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Animal Remains from Industrial Iron Age Communities in Phalaborwa, South Africa

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The Phalaborwa region in the Northern Province of South Africa has one of the richest copper- and iron-bearing deposits in southern Africa. These deposits have been worked for 1200 years and are still being worked. The abundance of ore reduction and metal production sites, dating mostly to the Late Iron Age, testifies to the importance of these deposits. Those sites that were excavated provide valuable insight into the industrial processes, economy, rituals, and use of animals by these specialized communities. The faunal remains reflect different lifestyles, but also indicate that animal husbandry was not of primary importance. The communities were focused predominantly on metal production. The soils and climate of the region are not very suitable for herding and agriculture. Subsequently products of the metal working activities such as hoes were used as replacement for cattle in bride wealth.

La région Phalaborwa dans la province Nord d'Afrique de Sud constitue l'un des dépôts les plus riches de cuivre et de fer du sud d'Afrique. Ces dépôts ont été exploités pendant 1200 années et le sont toujours. L'importance de la réduction du minerais et de la production de métal de ces sites, datés pour la plupart sur la fin del'Age de Fer, témoignent de la richesse de ces dépôts. Deux sites qui furent fouillés, donnent des renseignements valables à propos des processus industriels, de l'économie, desrites et de l'utilisation des animaux par ces communautes spécialisées. Les ossements de la faune reflètent différents modes de view, mais indiquent également que l'économie animalière n'était pas de la première importance. Les sols et le climat de la région ne sont propices, ni à l'agriculture. D'autres produits issus du travail du fer, comme des houes, ont été utilisées en remplacement de l'élevage.

KEY WORDS: South Africa; Iron Age; metal working; animal use; domestic animals; substitution; ritual.

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INTRODUCTION

The Phalaborwa region in the Northern Province of South Africa contains rich bodies of copper and iron ores. The copper ores have been worked, discontinuously, for the past 1200 years by a succession of people representing different archaeological complexes. Numerous settlements with metal working remains were recorded between Gravelotte in the West and the Kruger National Park to the East. The research results proved that there was relatively little involvement with domestic stock but that hunting was of greater importance (Mason *et al.*, 1983; Pistorius, 1989).

Three archaeological site complexes were identified, namely, the Loole, Sekgopo, and Ga-Masisimale (Fig. 1). Historical, ethnographic, and demographic evidence show that these can be associated with historically known groups of the area, namely, the Makusane and Maseke-Malatji, the Majaji-Malatji, and the Bashai. In the influence spheres of the Makusane and Majaji-Malatji, as well as in that of the Bashai, iron production was dominant, but in that of the Maseke-Malatji it was copper production (Fig. 2) (Pistorius, 1989, p. 319).

The Loole site complex covers a surface of approximately 100 km^2 and is geologically characterized by the Palabora Igneous Complex, with its abundance of iron and copper ores. The region is studded with numerous syenite hills which served as places of settlement for the metal workers. More than 50 settlements were identified, most of them still known by their historical names. Eleven of these were excavated, and faunal samples collected from 10 sites. Although the archaeological survey included much of the Sekgopo and Ga Masisimale site complexes, no significant faunal remains were retrieved from these two complexes. The faunal samples from 10 of the excavated settlements in the Loole site complex are discussed in this paper. These are from an earlier (1000–1400 cal AD) and a later (1600–1900 cal AD) occupational phase identified during previous research (Van der Merwe and Scully, 1971, p. 138; Pistorius 1989, pp. 315–318).

Earlier reports on the fauna of the two occupation phases at Kgopolwe, SPK4 (1600–1888 cal AD, with one doubtful date of 1434 AD) and SPK3 (1040–1380 cal AD), state that the meat diet of the occupants remained unchanged for more than 10 centuries and that the fauna consisted of 50% cattle, 25% goat, and 25% other species (Van der Merwe and Scully, 1971, pp. 178–196). These results differ markedly from those from Shankare Hill (Mason *et al.*, 1983, p. 192) and from other settlements in the region (Pistorius, 1989; Plug, 1988, pp. 181–208). However, it is unclear on what basis these figures were derived and what the identification criteria were. Comparisons between these figures and those of later excavations should be treated with care.

Faunal remains were collected from settlements of all three groups of sites identified in the Loole site complex and from both occupational phases which have been identified only at certain settlements. The faunal samples were analyzed

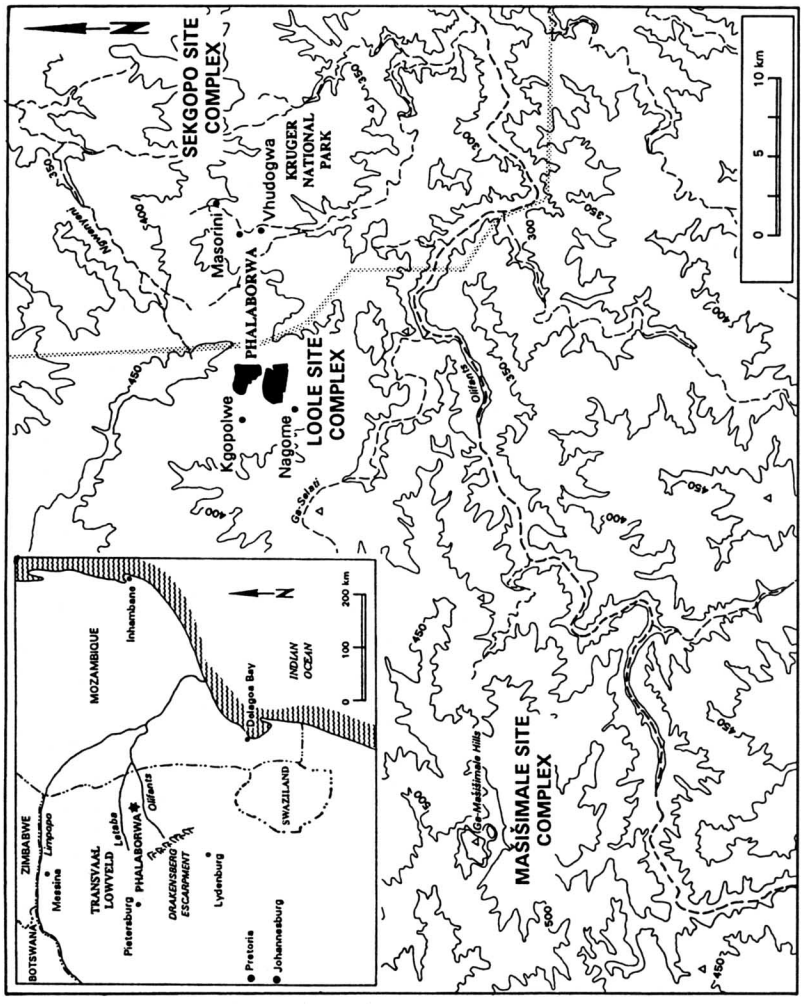

Fig. 1. Phalaborwa is situated in the Letaba district of the Lowveld of Mpumalanga, where three archaeological site complexes were identified by means of an archaeological survey.

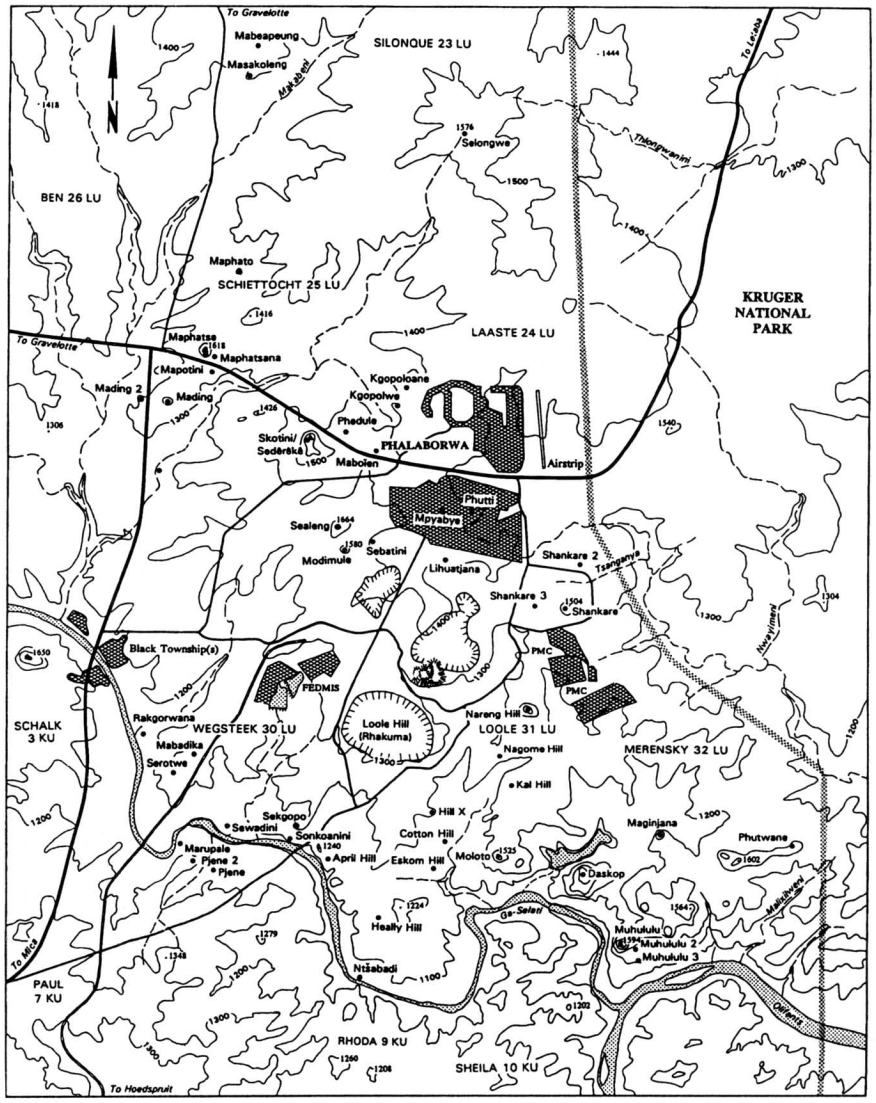

Fig. 2. Eleven settlements were excavated in the Loole site complex, revealing a hierarchy of settlements representing capitals of ruling lineages, settlements with immigrant groups, and industrial sites.

at the Transvaal Museum according to internationally accepted procedures. The samples varied from a few fragments to a fairly large assemblage. Preservation was generally good and many of the fragments were identified to species level.

PREVIOUS RESEARCH

Archaeological research in the northern and eastern parts of the former Transvaal initially focused on the Early and Late Iron Age remains West of the Drakensberg mountains. These studies yielded evidence for the earliest manifestation of the Iron Age near Lydenburg, industrial activities such as salt processing, soapstone bowl manufacturing, and copper mining and smelting in the Letaba district, and descriptions and explanations of the significance of stone walled settlements during the Later Iron Age (Collet, 1979; Evers, 1973a,b, 1974, 1975, 1977a,b, 1980, 1981; Evers and Van den Berg, 1974).

Geological reports make the earliest mention of archaeological remains at Phalaborwa and refer to ancient mining activities on Loole Hill and the Old Guide Mine (Hall, 1912, pp. 164–171; Trevor 1912, pp. 270–271). Schwellnus (1937, pp. 907–910) described furnace types used for iron and copper smelting at Serotwe Hill in Phalaborwa. Valuable ethnographic studies among the Baphalaborwa (Bamalatji) people who are associated with the metal working remains of Phalaborwa were done by E. J. Krige (1937) and J. D. Krige (1937) and later by Du Toit (1967, 1968). However, it was due only to the interest of Charles Moore (1966, 1974) and other amateurs that the importance of Phalaborwa was brought to the attention of professional archaeologists.

The first excavations were those by Mason (1962, 1965) and Van der Merwe (1969, 1971; Van der Merwe and Scully, 1971). Articles were published on the metal working technology, the identity and ethnohistory of the metal workers, the metallurgical remains, and the different occupational phases and pottery traditions in Phalaborwa (Verwoerd, 1956; Van der Merwe and Scully, 1971; Van der Merwe and Killick, 1979; Van der Merwe, 1980; Evers and Van der Merwe, 1987). Radiocarbon dates identified two phases of Iron Age occupation for Phalaborwa (Stuiver and Van der Merwe, 1968, p. 56; Pistorius, 1989, p. 499). Specialized articles on human remains, iron smelting at Square, and metallographic analysis of iron artifacts were published (Rightmire and Van der Merwe, 1969; Van der Merwe and Killick, 1979; Van der Merwe and Gordon, 1984). Experimental studies in the smelting of iron ores from the Palabora Igneous Complex also received attention (Küsel, 1974, 1978). The University of Pretoria's excavations at Masorini Hill in the Kruger National Park (Fig. 3), in collaboration with the National Parks Board, and the eventual development of this settlement in an archaeological site museum led to unpublished reports (Eloff, 1976, 1977; Van Vuuren, 1976; Verhoef, 1982).

Postgraduate projects include those of Thorne (1974), who did an archaeological survey of the Phalaborwa region and discussed the methodology used and the practical problems encountered during the survey. Scully (1978, pp. 240–241) documented the oral history of the Baphalaborwa, while Pistorius (1989) utilized historical, ethnographic, spatial, and experimental evidence to establish a cultural historical sequence for the metal-working remains of Phalaborwa.

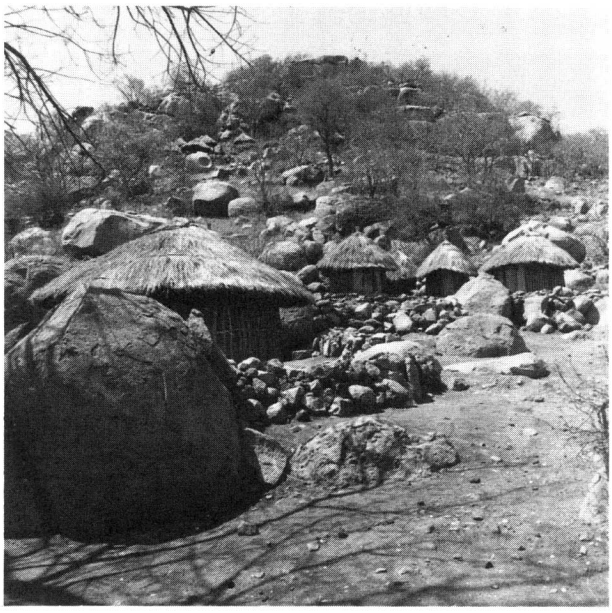

Fig. 3. Masorini archaeological site museum in Kruger National Park (Gauteng Museum Services).

METAL-WORKING DOMAINS IN PHALABORWA

As a result of recent research, the settlements of the Loole site complex can be classified into three groups according to spatial features such as residential and metal-working remains. These attributes were integrated with chronological evidence such as radiocarbon dates and historical evidence. This site typology clearly reflected a social and political hierarchical order for the settlements of the Loole site complex (Fig. 4) (Pistorius, 1997, p. 35).

1. Group 1 settlements represent villages of ruling lineages and were occupied from the seventeenth and perhaps as early as the sixteenth century. These settlements contain large-scale iron and/or copper manufacturing, as well as extensive residential remains. Most of these settlements were associated with hills and their ruins occur on the slopes and on the flat areas immediately below the hills. Settlements such as Kgopolwe, Nagome, and Shankare, belonging to this group, also had deposits of earlier phases of Iron Age occupation (900–1300 AD).
2. Group 2 settlements were established and occupied by immigrant groups such as the Monareng, Bakgaga, and Balobedu during the eighteenth century and perhaps as early as the seventeenth century. These settlements

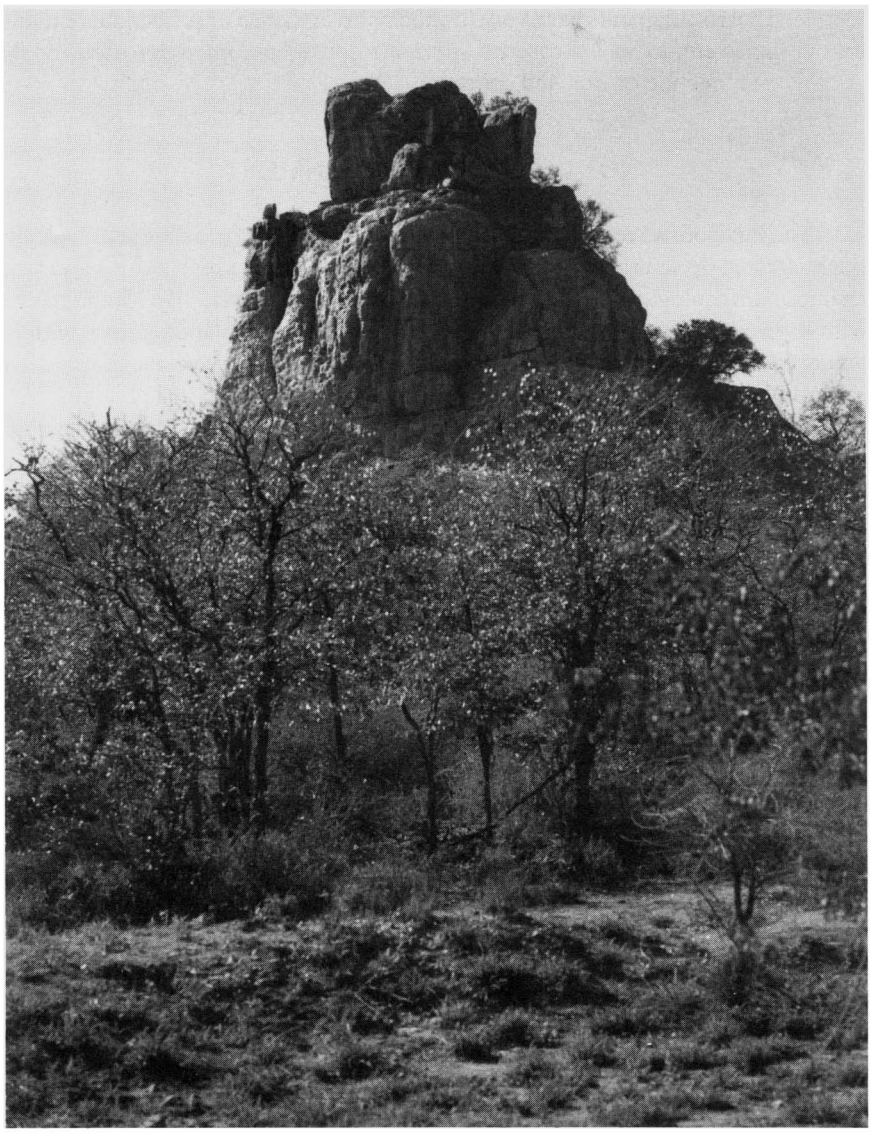

Fig. 4. Kgopolwe Hill, in the center of the modern town of Phalaborwa, is one of several settlements in the Loole site complex which has two phases of Iron Age occupation (Gauteng Museum Services).

were associated with the manufacturing of either iron or copper and had limited residential remains.

3. Group 3 sites were occupied by still later immigrants groups, such as the Tsonga, who entered the Phalaborwa region during the nineteenth century.

These settlements have very limited or no evidence of residential remains, but were, as in the case of Marupale and Pjene, intensely used for the manufacture of iron and copper.

NOTES ON THE ENVIRONMENT

The Phalaborwa region is relatively flat, *ca.* 300 to 400 m above sea level, and is demarcated by natural boundaries. To the West lies the Drakensberg escarpment, an important ecological barrier separating the warm, dry Lowveld of Mpumalanga, with its predominantly savanna vegetation, from the high inland plateau, with its higher rainfall and extensive grasslands. The Lebombo mountain range forms the eastern boundary and also acts as a rain shade, as rainfall immediately to its West is significantly lower than closer to the escarpment (Plug, 1988). The northern and southern boundaries are the Letaba and Olifants rivers, respectively.

The area has little surface water except for a few East-flowing perennial rivers such as the Selati and Olifants. Apparently many of the now dry rivulets used to flow regularly during the nineteenth century. Older people recall that many of these held enough water at the beginning of the twentieth century to support communities on their banks (Stevenson-Hamilton, 1934, p. 29). The building of dams upstream and increased industrial, agricultural, and urban development have caused a drop in the ground water table and reduced the annual flow of the rivers.

The climate is dry and warm, with daytime summer temperatures frequently exceeding 40°C. The extreme radiation keeps the night temperatures tolerable at *ca.* 20°C. The winters average 25°C during the day, but although nights are much cooler, temperatures seldom reach freezing point (Plug, 1988). Rainfall is restricted largely to the summer months between November and March, with an average of 450 mm per year. Less than 5% of the rain falls in winter (Barnard, 1975, p. ii). Evaporation is usually high, although humid conditions can occur in summer.

During the recent past the area was generally regarded as unhealthy, particularly in summer. Malaria was common, and although it is largely under control, cases still occur today and its general incidence is on the increase. The presence of tsetse flies in the region seriously inhibited human activities and animal husbandry. Although tsetse flies were endemic, historical evidence shows that fly populations were not constant and that great fluctuations occurred (Fuller, 1923). During the early eighteenth century the area was relatively free from tsetse and people were able to herd cattle (Punt, 1975). At the beginning of the nineteenth century the area was heavily infested and the local people had lost their herds, but by the end of that century tsetse flies had all but disappeared (Plug, 1988, pp. 19–20).

In southern Africa the trypanosomes that cause nagana and sleeping sickness are transmitted by flies of the genus *Glossina* (Lambrecht, 1964, p. 12; Fuller, 1923). Although it is not clear why tsetse fly numbers fluctuated so much over the last three centuries, some factors can be identified. These include climatic

variations, human land use, and the abundance of game. Bush clearing by farmers reduces suitable habitats and fly numbers decrease. However, overgrazing may lead to bush encroachment, with a subsequent increase in fly numbers (Dorward and Payne, 1975, pp. 253–254). Prolonged rains or a particularly wet rainy season reduces fly populations, as the pupae tend to drown in waterlogged soils (Nash, 1969; Lambrecht, 1964). Temperature also affects the successful hatching of pupae, as *Glossina* pupae develop best when temperatures are between 20 and 28°C (Lambrecht, 1964, p. 10). Reductions in game numbers do not affect the fly populations but will reduce the reservoirs of the trypanosomes. There is some suggestion of climatic variations in South Africa during the past 500 years, but their exact nature and timing have not yet been determined. The decline of tsetse fly populations toward the end of the nineteenth century may be attributed to any of these factors, although a reduction in game at that time would certainly have been one of the factors. The devastations caused by the rinderpest among game and domestic animals alike at the end of the nineteenth century accelerated the demise of fly populations in the eastern parts.

The dominant soil types are Hutton and Glenrosa, consisting of medium and coarse sandy loams, respectively. They have a high alkaline content, making them saline. Salty crusts, previously exploited for the salt, form in some of the low-lying areas. The soils are poor in nutrients and clays and are also poor water retainers. As a result, they are largely unsuitable for agriculture.

Acocks (1975) describes the vegetation as Arid Lowveld, a predominantly *Acacia nigrescens* savanna with *Digitaria* sp. as the dominant grass. *Combretum* spp. are also common trees, as are *Colophospermum mopane* in the North. Within this Arid Lowveld region, Gertenbach (1983, pp. 35–41) distinguished many landscapes. Three of these are relevant to the study area, namely, the Northern Mopane Savanna, the Phalaborwa Sandveld, and the Olifants River Rugged Veld. Most of the sites discussed in this paper are situated in the Phalaborwa Sandveld.

The diversity of plants and grasses makes it an ideal habitat for herbivores and their predators. Game was and, where protected, still is plentiful in the region. Antelopes of all size ranges, territorial individuals as well as migratory herd species, are particularly abundant, but other large herbivores such as zebra and giraffe are also common.

THE METAL WORKERS OF PHALABORWA

The settlements of the Loole site complex are distributed around the modern town of Phalaborwa. The northern perimeter of this complex stretches to the farms Quagga (21LU) and Selongwe (23LU), while its southern border is delineated by the Selati River. The western border of the complex roughly corresponds with the national road leading South to Mica and the eastern limit is represented by the border fence between the Kruger National Park and Phalaborwa town.

Fifty-three settlements, all associated with hills, were identified in the research area. The names of 41 of these were collected from Bamalatji spokesmen (Fig. 2). The densest concentrations of sites occur on the farms Schiettocht (25LU; 12 sites) and Loole (31LU; 13 sites). At least 10 of the 53 settlements of the Loole site complex have disappeared under tailing dumps since the start of modern mining in Phalaborwa during the 1950s (Pistorius, 1989, pp. 123–124). Fortunately two Baphalaborwa settlements, namely, Kgopolwe and Sealeng hills, are declared National Monuments.

GROUP 1 SETTLEMENTS

Shankare Hill

Shankare on the farm Loole (31 LU) is a dome-shaped hill with a steep northern slope where approximately 18 terraces were built. An extensive deposit with metal-working and housing debris skirts the hill's northern base. The earliest excavations were done at Nareng and Shankare Hills by Mason (1965, pp. 262–263, 1986, pp. 112–127). Shankare, Kgopolwe, and Nagome Hills are three settlements in the Loole site complex with an Early Iron Age occupation (Fig. 4).

Features investigated at Shankare include an iron reduction furnace (10/64), two middens (11/65, 12/64), and an iron forge (3/67). Two radiocarbon dates, from the forge's shelter and from household debris from one of the middens, provided a seventeenth- to a nineteenth-century date for this part of the settlement (Mason, 1986, p. 113). A copper reduction furnace was photographed on the northeastern foot of the hill (Moore, 1966, p. 42) and two terraces (SHA1T8, SHA1T18) and a first millennium copper-smelting site (SHA2M1) excavated on the northwestern foot of the hill (Fig. 3) (Pistorius, 1989, pp. 231–242). According to Bamalatji spokesmen, Shankare was the capital of Mpalakanya, one of the progenitors of the Maseke-Malatji. In more recent years, however, the site was occupied by the Tsonga (also cf. Du Toit, 1967, p. 8).

Faunal Remains

The faunal sample from Shankare Hill is small, consisting of 1145 fragments, of which 184 were identifiable. A wide variety of bovid species is represented, particularly in the earlier occupation phase (Table I). The deposits from the younger phase date to the eighteenth/nineteenth century and are from a terrace and smith's oven. Material from the older phase dates to the tenth century and was excavated from a copper working area. Cattle and goats were herded, but hunted animals dominate the samples, particularly during the early phase. The canid bone from the earlier phase could be that of a domestic dog, but it is too fragmented to allow

Table I. Shankare: Species Present

Species	Early		Late	
	NISP[a]	MNI[b]	NISP	MNI
Canis sp., jackal/dog	—	—	1	1
Equus burchelli, zebra	3	1	9	1
Phacochoerus aethiopicus, warthog	—	—	1	1
Giraffa camelopardalis, giraffe	1	1	1	1
Bos taurus, cattle	5	1	32	3
Capra hircus, goat	2	1	11	2
Ovis/Capra, sheep/goat	1	1	6	1
Damaliscus lunatus, tsessebe	—	—	5	1
Sylvicapra grimmia, duiker	—	—	3	1
Oreotragus oreotragus, klipspringer	5	1	1	1
Raphicerus campestris, steenbok	2	1	4	1
Aepyceros melampus, impala	6	1	1	1
Syncerus caffer, buffalo	—	—	15	1
Tragelaphus strepsiceros, kudu	—	—	3	1
Redunca arundinum, reedbuck	—	—	1	1
Small bovid	3	1	6	1
Medium bovid	—	—	3	1
Large bovid	2	1	22	1
Very large bovid	1	1	—	—
Tortoise	4	1	15	1
Achatina sp., giant land snail	1	1	2	1
Aspatharia sp., freshwater mussel	—	—	6	4

[a]Number of identified skeletal parts.
[b]Minimum number of individuals.

positive identification. The tortoise, land snail, and freshwater mussel remains were gathered. All cattle were adults, but the sheep/goat sample consists of one subadult and three adults.

The bones were too fragmented to allow sexing, but one pubis fragment of a medium-size bovid could be identified as a female. Only one bone has carnivore and five have rodent gnaw marks. Traces of burning occurs on 17% of the total sample. Butchering marks are visible on 38 fragments and include cut, chisel, and chop marks. A proximal radius of a goat was apparently used as an ornament, perhaps a pendant, as it has a hole drilled through the shaft.

Sebatini Hill

Sebatini Hill on the farm Schiettocht (25LU) was partly destroyed by modern mining activities. The colluvium saddle between the opposing syenite cores of this saddle-shaped hill contained numerous terraces, of which all but seven (SEB1T1–SEB1T7) escaped destruction. These terraces all contained the remains of huts with the exception of SEB1T1, where iron was forged. The remains of at least two

iron forges (SEB1T1.1, SEB1T1.2) and several massive anvil stones were found on this terrace. A copper reduction furnace and several iron reduction furnaces located at the base of the hill were destroyed in recent times (Pistorius, 1989, pp. 297–310).

Sebatini Hill is associated with the Nkwane (Ngwane?) of Nguni (Swazi/Zulu) origin. This group entered Phalaborwa at the beginning of the nineteenth century. They were renowned metal workers and attached themselves to communities already living in the area. While the Pilusa and Bagaselepe were known as manufacturers of hoes and guns, respectively, the Nkwane specialized in the manufacture of spear points and arrowheads, which were traded through the Hlame traders of Sekgopo Hill to Swazi and Zulu communities in Mozambique (Scully, 1978, pp. 288, 319, 324).

Faunal Remains

Although the faunal samples from Sebatini consist of only 532 fragments, it is nonetheless an important assemblage. Domestic animal, including chicken, remains occur (Table II). Hunting was still important and various species were taken. The first digit (*phalanx proximalis*) of a middle finger of a human was found in the deposits of SEB1T2. The same terrace yielded a number of tortoise carapace fragments in association with a copper bangle, suggesting that it could have been a container. Also from this terrace comes a tortoise anterior carapace fragment with a hole drilled through it. It could have been used as a pendant or been

Table II. Sebatini: Species Present

Species	NISP[a]	MNI[b]
Homo sapiens sapiens, human	1	1
Atilax paludinosis, water mongoose	2	1
Phacochoerus aethiopicus, warthog	1	1
Bos taurus, cattle	8	2
Capra hircus, goat	6	2
Connochaetes taurinus, blue wildebeest	9	1
Sylvicapra grimmia, duiker	13	1
Aepyceros melampus, impala	8	1
Large bovid	7	*
Very large bovid	1	1
Lepus saxatilis, hare	5	2
Gallus domesticus, chicken	1	1
Wild duck	1	1
Tortoise	184	3
Achatina sp., giant land snail	15	4
Tropidophora sp., terrestrial snail	2	2
Aspatharia sp., freshwater mussel	6	5

[a]Number of identified skeletal parts.
[b]Minimum number of individuals.

part of a container, or the animal may have been tethered, although no references to such practices are known.

An average of 22% of all fragments were burned. Most of the burned bones come from SEB1T2, with a third, and SEB1T5, with over half of the fragments burned. A shell fragment of *Achatina* sp. has a polished edge. During the Iron Age such modified shells were common and were used as scoops or burnishing tools for pottery and clay walls.

Serotwe Hill

This settlement on the northern bank of the Selati River on the farm Wegsteek (30LU) is associated with an exceptionally high syenite hill. A cluster of eight terraces (SER5T1–SER5T8), three iron reduction furnaces (SER2M1–SER2M3), and other deposits located on the slopes and at the base of the hill were excavated (Pistorius, 1989, pp. 242–257). A copper reduction furnace West of the hill was photographed by Moore (1974, p. 231) and excavated by Van der Merwe (1971, p. 5). It was donated to the National Museum in Bloemfontein. Serotwe is the second most important historical site of the Maseke-Malatji, who were, from the times of Mpalakanya, involved in a continuous struggle with the Makushane-Malatji to win political control of Phalaborwa (Scully, 1978, pp. 316–317).

Faunal Remains

Eight terraces were excavated of which all but SER5T5 and SER5T6 yielded faunal material. The samples from SER5T2 and SER5T3 were particularly rich. The total sample is large compared to that from the other sites in the area and numbers 5225 fragments, of which 1185 were identifiable. The species list is extensive (Table III).

The distribution of faunal material from the different terraces is interesting. The right cranium of a duiker (*Sylvicapra grimmia*) cut through between the horns found on Terrace 2 (SER5T2) fits the left cranium from Terrace 3 (SER5T3). A human astragalus and a distal metapodial could be from one individual, but the astragalus comes from Terrace 2 and the metapodial from Terrace 3. There was no evidence of graves or disturbed burials. The aardvark remains, also probably one individual, are distributed on Terraces 2 and 3. Domestic animals are scarce in the samples and only small stock and chickens are represented. The bulk of the samples consists of game animals.

Burned bone occurs in six of the eight terrace samples but are particularly numerous on Terrace 7 (SER5T7). Carnivore and rodent damage occurs on a few fragments only. The few bovid remains that could be sexed are all from females (three individuals). One male and one female fowl were also identified.

Table III. Serotwe: Species Present, per Excavated Unit

Species	Unit											
	NT		T2		T3		T4		T7		T8	
	N[a]	M[b]	N	M	N	M	N	M	N	M	N	M
Homo sapiens sapiens, human	—	—	1	1	1	1	—	—	—	—	—	—
Canis sp., dog/jackal	—	—	—	—	1	1	—	—	—	—	—	—
Felis lybica, wild cat	—	—	—	—	5	1	—	—	—	—	—	—
Felidae sp. indet.	—	—	—	—	2	1	—	—	—	—	—	—
Carnivora gen. et sp. indet.	—	—	2	2	1	1	—	—	—	—	—	—
Equus burchelli, zebra	—	—	2	1	7	1	—	—	—	—	—	—
Procavia capensis, hyrax	—	—	—	—	5	1	—	—	—	—	—	—
Orycteropus afer, aardvark	—	—	1	1	2	1	—	—	—	—	—	—
Phacochoerus aethiopicus, warthog	—	—	7	1	1	1	—	—	—	—	—	—
Suidae sp. indet.	—	—	—	—	2	1	—	—	—	—	—	—
Capra hircus, goat	—	—	2	1	4	1	—	—	—	—	—	—
Ovis/Capra, sheep/goat	—	—	1	*	9	1	—	—	—	—	—	—
Sylvicapra grimmia, duiker	—	—	20	3	33	2	1	1	—	—	—	—
Oerotragus oreotragus, klipspringer	—	—	—	—	6	1	—	—	—	—	—	—
Raphicerus campestris, steenbok	—	—	—	—	16	2	—	—	—	—	—	—
Aepyceros melampus, impala	—	—	6	1	17	1	—	—	—	—	2	1
Syncerus caffer, buffalo	—	—	10	1	39	3	1	1	—	—	—	—
Tragelaphus strepsiceros, kudu	—	—	1	1	13	1	14	2	—	—	—	—
Redunca arundinum, reedbuck	—	—	—	—	5	2	—	—	—	—	—	—
Small bovid	—	—	3	1	33	*	2	*	—	—	—	—
Medium bovid	5	3	7	2	13	*	1	1	—	—	—	—
Large bovid	3	1	32	1	134	2	1	*	—	—	—	—
Very large bovid	—	—	—	—	—	—	1	*	—	—	—	—
Lepus saxatilis, hare	—	—	13	3	27	4	—	—	—	—	—	—
Lagomorph	—	—	3	1	1	1	—	—	—	—	—	—
Rodentia gen. et sp. indet.	—	—	3	1	1	1	—	—	—	—	—	—
Gallus domesticus, chicken	—	—	—	—	13	2	—	—	—	—	—	—
Struthio camelus, ostrich	—	—	—	—	1	1	—	—	—	—	—	—
Francolinus sp., francolin	—	—	1	1	2	1	—	—	—	—	—	—
Varanus sp., monitor lizard	—	—	—	—	2	1	—	—	1	1	—	—
Tortoise	11	1	52	2	328	5	73	2	1	1	—	—
Clarias gariepinus, barbel	—	—	—	—	5	1	—	—	—	—	—	—
Pisces gen. et sp. indet.	—	—	—	—	1	1	—	—	—	—	—	—
Achatina sp., giant land snail	—	—	36	9	83	10	10	1	5	1	2	1
Aspatharia sp., freshwater mussel	1	1	9	4	18	4	—	—	1	1	3	1

[a]Number of identified skeletal parts.
[b]Minimum number of individuals.

Butchering damage in the form of cut and chop marks occurs on 127 fragments. Polish on a rib end suggests that the bone was used as a spatula of some kind. Good use was made of the *Achatina* and *Aspatharia* shells, where ground edges are common. The former would have been suitable as scoops, while the latter could have been used to smooth pottery and clay walls.

Mapotini Hill

Mapotini Hill is one of a triad of hills lying close to the Gravelotte–Phalaborwa road on the farm Schiettocht (25LU). Terraces extend over the western and southern slopes of the hill. Several iron and copper reduction furnaces are situated on ground level to the West of the hill. A terrace (MAP1) with copper working and two copper reduction furnaces (MAP2, MAP3) was excavated. One of the largest iron reduction sites (MAP6) discovered in the Phalaborwa region was found here (Pistorius, 1989, pp. 257–268).

Mapotini Hill is associated with Ramatladi, one of the contenders for the Baphalaborwa chieftaincy. Mapoteng, which was known in oral tradition as the place with cattle and many people, together with Matshwale Hill, represented the stronghold of the Ramatladi faction during the middle of the nineteenth century (Scully, 1978, pp. 163, 214).

Faunal Remains

The faunal assemblage of only 90 fragments yielded 28 identifiable pieces representing eight species (Table IV). Included is a right proximal fifth metacarpal of a large, adult man. Contrary to expectations (see the previous paragraph), the rest of the remains are all from wild animals. Some fragments have butchering damage. The ventral margin of an *Aspatharia* shell is ground.

Table IV. Mapotini: Species Present

Species	NISP[a]	MNI[b]
Homo sapiens sapiens, human	1	1
Equus burchelli, zebra	3	1
Phacochoerus aethiopicus, warthog	9	1
Connochaetes taurinus, blue wildebeest	4	1
Aepyceros melampus, impala	1	1
Medium bovid	1	*
Small mammal	1	1
Tortoise	6	2
Aspatharia sp., giant land snail	2	2

[a]Number of identified skeletal parts.
[b]Minimum number of individuals.

GROUP 2 SETTLEMENTS

These settlements were inhabited by various groups including the Balobedu, Bakgaga, and Monareng, who entered Phalaborwa during the eighteenth and perhaps early nineteenth centuries. The residential remains on these settlements are more restricted than those associated with the capitals and were usually limited to a few terraces on the slopes of the hills. These settlements were also associated with the remains of iron- or copper-working activities.

Sonkoanini Hill

Sonkoanini Hill, on the bank of the Selati River on the farm Rhoda (9 KU), rises some 25 m above the river. Six terraces, against the slope, slightly above ground level, were excavated (SON1T1–SON1T6). They contained the remains of copper-working activities, while a copper reduction furnace (SON2M1) was excavated on ground level to the Northeast of the hill (Pistorius, 1989, pp. 197–204).

Although no historical accounts could be found for Sonkoanini, it is clear that this site, together with surrounding copper-smelting sites such as Nareng, Moloto, and Hill X, fell within the influence sphere of the Maseke-Malatji.

Faunal Remains

The faunal sample of 1483 fragments is almost all derived from the ash heap on the lowest terrace. According to the species list (Table V), a variety of animals was hunted, snared, gathered, and fished. Although domestic animals include goat, cattle, chicken, and dog, the herded animals are poorly represented, suggesting trade or barter rather than herding. Some use was made of the riverine resources, but not extensively so. Bovid remains are the most common. Of particular interest is the presence of a lower mandible of a red billed hornbill, the first time that this species has been identified from a South African Iron Age sample.

Hill X (Ghoenkop)

Hill X on the farm Loole (31LU) lies in the center of the Maseke-Malatji's domain. This low, saddle-shaped knoll is *ca.* 25 m high. Its northern syenite plug is linked by three declining terraces to a smaller, inconspicuous outcrop. Excavations on these terraces (HXT1–HXT3) yielded abundant evidence for copper workings. A copper reduction site (HX2M1) is located to the West of the hill (HX2M1) (Pistorius, 1989, pp. 205–213). This site had no recorded name and no

Table V. Sonkoanini: Species Present, per Excavated Unit

Species	Provenance[a]									
	GT		SM		T1		T2		T2.6	
	N[b]	M[c]	N	M	N	M	N	M	N	M
Cercopithecus aethiops, vervet	2	1	—	—	—	—	—	—	—	—
Canis familiaris, dog	1	1	—	—	—	—	—	—	—	—
Rhinoceros	1	1	—	—	—	—	—	—	—	—
Procavia capensis, hyrax	2	1	—	—	—	—	1	1	—	—
Equus burchelli, zebra	11	2	—	—	—	—	1	1	—	—
Giraffa camelopardalis, giraffe	2	1	—	—	—	—	—	—	—	—
Bos taurus, cattle	—	—	—	—	1	1	—	—	1	1
Capra hircus, goat	3	1	—	—	—	—	—	—	—	—
Ovis/Capra, sheep/goat	2	*	1	1	—	—	—	—	—	—
Sylvicapra grimmia, duiker	44	4	—	—	—	—	—	—	—	—
Raphicerus campestris, steenbok	12	1	—	—	—	—	1	1	—	—
Raphicerus sharpei, Sharpe's steenbok	1	1	—	—	—	—	—	—	—	—
Aepyceros melampus, impala	24	2	—	—	—	—	—	—	—	—
Tragelaphus strepsiceros, kudu	24	2	—	—	—	—	—	—	—	—
Redunca arundinum, reedbuck	19	3	—	—	—	—	—	—	—	—
Kobus ellipsiprymnus, waterbuck	2	1	—	—	—	—	—	—	—	—
Small bovid	11	*	—	—	—	—	—	—	—	—
Medium bovid	18	*	—	—	—	—	—	—	—	—
Large bovid	44	*	—	—	—	—	—	—	—	—
Hystrix africaeaustralis, porcupine	2	1	—	—	—	—	—	—	—	—
Tatera leucogaster, small rodent	5	1	—	—	—	—	—	—	—	—
Lepus capensis, hare	37	4	—	—	—	—	—	—	—	—
Gallus domesticus, chicken	6	1	—	—	—	—	—	—	—	—
Coturnix sp., quail	1	1	—	—	—	—	—	—	—	—
Francolinus natalensis, Natal francolin	4	1	—	—	—	—	—	—	—	—
Francolinus sp., francolin	11	2	—	—	—	—	—	—	—	—
Tockus erythrohynchus, hornbill	1	1	—	—	—	—	—	—	—	—
Tortoise	23	2	—	—	—	—	—	—	—	—
Clarias gariepinus, barbel	1	1	—	—	—	—	—	—	—	—
Pisces gen. et sp. indet.	1	*	—	—	—	—	—	—	—	—
Achatina sp., giant land snail	13	5	—	—	1	1	1	1	—	—
Aspatharia sp., freshwater mussel	2	2	—	—	—	—	—	—	—	—

[a]GT, ground terrace; SM, smelter; T1, Terrace 1; T2, Terrace 2; T2.6, Terrace 2.6.
[b]Number of identified skeletal parts.
[c]Minimum number of individuals.

historical information could be obtained from spokesmen on the identity of the inhabitants or workers who utilized this site.

Faunal Remains

Hill X yielded one of the largest faunal samples, with nearly 4000 fragments, representing many species (Table VI). These include people, carnivores, domestic animals, and a variety of game animals, bovids in particular. The human remains

Table VI. Hill X: Species Present, per Excavated Test Trench

Species	Test trench													
	1.1		1.4		2.1		3.1		3.2		3.4		3.5	
	N[a]	M[b]	N	M	N	M	N	M	N	M	N	M	N	M
Homo sapiens sapiens, human	—	—	—	—	—	—	2	1	17	1	—	—	—	—
Panthera leo, lion	—	—	—	—	—	—	5	1	—	—	—	—	—	—
Felis caracal, caracal	—	—	—	—	—	—	—	—	1	1	—	—	—	—
Felis lybica, wild cat	—	—	—	—	—	—	2	2	—	—	—	—	—	—
Equus burchelli, zebra	5	1	—	—	—	—	64	3	15	3	—	—	5	2
Phacochoerus aethiopicus, warthog	2	1	—	—	—	—	—	—	1	1	—	—	—	—
Giraffa camelopardalis, giraffe	—	—	2	1	1	1	—	—	—	—	—	—	—	—
Bos taurus, cattle	13	2	—	—	3	1	39	3	26	2	16	2	18	1
Capra hircus, goat	38	2	—	—	4	1	9	2	—	—	—	—	—	—
Ovis/Capra, sheep/goat	38	3	—	—	4	1	9	2	—	—	—	—	—	—
Connochaetes taurinus, blue wildebeest	—	—	—	—	—	—	2	1	—	—	—	—	—	—
Damaliscus lunatus, tsessebe	4	1	—	—	—	—	—	—	—	—	—	—	—	—
Sylvicapra grimmia, duiker	16	2	—	—	—	—	1	1	5	2	—	—	1	1
Oreotragus oreotragus, klipspringer	1	1	—	—	—	—	2	1	—	—	1	1	—	—
Raphicerus campestris, steenbok	7	2	—	—	7	2	4	1	—	—	1	1	—	—
Aepyceros melampus, impala	38	1	—	—	—	—	45	4	16	2	3	1	4	1
Syncerus caffer, buffalo	—	—	—	—	—	—	—	—	2	1	—	—	5	1
Tragelaphus strepsiceros, kudu	3	1	—	—	—	—	2	1	4	1	8	1	—	—
Redunca arundinum, reedbuck	2	1	—	—	—	—	—	—	—	—	—	—	—	—
Kobus ellipsiprymnus, waterbuck	1	1	—	—	—	—	—	—	5	1	—	—	—	—
Small bovid	6	*	—	—	2	*	3	*	4	*	1	*	—	—
Medium bovid	1	*	—	—	—	—	1	*	—	—	—	—	—	—
Large bovid	48	1	—	—	4	1	117	2	19	*	9	*	30	2
Rodentia gen. et sp. indet.	6	1	—	—	—	—	—	—	—	—	—	—	—	—
Lepus capensis, hare	43	3	—	—	—	—	—	—	—	—	—	—	—	—
Gallus domesticus, chicken	25	3	—	—	—	—	—	—	—	—	—	—	1	1
Francolinus sp., francolin	6	2	—	—	—	—	—	—	—	—	—	—	—	—
Tortoise	56	3	—	—	—	—	2	1	—	—	2	1	7	1
Pyxicephalus adspersus, bullfrog	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Clarias sp., barbel	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Pisces gen. et sp. indet.	11	1	—	—	—	—	—	—	—	—	—	—	—	—
Achatina sp., giant land snail	82	7	—	—	2	1	1	1	—	—	—	—	1	1
Aspatharia sp., freshwater, mussel	11	6	—	—	2	2	3	1	1	1	1	1	—	—

[a]Number of identified skeletal parts.

[b]Minimum number of individuals.

come from an ash heap on Terrace 3 and belonged to a shallow grave where a woman was buried. The remains of a lion consist of a tarsal and metatarsal bones.

The presence of reasonable numbers of the domestic animals such as cattle, goat, sheep/goat, and chicken suggests that the community herded and kept these animals at the site and that they were not necessarily obtained through trading. Chicken eggshells were identified from the sample.

Hunting was of great importance. A variety of antelope was taken as well as zebra, warthog, and giraffe. The mortality profile is very interesting. The sheep/goat teeth are mainly of fetal or neonate animals, suggesting that these animals died before or soon after birth. The presence of many of the carcass bones suggests that they were interred whole. The mortality profiles of the hunted animals suggest selective hunting, as the catastrophic profile usually associated with communal hunting is absent (Plug, 1988, pp. 322–326).

Selongwe Hill

Selongwe Hill, on the border of the farms Laaste (25LU) and Selongwe (23LU), consists of three small syenite protrusions. Features excavated at this site included a midden (SEL1A1), an Iron Age forge (SEL2M1), and a locality, where glass was melted to manufacture beads (SEL3). This hill was occupied by the Mmopa and the Mapadi during the second half of the nineteenth century. One of their rulers, Sephari, was a son of Lepato, who was one of the rulers of the Makushane-Malatji (Pistorius, 1989, pp. 213–220). The Mmopa represents an ancient group in the Phalaborwa and provided the earliest Bamalatji chiefs with their wives. After the Mmopa lost their importance as wife-givers, they became poor and attached themselves to host communities (Scully, 1978, pp. 205, 216, 217).

Faunal Remains

The faunal assemblage of 2500 fragments from this site was retrieved from an ash heap and an hut area. Most of the fragments come from the ash heap, but the sample from the hut area included the finger bone of a human.

Goat and cattle remains occur in the sample, but the remains are few, less than 4% of the identifiable remains. The rest are of wild animals, again underlining the importance of hunting in the Phalaborwa societies (Table VII). The assemblage is unusual among all the other samples examined in its extraordinary large numbers of bullfrog and tortoise fragments. The condition of these remains does not suggest that they were postdepositionally introduced, and they appear to be contemporaneous with the rest of the deposits.

Table VII. Selongwe: Species Present

Species	Ash heap		Hut area	
	NISP[a]	MNI[b]	MISP	MNI
Homo sapiens sapiens, human	—	—	1	1
Proteles cristatus, aardwolf	1	1	—	—
Equus burchelli, zebra	7	1	7	1
Phacochoerus aethiopicus, warthog	21	2	—	—
Giraffa camelopardalis, giraffe	3	1	—	—
Bos taurus, cattle	5	1	7	1
Capra hircus, goat	2	1	—	—
Ovis/Capra, sheep/goat	4	1	10	3
Damaliscus lunatus, tsessebe	2	1	—	—
Sylvicapra grimmia, duiker	23	3	5	1
Raphicerus campestris, steenbok	12	2	4	2
Raphicerus sharpei, Sharpe's steenbok	4	1	—	—
Aepyceros melampus, impala	23	2	17	2
Tragelaphus strepsiceros, kudu	7	1	3	2
Small bovid	3	*	1	*
Medium bovid	—	—	1	*
Large bovid	26	*	17	1
Lepus cf. *saxatilis*, hare 5	5	2	4	2
Otomys sp., vlei rat	3	1	—	—
Rodentia gen. et sp. indet.	1	*	—	—
Struthio camelus, ostrich	15	1	—	—
Francolinus sp., francolin	2	1	—	—
Pigeon	—	—	1	1
Tortoise	165	12	123	10
Pyxicephalus adspersus, bullfrog	133	16	—	—
Ledoulxia mozambicensis, freshwater mollusk	2	2	—	—
Achatina sp., giant land snail	50	4	9	1
Aspatharia sp., freshwater mussel	39	5	3	1

[a]Number of identified skeletal parts.
[b]Minimum number of individuals.

Most of the animals represented in the samples were adults. There are some bones with carnivore damage and an average of 15% of all fragments shows traces of burning. Five of the *Achatina* fragments have polished edges.

Muhululu Hill

Muhululu Hill, at the junction of the Olifants and Selati rivers on the farm Merensky (32LU), is one of the largest hills in Phalaborwa. Iron reduction sites on the base of the hill were destroyed during road construction. Three terraces (MU2T1–MU2T3) with copper working, an iron reduction site (NU1M1) and an iron-forging site (NU1M2), were excavated.

According to spokesmen, Mpalakanya, one of the sons of Meele and the earliest progenitor of the Maseke-Malatji, was sent by his father to rule this settlement. During the nineteenth century Muhululu and other settlements on the eastern border

Table VIII. Muhululu and Pjene: Species Present

Species	Muhululu		Pjene	
	NISP[a]	MNI[b]	NISP	MNI
Loxodonta africana, elephant	1	1	—	—
Aepyceros melampus, impala	5	1	—	—
Hippotragus equinus, roan	—	—	3	1
Small bovid	1	1	1	1
Large bovid	9	2	1	1
Gallus domesticus, chicken	—	—	1	1
Achatina sp., giant land snail	—	—	2	1
Unionidae freshwater mussel	—	—	1	1

[a]Number of identified skeletal parts.
[b]Minimum number of individuals.

of Phalaborwa came under the influence of the Tsonga (Pistorius, 1989, pp. 283–284, 288–297).

Faunal Remains

The faunal sample from the Muhululu excavations numbers only 117 fragments, with only 16 identifiable specimens representing four species (Table VIII). The only important piece is an almost-complete disk cut out of the cranium of an elephant. The disk is cut in such a fashion that the intersection between two sutures falls in the middle of the object. Chisel marks are visible all along the edge of the object and one of the pieces has a single chop mark. Some insect damage is also present. The disk has a diameter of 110 mm and is 12 mm thick.

GROUP 3 SETTLEMENTS

These settlements were also termed industrial sites, as they were utilized primarily by certain Tsonga groups, such as the Mahlongane Changaan, who settled temporarily in Phalaborwa during the nineteenth century. The settlements served as industrial centers where iron and/or copper were manufactured. Little evidence could be found for the permanent or large-scale occupation of these sites by family groups. Other types of industrial settlements were Ntshabadi Hill and possibly also Sewadini Hill, both on the banks of the Selati River. Ntshabadi is remembered today as a place where salt was manufactured (Moore, 1966, p. 33).

Pjene Hill

Pjene Hill on the farm Rhoda (9KU) is characterized by three narrow elongated terraces (PNE1T1–PNE1T3) on the hill and an iron reduction site (PNE1M) and a copper-smelting site (PNE2M1) at the base of the hill. According to

spokesmen, Pjene and Marupale, which are situated adjacent to Pjene, were used by the Mahlongane Changaan to manufacture metal wares. This group was subordinate to the Maseke-Malatji of Serotwe and Nagome hills (Pistorius, 1989, pp. 164–171).

Faunal Remains

The faunal sample from Pjene is very small. Although only 9 of the 33 fragments were identifiable, five species are present (Table VIII). The only domesticate is a chicken. The paucity of the fauna may relate to the nature of this exclusively industrial site, where no evidence of living areas was found.

Marupale Hill

Marupale Hill, on the bank of the Selati River on the farm Paul (7KU), has three clusters of terraces, built with low, stone walls. On two of these clusters (MAR2T1–MAR2T5 and MAR3T1–MAR3T6) copper was worked, while copper was smelted at the base of the hill (MAR1M1) and in a furnace on one of the terraces (MAR3T3) on the hill. Marupale Hill, together with Hill X, Sonkoanini, Moloto, and Nareng, was used exclusively for the manufacture of copper (Pistorius, 1989, pp. 170–186).

Marupale is associated with the Mahlongane Changaan, who came to Phalaborwa during the nineteenth century. They were called Changaan as they came from the East. This group originated during the late eighteenth century when the rise and expansion of the Zulu kingdom caused dissidents to move away. One such a group joined up with some Tsonga people and together formed the Changaan. It is said that they were the first people to bring cattle, raided from the Nguni (Zulu) in the East, to Phalaborwa. They were also noted as elephant hunters, possessed rifles, and maintained tribute relations with Bamalatji rulers (Scully, 1978, pp. 5, 169).

Faunal Remains

The total faunal sample from this site is relatively large (2046 fragments). Most of these come from the terrace at the base of the hill, which also yielded a human tooth and most of the cattle remains. Goat and sheep/goat remains also occur and domestic animals form almost 29% of the sample. The rest are wild animals (Table IX). Together with Shankare, where domestic animals consist of 30% of the identifiable sample, Marupale has the second-largest assemblage of domestic animals from all the other Phalaborwa sites discussed in this paper.

Remains of the African wild cat and of a domestic horse were found in the deposits of the ground terrace. The latter is the first record of this species in the

Table IX. Marupale: Species Present[a]

Species	GT		T5		T1.2		T2.1		T2	
	N[b]	M[c]	N	M	N	M	N	M	N	M
Homo sapiens sapiens, human	1	1	—	—	—	—	—	—	—	—
Canis familiaris, dog	—	—	45	1	—	—	—	—	—	—
Viverrid	2	1	—	—	—	—	—	—	—	—
Felis lybica, wild cat	4	1	—	—	—	—	—	—	—	—
Procavia capensis, hyrax	—	—	—	—	—	—	—	—	26	1
Equus caballus, horse	2	1	—	—	—	—	—	—	—	—
Equus burchelli, zebra	8	1	—	—	—	—	—	—	—	—
Equid	1	*	—	—	—	—	—	—	—	—
Phacochoerus aethiopicus, warthog	2	1	—	—	—	—	—	—	—	—
Giraffa camelopardalis, giraffe	2	1	—	—	—	—	—	—	—	—
Bos taurus, cattle	112	8	—	—	—	—	1	1	1	1
Capra hircus, goat	—	—	—	—	1	1	—	—	—	—
Ovis/Capra, sheep/goat	5	2	—	—	—	—	—	—	—	—
Connochaetes taurinus, blue, wildebeest	4	1	1	1	—	—	1	1	—	—
Sylvicapra grimmia, duiker	6	1	1	1	1	1	1	1	—	—
Raphicerus campestris, steenbok	10	1	—	—	—	—	—	—	—	—
Aepyceros melampus, impala	15	2	1	1	—	—	—	—	—	—
Hippotragus sp., roan/sable	3	1	—	—	—	—	—	—	—	—
Syncerus caffer, buffalo	5	1	—	—	—	—	—	—	—	—
Cf. *Tragelaphus strepsiceros*, kudu	2	1	—	—	—	—	—	—	—	—
Taurotragus oryx, eland	1	1	—	—	—	—	—	—	—	—
Cf. *Redunca arundinum*, reedbuck	1	1	—	—	—	—	—	—	—	—
Cf. *Kobus ellipsiprymnus*, waterbuck	1	1	—	—	—	—	—	—	—	—
Small bovid	5	1	1	*	—	—	—	—	1	1
Medium bovid	29	*	—	—	—	—	1	1	—	—
Large bovid	19	1	1	*	—	—	2	*	—	—
Very large bovid	1	*	—	—	—	—	—	—	—	—
Lepus capensis, hare	—	—	—	—	1	1	—	—	—	—
Lagomorph	2	1	—	—	—	—	—	—	—	—
Thryonomys swinderianus, cane rat	—	—	1	1	—	—	—	—	—	—
Hystrix africaeaustralis, porcupine	1	1	—	—	—	—	—	—	—	—
Tortoise	73	1	4	1	—	—	1	1	—	—
Achatina sp., giant land snail	3	2	—	—	—	—	2	1	—	—
Unionidae freshwater mussel	—	—	—	—	—	—	1	1	—	—

[a]GT, ground terrace; T5, Terrace 5; T1.2, Terrace 1.2; T2.1, Terrace 2.1; T2, Terrace 2.
[b]Number of identified skeletal parts.
[c]Minimum number of individuals.

Phalaborwa region. An almost-complete skeleton of a domestic dog comes from Terrace 5 (MAR1T5), and that of a hyrax from Terrace 2 (MAR1T2). Most animals were adults. Incidence of burning was relatively low, on average 6%.

CONCLUSIONS

The Lowveld is marked by a low annual summer rainfall and scarce surface water supplies. This, coupled with the extremely hot summer temperatures, makes

the area largely unsuitable or, at its best, marginal for agriculture. The presence of endemic diseases such as malaria and those caused by the tsetse fly, which occurred, albeit intermittently for the latter, until the early twentieth century, made the region harsh and not very amenable for human occupation. The grasses of the region are suitable for cattle, provided the animals are adapted to hot conditions. As many of the indigenous African livestock breeds, such as sheep, goats, and cattle are heat tolerant, this would not have been the major barrier, but the presence of tsetse fly was much more restrictive to herding. However, as tsetse fly belts expand and retract, cattle keeping would have been possible during those periods when the fly populations were absent, or low and localized, as appeared to have been the case around 1725 (Punt, 1975; Plug, 1988). However, during the nineteenth century the area was heavily infested (Le Roux, 1964), evidence that the spread of the tsetse fly can be very rapid. As a result of these conditions it becomes clear that farming was an unreliable and marginal source of subsistence. Limited stock herding became viable only after the rinderpest in the early twentieth century, as the disease wiped out large numbers of game hosts of the trypanosomes. At the same time a rudimentary agriculture, comprising the planting of crops on river banks, became an established practice.

It is possible that some fluctuations in the climate occurred during the last 1000 years, but the evidence is scanty at best. At this stage too little is known to correlate such possible fluctuations with site occupation in the Phalaborwa region or to link it to the spread and distribution of tsetse flies.

The relative abundance/absence of domestic stock, particularly cattle, from the archaeological sites at Phalaborwa, reflects both the environment and the nature of the sites. Reasonable amounts of cattle bones were found only at Shankare, Hill X, and Marupale. The other sites yielded none or small numbers only. Although Mapotini was apparently known as the place of cattle and people, no cattle remains were identified from the faunal samples. This may be the result of the small sample size but could indicate a discrepancy between oral tradition and archaeological finds. Sheep and/or goat remains were recovered only from Shankare and Hill X and, as in the case of cattle, occurred in only small numbers or were absent from the other sites. The generally adverse environment for farming and the dedication needed to run factory sites would have been the major factors that prevented the communities from practicing herding on any significant scale. Nevertheless, as with all southern African Iron Age people, cattle would still have been of some importance for certain social and ritual purposes. However, it is not necessary for a community to possess large numbers of cattle to fulfill these obligations or to use for food. The required animals could easily have been obtained through trading or exchange (Plug, 1994, pp. 126–127).

Archaeological evidence shows that Phalaborwa was occupied by metal-working communities during at least two time periods over the last 1200 years. Both phases of occupation, namely, from the ninth to the thirteenth centuries and from the seventeenth to the early twentieth centuries, coincided with trade along

the East Coast of Africa (Smith, 1971, 1983; Pistorius, 1997). Although it is conceivable that the metal workers of Phalaborwa could have participated in this trade from the beginning, the fauna does not reflect this. East coast shells, usually associated with such trade, are absent from the deposits. There is a strong possibility that the metal trade was, initially at least, geared to address the needs of local communities rather than to traders from elsewhere.

West of Phalaborwa, in the fertile foothills of the Drakensberg, eastern Sotho clans such as the Balobedu, Bakgaga, and Monareng led a predominantly agricultural existence (J. D. Krige, 1937; Krige and Krige, 1954; Hammond-Tooke, 1981). Physiographic and climatic differences between the tropical foothills of the Drakensberg and the dry, barren Lowveld farther East supported a process of cultural ecological symbiosis (short-distance trade) between the Drakensberg agriculturalists and the Lowveld metal workers. Iron tools, vital for agriculture, were traded for crop plants which could not be produced in Phalaborwa (Pistorius, 1997, p. 27). It is possible that domestic animals, such as cattle, formed part of that trade, but this could not be substantiated.

Long-distance trade between the South African interior and the East coast, which started as early as the eighth century AD, expanded in the sixteenth century when Europeans entered the Indian ocean trade network. Phalaborwa became a hub in short- and long-distance trade networks. The manufacture and trade of metals were controlled by different political spheres. Comparable to the way in which the Central Cattle Pattern (Kuper, 1980, 1982) reflects social and political organization, subsistence patterns, and ideology (see, e.g., Pistorius, 1992, 1995a, 1996, 1997, p. 89), metal working served as a metaphor for social and political status, gender relations, rituals, and sexual practices in African communities (Haaland, 1985; Childs and Killick, 1993; Collet, 1993; Herbert, 1984, 1993; Pistorius, 1995a,b; Pistorius and Steyn, 1995).

The settlement style of the Baphalaborwa metal workers indicates a geographical separation of primary (ore smelting) and secondary (iron forging and copper melting and forging) metal-working activities. This pattern is consistent with an ideology in which smelting was practiced with ritual and taboo, away from villages, where menopausal women could not attend or interfere with these activities (Childs and Killick, 1993; Collet, 1993; Herbert, 1984, 1993). Medicine holes in iron-smelting and certain iron forge furnaces served as receptacles for medicine, such as human hand bones (Fig. 5). Human astragali have been found at Sebatini Hill (iron forge), Serotwe Hill (iron forge), Mapotini Hill (copper smelter), Hill X (copper smelter), Selongwe Hill (glass melting), and Marupale Hill (below copper smelter) (Pistorius, 1989). These medicines were used to propitiate forefathers to ensure a successful smelt. The ritual butchering of domestic stock such as cattle, sheep/goat, and chicken may have served a similar purpose. The remains of neonatal sheep (Hill X) may perhaps indicate some form of ritual associated with fertility and fecundity. The remains of domestic animals occur on only a limited scale on sites dating from the seventeenth century.

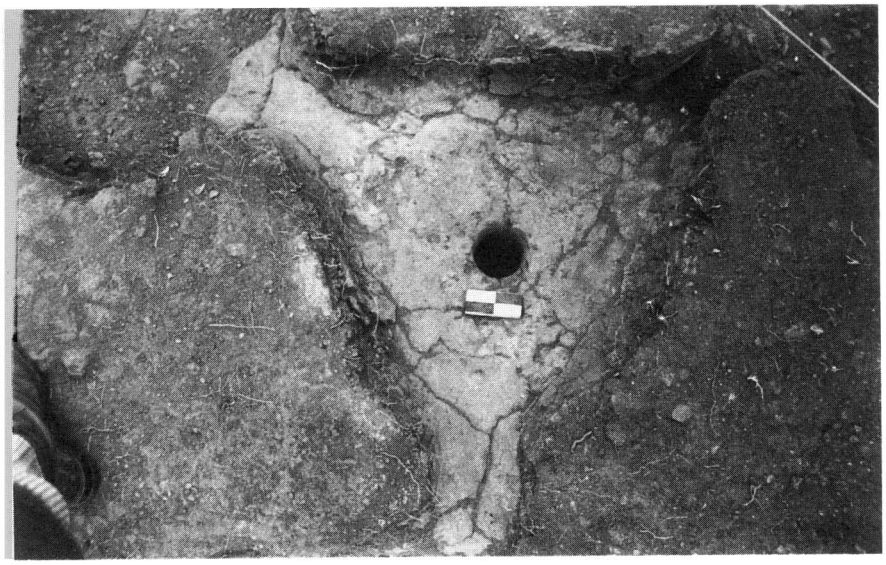

Fig. 5. Iron reduction furnace from Muhululu Hill with a medicine hole in which offerings were placed during iron smelting.

The remains of one aardvark individual and the human remains, also possibly from one individual, found on Serotwe Hill Terraces 2 and 3, are most likely also associated with ritual practices, as aardvark is regarded as a potent animal by many southern African societies and its talus bones are frequently important components in sets of divining bones (Grivetti, 1976, p. 100; Plug, 1988, p. 65; Quin, 1959, p. 126). However, the nature of the ritual relationship between the two terraces is a matter of conjecture. The lion remains from Hill X may also have been associated with ritual or divining practices.

The geographical separation of smelters' working areas from the residential areas may indicate that smelters were "married to their furnaces" during smelting periods and subsequently abstained from sexual intercourse with their real-life women during times of iron and copper smelting. The smelters ate their meals, which could have been brought to their workplaces by postmenopausal women or young girls, at the smelting sites. Middens were found in association with iron and copper smelting, which suggests that smelters were working in seclusion at Sonkoanini, Hill X, Serotwe Hill, and other settlements.

According to Scully (1978, pp. 358–359) and Bamalatji spokesmen, young men were employed by established metal workers to work the bellows of forges and to hammer bloom into iron implements. Groups, such as the Mmopa, were also employed as smiths by affluent communities after losing their role of wife

givers to the royal Bamalatji lineage. Groups who were impoverished or who were displaced outside Phalaborwa attached themselves to established metal-working groups. In exchange for their labor, young men received hoes from the master smith. These were used as bride wealth payment. The custom of using hoes to buy wives became widely established over a large part of the Lowveld and even farther West of the Drakensberg (Mönnig, 1967, p. 132). This practice replaced the more usual cattle as bride wealth and supports the findings that the region was unsuitable for cattle and that a viable alternative was found for certain social purposes. With the substitution of hoes for bride wealth payments, it may be assumed that the relatively low numbers of cattle needed for other purposes could have been obtained through trade.

Industrial settlements (Group 1) with no residential remains, such as Pjene, Marupale, Shankare II, and others, probably served as sites where young, unmarried men manufactured iron and copper for master smiths living at Group 2 and, particularly, Group 1 settlements. Group 2 settlements are associated with small communities which may have included a limited number of women. The faunal remains from settlements such as Sonkoanini Hill, Hill X, and Selongwe Hill included a wider variety of fauna, reflecting the attendance of communities perhaps more representative of all genders and ages than the industrial settlements.

Group 1 sites were occupied by ruling lineages and therefore by extended families of all ages and genders. Representative samples of fauna were, however, not retrieved from these settlements. Sealeng and Kgopolwe hills are national monuments, while Nagome Hill has disappeared under tailings dumps. The archaeological remains of Sebatini Hill are badly damaged, and this site has no undisturbed midden left. The excavations at Mapotini Hill were limited to smelting furnaces. Only Shankare Hill revealed substantial faunal remains reflecting evidence of subsistence patterns during two separate but successive stages of metal working in Phalaborwa (Pistorius, 1989, pp. 316–318). The remains of domestic animals from both occupational phases are, however, of a limited extent (Pistorius, 1989, p. 565). It seems that stock herding never was common practice during either periods. The more numerous samples from the 10 sites of the later phase bear this out. The metal workers of the Later Iron Age, similar to the eastern Sotho cultural group, did not value domestic animals as highly as the western and plateau Sotho, primarily as a result of the historical depredation which ecological constraints placed on stock herding. The metal workers were further inhibited by the fact that they could not produce the wide variety of agricultural products which the eastern Sotho agriculturists produced.

Herding was not a viable option for the people of Phalaborwa. However, protein was and is nutritionally important. The variety of game animals identified from many of the samples shows that hunting played an important role in providing the necessary nutrients. It is debatable whether the metal workers did their own hunting. The age profiles of the hunted animals argue for hunting by individuals or

small groups, and not communal hunting (Plug, 1988, pp. 322–325). It is possible that communities at settlements such as Hill X employed professional hunters to provide the game, but there is no evidence in the excavated material as to the identity of such hunters.

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