

ture rouge-brun avec des taches d'ocre et une texture homogène.

Matériel récolté

En surface du sol apparaissent de nombreux débris: charbon de bois, scories de fer et quelques tessons de poteries. Les différentes perturbations enregistrées sur le site, l'une anthropique par l'action de l'homme et l'autre naturelle par la fréquence de pluies dans la région des Monts de Cristal, nous ont permis de récolter: 3.8 kg de scories et des tessons ornés des pots de plusieurs types. Le reste du matériel était constitué de charbon de bois, d'une partie supérieure d'un vase, des morceaux de quartz, de quelques morceaux de charbons de bois certainement ayant servi à la fonte du minerai. A cela, il faut ajouter la collecte de morceaux du minerai de fer utilisé d'origine latéritique.

Interprétations et conclusions

La découverte du site de Bibulu vient enrichir l'archéologie woleu-ntémoise en particulier celle du Département de l'Okano jusque là très mal connu archéologiquement dans le domaine de la métallurgie du fer. Pour l'heure, nous ne pouvons pas parler soit d'un Age du Fer Recent soit de celui du Fer Ancien, car n'ayant pas jusque là de séquences chronologiques et autres données devant nous permettre de soutenir l'une ou l'autre de ces hypothèses. Les premiers sondages et fouilles qui seront effectuées dans l'avenir permettront d'esquisser le contexte de la réduction du fer à Bibulu.

Bibliographie

Farine, B.
 1967a Quelques outils principaux des divers faciès préhistoriques des districts de Ndjolé et de Booué. *Bulletin de la Société Préhistorique et Protohistorique Gabonaise* 7: 22-36.
 1967b Nouveaux gisements préhistoriques dans les environs de Ndjolé et des portes de l'Okanda. *Bulletin de la Société Préhistorique et Protohistorique Gabonaise* 7: 14-21.

Meye, F.
 1989 Nouvelles prospections archéologiques dans la Province du Woleu-Ntem au Gabon de 1987 à 1989. *Nsi* 7: 26-32.
 Oslisly, R. et B. Peyrot
 1985 *Paléoenvironnement et recherches archéologiques au Gabon: 1984*. Rapport d'activités dactylographié, 42 pages, 32 figures.

■ **MADAGASCAR**

New field data on the ancient iron metallurgy of Madagascar

Bernard Clist
 B.P. 1456
 Libreville, Gabon

Geographical setting

In September 1993, a survey was made of the immediate hinterland of the small town of Sambava on the north-eastern coast of Madagascar. Extensive field walking was carried out in between the first hills overlooking the coastal sand cordons to the east where the Andamoty and Andohabe lakes lie near to the Indian Ocean and the Soavinandriana to Ankalimanavoky dirt road to the west. The survey area is between 1,300,000 / 1,310,000 and 797,000 / 805,000 metric coordinates.

Among other discoveries, a major iron smelting site was found 6 km south-south-west of Sambava (1,304,000 and 800,300 metric coordinates) (Figure 1).

The site survey

The smelting site was located on a sand plateau of a few hectares extension, directly overlooking the small Matavy river (= Andrano matavy). The first sign of its archaeological interest was the numerous iron slag remains which jut-

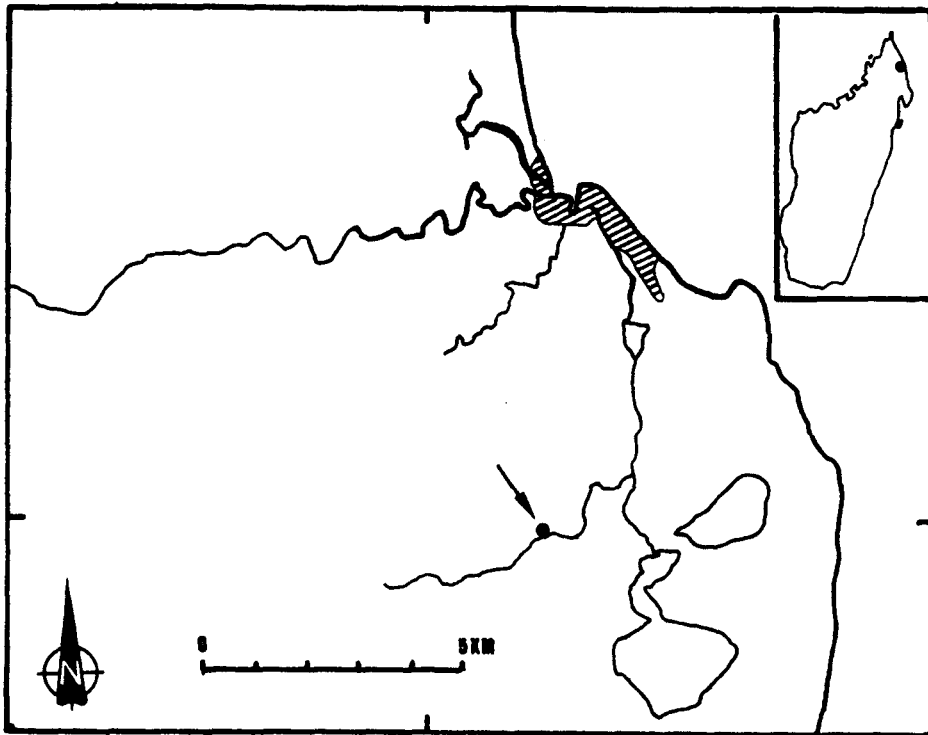


Figure 1: Location of study area in northeast Madagascar

ted out of the white sand formation in closely packed circular structures. The survey and subsequent mapping of the site identified 14 iron smelting locations (Figure 2). Others could be present in areas of dense grass cover. Out of the 14 locations, 13 are very similar: they are around 2 m in diameter, circular on the surface with very abundant slag pieces, some quite large and densely packed together in a very black sandy soil, contrasting with the white sands of the plateau. Location 10 is unique; it is a 11 m by 9 m slag heap, still 1 m in height. Rare potsherds and tuyere fragments were surface collected at some of the slag locations.

Excavation

Several observations make one think this is an ancient site. The slag heaps on the surface seem to be the central part of heaps still buried in the sand. On the hill slope going down to the small Matavy river, slag seemed to be stratified some 30 cm in the sand. In addition, the local inhabitants did not know of the site and as soon as they were shown

the artifacts they claimed them to be remains of 'arab' settlers because all ancient and well made artifacts must be 'arab' and cannot be malagasy!

It was decided to carry out a test excavation on one of the slag heaps to get a good idea of the structure of the heaps on the site and to try to get a charcoal sample to verify the antiquity of the smelting operations there. Location 6 was chosen for excavation. The method used first studied the stratigraphy of the heap, then the spatial disposition of the refuse. A trench half a meter in width and 4.5 m long was positioned across the center and excavated until the base of the slag heap was reached at around 0.60 m below the surface. On the eastern side of the trench a small pit was found cut into the sand from the base of the slag heap. There the excavation extended to 1.10 m in order to be able to study its fill in some detail. At the end of the excavation, an area of 6 m² was studied on the western side of the trench in order to test the spatial extension and disposition of the smelting refuse.

The stratigraphy of the trench shows a small circular pit of 0.40 m diameter dug in the white

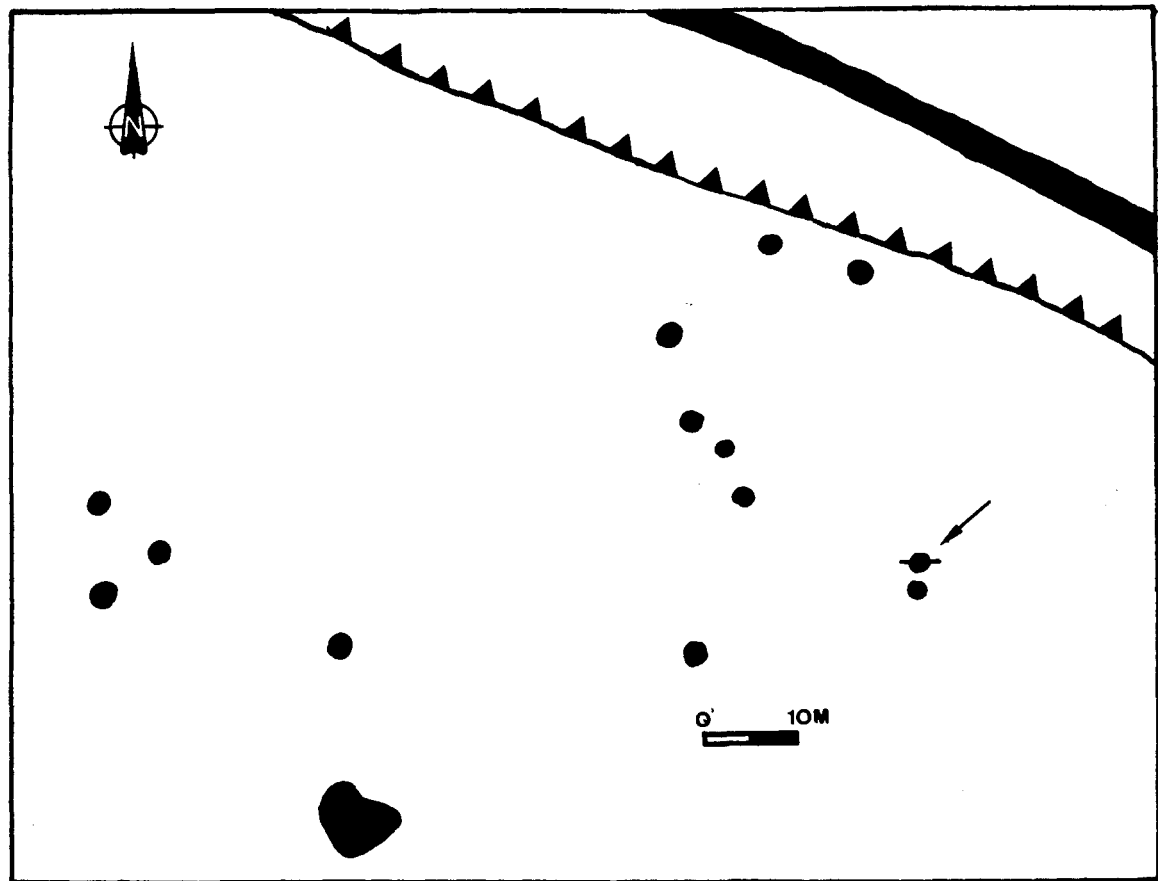


Figure 2: Distribution of iron smelting localities at the Matavy river site

sands for 0.45 m (Figure 3). The lower part of the pit is filled with some compact brown sand mixed with some iron slag. A second layer is made up of rather loose grey sands again mixed with some iron slag but also with some potsherds and small pieces of charcoal. The charcoal from this layer has been dated back to 750 ± 70 b.p. (Beta-74287). Using the 1993 correction tables (Stuiver and Reimer 1993) the calendar date is A.D. 1220-1295 (one sigma) or A.D. 1159-1392 (two sigma). A third thin layer tops the filling of the pit. It is made up of grey to brown sands with iron slag and potsherds. After the pit was filled, the area was used for extensive slag refuse disposal which then covered the filled pit. The slag was included in a black sandy layer. Apart from the slag itself, some potsherds were found in this layer but no charcoal. The sherds do not differ from the ones found in the pit. The spatial study did not yield any new

information on the stratigraphy nor the spatial disposition of the slag.

The material from the excavation consist of two stone querns fragments and a number of potsherds. Pottery uncovered during the excavation is identical to sherds surface collected on the site and associated with other slag locations. The pottery is from 8 to 11 mm thick, with well baked clay, hardly scratched by hand, with a 2.5 YR 3/2 to 10 YR 3/2 color (Munsell color chart) at the center and from 2.5 YR 3/4 to 5 YR 4/4 on the inner and outer surfaces. Temper is composed of stone fragments of thin (< 1 mm) size, consisting of quartz and one other unidentified material. Cross sections can be seen in Figure 4; most of the pottery seem to be open forms, with the exception of the restricted vessel (#1) with a carination marking the limit between the body and the neck. Most (n=6) of the lips are flat, with some

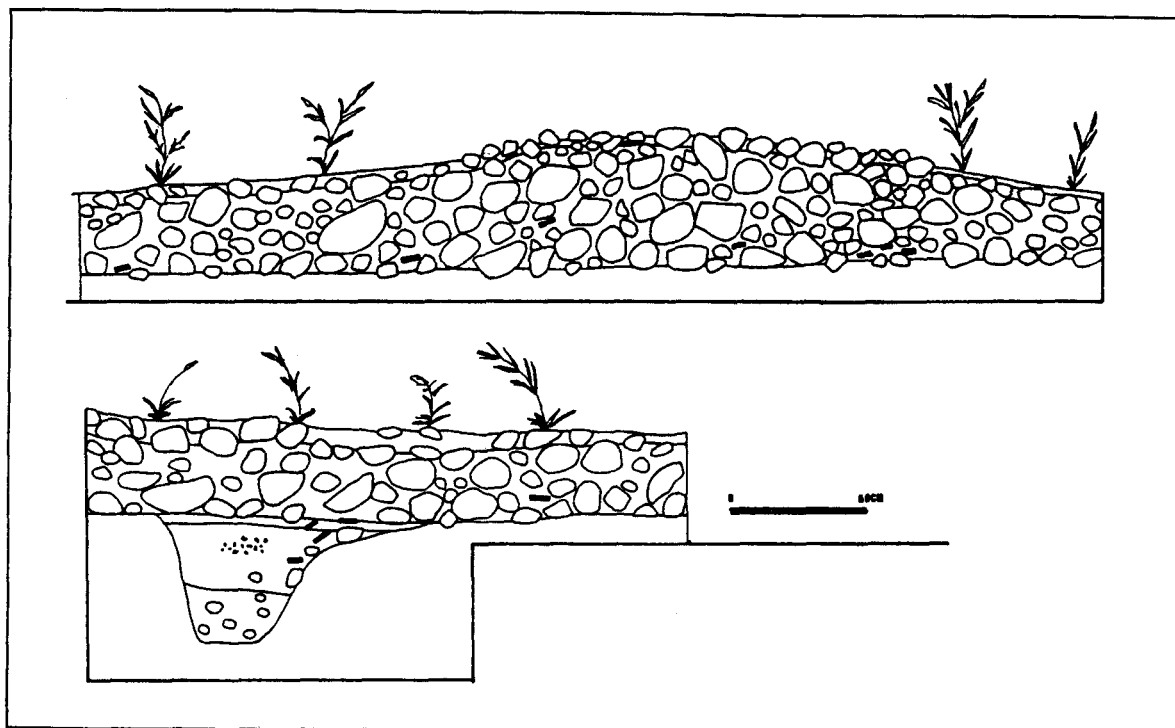


Figure 3: Stratigraphic sections through slag heap #6

convex shaped ones (n=2). Apart from one sherd, no decoration is found on the vessels. The decorated sherd (#8) has two wavy-line incisions running horizontally on the upper part of its neck, right under the lip.

Discussion

Carinated sherds seem not to be known elsewhere in this area of Madagascar. The 'wavy-line' incised motif found on some potsherds from location 6 and similar surface collected pieces are known in the so-called "Complexe de Serenambe" dating to between the 11th and 17th centuries A.D. (Wright and Fanony 1992) further south down the coast.

These Sambava excavations throw some light on the iron smelting practices of the peoples of the northeastern part of the island and partly fills the gap in our knowledge of ancient iron metallurgy as outlined by C. Radimilahy (1985). Furthermore, it shows human occupation of some importance in this area in the 13th century A.D. Similar sites to the one described, though smaller

in extent, have been found in the nearby hills. This shows that the Sambava hinterland was a strong iron smelting area in antiquity.

Acknowledgements

I thank the Ahmedaly family of Sambava who loaned me a 4-wheel drive vehicle along with a guide/translator; this allowed the survey to be carried out.

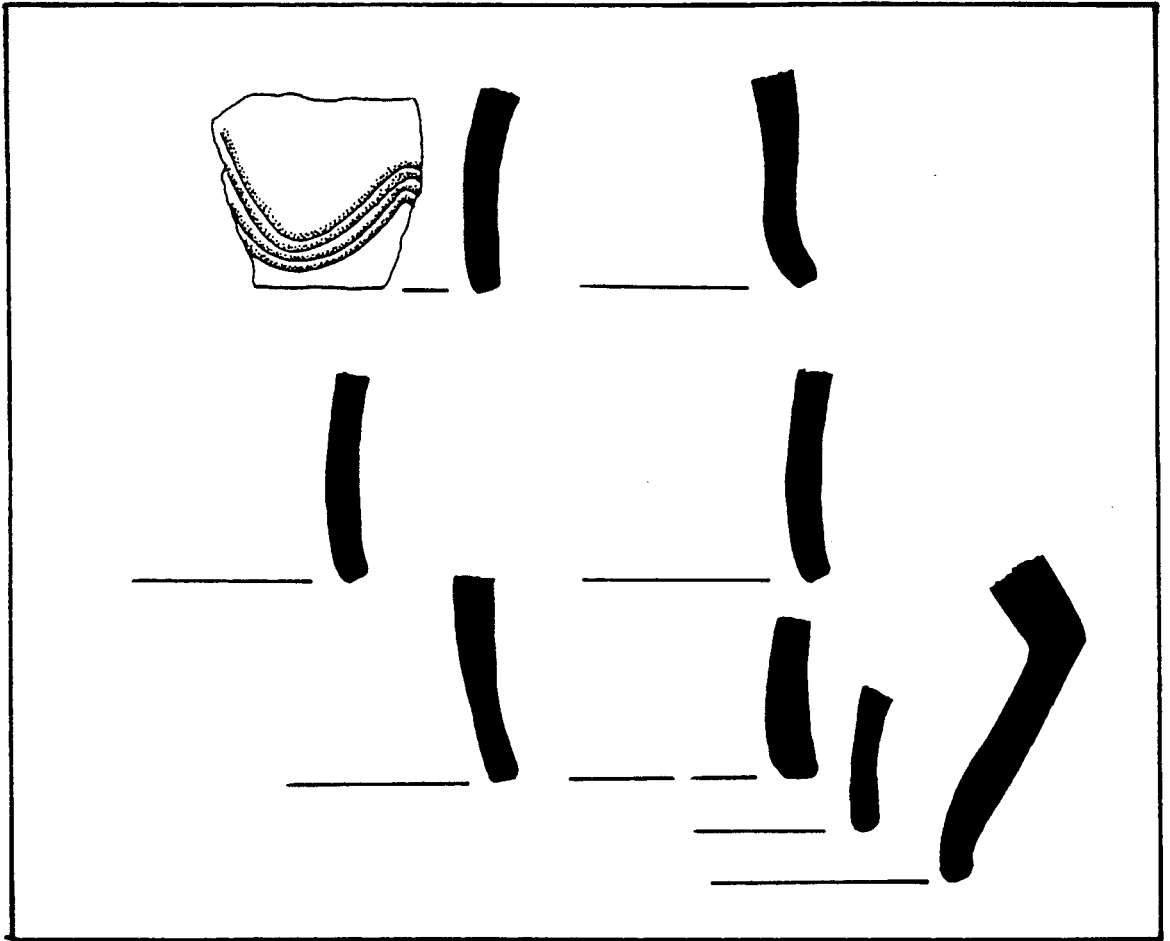


Figure 4: Decorated potsherd found in top layer and profiles of other potsherds

Bibliography

Radimilahy, C.

1985 *Contribution à l'étude de l'ancienne métallurgie du fer à Madagascar.* Musée d'Art et d'Archéologie de l'Université de Madagascar, Travaux et Documents XXV. Tananarive.

Stuiver, M. and J. Reimer

1993 Extended 14C data base and revised CALIB 3.0 14C age calibration program. *Radiocarbon* 35(1): 215-230.

Wright, H.T. and F. Fanony

1992 L'évolution des systèmes d'occupation des sols dans la vallée de la rivière Mananara au nord-est de Madagascar. *Taloha* 11: 16-64.