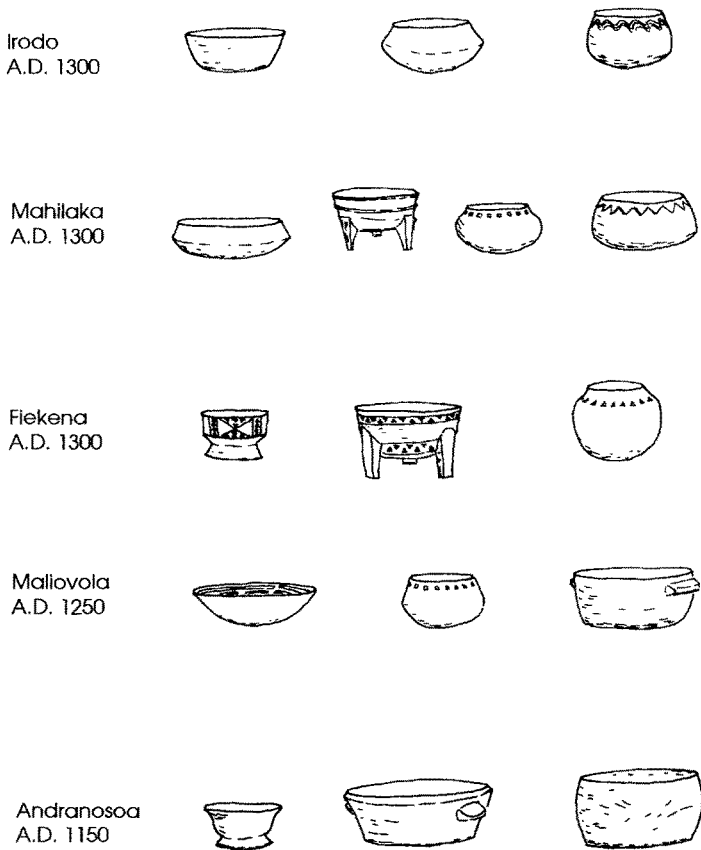


Fig. 5. Typical ceramic vessels of A.D. 1150 to A.D. 1300, from settlements of (top to bottom) Irodo, Mahilaka, Fiekena Phase, Maliovoia Phase, and Andranosoa.

with their triangle impressed vessels, both low-necked jars and graphite-coated pedestaled bowls.

There is still much to be learned about these times. First, although there are tantalizing hints, we can trace no direct contact between Madagascar and the eastern Indian Ocean. Second, we cannot account for the economic diversity present on the island at even this early date: Were the diverse adaptations developed *in situ* or imported to Madagascar by a diverse collection of immigrants? Third, we cannot securely trace the contacts between regional populations, so we cannot yet say whether the island had a social network of its own or was settled by more or less isolated groups, each of which had more important contacts with peoples elsewhere. Finally, these centuries saw the demise of most of the subfossil megafauna, and we can demonstrate that some were hunted by humans, but the precise magnitude of the human contribution remains uncertain.

Answers to all of these questions will require further work in the zones already identified and expansion of archaeological research to the many unknown areas—especially along the eastern and western coasts.

## THE EARLY MODERN PERIOD

### Settlements of the Mid-Fourteenth to Mid-Sixteenth Centuries

#### *Kingany, Langany, and Related Sites on the Northwest*

During the fourteenth century, another generation of Islamized trading ports was established on beaches, islands, and embayments of the northwest coast (Fig. 6). The best-known of these is the site at Kingany on the coast 50 km west of modern Mahajanga, mapped and extensively excavated by V $\acute{e}$ rin (1986, pp. 161–167). The small town was located on an early beach ridge facing north toward the open sea and had two concentrations of masonry constructions, including small mosques, tombs, and houses in a 4-ha area that was probably covered largely by impermanent housing. The local ceramics include spherical jars and heavy rim bowls, both often with triangular impressions in “false-chevron” motifs and the latter often with red slips. Three small hamlet or village sites on the beaches of the nearby Bay of Boeny have similar ceramics, but survey of the nearby interior has not revealed additional contemporary settlements. V $\acute{e}$ rin (1986, pp. 171–173) argues convincingly that Kingany was the town attacked and burned by the Portuguese fleet of Admiral Tristan de Cunha in May 1506, after which it was abandoned in favor of the more defensible island of Antsoheribory in the Bay of Boeny. Unfortunately, the Portuguese accounts record neither the name nor a description of the town.

A settlement was founded by the fourteenth century on Nosy Manja, a

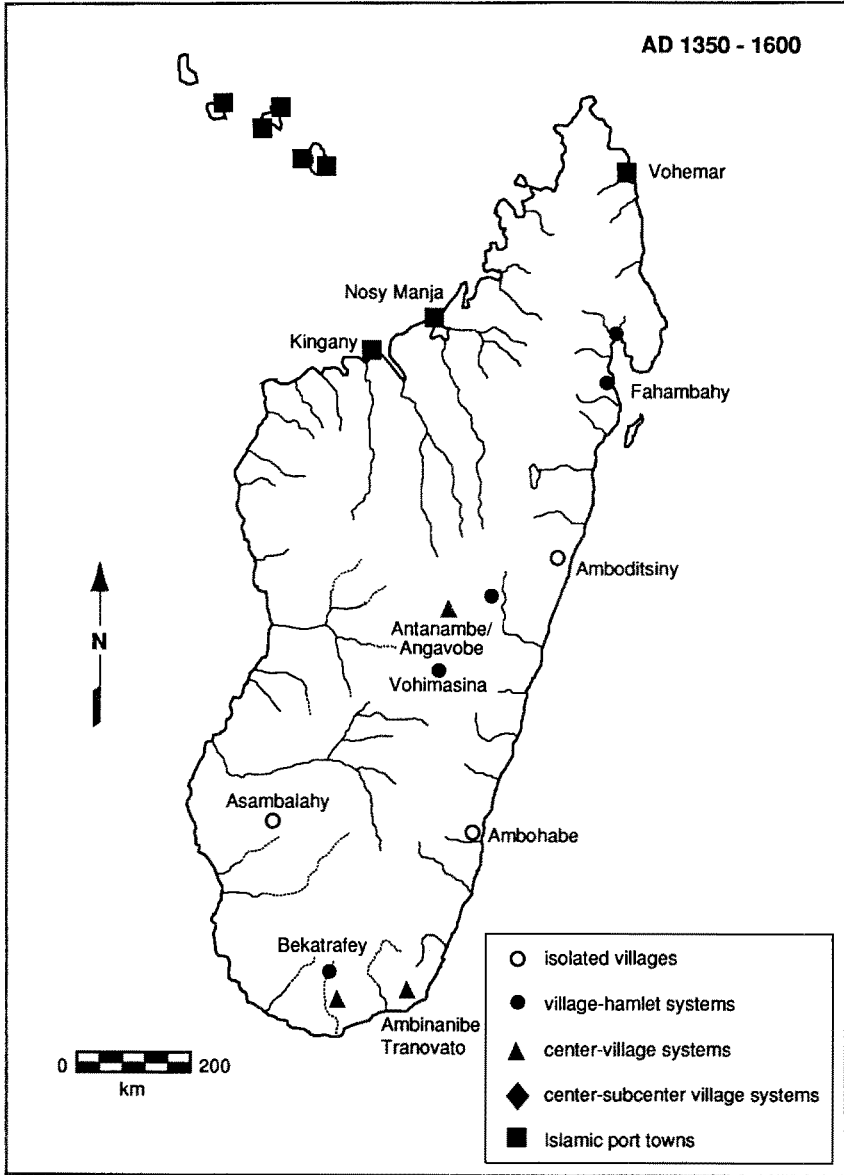


Fig. 6. Archaeological settlements discussed in the text dating from A.D. 1300 to A.D. 1600.

5.7-ha island at the mouth of the Bay of Mahajamba, 30 km northeast of Mahajanga. It prospered in the sixteenth century and survived until the beginning of the seventeenth century, when it was known as “Langany” or “Old Masselage” under various spellings. Vérin (1986, pp. 153–155, 173–183) recorded a number of tombs, an ensemble of three masonry tripartite residences, and a small mosque only  $11.2 \times 7.5$  m decorated with Chinese blue-and-white porcelain bowls. There are contemporary occupations along beaches on the nearby mainland, but these have not yet been mapped in detail.

#### *Vohémar and Related Sites in the Far North*

Along the northeast coast, between the Bay of Antongil and Irodo, is a series of coastal sites, often located at river mouths. These sites, and associated inland locations where chlorite schist was mined, were termed collectively the Rasikajy Civilization by Vérin (1986, pp. 209–282). There has been no recent archaeological research at any of these sites, although they were among the first to be investigated on the island. What attracted the attention of scholars was the spectacular artifactual contents of tombs, in large part dating from the fourteenth through the seventeenth centuries (McBain, 1992). The tombs contained ceramics of China and the Near East, earthenwares, objects in gold, silver, and iron, glass vessels, beads of glass and carnelian, and many complete chlorite schist vessels. The excavators appear to have paid little attention to the earthenware vessels, but the dominant decoration is a wavy-line incision below the rim, familiar from both Irodo to the north and, later, Nosy Mangabe to the south.

The most famous of the Rasikajy sites is Vohémar, where French scholars opened more than 600 tombs between 1899 and 1955. Although some of the objects have been published (Vernier and Millot, 1971), remarkably few provenience data are preserved, and what we know is largely due to Vérin’s assiduous scholarship. Vohémar’s evident wealth seems to have been derived in part by control of the manufacture of chlorite schist vessels. Many quarries in the interior have been located, where vessels were roughed out, but the final lathe-turning and polishing seem to have occurred at Vohémar and other smaller sites along the coast. The tombs at Vohémar evidently showed great variability in the quantity of grave goods, suggesting some social differentiation. Body orientation, however, seems to have been uniform and conforms to the pattern expected for Muslim people: head to the east and facing Mecca in the north.

Vohémar was known to Europeans in the sixteenth and seventeenth centuries, but it was apparently largely abandoned by late in the eighteenth century. Vérin believes that a collapse of the export trade in chlorite schist vessels proved the undoing of Vohémar and its dependencies.

#### *The East Coast*

Some settlements of the fourteenth to seventeenth centuries with fine wavy-combed ceramics are known in the area of the Bay of Antongil. For example, along the intensively surveyed Mananara River estuary (Wright and Fanony,

1992), there are only a few hamlet occupations, but at the mouth of the Fahambahy River to the north is a large village covering at least two hectares. However, the density of settlements appears to have been low.

The East Coast farther south has yet to be intensively surveyed, and the evidence of settlement is spotty. The first European visitors to the area record small local paramountcies centered at the estuary mouths, but the presently available evidence does not allow an archaeological evaluation of these accounts.

*The Southeast: Ambinanibe and Tranovato in the Anosy*

In the well-surveyed Efaho valley near Fort Dauphin, the archaeological evidence indicates that the fourteenth to seventeenth centuries was a period of cultural transformation and the emergence of hierarchical organization (Wright *et al.*, 1993b). By the fourteenth century, if not before, the earlier Maliovola ceramic assemblages, with their diversity of slipped bowls and basins, were replaced by the Ambinanibe ceramic assemblages, with many spherical jars with incised and applique decoration. The settlement pattern is similar to the earlier pattern. Small Ambinanibe Phase settlements near the beach cover less than a hectare and have much shell and fishbone. The settlement on the estuary covers at least 1.5 ha and has much cattle bone. We have no evidence of cultivated plants from these sites. Imported Far Eastern green-glazed bowl fragments occur at all sites. There is little evidence of settlement hierarchy or social differences.

During the fifteenth century, a radical change in material culture took place: Tranovato ceramic assemblages appeared. It has spherical jars with fine wavy combing and punctates and a range of carinate bowls with graphite coatings and triangular impressions decorating the exterior. Only one Tranovato site, the fifteenth century center at Efangitse, has a simplified form of the Ambinanibe incised ceramics. Unfortunately, our chronology is not precise enough to say whether this represents a late Ambinanibe Phase hamlet that preceded the Tranovato center or a neighborhood of that center in which some people continued to use pottery developed from Ambinanibe Phase models. In either event, there was a cultural disjunction which supports the statement of mid-seventeenth century paramounds to the French colonizer Flacourt (1661) that their ancestors came to the Efaho Valley from the north.

Tranovato Phase settlement is concentrated in the formerly little inhabited middle and upper Efaho Valley, an area in which documentary sources indicate that irrigated rice has flourished since at least the seventeenth century. Both large and small settlements occur. The larger settlements, termed "centers," range in size from 2.0 to 7.5 ha, and all have evidence of surrounding defensive ditches. If Efangitse was a relatively early center within the Tranovato Phase, the latest and largest center is the 7.5-ha site of Fanjahirambe, certainly "Fan-shere," the capital of the Zafiraminny paramounds burned by French forces in 1651. These larger centers have more elaborately decorated graphite-coated

serving bowls. They also had more imported vessels, both Far Eastern green glaze and blue-and-white porcelains and European stonewares, earthenwares, and glass bottles. The small settlements are a hectare or less, are only sometimes surrounded by a ditch, and have very few graphited serving vessels and few imported items. This is a pattern with clear settlement hierarchy, and there are artifactual indications of a socioeconomic hierarchy as well. This conforms well to the historical account of Flacourt (1661) of Anosy society with ranked endogamous groups ruled by ever-shifting coalitions and hierarchies of paramount chiefs and subchiefs.

### *The Arid South and Southwest*

In the steppes and thorn forests of the south and west, the settlement patterns continue to be dominated by relatively large settlements. In the hills near Antanimora east of the Manambovo valley, intensive survey has revealed fourteenth–fifteenth-century settlements with large hilltop centers protected by multiple embankments and satellite forts (Parker Pearson, 1992). The ceramics are predominantly spherical jars with panels of incised parallel lines, similar to those of Ambinanibe in the southeast and Rezoky in the western interior. Some of these centers also had ceramics with graphite coatings and triangular impressions like those of the Tranovato Phase (noted above), which probably dates during the fifteenth–seventeenth centuries, though direct chronological evidence is lacking.

There are no published intensively surveyed areas along the west coast, but excavations at Rezoky and Asambalahy to the east of Morombe, 135 km inland, provide important data on site structure and economy (Vérin, 1971). We do, however, suggest revisions of the datings for these sites. At the former site, probably thirteenth–fifteenth centuries given the occurrence of late varieties of *sgraffiato* and Far Eastern green glaze, there are many local spherical jars with appliques and oblique incised lines, similar to ceramics of the fourteenth century Ambinanibe Phase of the southeast, and a few bowls with triangular impressions. At the latter site, dated to the fourteenth–sixteenth centuries by the occurrence of Far Eastern green-glazed bowl sherds, the local ceramics have jars with panels of incised vertical parallel lines and appliques and arrays of rectangular or oval punctates. Independent absolute dating of these sites is needed. Rezoky is larger, covering several hectares, with not only a few sherds of imported pottery, but also imported glass beads. Asambalahy covers about a hectare. Domestic cows dominate the faunal remains of both, with some bones of hunted lemurs and tenrecs. Rezoky also had the earliest bone of a domestic dog yet reported from Madagascar and possibly the giant *Aepyornis*. Both sites had much iron slag and a number of iron tools and sharpening stones, indicating local iron-working. Because the two sites are in different valleys, perhaps with different grazing potentials, and are from different time spans, perhaps when

imported goods had varying availability, we cannot attribute the size and ceramic differences between the sites to social differences between their occupants. Intensive regional survey is needed to place these data in perspective.

*The Central Highlands: Antanambe, Ankatso, and Angavobe*

In Imerina, the fourteenth century saw the development from Fiekena Phase villages to hierarchically organized clusters of settlement. Antanambe ceramic assemblages show changes which may be a response to the increased social complexity. The low-necked jars are larger and have a range of impressed triangle and incised decoration in shoulder bands. The graphited bowls are also larger and have more complicated rims and panels of impressed decoration. Some vessels have pedestal feet, clay copies of the feet found on east coast chlorite schist basins. During the fifteenth century, the Ankatso ceramic assemblages continue the Fiekena and Antanambe traditions, but there is a shift from triangular imprints to oval imprints on both jars and bowls.

In the central Imerina, contemporary major centers of these phases are 8 to 10 km apart, typically on hills with raised springs nearby. The center of Ambohidahy 18 km north of Antananarivo in intensively surveyed western Avandrano (Wright, 1979; Kus and Wright, 1986, pp. 53–54, Fig. 3) is typical. The site covers 4 ha and has multiple ditches surrounding terraces with houses of unknown form, storage pits, multitiered tombs, and deep middens indicating prolonged occupation. A satellite village to the west covers 1.5 ha, has one ditch, and lacks middens, suggesting a brief occupation; most of its associated tombs are outside the ditches. Six small hamlet sites near the river terraces below Ambohidahy together cover less than 0.4 ha. If all these sites were simultaneously occupied, and assuming about 150 people per ha as indicated by housefootings on slightly later sites, then this settlement cluster would have had a population of about 1000 people. Cattle bone was recovered at this and contemporary sites, but there is as yet no evidence of cultivated plants. That Ambohidahy itself was a center of socially prominent figures is indicated not only by its size and the centrality of its tombs, but because here alone sherds of imported Far Eastern green-glazed bowls were found.

There are two other manifestations in the central highlands that are similar to Antanambe Phase and earlier Fiekena Phase remains, though less complex. One, south of Imerina in the Mananadona Valley south of modern Antsirabe, known from the site of Vohimasina, has ceramics with complex arrays of triangular imprints dated to the sixteenth century by C-14 and TL dates (Wright *et al.*, 1992). The villages, encircled by ditches, are on high peaks overlooking the marshy river valley (Raharijaona, 1986, 1989). The other, in the Moramanga Basin east of Imerina along the terraces of the Mangoro River, has small villages and hamlets with bowls with triangular impressions but with spherical jars with

incised designs similar to the Ambinanibe ceramics of the southeast (Ramilisonina, 1990, 1993). Also found are small sites with concentrations of iron slag.

At the end of the fifteenth century settlements with a very different material culture appear in Imerina, well documented by the near-total excavation of the site of Fanongoavana on the eastern periphery of Imerina (Rasamuel, 1984b). The ceramic vessels are undecorated. The plain flared-neck jars range from small to very large. The bowls have high pedestal feet, thickened rims, and well-made graphite coatings. These vessels were used to prepare and serve dishes prepared from irrigated rice [whose carbonized remains are henceforth common on sites in the central highlands (Wetterstrom and Wright, 1992)], legumes, and beef. The houses have stone platforms and post-rests, rather than postholes. The historic Merina house pattern of the door in the southwest corner, and the hearth in the northwest corner is well established. Potting areas and iron-working areas are located within the settlement. Elaborated tombs built with stone slabs occur both inside and outside the surrounding ditches of the hilltop villages; oral history attributes some of those within to prestigious political figures of the earliest historical traditions of the Merina people.

In intensively surveyed Avarandrano, settlements of this period, the Angavobe Phase (Wright, 1979; Kus and Wright, 1986, p. 56, Fig. 5), are intermediate-sized villages typically found on the highest hill in any given area. There is no definite co-occurrence of Ankatso- and Angavobe-phase occupation on the same site, and it is possible that the two phases are contemporary material manifestations of different social groups. Merina traditions refer to this as a time of migration, when indigenous "Vazimba" communities were replaced by the ancestors of the major Merina demes of today (Callet, 1974). Such traditions, however, may disguise considerably more complex processes in which a few groups move, while others change allegiance and adopt new material patterns symbolizing new allegiances. Elucidation of such processes will doubtless be a focus of future work.

### **Discussion: Paramounts and Trading Ports**

Whatever the significance of the cultural variability documented for the earlier periods, the archaeological evidence of the fourteenth to sixteenth centuries indicates a relatively uniform cultural pattern on the island. In settlement terms, usually 5–10 small settlements cluster around larger centers of about 5 ha, which may have had populations up to 1000 or more. In the northeast around the Bay of Antongil, in the southeast in the southern Anosy, in the south in the northern Androy, and in the central highlands in Imerina, either the archaeological evidence of elaborated local craft goods, imported goods, and special tombs or the reports of the earliest European visitors indicate that the centers were the residences of political paramounts who claimed superior social status.



In the north of Madagascar, older ceramic traditions with incising and combed wavy designs appear to continue. In the south and west, however, local incised ceramics gave way to graphite-coated pieces with elaborate arrangements of triangular impressions, represented in Fig. 7 by samples of the Kingany, Antanambe, and Tranovato phases, first known from the Fiekena phase in the central highlands in the thirteenth century. This decorative approach later came to be used on wooden items, silver jewelry, and fabrics. Its widespread use on ceramics by at least the fifteenth century may indicate the adoption of a common visual aesthetic. In all areas, the paramounts in the central communities had access to imported luxuries, initially the green-glazed bowls from the Far East and outstandingly the Long Qan green glaze from South China, but also many replicas from Southeast Asia and the Near East. Later the blue-and-white porcelains of South China and various European items became popular items of exchange.

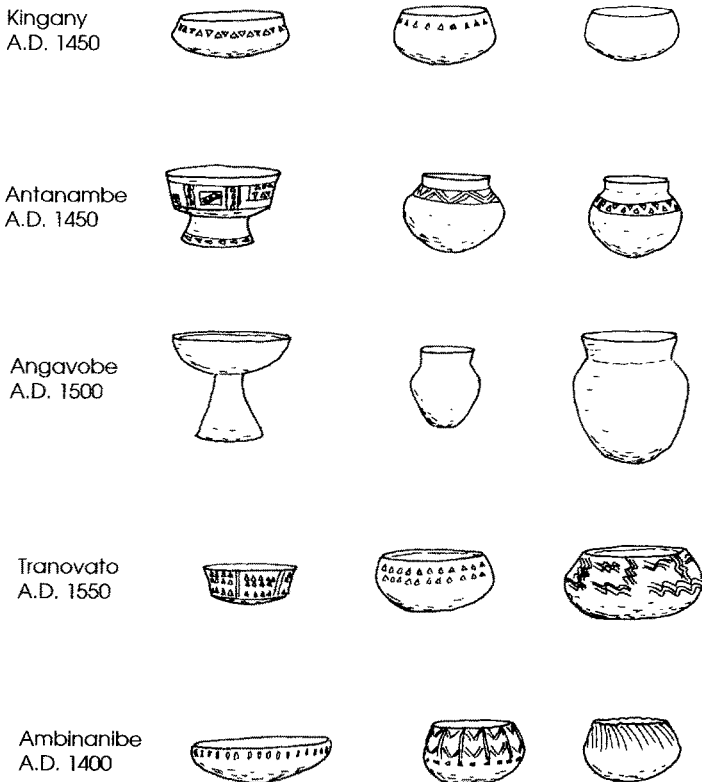


Fig. 7. Typical ceramic vessels of A.D. 1400 to A.D. 1600, from settlements of (top to bottom) Kingany, Antanambe, Angavobe, Tranovato, and Ambinanibe.

The trading ports whence the many products of Madagascar—from such items of daily use as mats, iron, rice, and cattle to such exotica as copal, semiprecious crystals, fabrics, and gold—entered the Indian Ocean commercial networks contrast with the other communities of the coast and the interior. Only the ports of the northwest and extreme northeast coasts are known. During the fifteenth and sixteenth centuries these were uniformly small settlements on unprotected beaches or small offshore islands. The mapped examples covered 2 to 4 ha and had a few mosques and substantial houses of masonry amidst a scatter of impermanent houses. The mosques and the tombs around them are small and spare. The port settlements lack a central focus and have only a few subsidiary villages. These coastal ports were a conduit for items of social display used throughout Madagascar. They also placed demands on local production and exchange and may have been responsible for the widespread adoption of Swahili day names in the Malagasy language. However, these small ports seem unlikely to have provided a political model useful to would-be state founders. It is important to remember, however, that the several early towns either known from documents, such as Ankoala near the Bay of Ampasindava on the northwest coast or Sadia in the Manambolo Valley north of Belo-sur-Tsiribinha on the west coast, or suspected on other grounds still require study.

Research on the fourteenth to sixteenth centuries in Madagascar should help anthropologists evaluate proposed general explanations for the development of “complex chiefdoms” (Earle, 1977) or “paramountcies” (Taylor, 1975). Even at this preliminary stage, the evidence clearly contradicts several widely held ideas. For example, such polities flourished not only in the forested valleys of the east coast and on the central plateau, where irrigated gardens were probably important, but also in the thorn forests of the south and probably in the savannas of the west coast, where shifting cultivation and cattle herding predominated. Thus, neither the managerial requirements of irrigation nor the stable productivity it permits can solely explain why some areas develop such systems while others do not. Other factors, such as trade, conflict, and population movement, merit further consideration.

## THE MODERN PERIOD

### Settlements of the Seventeenth and Eighteenth Centuries A.D.

#### *Antsoheribory and the Sakalava Polities in the Northwest*

During the seventeenth century, profound organizational transformations occurred along the beaches and estuaries and in the semiarid forested valleys and savannas of the west coast (Fig. 8). Unfortunately, we have little archaeo-

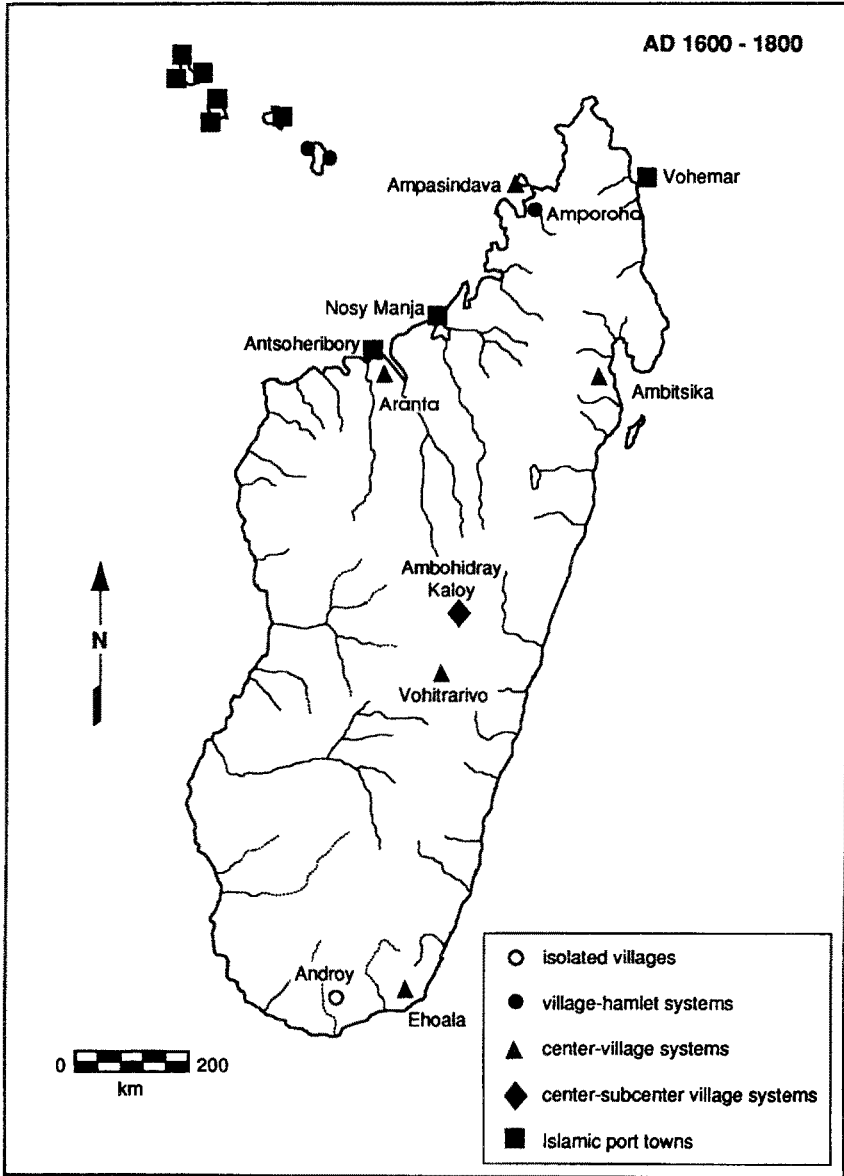


Fig. 8. Archaeological settlements discussed in the text dating from A.D. 1600 to A.D. 1800.

logical knowledge of the central west coast, the region known as “Menabe,” where historical sources tell us the first Sakalava polity emerged about 1660 under the control of Andriandahifotsy (Kent, 1970, pp. 159–204). The Sakalava dynasts moved their capitals about the interior but kept close control over the coastal ports, where they exchanged captives taken in their many military campaigns for guns, gunpowder, and other commodities. Archaeologically, the best-known of these later ports is the northwest coast site of Antsoheribory—known to mariners and slave traders as “Boeny” or “New Masselage” (Armstrong, 1984, pp. 213–216)—in an embayment 50 km west of modern Mahajanga, mapped and extensively excavated by Vérin and a team from the Université de Madagascar (1986, pp. 291–303). The Boeny area was an independent principality, not brought under Sakalava control until about 1690. Nevertheless, archaeological study of the Boeny area informs us about aspects of the scale and structure of regional systems in the west not clearly recorded in European visitor’s accounts. The Antsoheribory ceramic assemblage is composed of heavy vessels with a sandy body, both large jars with straight necks decorated with heavy vertical and horizontal combing and bowls with graphite coatings and some punctate decoration. Earlier bowls are hemispherical with thickened rims like those in the Kingany assemblage; later bowls have carinations and tapered rims.

The port town of Boeny was located on the 40-ha island now called Antsoheribory in the Bay of Boeny. Midden heaps, building remains, and tombs cover about 20 ha. Visitors estimated its population to have ranged from 2000 to 7000. However, at maximal densities of 250 people/ha, the site could have had only 5000 people (Wright *et al.*, 1993a). In its north central area was a mosque measuring 14.0 × 8.6 m with a plain mihrab and small but well-built masonry residences. This area has more imported pottery than other areas of the site. In various parts of the site are groups of massive and elaborate masonry tombs, traditionally associated with the sultans of Boeny, their family members, and ministers (Fig. 9). The west area of the site has less imported pottery and more iron slag, and may have housed craft workers of lower status. The south and east portions of the site have not yet been tested. In all excavations, shell, cow bone, and fish bone are the common food remains. Evidence of imports in the form of Chinese blue-and-white porcelain vessels, Persian glazed bowls, Portuguese jars, and other ceramics is abundant. New items of trade include gunflints and clay tobacco pipes. Of the principal export, slaves, there is no direct archaeological evidence, although up to 3000 people were exported each year (Armstrong, 1984, p. 214).

Nearby sites of the Antsoheribory Phase comprise at least five small village sites of 1.5 ha or less on the beaches of the bay. Few of these would have had direct access to rice fields, though they may have contributed swidden crops, cattle, and fish to the town. None show evidence of iron working. Survey in



Fig. 9. A masonry tomb from Antsoheribory.

the interior, around the rice growing areas of the Mahavavy River valley, revealed no habitation sites of this period. However, we did find Antsoheribory phase sherds around rectangular stone tombs without associated habitation sites. These are probably the funerary monuments of late sixteenth- to early eighteenth-century herding groups who moved around the interior herding cattle and, perhaps, took captives whom they sold to slave merchants in the port towns.

The town of Boeny was abandoned in the early eighteenth century as the Sakalava court shifted eastward from Bezavo on the Mahavavy to Marovoay on the Bay of Bombetoka, the estuary of the Betsiboka River, and the focus of commerce shifted to port towns such as Majunga. Through the nineteenth century, the Sakalava polity splintered into small units with competing courts, but villages continued to flourish in the Boeny area. The fine combed ceramics of this period, termed the Aranta Phase, occur on six villages around the Bay, and several in the Mahavavy valley. The late nineteenth-century capital of a Bemazava Sakalava ruler at Mitsinjo was an uncentralized linear array of Aranta Phase villages along a ridge. The paleoecological data indicate that during the last four centuries, as coastal villages proliferated and the population grew in the interior, deciduous forest vegetation showed increasing damage and was progressively replaced by fire-scarred grasslands with scattered palms (Matsumoto and Burney, 1993).

While our data from intensive survey in the Boeny area are not relevant to the formation of Sakalava polities, they do indicate something about the limits of Sakalava administration. The regime which dominated the Boeny region was ephemeral, and without a permanent presence in large towns or centers in the area. It was also fissile, breaking down into smaller and smaller units. In spite of political instability and the tragedies of the slave trade, however, rural villages appear to have proliferated, a process which was accompanied by an increasing transformation of deciduous forest into grassland.

#### *Antongil and the Betsimisaraka Polity in the Northeast*

During the eighteenth century, organizational transformations similar to those documented for the seventeenth century on the west coast also occurred along the beaches and estuaries and among the forested hills and valleys of the northeast coast. Unfortunately, we have as yet no archaeological knowledge of the valleys between the Maningory River near the modern town of Fenoarivo and the Soamianina River near Soanierana-Ivongo, where historical sources tell us the Betsimisaraka polity was established about 1740 by Ratsimilao (Berg, 1985). His polity began to break up into smaller units after his death in 1753, and little remained by the end of the eighteenth century. However, the name he gave and the customs he established remain today as ethnic markers for the Betsimisaraka people. Detailed survey information from farther north in the Mananara Valley provides a wealth of archaeological information on the period

of Betsimisaraka unification and after (Wright and Fanony, 1992, pp. 47–60). In this area, the spherical jars with fine wavy combed decoration and hemispherical bowls with punctate decoration and graphite coatings continued to be used in settlements of the early eighteenth century. Such settlements occur not only on the coastal estuaries and river terraces, but also on high ridges in the interior; however, they appear to be rare. Settlements of the middle and later eighteenth and the nineteenth centuries are more common, distinguished by the Ambitsika ceramic assemblages with plain jars with everted rims and carinated bowls with complex arrays of triangular impressions inside their rims.

During the Ambitsika phase villages are common, but there were neither hamlets nor large centers; all settlements are 1 to 2 ha in size. Local iron forging is evident in most villages, and pottery fabrics suggest that pottery was usually locally produced. Evidence of trade and exchange is limited to rare imports of graphite-tempered pottery from the Toamasina area to the south, Chinese blue-and-white porcelains, and European glass bottles. A number of Ambitsika Phase funerary caves with preserved wooden coffins have been mapped. In caves with a number of coffins, some are more highly decorated and have more pottery and iron objects placed around them. This pattern implies a very limited degree of social differentiation among the families in the Ambitsika Phase villages. Indeed, if we had not other evidence than the archaeology, we would not infer existence of the centralized polity of Ratsimilao or of the Zanamalata Dynasty of which he was the founder. However, just as we might have a clearer archaeological manifestation of Sakalava polities if we were to survey a capital such as Marovoay, so we might have a different assessment of Betsimisaraka polities if we were to survey around Fenoarivo-Est.

#### *The Central Highlands and the Merina Polity*

By the seventeenth century, if not before, new kinds of settlement groupings had developed around the rich rice-growing areas of the central highlands. In the most thoroughly surveyed area, the west portion of what is traditionally called Avarandrano, immediately north and northeast of modern Antananarivo and surrounding the old sacred capital of Ambohimanga (Wright and Kus, 1976, pp. 55–61), this cultural phase is characterized by Ambohidray ceramic assemblages (Wright, 1979). These ceramics differ from the preceding Angavobe ceramics in having graphite coated jars and other minor variations. As before, these vessels were used to prepare and serve dishes made from rice grown in irrigated fields, legumes, and beef. Houses and tombs are similar to those of the Angavobe Phase. Iron-working is found in specific areas of villages. In addition to knives and spears similar to those made earlier, the first gunflints are found, indicating that at least a few muskets had reached central Madagascar.

The settlement clusters of the Ambohidray Phase are centered on large polygonal fortresses, often with multiple ditches and baffled entrances, enclosing

from 2 to 4 ha. The surrounding subsidiary fortresses have a similar structure, but include only 1 to 2 ha. There are two small fortified hamlets, big enough to enclose only a single house. These proliferate in subsequent periods. Some settlements have tombs on the interior and exterior, indicating that families of both high and low rank lived in the community, but a few have no tombs on the interior, perhaps the beginning of the later pattern of discrete commoner and noble villages. The cluster of eight villages centered on the ca. 6-ha site of Ambohimanga can be estimated to have included 17.6 ha. If there were about 150 people/ha of occupational space, and if these were occupied simultaneously, the population could have totaled 2600 people. A sparsely occupied zone about 5 km wide separated the Ambohimanga cluster from the adjacent cluster around Ifafy to the south. Thus, four centuries after the start of village occupations, there was much valley bottomland far from villages and not yet cultivated (Schwartz, 1992).

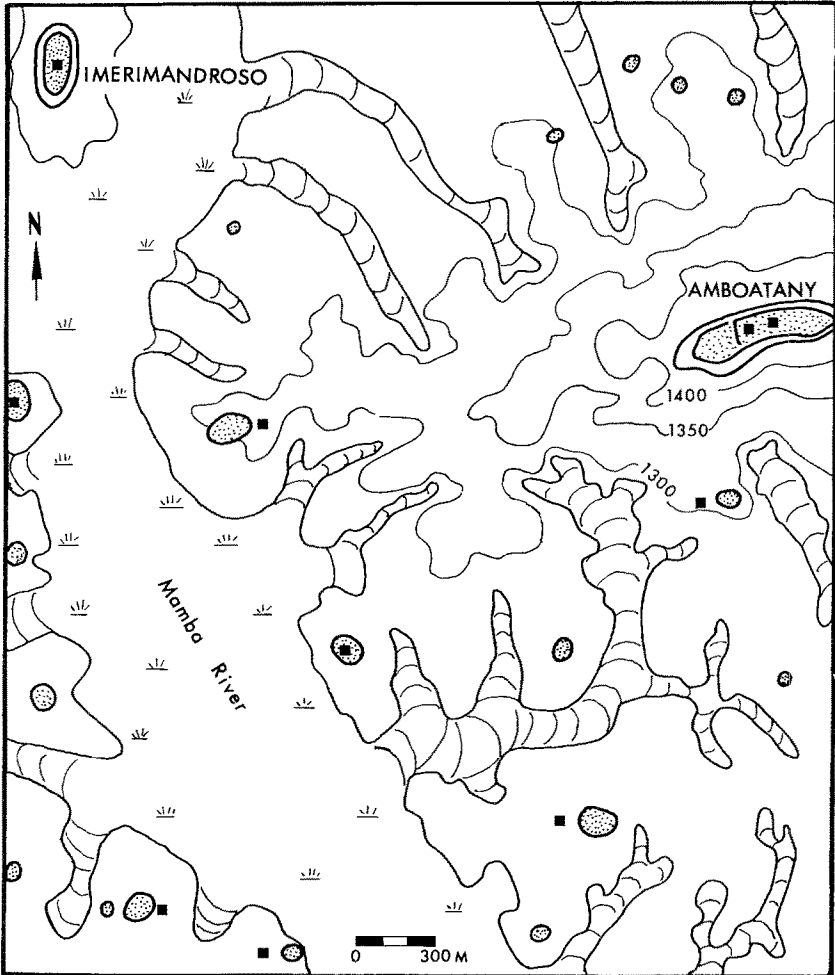
Late in the seventeenth century, the Ambohidray ceramic assemblages develop into those of Early Kaloy. Jars become more differentiated and bowls are manufactured with less care.

The settlement patterns of the Early Kaloy Phase are broadly similar to those of the preceding Ambohidray Phase. The larger towns grow slightly; for example, Ambohimanga reached at least 8 ha. Some villages were abandoned, and new ones were founded. Within the areas protected by the networks of larger villages, a number of small hamlets were built, each protected by its own ditch. However, the overall regional settlement density and spacing changed little, and the Ambohimanga cluster includes settlements with a total area of only 19.6 ha. Employing the same assumptions as for the Ambohidray Phase, the population could have reached almost 3000 people. In this period the traditional histories describe the breakdown of large paramount chiefdoms and petty internecine wars among successor polities (Callet, 1974). The archaeological evidence for limited population growth may indicate that loss due to war deaths, the sale of captives as slaves, and emigration balanced any natural increase.

The Late Kaloy ceramic assemblages of the middle and late eighteenth and early nineteenth centuries have jars similar to the Early Kaloy Phase. Among the bowls the same forms continue, but the heavy, poorly made bowls predominate. However, the vessels preserved in the oldest of the royal palaces at Ambohimanga and sherds from middens near these palaces indicate that the palace occupants used larger and higher-quality vessels. Historic accounts indicate that manioc supplemented rice, but there is as yet no means of paleo-ethnobotanical verification. Similarly, traditional histories emphasize the importance of cattle for prestations and the maintenance of the army, but there are as yet insufficient faunal collections to confirm this. The historical accounts also describe many other crafts, including iron-working and weaving, for which archaeological evidence is as yet sparse.



The density and organizational complexity of Late Kaloy settlements increase to levels unprecedented not only in the Imerina, but also, so far as we know, anywhere in Madagascar (Fig. 10). Four classes of settlements can be distinguished. The small hamlets and villages of the Early Kaloy Phase contin-



**Fig. 10.** Settlement pattern map showing the western frontier of the kingdom of Ambohimanga during the Late Kaloy Phase (ca. 1760–1810). Settlement sites with ditches are indicated by ovals with dots. The black rectangles indicate associated tombs. Ambohatany is an earlier secondary center enlarged at this time. Imerimandroso is a new center on the frontier. The line of larger sites east of the Mamba River is the inner, presumably earlier, frontier; the line of sites west of the Mamba is the outer frontier. All smaller valleys were probably fully developed as rice paddies at this time.

ued without change in structure. Several larger villages on the periphery of the Ambohimanga polity expanded into subsidiary towns up to 10 ha in size, with new and more massive ditches and gates closed by granite disks up to 1.5 m in diameter. Ambohimanga itself was almost entirely surrounded by two huge ditches more than 10 m wide and 10 m deep, enclosing 35 ha, of which at least 18 ha were inhabited. It had numerous gates, including massive ceremonial entrances closed by granite disks 4 m in diameter (Kus, 1982).

The southern and western frontier of the Ambohimanga polity was protected by concentric lines of villages one to two kilometers apart. The line just to the south of Ambohimanga, presumably the earlier frontier, protected some areas good for rice paddies in smaller side valleys. These sites had tombs only outside their ditches and were, therefore, probably inhabited by commoners. The line farther south, presumably a later frontier, protected large areas of river valley with open marsh and many small hamlets overlooking these areas. Schwartz (1992) estimates that cultivation of all of these marshes would be needed to feed the expanded population of almost 10,000 people in the Ambohimanga polity. The villages of the outermost Late Kaloy frontier had unusually thickly packed clay walls, perhaps a response to the increased use of muskets. The alternation of villages with tombs within their ditches and those with tombs outside suggests that commoner and noble demes served on the frontier and that they lived in segregated settlements.

Limited surveys in areas outside Avarandrano (Kus and Wright, 1986; Wright and Kus, 1981) indicate that Antananarivo and other capitals of competing polities had similar settlement transformations, with subsidiary centers and linear frontiers protecting concentrations of fortified hamlets. This is the period that both historical traditions (Callet, 1974) and early European travelers' accounts (Mayeur, 1912, 1913) document as the climax of the civil wars, with the consolidation of the Ambohimanga state by King Andrianampoinimerina and its expansion to control all of central Madagascar. The settlement array, with its hierarchy, frontiers, hamlet concentrations, and elaborate gates, is the material manifestation of Andrianampoinimerina's political, military, agricultural, and ideological policies; these policies are also manifest in many of his remembered (and later recorded) speeches.

There is still much to learn about the latest archaeological phases in the Avarandrano and elsewhere in the central highlands. We lack detailed knowledge about agriculture and the structure of local social units. Population estimates remain tentative. Understanding the increase in population growth on the eve of state formation will require many more data about the borderlands of Avarandrano. The archaeology of craft production and of many of the important political and military sites discussed in the recorded oral histories has barely begun, and many of these are threatened by the expansion of modern Antananarivo. We are still not able to evaluate extant hypotheses explaining Merina

state formation, for example, those involving irrigation and the import of guns (Bloch, 1977), much less more complex constructs involving political strategies, and ideological manipulations (Berg, 1988).

### *Other Possible Centers of State Emergence*

We know from ethnohistorical studies that other areas of Madagascar developed complex political organizations during the eighteenth century. For example, the southern highlands, later conquered by the Merina and called the Betsileo province, had several polities that may have achieved state organization (Kottak, 1980). But archaeology has only begun there, and the emergence of these polities is still unknown. Other areas of Madagascar, such as the northern highlands, are completely unknown. These areas may have developed complex polities that were erased during the seventeenth century wars engendered by demands for slaves. Other areas maintained the early pattern of paramountcies. For example, in the far northwest around the coasts of the Bay of Ampasindava, the Amporoaha phase, probably the material remains of Sakalava splinter groups, has only villages and hamlets. In the far southwest in the Efaho valley, the Tranovato phase is succeeded by the Ehoala phase, which has small centers and dependent villages similar in scale to those of the Tranovato phase.

### **Discussion: Malagasy State Formation**

Madagascar is sometimes viewed as a testing ground for general theories of state formation. We hope that will be true in the future, but at the moment it is possible only (1) to clarify aspects of the polities that emerged in the seventeenth and eighteenth centuries and (2) to place some constraints on specific models of state formation processes suggested for Madagascar. It is notable that domestic ceramic traditions continue in each area, in spite of the tumultuous political clashes of the seventeenth and eighteenth centuries (Fig. 11).

With respect to the polities that we have considered—those of the Sakalava, Betsimisaraka, and Merina—only the Merina has the material signature of a state. In particular, the four-level hierarchy of capital, subsidiary centers, villages, and hamlets would be unstable without a permanent system of administrative control. The specialized military sites on the frontier must have required permanent logistical arrangements. The archaeological evidence reinforces the rich ethnohistorical record of Andrianampoinimerina's political acumen. Such compelling evidence for state organization does not exist for the east or west coasts. If the Sakalava or Betsimisaraka polities were established states, we might expect settlement reorganization in such resource rich areas as Boeny or Mananara. Clearly, we need intensive archaeological efforts in the heartland of both east and west coast political development. Whatever their political struc-

Amporoaha  
A.D. 1750



Aranta  
A.D. 1750



Kaloy  
A.D. 1780



Ambitsika  
A.D. 1770



Ehoala  
A.D. 1750



**Fig. 11.** Typical ceramic vessels of A.D. 1700 to A.D. 1800, from settlements of (top to bottom) Amporoaha phase, Aranta phase, Kaloy Phase, Ambitsika phase, and Ehoala phase.

ture, these coastal polities exerted military pressure on the highlands, and this will be important in explaining developments in the central highlands.

Even at present, the evidence suggests some ideas about Malagasy state formation are worthy of further research. For example, the Merina state developed in an area of highly productive rice cultivation where productivity could be expanded with increased labor investment. When the heartlands of the Bet-simisaraka and Sakalava state formation are surveyed, the assessment of seventeenth- and eighteenth-century food production capabilities may indicate material limits on political stability. Other ideas, for example, that population growth engendered conflict, conquest, and state formation (Carneiro, 1970), appear to be untenable here. Population did grow around Ambohimanga, the

center of state formation in the Imerina, but it was too rapid to be the result of local population growth, and oral tradition indicates that it was the result of nucleation around the emergent political center. Nevertheless, population mass is clearly important and merits further research.

## CONCLUSIONS

Hubert Deschamps began his history of Madagascar by noting that “if the origin of a people is always more or less conjectural, that of the Malagasy is enveloped by a particularly opaque mystery” (1965, p. 13; our translation). The past quarter-century of archaeological research has brought some of the Malagasy past into sharper focus, but much remains to be learned.

Madagascar is a special place for archaeologists and prehistorians. It was the last large landmass on earth to be permanently settled, and many of the common processes of human ecological and social development have left better-preserved and more readily understood records. Archaeological research continues to expand on the island, and we will continue to learn more about its past. But, in addition, we will be challenged to refine and expand our understanding of general processes that underlie human ecological adaptation to environments, the role of trade and migration in the formation of spheres of cultural integration, and the origins of complex societies.

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