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Three iron age industrial sites in the Eastern Transvaal Lowveld

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Three Iron Age industrial sites in the Eastern Transvaal lowveld.

T.M. Evers.

Dissertation submitted to the Faculty of Arts, University of the Witwatersrand in accordance with the requirements for the degree of Master of Arts.

November, 1974.

Declaration

I hereby declare that this dissertation is my own work unless otherwise acknowledged, and has not been submitted for a Masters Degree at any other University.



T. M. Evers

Although the text of this dissertation concerns excavations in 1972-3 at three sites at Harmony, the results of fieldwork and excavations done subsequently have been included in the last chapter, to provide a more coherent background of Eastern Transvaal Iron Age studies into which the Harmony information can be fitted. This fieldwork includes:

1. Excavations at Early and Late Iron Age sites at Lydenburg (sites 57/73 - 62/73) in November 1973.
2. Excavations at a salt works, habitation site and smelting furnace at Eiland (sites 1/74 - 8/74) in January 1974.
3. Ethnographic work at the modern Shangaan salt works of Sautini, January 1974.
4. The discovery and preliminary excavation of a habitation site (50/74) at Harmony, May 1974.
5. Discovery of an Early Iron Age site on the farm Klipspruit, near Lydenburg, May 1974.

The positions of these sites are marked on Fig. 85.

The financial assistance of the Human Sciences Research Council towards the cost of this research is hereby acknowledged. Opinions expressed or conclusions reached are those of the author and are not to be regarded as a reflection of the opinions and conclusions of the Human Sciences Research Council.

The excavations at Harmony were conducted as part of the University of the Witwatersrand African Studies Iron Age Programme. The Committee governing the Programme was set up in 1965 under Dr. R. J. Mason, its present Chairman.

ACKNOWLEDGEMENTS

Much of this work would have been impossible without the assistance of the following to whom I extend my warmest thanks.

Mr. R. van den Berg whom I consulted for geological explanations at the soapstone bowl factory and the copper mine; who prepared a short geological report (Appendix A) and who provided me with a map of the surface geology and major archaeological features of the soapstone bowl factory (fig. 2).

Mr. P. Allen whom I consulted on the best methods of survey at both the soapstone bowl factory and the copper mine and who surveyed and drew the longitudinal and cross-sections at the copper mine.

Mr. R. G. Welbourne who helped with digging, who was responsible for the safety precautions which enabled us to open Unit 22 at the copper mine and who analysed the animal bones from the excavations. (Appendix C).

Mrs. P. Pugsley for acting as a supervisor at Site A and for help with keeping the camp running smoothly.

Mr. J. Weaver for taking geological samples and providing me with a plan of the trenches at site A.

Mr. and Mrs. J. A. Kruger and Mr. and Mrs. L. Koekemoer for providing us with rondavels, labour, firewood, spare equipment, gifts of fruit, gas lighting and heating, and for obtaining supplies from Tzaneen and Trichardtsdal; for giving us permission to work on the farm Harmony 24 and for obtaining permission from neighbouring land-owners for us to work on their properties.

Mr. J. M. C. Horn for writing to tell me of the site.

Dr. I. E. van den Ende and Mr. J. Meintjies for permission to work on their land.

Students of the University of the Witwatersrand, pupils and teachers of Germiston High School for helping with excavations.

Mr. M. Lewis for doing research into the rules of the game Mruba (Appendix E).

Mr. Hugo Hagen for taking special photographs of the copper mine.

Staff of the 'Phalaborwa Gazette' and the 'Tzaneen Herald' for further photographs showing our methods.

Mr. M. Klapwijk for discussing various aspects of archaeology in the Lowveld, in particular mining techniques and pottery.

Mr. J. H. G. Witt for discussing salt making techniques.

Mrs. L. E. Hodges, Curator of the Zimbabwe ruins, for discussions on pottery and metal work, and for showing the source of her latest finds.

Professor N. J. van der Merwe for discussion on salt, mining, copper smelting, pottery and for showing me the salt site on Landraad 774.

Dr. G. Lombard of the Department of Nature Conservation, Transvaal, for discussions on salt making, for conducting me round the Eiland Mineral Spring and Hans Merensky Nature Reserve sites.

Mr. G. Catto, Department of Nature Conservation, Transvaal, for discussions on nearby soapstone bowl factory sites.

Professor R. J. Mason for obtaining money to make the research possible, for discussions concerning Iron Age in the Transvaal in general, for giving me access to his previous excavation records at Phalaborwa, for access to photographs and surface material recovered in the Letaba District (especially at Eiland, Sheila and Phalaborwa); for advice on photography and excavation methods; and for submitting charcoal samples from my excavations to Radiocarbon Ltd., New York, for dating.

Human Sciences Research Council for my part in the money awarded for research into the Iron Age in the Transvaal to the Departments of Archaeology, Linguistics, Botany, Geography, Social Anthropology and Geology at the University of the Witwatersrand.

Mr. P. Wallace for helping with preparing the final drawings.

Mrs. J. M. Banning for typing the manuscript

Mr. N. Rosendal for discussions on reproduction of the thesis and drawings.

My wife Ann for her great patience and for consultations on chemistry.

Dr. H. Friede for analysing a sample of slag from furnace area CIII (Appendix B) and for submitting a further sample to the National Institute for Metallurgy for analysis.

J. Swan for drawings figs. 74 and 75.

J. Houmoller for helping prepare the final drawings

Mr. P. Bonner for discussing African historiography with me.

Dr. T. N. Huffman for discussing points of the Eastern Transvaal Iron Age.

Abbreviations

p.	page
pp.	pages
e.g.	for example
O.E.D.	Oxford English Dictionary
Km.	Kilometre
Lat.	latitude
Long.	longitude
mm.	millimetre
m.	metre
ft.	feet or foot
etc.	et cetera
pers. comm.	personal communication
N.	north
S.	south
E.	east
W.	west
M^2	square metre(s)
E. S. A.	Early Stone Age
fig.	figure
cm.	centimetre
cf.	compare
i.e.	that is
lev.	level
assoc.	associated
Archaeol. Collect.	in the collection of the Archaeology Department, University of the Witwatersrand
Dept. of Archaeology	Department of Archaeology, University of the Witwatersrand
vol.	volume
ca.	circa
op. cit.	work cited
n.d.	no date
S. A. A. A.	South African Association of Archaeologists
sp.	species
g.	grammes
l.	litre

DEFINITIONS

open stope - restricted open air mining

shaft - a vertical or inclined well-like excavation leading from the surface to the major workings below ground level and used for obtaining access to these workings and for hoisting ore out.

ventilation shaft - a shaft which has a smaller diameter than those used for hauling ore out of the mine and which which were probably used solely for ventilation purposes as described in Summers (1969, p. 166, 174).

drive or gallery - an underground passage (O.E.D. 1967).

bridge - the gap between two shaft heads on the surface.

tailings - waste material removed from the mine and dumped after sorting for the ore has been completed. Little to no ore is found in tailing deposits.

stull - a platform or framework of timber covered with boards to support workmen or to carry ore or rubbish; also a framework of boards to protect miners from falling stones (O.E.D. 1967).

pit prop or prop - a piece of timber set upright to support the roof or keep up the strata (O.E.D. 1967).

ore lode or lode - a vein of metal ore (O.E.D. 1967).

malachite - a bright green coloured copper carbonate ore chemical composition: $CuCo_3$ $Cu(OH)_2$

azurite - a bright blue coloured copper carbonate ore strongly related to malachite

chalcocite - a copper sulphide ore. Chemical composition: Cu_2S

gad - a pointed tool of iron or steel; e.g. a wedge, or a small iron punch with a wooden handle (O.E.D. 1967).

fire setting - a process of breaking up rock by inducing thermal stresses derived from heating the rock with fire and quenching it quickly with cold water.

furnace - a clay upright structure or clay lined cavity with one or more lateral openings to admit forced air, in which ore is reduced to metal by smelting.

smelting site - any locality where evidence for smelting is found. Evidence may range from the furnace to any of the by-products, e.g. slag, pieces of the furnace structure, or pieces of tuyère.

slag - a vitreous substance, composed of earthy or refuse matter, which is separated from metals in the process of smelting (O.E.D. 1967).

tuyère - a clay funnel-shaped bellow nozzle.

smelt - "Involves a chemical reaction between the ore and the fuel, or between a heated sulphide ore and the atmosphere. Most smelting processes are carried out above the melting point of the metal concerned, the main exception being iron." (Tylecote 1962 : 315).

karabiner - an elliptical metal ring used to fasten ropes in belay and other positions in mountaineering.

soapstone - a very weathered schist.

factory - a locality where the manufacture of objects or other produce is the primary concern of a population represented at the archaeological site.

quarry - a locality which shows evidence for raw material being cut out of a fixed outcrop of rock.

Mruba board - a piece of stone or other material into which four rows of holes have been excised for the playing of the game Mruba.

quern - a lower grindstone, made of a slab of rock and determined by the presence of a hollow produced by grinding in one or more faces.

soapstone bowl - a bowl made from soapstone.

spindle whorl - a disc of soapstone or fired clay with a central perforation. The use is conjectural though based on an ethnographic model.

lixiviation - the action or process of separating a soluble from an insoluble substance by percolation of water, as salts from wood ashes (O.E.D. 1967).

tradition - the word is used in the wide American sense. (Willey, G. R. and Phillips, P. 1958 Method and Theory in American Archaeology, Chicago: University of Chicago Press: p. 41), except where 'oral' qualifies the word where the expression 'oral tradition' means record of historical events passed down by word of mouth.

daub - fired or semi-fired pieces of irregularly shaped mud with grass or twig impressions.

saline soil - soil containing a proportion of salt.

industry - a trade or manufacture (O. E. D. 1967).

Early, Middle and Late Iron Age - In the Eastern Transvaal these are temporary, informal terms used at present to separate assemblages with distinct settlement plans, pottery and Cl^4 dates into stages within the two regional sequences set up in the Eastern Transvaal. The terms are to be understood in a relative sense with the proviso that they do have some chronometric boundaries. In the Eastern Transvaal the terms will be replaced by tradition names once these have been formally proposed and accepted.

I have followed the methods used by R. J. Mason in setting up the stages of the Iron Age in the central and western Transvaal. His research from 1960-1971 revealed two stages, an "Early" and a Late Iron Age. In 1973 his excavations at Broederstroom proved the existence of an Iron Age tradition earlier than that designated, "Early Iron Age" in 1960-1971. Mason then reclassified these last sites as Middle Iron Age intermediate between a true Early Iron Age represented at Broederstroom and a Late Iron Age represented by Olifantspoort 20/71 and other sites. Pottery and settlement type comparisons between the three stages showed them to be distinct, a fact confirmed by the Cl^4 dates and supported by historical and ethnographic comparisons between the Iron Age sites and Tswana and Kgalagadi settlements. Mason's research proved the existence of a three stage development in the Iron Age of the Central and Western Transvaal which he termed "Early, Middle and Late Iron Age".

In the north-eastern Lowveld I have been fortunate to excavate at Eiland where three different pottery assemblages representing three separate traditions were preserved stratified consistently in several profiles.

On the Eastern Transvaal escarpment only two traditions have been recognised. Wide comparisons show these to represent facies of Early and Late Iron Age and further comparisons with the sequences in the Central and Western Transvaal and the north-eastern Lowveld suggest that a Middle Iron Age also awaits discovery. The basis of the Eastern Transvaal classification of sites into stages is discussed in Chapter VI, section 1.

Tsonga - The peoples of Southern Mozambique have been the subject of a recent historical study by A. Smith (1973), who points out that there are three groups of people living in the region. These are Tsonga, who live near Delagoa Bay and in the area east and immediately north of the Limpopo River; the Chopi, who live along the coast north of the Limpopo River mouth; and the Tonga who now live in a small enclave round Inhambane but who before Tsonga invasions of the eighteenth and nineteenth century had a much wider distribution. Trade between Delagoa Bay and the interior was in Tsonga hands, from Inhambane in Tonga hands.

Culture - A term used by other Iron Age archaeologists in contexts where I have used the word 'tradition'. In places I have used the word 'cultural' in place of 'traditional' to avoid confusion with other nuances of meaning implied in the latter word (e.g. p. 59).

Complex - (as used on p. 41). A group of tribes known collectively by a single name. Eg. The 'Sotho' complex comprises Kwena, Kgatla, Rolong, Fokeng, Narene, Phalaborwa and other tribes.

Abstract

Three Iron Age industrial sites on the farms Harmony 24 and 25, Letaba District, are described. The sites are a salt factory, a soapstone bowl factory and a copper mine with adjacent copper smelting sites. Excavations were conducted at the salt factory which produced evidence of soapstone bowls having been used for salt production and provided artefacts and animal bone foodwaste derived from wild species. At the soapstone bowl factory the site was mapped and selected areas plotted in detail. Analysis of bowls provided a reconstruction of bowl manufacture methods and reasons why some bowls had been abandoned. A number of other artefacts, notably Mruba boards were also found. Three other smaller factory sites were briefly discussed. At the copper mine a plan and sections were drawn. The mine is described in detail. Excavations gave some light on mining and smelting processes, and artefacts associated. Correlative material between the three sites is discussed and strong positive correlations are found to exist between the salt factory and the soapstone bowl factory. Links between the salt factory and copper mine are tenuous. The discovery of a habitation site with remains linking it to the copper mine, to the soapstone bowl factory and the salt factory, proves that the industrial sites were exploited simultaneously by a single community.

The sites are put into perspective as far as is possible with regard to the present state of knowledge of the Iron Age and the ethnology of the Eastern Transvaal. Their place in Iron Age trade is discussed. The conclusions reached point out the difficulties inherent in trying to discuss the sites in this manner.

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I INTRODUCTION

1. Industries represented at Harmony

Three Iron Age industries are represented on the farm Harmony 24 in the Letaba district, Eastern Transvaal Lowveld. These are salt making, copper mining and metallurgy and soapstone bowl manufacture. The first two are extremely important in Iron Age contexts as both are connected with trade, both local and long distance. The manufacture of soapstone bowls is purely local and in the Lowveld, appears to be connected almost entirely with making salt.

The importance of the sites at Harmony lies in two directions. Firstly the sites are all well preserved. The copper mine is still in the state in which it was left by the ancient miners. This is even more important when one realises that all other known examples have been damaged by modern mining and prospecting. The soapstone bowl factory still has many broken, partly finished bowls lying round the outcrops of raw material and also has evidence for some of the games played in Iron Age times. The salt factory is not, perhaps, the most well known salt site in the Lowveld but this at least means that the site has not been destroyed by keen amateur collectors of antiquities. Good collections of material and important information on these aspects of Iron Age technology could therefore be obtained.

Secondly the fact that the sites are situated so close to one another (about 3 Km. apart) affords a unique opportunity for studying the industries in relation to one another. This is what I have attempted to do here with varying success. It seems that salt and soapstone bowls are strongly connected but that neither are connected, archaeologically, with copper production. A small piece of ethnographic information, however, does connect the copper mine with the soapstone bowl site for, in both, banyai, or smiths, are responsible for production. Ethnohistorical evidence also shows that all three sites are likely to have been in the control of one chief at some time during the period and that the same population must have been responsible for exploiting these resources.

Thirdly, the recent find of habitation site 50/74, however, ties the three sites together closely and shows that they were exploited by a single Iron Age community.

2. History of investigation

In October 1971 I visited the farm Harmony 24 at the invitation of one of the directors of the Kampvuur Vakansieoorde, the firm owning the farm, following their discovery of a soapstone bowl factory. During the day we visited the site, a copper mine which lies mainly on the adjoining farm Harmony 25, and I explored the area on the north bank of the Makhutswi river where the owners are developing a holiday resort around a mineral spring. I was told that during the period before European occupation the spring and surrounds had been exploited for salt making. On a river terrace just west of the resort office I discovered a low mound over the top of which was scattered a number of sherds, animal bones and soapstone bowl fragments. I took this to be a habitation site and realising the potential of correlating the three sites, all possibly connected with local trade I obtained permission to excavate on the farm and was asked to prepare an exhibit for a small museum which would be set up at the resort.

I revisited the sites later the same month when Mr. Koekemoer, the chairman of the company, showed me a soapstone spindlewhorl and a small dagga pipe made of the same material which his son had found on the mound near the resort office. Arrangements were made concerning accommodation and labour, with both of which, the resort provided us free of charge.

During the short Easter break in 1972, a series of small test trenches were dug into the mound, with some success, as I was able, on the basis of the findings, to lay out the main excavation in June-July to maximum advantage. Further exploratory work was carried out at the soapstone bowl factory and the copper mine.

At the end of May, a further visit was made in the company of Mr. P. Allen, a trained surveyor, to assess the amount of work that would have to be done at the soapstone bowl factory and the mine. A course of action was decided upon but owing to unforeseen circumstances had to be postponed. In June-July four weeks were spent excavating at the resort site (Site A, or salt factory), surveying at the other two sites and doing further exploration. This information forms the bulk of the rest of this dissertation.

Further visits were made in October when new sites across the river from site A were discovered. One of these appears to be an Early Iron Age site and does not fall strictly into the scope of this dissertation.

Excavations of this site and final work at the other sites was carried out in January 1973 over a three week period. At the same time further work was done at the copper mine where a shaft was partially opened, three smelting sites excavated and some sections surveyed by Mr. P. Allen. Arrangements were made to open further shafts at the mine and to develop this as a major project on its own.

3. Position of sites

The sites thoroughly investigated are on the farms 24 and 25. Both of these are part of the large Harmony block situated in the Letaba district, east of the village of Trichardtsdal. Site A, at the resort, is almost exactly 16 miles from the village by road.

The sites are located on the South Africa 1:50,000 series map 2430 BA, Selati river:

Site A	Lat. 30° 35' 35"	Long. 24, 11' 40"
Soapstone bowl factory	Lat. 30° 35'	Long. 24, 10'
Copper mine	Lat. 30° 36' 35"	Long. 24, 10' 30"

Site A is on the north bank of the Makhutswi river near a mineral spring, situated in the river and just across the river from the main traditional salt making area.

The copper mine is 2-3 Km. to the north-east of site A and is bisected by a gravel road between Leydsdorp and the main Tzaneen-Lydenburg road, approximately 1 Km. north of where the road crosses the Makhutswi river. The soapstone bowl factory is about equidistant from both site A and the mine, the distance being 2-3 Km. The site is situated on west and north-west facing slopes between two seasonal streams that flow west to a tributary of the Makhutswi.

4. Environment

The farms Harmony 24 and 25 fall into a belt of Arid Lowveld, described and mapped by Acocks (Acocks 1953). Annual rainfall is between 450-500 mm. per annum, the majority of which falls between February and April (Koekemoer and Kruger, pers. comm.). Some years the area experiences much higher rainfall, the 1971-72 season was one of these. During the season about three times the average rainfall was measured, which had a great effect on the local vegetation cover. In October there was hardly a blade of grass to be seen, in April the grass was so thick that we experienced great difficulty in relocating some sites and in two cases failed to do so.

The majority of woody plants are trees and shrubs, most of which are Combretum species with an admixture of Acacia spp. Sclerocarya caffra and other species in small quantities away from the river. Along the river banks are scattered larger trees Combretum imberbe, Schotia brachypetala, Ziziphus mucronata, Diospyros mespiliformis, Terminalia sericea, and shrubs including Gardenia spatulifolia. Grass cover is generally sparse and clumpy during the wet season and dies away during winter and early spring. While this is handy for field investigations it does introduce hazards for herding peoples who wish to be more or less permanently settled.

Topography is undulating, land rises from 457 m. (1500 ft.) at the river to 520 m. (1700 ft.) at the northern end of the farm about 3 Km. away. Geologically the area is extremely complex. North of the Makhutswi schists, pegmatites and more recent volcanic dykes overlying granite are the main surface features, the majority of which have been subjected to faulting to a greater or lesser extent (e.g. at the copper mine and the soapstone bowl factory). South of the river the land is rather lower, rising to 1650 ft. at some distance from the river. The geological composition is correspondingly different consisting only of granites.

All the rivers and streams are seasonal to semi-permanent. The Makhutswi usually has some water (Hall 1912), though only flows well for a couple of years after a season of very good rains like the last one (Kruger, pers. comm.). Otherwise the two nearest permanent water sources are the Olifants river about 27 Km. to the south, and the Selati river about 16 Km. to the north, Water, while present throughout the year, is not plentiful and is now supplemented strongly by numerous boreholes.

Resources are good. The area is not well suited to arable farming, largely due to the low rainfall, though most farmers do grow a cereal crop or tropical fruit, cotton and a number of other cash crops. Cattle are kept on most farms where they rely on grazing and browsing during the summer and have a supplemented feed during the dry season. Goats and sheep are also kept but in small quantities. Game farming and private nature reserves are common. Harmony 24 is one of the many private nature reserves in the district and is registered as the Rio Private

Nature Reserve. Game is plentiful; we saw, in the reserve, zebra, vervet monkeys, bushbabies, giraffe, impala, duiker, warthog, steenbok, tortoise, hares, squirrels, mice, rats and a large variety of birds, a number of which are edible (guineafowl, francolin, etc.). That the animals mentioned are native to the area is borne out by the excavated animal bones from site A where zebra, impala, warthog and tortoise are specifically identified and are supplemented by tsessebe/hartebeest, kudu, waterbuck and reedbuck. Giant land snails were found both in the excavations and in the veld; large fresh water mussels both in the excavations and in the Makhutswi. The latter are inedible and were presumably gathered for use as tools, as a number of examples from site A testifies.

Clay and sand deposits are to be found on the banks of the major water courses. The clay is brown and fairly gritty, very much like the material out of which the pots were made.

Salt is readily obtainable by lixiviating the saline soil near site A at certain times of the year. The salt appears to be leached out of the ground during the rainy season and is deposited as a white crust on the surface. This crust is gathered and processed in the manner described in chapter VI.

Minerals are abundant, copper on Harmony 25, gold further north on the farm Maranda where D. J. van der Merwe (file in the Department of Archaeology) reported ancient gold workings, mica on the farm Islington to the east, copper and iron at Gravelotte and Phalaborwa to mention the most important. Much of the local schist is soft enough to have been made into vessels and other artefacts. Sites are not restricted to Harmony and occur on Sheila just south of Phalaborwa, Kondowi, a few miles east of Eiland, another well known salt making site, and possibly also on Islington near Mica.

A large number of Iron Age sites are known from this part of the Eastern Transvaal Lowveld covering a wide variety of Iron Age activities. The majority of habitation sites known are from Phalaborwa and the adjacent areas of the Kruger National Park. This distribution, however, merely reflects the distribution of archaeological activities. Other habitation sites are known from Eiland (Evers excavations, January 1974).

Numerous iron and copper smelting sites have been reported and extensively investigated. Centres appear to be Phalaborwa and Gravelotte with minor centres near Tzaneen, at Harmony, near Leydsdorp and near Eiland. These are closely associated with ancient mining.

Salt manufacture is also widespread. Sites are known from Harmony, Eiland, Loole (D. S. van der Merwe report), Rhoda (D. S. van der Merwe), Sautini (Witt, J. 1966) and Landraad 774 (N. J. van der Merwe, pers. comm.). Metallurgy and salt production may have been major reasons for settlement in this part of the Lowveld.

II THE SOAPSTONE BOWL FACTORY

1. Position and description

The position of the factory has been described above.[1] The site is situated on west, south and north facing slopes between two streams that flow into a tributary of the Makhutswi river. Outcroppings of soapstone occur both to the north and the south of the two streams, but as far as I know worked outcrops occur only to the north. Other worked soapstone outcrops occur on the farm (see below) but none of these is as important as the main site. The area mapped covers the greatest concentration of worked soapstone outcrops. One reaches the site by a small track that peters out just upslope of outcrop AB on the south-eastern side (see fig. 2). Four fairly prominent land-marks help one to orientate oneself: outcrop AB, point F, the diabase dyke, outcrop X. Starting from the end of the track to the south east of AB one walks in a westerly direction. The first land mark is AB, a large outcrop, roughly circular in plan and abou' 50 m. in diameter. The height of the outcrop, 6-7 m., is due to the hardness of the stone which rendered much of the outcrop unsuitable for artefact making. Nearly all the suitable material is on the south side, extending round to point c5. Unfortunately, nearly all the bowls were removed for use as decorative wall building material before the owners realised the scientific value of the site. Points c5-7 refer to the findspots of stones with small conical holes bored into them (see below). Proceeding in a north-westerly direction one crosses an expanse of open ground. A peg at C marks the spot where two bowls in a nearly complete state were found. One has a handle at each end. Both were removed to prevent their being further damaged before being exhibited at the museum. Walking westerly, one reaches point D, marking a concentration of bowls in the outcrop DEFGQ. This outcrop, physically, is different from AB as it is very low, reaching a maximum height of perhaps 0.5 m. over the majority and 2 m. at F. All the soapstone, save the majority of that at F, is suitable for bowl manufacture and it seems to have been extensively exploited.

We plotted areas D, C and Q, giving details of bowl fragment distribution round outcrop areas. Just upslope (i.e. N. N. E.) of point G, there is a hollow in the outcrop which is almost undoubtedly the result of quarrying operations. At E a small quantity of ash eroding out of the hillslope was noted but not further investigated.

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1) Page 3.

The soapstone at F is of a peculiar pitted type. The pitting is the result of the weathering of small dark mineral inclusions which gives unweathered examples a spotty appearance. This characteristic presumably made the material unsuitable. Certainly no bowls appear to have been made of it. Outcrop DEFGQ abuts onto a diabase dyke just northwest of F. The dyke runs roughly east-west. Crossing the dyke in a northerly direction, one arrives at outcrop H, a small but heavily exploited outcrop, measuring about 15 m. in diameter. The centre has been hollowed out in the same way as at Point G. To one side of the hollow, the in situ soapstone shows signs of quarrying. The whole outcrop was plotted in detail and we hope to reconstruct it at the resort as part of the display. To the east, there is another small outcrop, not marked on the map, which does not seem to have been as extensively worked. Walking west along the line of the dyke, one bypasses H and a short way further on notes a large quartz vein similar to those found in conjunction with soapstone outcrops elsewhere in the Letaba district. Further along the dyke is another heavily exploited outcrop, LM. Most of the worked stone is to the south and to the southwest, or downslope side. Points L and M are of particular interest as L marks the position of a large Kruba board and M the position of an outcrop with very informative quarry marks on it (see below). A walk of about 100 m. in a northerly direction brings one to point X, an outcrop similar in shape and size to AB and for the same reasons. Most of the outcrop is unsuitable for bowl manufacture owing to its hardness. The centre of the unit has a flat earth filled platform, on which two quartzite querns were found. Point d6 refers to another stone with small holes bored into it. On the north-west side is the best example of a quarry known to date and this has provided us with the most information about quarrying methods. As with AB and LM, the great majority of worked soapstone occurs on the downslope, south and west sides of the outcrop. The most suitable material is on these sides and it is quite possible that these parts have been subjected to the greatest weathering. The soapstone used is, after all, a very weathered form of talcose and chloritic schist.

There is no further worked soapstone for 100 m. in any direction other than the one travelled from. The next outcrops occur across a stream bed and vlei to the north of X. One of the nearer examples, Z, has another stone with small borings in it and a well executed circular, flat bowl.

2. The survey

The survey took place in two parts. The first part involved the drawing of a map of the area extensively explored. This was done by R. van den Berg, a geologist at E.R.P.M., who mapped all the surface geology. He emphasises that the edges of outcrops can not be accurately fixed and that another worker might extend or contract the boundaries he decided upon. The main point of difference that a non-geologist might like to make regards DEFGQ. Geologically, this is a single unit. Archaeologically, it can be divided into four, based on the distribution of bowls in relation to surface features of the raw material. These differences are, however, too small to be shown on a map of this scale. Plots of the outcrop do show the differences quite clearly.

The second part of the survey involved the detailed plotting of 1070 m^2, covering H, DEFGQ. With reference to the plans the following general points can be made. (figs. 3-7)

(a) Bowl fragments cluster close to the source of raw material: e.g. at H outside the plot only 4 bowls have been seen within 10 m. of the plotted area in any given direction; plot G shows two concentrations, the first just below and around the quarry, the second in the bottom left corner very close to point F; There is a strong cluster of bowls between the two outcrops of D and a gap between that and the concentration of bowl fragments round outcrop R south of plot D. As previously noted, similar concentrations of worked soapstone at AB, IM and X are found close to the source of potential raw material.

(b) Working appears to have been done downslope of the major sources of raw material. This probably due to human agencies. It is, after all, easier to carry a heavy weight down a slope than up. Where the slope is less marked the scatter of bowls is more general. The principal reason, however, lies in the fact that upslope, the terrain is very uneven, whereas downslope, it is regular.

The points made above are to be expected. In addition to the task of plotting an analysis of worked soapstone into 12 ad hoc groups was done. With these I attempted to gain an overall impression of the content of, and the variability in the worked soapstone from each plotted area. Groups were defined on the site to take cognizance of what was actually observable and were added to as the analysis and plotting proceeded.

Comparison between the plots was not easy as four teams of students were responsible and patterning perception naturally varied from person to person. The analysis and problems related to it are described in section II.4.

A careful search was also made in the areas between outcrops. The search revealed few artefacts; those recovered included a bored stone and a second that someone had failed to perforate completely. The first was found midway between C and G, the other at the bottom of DEFGQ. No artefacts that could have been used for making bowls were found, save a few quartzite rubbing stones. To the east of AB, a rough out of a pipe was found and nearby several flakes, handaxes and cleavers of E. S. A. types.

3. Reconstruction of bowl manufacture process

Owing to the fact that bowls were abandoned in all stages of manufacture, the processes by which they were made can easily be reconstructed. Three major stages are recognised; obtaining the raw material (quarrying); roughing out the bowl; finishing the bowl.[1)]

Quarries are common. Mention has already been made of the hollows at G and H and the stone with quarry marks at H, M and X. One can see others on the west face of AB, and more still await discovery. Those at M and X are particularly informative. At M the top of an outcropping piece of soapstone has been chipped to form the bottom of a bowl. Work was abandoned before the craftsman started to undercut the piece owing to a breakage.

At X the evidence is more complete. Here an outcrop has had its top undercut and removed. Undercutting was done with a sharp, round-ended iron tool, probably an adze. Before the process was complete, a lever was inserted and the undercut portion broken off. The levering seems to have been slightly premature as a jagged piece was left protruding from the centre of the concave scar in the parent material. This concave scar is typical of quarries and has been seen at H and AB, as well as at X. The concave surface is covered with adze marks (see photograph). The fact that hollows have developed at H and G suggests that the bowl makers quarried a good deal of their raw material. Perhaps as many as half of the bowls were made from quarried stone.

Roughing out the bowl appears to have followed a fixed set of procedures. Usually the bottom of the bowl was completed before the maker started the hollowing process. This is borne out by examining the numerous bowl fragments abandoned at the site and in particular one

1) This technique was noted by Mason (1962).

specimen from H which has the base completed and only a few adze marks on the upper face to show that the hollowing process had been started. The bowl was abandoned because a misdirected blow removed part of the edge. That not all bases were completed before bowls were hollowed is shown by an example at point A. This specimen is, however, of a harder form of soapstone than was usually used and working was abandoned almost as soon as it was begun. Some of the blows are randomly placed and look like those of a rather exasperated individual who was not doing as well as he had hoped.

The next step was the hollowing out of the vessel. Invariably the worker chipped a ring round the top surface marking the maximum internal diameter. This was usually taken down to maximum depth before the central block was removed. In the removal of the centre some variation in technique can be seen. The ordinary semi-skilled worker merely hacked at the centre until he had removed it; more ambitious craftsmen undercut the central portion until it could be broken off with a well directed blow. This was in many ways an advantage as the work of finishing the vessel was considerably reduced; its main hazard lay in the distinct possibility that the adze might break through the base. A good example of a central portion undercut in the manner just described comes from the west side of X, and several bowls with unlooked for holes in the base are known, especially from H.

Finishing off the vessel takes two forms. Some bowls were merely chipped delicately all over the interior until they were satisfactorily smooth. A smoother more aesthetically pleasing finish was achieved by rubbing the inside of the bowl with a river stone until all the chip marks and irregularities had been removed. Grinding is not an arduous task, as the material from which the vessels are made can be scratched with a finger nail. The best evidence comes from four complete vessels found in the resort area. Three were found near the little dam to the east of the resort office, the fourth on the river terrace ca. 20 m. from the north-west corner of the swimming pool. Of these, the last is of the first finish type mentioned, the other three of the smoother finish. One of these three was also smoothed on the outside with a rubbing stone.

Shapes are divided by the attribute of planform. No figures are available owing to the fragmentary nature of the bowls. However, the following shapes are discernible:

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1) 10/72

(1) sub-rectangular plan form. This is a bowl with slightly curving sides and well defined, rounded corners; e.g. specimen 1 from the dam site, the nearly complete bowl from site A, unit Ah (1). (fig. 19)

(2) ellipsoidal plan form. This plan is usually associated with a curved base; e.g. an example from the dam site and the great majority of specimens from the soapstone bowl factory. (fig.

(3) circular, e.g. the remaining two specimens from the resort area, one of the two bowls from point C at the bowl factory and a further example at Z. (fig. 15)

(4) semi-triangular to oval; these are not common, only three specimens are known, all from the hollow at H. They may have been strongly influenced by the shape of the original material.(fig. 20)

(5) an exceptionally deep bowl of sub-rectangular plan can be separated from the rest of class (1). Two examples are known, one from point D, the other from one of the later Iron Age sites on the south bank of the Makhutswi. (fig.80).

A very few bowls have lug handles at either end. They are usually of class (2) shape; e.g. the second of the two bowls at Point C, one specimen from plot G and a third from just below plot D. (fig. 15, 17)

4. Analysis of worked soapstone from plotted areas

Bowl fragments from four plotted areas were analysed at the same time as being plotted. Twelve categories were used:

1. whole bowl broken in half, the halves lying next to each other
2. whole bowl, cracked
3. whole bowl with hole in the base
4. bowl with an edge broken off
5. chips of undecided provenance
6. foreign stones other than quartz and diabase
7. adze marks on rocks - parts of bowls to rocks with 2-3 chip marks
8. whole bowls, no reason ascertainable for their being abandoned
9. holes in soapstone - cf. mruba board or perforated stone
10. bottom or base of a bowl with the sides missing
11. bowl edge with a handle
12. bowl edge.

Table I shows the relative proportions of each class by plotted area:

Class No.	H		D		G		Q		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
1.	15	13,02	12	10,04	30	10,08	2	2,41	59	10,00
2.	1	0,87	6	5,21	1	0,36	3	3,62	11	1,87
3.	4	3,48	1	0,87					5	0,80
4.	4	3,48	12	10,04	9	3,26	4	4,82	29	4,92
5.	12	10,04	5	4,35	118	42,70	57	68,70	192	32,60
6.	10	8,70	5	4,35	18	6,52	2	2,41	35	5,95
7.	65	56.50	72	62,60	74	26,80	12	14,90	223	37,80
8.	3	2,60	1	0,87	9	3,26	1	1,20	14	2,38
9.	1	0,87			3	1,08			4	0,68
10.			1	0,87	13	4,70			14	2,38
11.					1	0,36			1	0,17
12.							2	2,41	2	0,34
Total	115	99,56	115	99,20	276	99,12	83	100,47	589	101,19

At first glance two groups are apparent. However, a number of factors have to be considered which have a strong bearing on the results.

(a) Some of the categories overlap; e.g. 5 and 7; 1 and 7; 5, 7 and 10. Of these, the first overlap listed is probably the greatest source of error.

(b) The plots and analysis were done by a constantly changing party of students. Four basic parties were used and were responsible for the following plots:

Party 1 - H
Party 2 - D
Party 3 - G
Party 4 - G and Q

In each case there was an overlap of members between parties so that, for example, one member of group 1 could train the new members forming party 2, etc. Parties 1 and 2 were largely composed of medical students, party 3 of archaeology I students and R. G. Melbourne, party 4 of two teachers, one archaeology student and one social anthropology student. Of these parties 1 and 2 needed little training, parties 3 and 4 a lot of training. It is

interesting to note that the bowl fragment analyses fall into two groups that conform to the two groups of students. The students who were extensively trained observed more of the chips resulting from the manufacturing process (class 5) and may have been more strongly motivated than the first group.

(c) It is likely that exploitation of the soapstone bowl factory was carried out over a long, perhaps intermittent, period of time. In this case many of the small chips would become so weathered as to be unrecognisable, or could have been washed away. The last is certainly possible at D which is very exposed.

(d) The dearth of class 5 at D may also be explained by the fact that no quarry is visible on either of the two small outcrops in the plot. Quarrying operations no doubt added greatly to the number of chips in areas where quarries are found.

In general, plots G and Q have more likely proportions of specimens of classes 1-12 than H or D. At a factory site one should expect high proportions of small chips as the waste products of both quarrying and bowl manufacture. A more diligent search at H and D would probably have revealed a greater number of class 5 examples.

The proportions of the other classes seems fair though two are worth commenting on. Class 8 is described as whole bowls undamaged. There is an amazingly high incidence of this class in the plots, a total of 14. Most examples come from plot G and, in fact, are slightly damaged. By rights, they belong to class 4 (bowl with an edge broken off) as each has a nick or nicks, in the rim. Two examples are in a very hard stone and the makers probably abandoned them in favour of more suitable material.

The second class worthy of comment, is class 11 (bowl edge with handle), a single specimen of which was found in G. This is an uncommon class and was probably only made when the raw material and the skill of the craftsman allowed it.

Breaks in bowls can be divided into three categories:

(i) flaws in the raw material which cause cracking during hollowing, e.g. the handled specimen from point C.

(ii) holes in bases, e.g. class 3.

(iii) bowls with part of the edge broken off, e.g. class 4, part of class 7, class 10 and class 12.

The last two are the results of careless adze blows.

5. Other artefacts

Artefacts other than soapstone bowls fall into seven main categories:

(1) E. S. A. flakes and tools

(2) Querns

(3) Rubbing stones

(4) Mruba boards

(5) Bored soapstone fragments

(6) Large stones with rows of conical holes drilled into them

(7) A pipe roughout

(1) E. S. A. artefacts. These artefacts are scattered over most of the factory area east of the dyke and are concentrated south east of AB. Between the end of the track and AB three handaxes and two cleavers were picked up. The material is a coarse indurated sandstone (?) and appears to be derived from a small outcrop of the same nearby. The tools are crude but much of the crudeness may be due to the coarse nature of the raw material.

(2) Two querns of quartzite were noted on the flat earth platform in the middle of outcrop X. They are of the common type, an irregular slab with a dimple ground into one face.

(3) Rubbing stones are usually waterworn river pebbles, obtained from the nearby stream bed. They are scattered, apparently indiscriminately, among the soapstone fragments around outcrops. It is this fact, combined with the smoothed interiors of some bowls, that suggests they were used to smooth bowl interiors.

(4) A complete mruba board and an attempt at making another were noted. The first is at point L and measures ca. 1,5m. x 0,5m. 71 holes are visible but there are indications that these continue under the rubble directly upslope of the flat outcrop on which the board is made. Consultation with two members of my labour force, Franz and Freddie (Mr. M. Lewis interpreting), revealed that the great number of holes was due to the boards having been re-made on several occasions. They deduced this from the fact that the game is played on a board comprising four rows of eight holes each (total of 32 holes). Re-making was probably due to breakages on the edges of the holes. The soapstone is fairly flaky and would be likely to break if too much pressure was exerted in the excitement of the game. We noticed, when being taught the rules of the game, that wear of the holes in three slow, sedate games was very noticeable. The rules of play are described by M. Lewis in Appendix E. Hall (1905) mentions the game as being extremely popular

among his labourers at Zimbabwe and that skill was needed to win a game. Finds from Zimbabwe Great Enclosure (Summers, Robinson and Whitty 1961) suggest that the game has been popular in Southern Africa for many centuries. The other board was found at the end of the track southeast of AB. It was a small piece with four holes irregularly set on it. Further examination was precluded by its being stolen during July.

(5) Two stones with holes bored through or partly through, were found, the one between C and G, the other below D. The first is completely perforated, the second is incomplete, abandoned before completion as the maker could see that his borings, started from both sides, were not going to meet in the middle. The borings are biconical and thus different from those in the spindlewhorls at the salt site. It is difficult to say what they were used for, though a suggestion, by Mr. Klapwijk, that they might have been weights for extracting the afterbirth from cattle is a useful one. M. Klapwijk derives his suggestion from his own ethnographic work in the Eastern Transvaal Lowveld.

(6) Six stones with small conical holes drilled into them were plotted. Four of them were mapped on the north side of AB (c 5-7 and one unlabelled specimen); one was plotted and removed from the south west side of X (d6); and the last was noted at point Z to the north of outcrop X. (figs. 22-24)

c5 has a row of 13 conical holes along one edge

c6 has a curved line of 9 holes on the top, a smoothed soapstone boulder

c7 has three deeper holes set in a triangle on a small rounded and smoothed soapstone fragment.

The unlabelled specimen from AB is a single hole bored into the middle of an outcrop between c5 and c6.

d6 is different from the other five in that the holes are drilled at an acute angle to the surface of the stone whereas all the other examples have holes at ca right-angles to the surface. Two holes were drilled very close together, ca 2mm. apart in one direction. A single hole was drilled at about the same angle to the surface in the opposite direction. The latter is partly broken giving it the probably misleading, appearance of a complete perforation.

The example from Z has 13 holes set out in a T-shape with the cross of the 'T' composed of 9 holes, the other stroke of 4. The purpose of these stones is a complete mystery.

(7) The pipe roughout is a cylindrical piece of worked soapstone with adze marks all round the circumference. No perforations are visible and the interpretation is largely based on the fact that it is very nearly the same size as two pipes recovered by the resort owner at the salt factory.

6. Other soapstone bowl factories on Harmony 24

Three other sites merit some discussion.

(1) The first is situated in the northern part of the farm, a few hundred metres south of the northern borehole. The soapstone occurs in fairly large outcrops but appears to be of a different quality and type from that found at the main site. The principal sorts are, firstly, a hard fine grained compact variety found as an outcrop a few metres from a recently abandoned Bantu homestead, the second is a coarse grained, crumbly, variety unsuited to bowl production. A prospectors trench has been dug into the first mentioned and closeby there is a single very weathered, partly completed bowl.

(2) The second site is much closer to the salt site than the main factory is but the outcrops are very small and not all the material is suitable for bowl making. The site is situated 1 Km. along the track marked on the relevant 1:50,000 map leading northwest from the main resort - Tzaneen road. Only two worked pieces of soapstone were found, with one water worn river pebble, probably used as a rubbing stone. A stream runs north-south about 400 metres to the east of the factory and in this a curious soapstone object ca. 60 mm. square with two complete conical perforations through it was found. Several suggestions concerning its possible use have been made. These include that it was used for drawing wire, an unlikely suggestion because the stone is too soft and the perforations too large. Another, that it may have formed part of a furnace mask, may be discounted as the holes are too close together to act as eyepieces. It may have been a 'bull-roarer'.

(3) The third site is within 1 Km. of the copper mine and to the north and west of it. It consists of a single, thin, low, outcrop of soapstone, very closely associated with quartz veins. A number of bowls and a quarried area were seen. About 50 m. west of the site a broken mruba board was found but left in situ. It had the gaming holes on both sides.

III TH. COPPER MINE

1. Description

The workings are about 400 m. long and run east to west along a fault zone. They are comprised of a series of shafts and ventilation shafts with a single open stope. Each of these is regarded as a unit and units are numbered from west to east (see plan fig. 27,28). Their description is as follows. (Measurements given are those on the present surface level, depths are estimates).

Unit 1. Ventilation shaft. 6 m. square and about 2 m. deep

2. Ventilation shaft. 6 m. square and about 2 m. deep

3. Shaft. 9 m. long x 8,5 m. wide, about 3 m. deep

4. Shaft(s).18 m. long x 8,5 m. wide, about 3,5 m. deep
A double pit longitudinal section suggests the possibility of two shafts. Built up walls are present in the north tailings, 7 m. from the west end. Books of mica are present.

5. Shaft. 24 m. long x 14,5 m. wide and about 6 m. deep. Part of the tailings between units 5 and 6 are artificially built up with a stone retaining wall.

6. Shaft. 17,5 m. long x 14 m. wide and about 5 m. deep. A core of solid rock juts out from the east end. A dimple-faced hammerstone was found between units 6 and 7, 1,5 m. from 7.

7. Two shafts. 11,5 m. long x 9 m. total measurements; depth about 3,5 m. Two nearly circular pits separated by a low, narrow earth bridge. At the east end hard rock is found to the north and soft brecciated fault fill to the south.

8. Open stope and shaft. 52 m. long x 6 m. 30-17 m. wide and about 10 m. deep. The stope covers the western 27 metres. The shaft meets the stope at an angle. Trenches CI, II and IV were dug through the tailings of the stope 7 m. from the west end. CI and II are in the south tailings, CIV in the north. Highest point of tailings about 3 m. Artificial stone walls encountered at east end and in south tailings at the point of contact between the stope and the shaft.

9. Shaft. 7 m. in diameter, depth about 3,5 m.

10. Ventilation shaft. 4 m. in diameter, about 2 m. deep.

10.a Ventilation shaft. 4 m. in diameter, about 2 m. deep. This unit is off the line of the other units and presumably reflects a lateral mining operation underground. There is a 50 m. gap between 10 and 11 which probably at one time contained a shaft or two. The gravel road Lydenburg-Gravelotte runs north-south through the gap and any shafts would have been filled in by the Roads Department.

11. Ventilation shaft. 5,5 m. in diameter, less than 1 m. deep.

12. Shaft. 24 m. long x 9 m. wide, about 4 m. deep. The unit is in two stages, 0-6 m. (from west) which is shallow (ca. 1,8 m.) and 6-24 m. which is deeper and wider. Tailings are correspondingly higher around the second part.

13. Shaft. 7,5 m. in diameter, about 3 m. deep. Ash visible in the north tailings.

14. Shaft. 23,5 m. long x 12 m. wide and about 10 m. deep. It is widest at the west end from which it narrows and grows shallower towards the east. A dimple-faced hammerstone was found at the east end.

14.a Ventilation shaft, 3 m. in diameter, less than 1 m. deep. Just south of the west end tailings of unit 14.

15. Ventilation shaft. 3m. in diameter, less than 1 m. deep.

16. Ventilation shaft. 3 m. in diameter, less than 1 m. deep.

17. Shaft. 14 m. long x 10 m. wide, about 5,5 m. deep.

18. Shaft. 9,5 m. long x 6,5 m. wide, about 3,5 m. deep.

19. Ventilation shaft. 5,5 m. long x 8 m. wide, about 3 m. deep.

20. Shaft. 12 m. long x 8,5 m. wide, and about 9 m. deep. Shaft open to depth of 2 m. below the bottom of the rest of the unit. The shaft is on an

incline under the narrow bridge separating units 20 and 21. It is about 1,2 m. in diameter and follows the fault line against the rock north wall.

21. Shaft. 12,5 m. long x 10 m. wide, depth about 5 m.

22. Shaft. 10 m. long x 8 m. wide, depth about 5 m. This shaft was partially cleared in January 1973. (See section III 2). A dimple-faced hammerstone was found on the tailings north east of the shaft.

23. Ventilation shaft. About 8 m. in diameter and 3 m. deep. This is the most easterly unit.

Between units are gaps ranging from less than a metre (20-21) to 6 m. (6-7). Work in clearing the shaft of unit 22 shows that below the present fill in the base of each unit, the dimensions decrease rapidly. The top of 22 measures 10 m. x 8 m., after clearing, the shaft's lower dimensions are 1,7 x 1,5 m. It seems likely that the top few metres were stoped out before shafts were sunk to exploit the ore lode lower down (e.g. units 5, 8, 14, 20). The tops of all units, except perhaps some ventilation shafts, have been widened by erosion, which has added greatly to the fill inside each unit. This fact and the difficulty of assessing exactly where the boundaries of units lay, meant that measurements given above are only to the nearest half metre.

Smelting sites are also associated with the mine. These are located both to the south and to the north of the workings (fig. 27-8) and are discussed in detail (section III 5).

2. Clearing of shaft at Unit 22, January, 1973 and reconstruction of the mining method

As I had a mountaineer (R. G. Welbourne) experienced in the use of ropes as safety devices in my team, I decided, in January 1973, to try and open this shaft. It was chosen because it had been open within living memory and the fill was, therefore, loose and possibly formed a plug.

Method

A platform (see figs. 29-30) was rigged up over the hole, from which buckets could be raised and lowered to the person working in the shaft. The bucket was attached to the rope by means of a mountain climber's Karabinér. The rope was anchored at both ends allowing maximum safety both for those raising and lowering the bucket and for the digger several metres below. Material in the shaft was loosened by pick and shovelled into the bucket which was then raised to the surface

and emptied. As timbers were found in some profusion these were labelled and photographed as found. Timbers were raised to the surface as soon as they became loose, to expedite the work.

Rubble about three metres deep was extracted from the mine using the method above. At this stage it was decided that mechanical means would be the only economical method for removing the rest of the fill. By this point there was a large hole on the north side of the shaft through which we could clamber into the stope and, with both natural light and torches, could make out three remaining pit props still in situ; the bottom is about 10-15 metres vertically below the platform. Photographs down the shaft were taken by Professor Mason, by a professional photographer from Phalaborwa, Hugo Hagen, and by myself, all using flash. Photographs within the stope were taken by myself.

Results

The shaft appears to be vertical for the first five metres and then dips at approximately 50° both to the north east and to the north west. The latter dip is not as well documented as the former because clearance has not produced a hole as big as the one showing the north east dip. The miners appear to have made a vertical shaft measuring 1 m. 50 north-south and 1 m. 70 east-west, which they reinforced with timbers. Where the shaft dips the shaft dimensions are unknown north-south, but east-west have increased dramatically to about three metres (exact measurements not known). The excavations at present indicate a possible shape for this shaft which is given diagramatically in fig. 31-32. This will have to be confirmed by further work later in 1973-74.

Timbers were found in the fill of the vertical shaft. Thirteen were labelled pending removal but of these, several are still firmly fixed. They do not appear to be in their original positions, nor are they, in length, suitable for use as pit props. It is possible that they formed a stull above the vertical shaft, used in the same way as our own platform. Much of the above will have to be confirmed by later more extensive investigations.

The geologist's report (see Appendix A) (Evers and van den Berg, 1974) shows that miners followed the fault zone in mining operations. The fault fill itself is soft and easy to work and is found next to the copper bearing schist-granite contact. Malachite and azurite were mined.

Mining appears to have been conducted on a roughly west to east axis along the fault line, but as the fault zone dips at ca. 50° to the north, material was removed in a northerly direction as well. Back filling presumably would have taken place as work proceeded, partly to obviate the necessity for removing all waste and partly to assist primitive timbering in supporting the hanging wall. This will have to be confirmed by future research.

The open nature of the tops of the shafts suggests the possibility that copper ore was removed from this area first. R. van den Berg (pers. comm.) suggests that the ore body may have been stoped out for the first 3-4 m. at which point open stoping became uneconomic. Below 3-4 m. the economic method was to remove only the ore body shoring up the country rock hanging wall. In this way a system of shafts and underground stopes evolved. In some shafts haulage may have been facilitated by stulls (e.g. 22). Stulls have been found at other copper mines, notably Umkondo Mine in Rhodesia. (Summers 1969).

Below ground level, miners probably worked using natural light supplemented by crude torches (cf. van Warmelo, 1940). Ore was broken off the side of the workings by iron gads (cf. Rooiberg, Baumann, 1919) hammered like wedges into cracks by dimple-faced hammerstones. Fire setting was used to crack harder material and fires may also have been used to create draughts below ground for ventilation purposes (cf. Rhodesian gold mines, Summers 1969). Evidence for fire setting was obtained from trenches CI, CII and CIV (see section III 3). Material may have been sorted below ground so that only a fraction of the loosened material (presumably that bearing copper) was sent to the surface. The rest would have been used for backfilling as suggested above.

On the surface the ore would have been sorted a second time (numerous sorting areas occur between the main body of the tailings and the smelting sites). Once sorted the ore was either smelted close by, e.g. CIII, CV, CVI, CVII, or taken nearer the river for processing (e.g. 6/73).

3. Excavations, trenches CI, CII, CIV, CVIII

Three trenches were dug into the tailings of the open stope in unit 8, CI and II on the south side, CIV on the north side. The reasons for digging were twofold:

1. To test a patch of ash eroding out of the south tailings in the position covered by CII
2. To determine the stratigraphy of deposits in the tailings, especially ash levels. It was hoped that successive layers of ash would be revealed, which, in turn, would indicate whether fire setting had been used.

All three trenches were dug quickly in 10-20 cm. spits, the profiles of the trenches being the most important source of information from my point of view. A careful lookout was kept for artefacts, animal bones and charcoal.

Stone mining tools and slag were found, some animal bones were recovered and a small amount of charcoal. A sample of charcoal combined from all three trenches has been submitted for dating to Radiocarbon Ltd., New York. (Appendix G).

Trench CI

This trench is situated in the south tailings on the side away from the mine. The trench is 4 m. 80 long and 2 m. wide. Maximum depth at the maximum height of the tailings is 1 m. 78. Six ash levels are visible in the west face of the profile, of these, two may be the same, so an absolute minimum is five. The deposit otherwise is composed of earth with a fine rubble admixture and finally a coarse rubble with little earth. The lowest ash level is black, not the light grey to white of the others and may represent the burning of the surrounding bush or the sweepings from the first fire setting. A third source is indicated by some slag found in the ash, which could be derived from the smelting site, CIII, ten metres away. Nearly all the finds came from this level or just above it. Immediately below the ash is a layer of red compacted earth which may be the result of fire. Immediately below the red zone lies topsoil which is taken as the base on which the tailings rest.

Finds: spit 1. charcoal
spit 2. charcoal
spit 3. mica, charcoal, single plain body sherd.
spit 4. mica, one plain rim sherd, animal bone, charcoal.

spit 5. mica, animal bone, slag, tuyere fragment, charcoal

spit 6. mica, animal bone, plain body sherd, charcoal, dimple-face hammerstone

spit 7. animal bone, one plain body sherd, slag.

Cleaning the face of the profile for drawing purposes yielded one decorated sherd, some more charcoal and a single piece of slag, all from the level of spits 5-7.

Trench CII

CII is separated from CI by a 1 metre balk and covers the ash exposure mentioned above. The deposit is extremely loose and the sides of the trench had to be drastically sloped in from the 2 metres at the top to less than 50 cm. at the base, at a depth of about 1 m. 20. Ash was found in two places:

1. on the surface where it had been exposed by erosion;
2. in the deeper part of the trench at about the same level as the thickest ash layer in CI. No profile was drawn.

Finds: spit 1. nil
spit 2. battered quartz nodule
spit 3. nil
spit 4. charcoal and a battered quartz nodule
spit 5. nil.

Trench CIV

CIV was dug right through the tailings on the north side of the mine immediately opposite CII. The profiles from this trench tell a story similar to, but more detailed than, that from CI. The west section is the more useful. The south end of this section contains a large block of coarse rubble which on the edge of the mine looks as if it was deliberately stacked to form a retaining wall. North of the rubble is a profile recording successive layers of ash, reddish rubble with a rock fracture different from that in the coarse rubble, and the earth with fine pebble admixture which forms the bulk of the sequence. The reddish rubble is the most interesting level here, two interpretations are possible:

1. the layer represents merely the reddish brecciated fault fill
2. that the red colour and the fracture were due to thermal stresses like those generated in the fire setting process.

Mr. van den Berg felt that either was possible but would not commit himself. The second interpretation is very attractive and circumstantial evidence points to its being correct. The most important point is that the red rubble occurs immediately above ash layers. In fire setting the succession of layers runs from top to bottom as follows:

top: fire and the results of burning (charcoal, ash, etc.)
middle: rock immediately affected by fire and later by cold water. This layer is in contact with the fire
bottom: deposit unaffected by fire, except indirectly.

When this is removed from the mine and dumped onto the tailings one can expect the stratigraphy to be inverted and this appears to be the case here, ash at the bottom, followed by material affected by heat and then by unaffected material.

Finds: spit 1. dimple-faced hammerstone, one battered quartz nodule
spit 2. one plain body sherd, one battered quartz nodule
spit 3. charcoal, one battered quartz nodule
spit 4. charcoal
spit 5. one battered quartz nodule
spit 6. one dimple-face hammerstone

Trench CVIII

This trench was excavated in May 1974 to provide confirmation of the nature of tailings deposits as seen in the 1972 excavations of CI, CII and CIV. Excavation was possible only at the tailings of unit 4 on Harmony 24 as the ownership of the rest of the mine had changed since 1973 and permission to excavate was refused.

An area 1,3 x 5,1 m. was excavated to a total depth of 1,7 m. at the deepest point. Excavation proceeded in spits of 10-20 cm. each following as closely as possible the slope of the ground. Extreme difficulty was experienced in maintaining spit depths and finally in cleaning down the sides of the trench for photography. A glance at fig. 45 will give the reason. There is a band of very loose bouldery rubble about 0,50 m. thick covering most of the area of the trench. This rubble is so loose that the dislodging of a single stone is enough to cause a minor landslide. All deposits are derived from the mine geology and agree closely with that part of unit 4 which was exposed in an unsuccessful attempt to clear the shaft in May 1973.

The top 25 cm. is composed of a red earthy rubble of a comparatively stable nature. Towards the south end this is replaced by a darker brown rubble of the same nature which has been humified. Underlying the red rubble at the northern end of the trench is a layer of white powdered rock which is relatable to the north side wall of Unit 4. Below this is the band of very loose red boulder rubble merging at the northern end into a boulder rubble of greyish colour. A red earthy rubble separates the grey rubble from the underlying light brown earthy rubble with boulder rubble lenses. This is again a loose deposit but is considerably more stable than the overlying boulder rubble. In the centre of the cut and towards the southern end the light brown earthy rubble is underlain by a dark brown possibly burnt soil remarkably like the black ash layer at the base of trench CI. No ash was found at all throughout the section except for a small patch in the south face which could possibly be recent. Charcoal nodules were, however, found between the second red earthy rubble and the light brown earthy rubble.

Comparison with the section of trench CI shows the two to have several similarities. In both cases a loose boulder rubble separates the more stable earthy rubbles; in both cases the loose boulder rubble made spit depths and vertical sides extremely difficult to maintain or attain (it took 6 man hours to clean the sides of trench CVIII). The major difference lies in the fact that ash was stratified in the CI profile and not in CVIII.

The CVIII trench adds no new information to that obtained from trenches CI and CIV. CVIII charcoal, however, could provide a new date. No artefacts of any kind were found except for two stone hammers of Class 2 which were located at depths 22cm and 70 cm.

Discussion

Two features warrant further discussion, first the origin of the ash in the tailings, second the nature of the deposition in the tailings.

Ash in the tailings at CI clearly has a complex set of possible origins. At least one and possibly two layers (the lowest two) are associated with slag which suggests that the layers are the result of clearing out a furnace a few metres away at CIII. Subsequent ash levels have no slag and, therefore, need not be attributed to furnace clearance. The thick ash layer that appears in all three faces of CI and in CII conforms to the shape of the mound and its position among the deposits that come from the mine suggest a similar origin.

In CIV the problem is less complex. Numerous ash levels are present. Their plan form was sketched throughout the sequence and these show a patchy distribution concentrated in the middle and towards the mine side. The nearest smelting site is over 100 metres away and seeing that this site, CV, is closer to units 4, 5 and 6 than it is to unit 8 where CIV is situated, it is unlikely that the ash is derived from it. The most obvious source is the mine and this, in turn, suggests fire setting.

The nature of deposition on the tailings is extremely complex. From excavating CI and CIV it appears that each form of deposit (rubble, ash, etc.) has a limited spatial distribution along the length of the tailings. This means, in effect, that trenches 2 metres on either side of those dug, would show different arrangements of the constituent deposits. The reason for the complexity is twofold. The first is that the deposits mined show change along the length of the workings. These changes affect the mining method used and the deposit dumped on the tailings. The second is that mining probably was only carried out in one place at any time. Hence, fire setting in unit 8 would have several different centres, partly to facilitate moving hot material and partly because the working party would not have been large and, therefore, would not have been able to undertake large scale operations. Dumping waste material on the tailings would then result in a patchy distribution of deposits.

4. Mining tools at the Harmony copper mine

Two types of hammerstone were found, those with dimple faces made of igneous rock and battered quartz nodules. Details are tabulated in table II.

Class 1. tools Table II

Site	measurements (mm.)	weight (g.)	number of dimples	dimple depth (mm.)	raw material	state: fresh/ weathered
CIV6	68 x 87 x 83	850	2	ca 5	diabase	fresh
CI 6	116 x 93 x 89	1110+	5-6	ca 7	diabase	fresh
CIV 1	irregular	688	2	?	quartz	fresh
Sur.1	83 x 84 x 86	1110+	5-6	ca 3	diabase	fresh
Sur.2	85 x 84 x 83	1031	3	?	diabase	weathered
Sur.3	72 x 93 x 94	1110+	5	?	diabase	weathered
Sur.5	128 x 75 x 122	1110+	8	?	diabase	fresh
Sur.6	100 x 111 x 84	1110+	6	3-5	diabase	weathered
Class 2. tools						
CIV 1	irregular	1110+			quartz	
CIV 2	irregular	1110+			quartz	
CII 2	irregular	607			quartz	
CII 4	irregular	1019			quartz	
CIV 5	irregular	897			quartzite	grinding stone ?
CIV 3	irregular	427			quartz	
Sur.4	irregular	843			quartz	

Class 1. tools compare well in size and weight and description with those reported from Rooiberg by Baumann (Baumann 1919, Trevor 1912, Mason 1962). Baumann describes his specimens as of a size to fit into the hand, weighing three to six pounds and having a concentric groove or dimples in the faces. The dimples are, however, much deeper than those in the specimens from Harmony. One of the Harmony examples (Sur. 6) has the start of a concentric groove round it.

One of the Harmony tools, CIV 6, is unusual in that it is sub-spheroidal with a dimple in each of two opposite ends. All the other class 1. tools are cubic with rounded corners. The weathered specimens are interesting in that they may imply a considerable lapse of time between their being used and the present day. That and the fact that another surface find is still fresh suggests that the mine may have been worked over a long period of time.

5. Excavations at the smelting sites 9/72 CIII and CV
4/73 CVI and CVII

1. At CIII an area of ca 25 m.^{2} was found to have slag on it. Two concentrations, one in the north east, the other in the south west, appeared and a 5 x 5 m. trench was laid out to cover them. Expecting to find a furnace of the types found hitherto in the Lowveld, the topsoil was quickly removed and some slag and tuyere fragments recovered. Below 5 cm. at most no finds were made and I concluded that the furnace had been destroyed.

2. At CV a larger area, ca 10 m. x 8 m., had a scatter of slag on the surface. Bush and grass were cleared and a trench 1,5 m. square was excavated on a spot that had a marked concentration of slag and slag on stone. This was excavated carefully with every find plotted. The top layer showed a general scatter of slag, slag on stone and clay fragments and a concentration of tuyere fragments in the south eastern corner. These were removed and excavations continued to a depth of five centimetres at which level an indistinct circle of stone and clay, both with slag on them, was revealed. The circle was open at the south east facing the concentration of tuyere pieces from the previous layer.(figs. Further digging showed that this was the base of the archaeological horizon. The remains may indicate a furnace made of stones with clay filling in the cracks but excavations at CVI and CVII show this is unlikely. Stones were small, generally measuring less than 10 cm. in maximum length, and slag adhered to one side only. Clay fragments were smaller than the stones and occasionally had slag adhering. Very little

free slag occurred in the excavated area though pieces were picked up in the surrounding area. Pottery was found in the trench to the south of the furnace and is undecorated. A single cross-hatched body sherd was seen 3 m. to the north.

3. CVI. This furnace was situated ca 20 m. north west of excavation CV. The furnace was easily recognised by the fact that it had only partly been filled in. The furnace measured 54 cm. in breadth x 72 cm. long and was of a roughly oval shape. There was a single tuyere entrance in one of the short ends which led into a hollow depression, 62 x 38 cm., forming a second oval shape complementary to the first. The wall was well preserved to a depth of 30-35 cm. The excavations appeared to have been taken down below the actual base of the furnace which did not seem to have been clay lined. Fragments of tuyere and slag were found scattered round the furnace and ca 1,5 m. away in a group of stones were fragments of two lower grindstones. The furnace was cylindrical and the walls vertical with no definite outside edge. The tuyere opening faced south east and measured 13 cm. across.

4. CVII. Two furnaces were located 50 cm. apart about 75 paces north of the shaft at unit 22. Both belonged to the same type as that excavated at CVI. They were called furnaces A and B. A was the more easterly of the two and the better preserved. It was bell shaped, being wider at the bottom than at the top, measuring 48 cm. x 42 cm. Again the tuyere opening was on the long axis but here faced south west. The width of the aperture was not measured as part of the wall is not preserved. The opening, however, was lined to form a funnel, a feature not seen, or perhaps preserved, at the other two. The tuyere was preserved in place, though broken at the outer end. Furnace B was less well preserved and measurements were, therefore, less reliable. The width was 44 cm. but the length cannot be measured. The tuyere opening was not well preserved but orientation appeared to have been south. This may mean that the bellows for both furnaces could have been operated simultaneously by the same person. The physical work of pumping the bellows furiously might have precluded this.
Excavations in May 1973 revealed that a depression similar to that found in front of CVI was present in front of CVIIA.

5. Other smelting areas:

(a) A further smelting area was located by finds of slag and furnace wall a few metres south of units 7 and 8 and a few metres west of CIII. No furnace has been located.

(b) A second area on the south of the mine has been identified by the find of three pieces of slag about 60 paces south of unit 4.

(c) A third area was located on the north side of the road where it passes through the main private motor gate between Harmony 24 and 25. (Site 6/73).

In none of the above cases was the furnace itself exposed. The third site is c 800 m. south of the mine and c 200 m. north of the Makutswi. There is, therefore, a distinct possibility that more smelting sites should be preserved between the river and the mine.

Analysis of slag from CIII by Dr. H. Friede, the close proximity of furnaces to the mine and the find of copper beads in another piece of slag from CIII are conclusive pieces of evidence that copper was the metal produced in the furnaces.

IV THE SALT FACTORY

1. Position and description

The salt factory is situated on both banks of the Makhutswi river, in a southward bulge, near its confluence with the Kuanyane river. The area selected for intensive study is on the north bank ca 100 m. west of the resort swimming pool. The major site is situated on a river terrace, on a level above the pool, and forms a low but distinguishable mound above the terrace.

The main mineral spring is situated several hundred metres east-south-east of the mound in the river bed, and only flows after the rains.

The site was recognised by a scatter of sherds, broken animal bones and soapstone bowl fragments on the surface and also by small patches of ashy soil eroding out of the top of the mound in two places. Evidence for occupation extends along the terrace edge both east and west of the mound which was designated 9/72 site A.

Two other localities were excavated. The first, site B, was dug next to Rondavel 100 where, in the digging of the rondavel foundations, a patch of ash had been discovered. The trench proved to be sterile. The second site, 10/72 D, is situated on the river side of the little dam, constructed east of the resort office and south of Mr. Kruger's house. In digging the basin for the dam three complete soapstone bowls were found. Trenches were dug in two places but these proved to be sterile. The dam was drained and the area probed to a depth of one metre but no obstructions, other than roots, were noted.

2. Excavations at 9/72 site A, April 1972

Two sets of excavations at site A were carried out. The first of these took the form of trial trenches in April, the second, an area excavation, was undertaken in June-July 1972. In April, five test pits, ranging in size from 1 m.^{2} to 3 m.^{2}, were set out within the boundaries of a grid. Excavated 1 m. squares are F 1-3, C 16, A 11 and B 11, K 14 and L 14, and T 17. The major objects were to try to establish the nature, depth and extent of the archaeological deposits relating to the Iron Age.

In F 1-3 the archaeological deposits covered F 3 and the adjacent half of F 2. The main constituent was ash, at that time thought to be a midden, but later realised to be the remains of a large fireplace that also covered parts of Aa and Ab of the July excavation. Finds were largely restricted in distribution to the ash and consisted of animal

bones and sherds, including a number that were re-assembled to produce about one quarter of one pot.

The excavation of A 11 and B 11 was very disappointing. A few sherds, some heat spalled river stones and a fragment of a soapstone bowl were found in the top 10 cm. Below this the excavations were sterile, save for a tree stump at 40-50 cm. The deposits changed little; from 0-25 cm. the section shows a dark brown, slightly sandy clay. Below this the clay is less sandy and has a reddish-brown colour. This was confirmed as being below the Iron Age occupation layer at other parts of the site.

K 14 and L 14 had a very rich series of deposits with artefacts from 0-30 cm. Below the artefact bearing horizon is reddish-brown clay. The majority of finds was made between 10-30 cm. The top 10 cm. contained two small isolated patches of ash with a sparse scatter of artefacts. Below this the only change in deposit was the increase in daub and small pebbles. At 30 cm. a layer of soapstone bowl fragments (ca 5 cm. maximum dimension) was encountered. This was attributed to ants re-working the deposit and forming a biotic stone line; ants were common throughout the whole excavation. Finds include sherds, animal bone foodwaste, soapstone fragments, 'daub' and charcoal. Stratigraphy was almost identical with that found in A 11 and B 11.

T 17 was dug on the steeper slopes of the terrace. On the surface we found some heat spalled river stones and a soapstone bowl fragment. Below these was a 2-3 cm. thick topsoil overlying clean river sand. The excavation was abandoned at 60 cm. without reaching the bottom of the sand. Excavations in July confirmed that the archaeological deposit overlay river sand (Ag and Al), where it did not overlie reddish brown clay.

C 16 was dug in what I, in April, thought was the western edge of the mound. The square contained a soapstone bowl fragment with a set of mruba holes on the other side. The deposit was a mixture of clay, sand and ash and the last suggested that further digging in the vicinity would be profitable. This pit was incorporated into unit Ae in July.

3. Excavations at site A, June-July 1972

The grid set out in April was abandoned and excavation units, 4 m. x 3 m. were laid out using the base lines of the grid. Balks of 1 m., running east-west, and 1,5 m., running north-south, were left to preserve the profiles and to provide easy access to all parts of the

site, should the excavations be extended. Six units, Aa-Af, were set out first and these were extended by five further units, Ag-Al. This brought the total excavated area of site A to 141 m.^{2}, including the April test pits. (See plan, fig. 57)

Units were dug in 5 cm. spits, however, control over these was very difficult as my labour force changed weekly and new members constantly made mistakes. In seven squares, Aa, Ac, Ad, Af, Ag, Aj and Ak, spit depths were reasonably constantly adhered to, some bad mistakes were made in the others. However, all excavations showed that there was no series of living floors and that the archaeological deposits represented rather an accumulation, probably rapid, of earth and occupation debris. Ant working of the deposit is noticeable, especially in Ab, where we dug into an antheap in the south east corner. Re-working of the deposit by insects and also by human agencies is neatly shown by fitting sherds together; in Ad three sherds from spits 1, 3 and 5 were found to join. This also confirms that the deposit represents the remains of a single occupation.

A great many ash lenses were noted but the only stratified series were found in Ad and Af. In Ad there were three small lenses stratified one above the other; in Af, a small patch of ash was noted on the surface and near the base a large accumulation was uncovered, the same was noted for Aa.

In all squares, save Al and part of Ag, the bottom of the Iron Age layer was recognised by the presence of the lighter, reddish-brown clay. In the two exceptions the clay was replaced by river sand. Proof that the bottom of the Iron Age occupation had been reached was provided in the for of quartz flakes, found especially in Ad, where two spits were dug into the red clay.

The deposits bearing Iron Age artefacts and food waste are essentially a dark brown clay with varying amounts of sand mixed in. Heavy sand admixtures occurred in patches in Ab, Ae, Ag and Ah. Quite why this should have occurred is difficult to say. While the stratigraphy of the resort is complicated and is based on clay and sand, comparisons with Sautini and Eiland, both salt making sites, suggest that a human agency was responsible. Ethnographically at Sautini sand is added to the clay/salt mixture to aid the lixiviation process.

Under several of the ash lenses there was a hard crumbly red earth deposit. This was always thin and never extended over the full area covered by the ash. On investigating our own camp fire place, we noted

a very similar deposit immediately underneath ash. The possibility that the red colouring was caused by heat is attractive. Examples were found in Aa, Ab, Ad, Ae, Af, Ah and Ak. These probably represented fireplaces for fires about the same size as a large camp fire. All patches of red earth were on the same level ± 1/10th of a foot.

Plans were made of only some levels in each square save in Ag and Ah. In the top one or two spits of each square so few finds were made that I felt that plotting them was a waste of time. Ag and Ah were completely recorded and Ag plans are given as typical for the site. All plotted spits show an overall scatter of artefacts and bone foodwaste in and around the piles of ash. No strong concentrations of any one type of artefact could be distinguished, though two groups were distinguisable on the basis of quantities of finds. Group 1 comprises Ac-Ag, group 2, Aj and Ak. Very few finds were recovered from the remaining squares. Group 2 had a high bone content, with comparatively few artefacts, group 1 had a high content of both bone and artefacts.

Important features and finds from each square

Aa: Ash appeared both on the surface (south-central) and in spits 2-3 (east centre). Two red patches were noted on the lower ash level, one associated with ash, the other not. A white snapped cane glass bead was found in the upper ash. A soapstone fragment with perforations in it was found in spit 3 (west-central). Deposit apart from ash was a very hard clay with little to no sand.

Ab: One major ash concentration and several smaller ones were noted. The major concentration was in the north east corner, bounded in the south by anthill and associated with a patch of red earth. Other ash piles occurred in a rough line, running west-east down the centre of the square. The unit was heavily worked over by ants. In the south-east corner, in the anthill, a portion of a single pot in a very fragmented state was found.

Ac: One large ash lens was situated in the south-west corner in spits 2-3 and around this ash the majority of artefacts, etc., was uncovered. A thinner scatter of occupation debris was found over the rest of the square. A feature of the ash itself was the great number of 'daub' fragments compared with the amount outside.

Ad: This unit had at least three levels of ash lenses in the central and western parts of the square. All ash lenses were small, the largest appearing in the balk, left as a witness section, in the centre of the square. In the north west, a clay deposit with a sand and ash

admixture was noted. Most artefacts and foodwaste remains came from around the ash lenses though the scatter was fairly even, both horizontally and vertically.

Ae: Ash was uncovered in three zones: along the south edge, in the centre and in the north east. The last was most interesting as it differed in shape from any of the others. It was bowl shaped, like a modern Pedi cooking hearth, and may well have been used as a cooking place. The central and southern zones were mixtures of ash, sand and clay, with the emphasis on the first two. Two small red earth patches were noted along the southern zone. Most finds came from in and around the ash and these were probably mixed with the earth, after the fires had been abandoned.

Af: This was the richest square that we excavated. The top few centimetres in the north-central area were composed of ash and ashy soil. Few finds were associated with this ash. From 10 cm. and below, finds were much more numerous. At this level, another ash concentration was visible in the south west and north west portions and this continued to the base of the Iron Age occupation, where three red earth patches were seen, two along the southern edge, the other in the south-western corner. The majority of finds was in a general scatter in and around the ash. Important finds included abraded river mussel shells, part of a polished bone spatula, a nearly complete, though fragmented soapstone platter, and a piece of copper.

Ag: This square was on the steep slope of the river terrace. Ash was again present, though in patches. (cf. Ae). The major concentrations were in the south east, protruding towards the centre, with a number of minor occurrences in the west-central portion. Artefacts were again evenly distributed and mixed with foodwaste. Plots of Ag are given as representative of the type of distribution we found. (figs. 64-67)

Ah: Ash patches occurred in an S-shaped line starting in the south east corner and finishing in the north west. The line was not continuous but was made up of four concentrations of ash, under two of which, red earth areas were noted. An almost complete soapstone bowl was found on one of the piles of ash, and two half bowls on another. It is interesting to note that these bowls were found on the ash piles covering red patches and that the bowls bear traces of soot on the outside.

Aj: Ash patches were small and confined to the eastern edge. Spit 1 produced a light olive green, unapped cane, glass bead. Spit 2

had an extra-ordinary distribution of bone in a line running east to west along the centre of the unit. This may have been contrived by the excavators. In all three spits the majority of finds comprised animal bone foodwaste. A soapstone spindlewhorl was recovered from spit 3.

Ak: A large pile of ash covering just under half the square was present from top to bottom of the Iron Age sequence. Finds were distributed all over the square with a heavier concentration in and around the ash. Bone and giant land snail shells were particularly prominant. Away from the ash, and particularly to the south, the deposit was an exceptionally hard clay.

Al: Only a single tiny patch of ash was noted, less than 20 cm. in diameter. Finds were thinly scattered over the square. Black hard clay gave way to river sand below the Iron Age horizon.

4. Finds - June-July excavations 1972

A. Pottery

Sherds of two groups are represented here. The first group is represented by six sherds of the types found at the Early Iron Age site 65/72 across the Makhutswi. (Evers, 1973). The second group comprises the rest of the ceramic material at site A. Of those in the first group, 5 are rim sherds, three of which belong to pots with flaring mouths and constricted necks. The other two can not be put into any particular shape category.

The three belonging to pots with constricted necks each have a line of single stylus impressions just below the rim. One rim is bevelled, the others are rounded. The other three sherds have two varieties of herring bone design. Two, probably belonging to the same vessel have lines of diagonal incisions separated by broad U-shaped incised lines. Each line of diagonal slashes is in the direction opposite to those immediately above and below, giving a herring bone motif effect. The final sherd has lines of herring bone incisions between broad lines of U-shaped section (see fig. 68).

The second group is represented by 1391 sherds. Analysis was centred on the rim and decorated sherds, these being regarded as diagnostic. All undecorated body sherds were counted and an analysis of thickness, ware and burnish was carried out on a sample of the whole (all sherds from Ae and Af). Rim sherds were analysed for section type, and for any indications they could give on the shape of the vessel; however, less than half could do so.

Shape: Two basic shapes with some internal variations are discernible. The first is a hole-mouth pot with a globular body and a round base. Variations are seen in rim morphology and ir the diameter of the mouth. The angles of body to rim were measured, these varied between 40° - 70° over all. However, pots with beaded rims vary between 40-60°, those without beaded rims between 45-70°, the majority above 55°. (See figs. 68-77)

The second basic shape is an open bowl. Variations are again present:

1. sides nearly vertical (80-90°) with straight rims
2. the same with everted rims
3. an example with a restricted neck
4. wide-mouthed flaring bowls (100-120°)

Ware: This was resolved as an analysis of colour with an assessment of the grit content of the clay. Colour variants are: red; brown; black; grey; red + brown; red + black; red + grey; brown + black; brown + grey; black + grey. Grit content was assessed as follows: A - no inclusions; B - quartz present, ware firm; C - quartz present, ware crumbly. The size of quartz inclusions in B and C were given as f - fine; m - medium; c - coarse; intermediate classes are also recognised. Most sherds are brown + black in colour with quartz inclusion between Bf - Bm/c.

Thickness was also measured. Measurements range between 3 - 17 mm. the great majority falling between 7 - 10 mm. Despite the great range, a plot of the frequency distribution shows a single peak, only very slightly skewed from the normal distribution. The slight skew can probably be attributed to the fact that some sherds vary considerably in thickness and that the smaller measurement was used for the plot. Examples of thickness variation are: 5 - 11 mm.; 5 - 12 mm.; 8 - 13 mm.; 10 - 16 mm. Thickness, colour and grit content are tabulated in tables III-V and plotted in figs. 78-80.

sample 1 - undecorated body sherds from Ae and Af.

sample 2 - rims and decorated sherds from Ae and Af.

Table III — Thickness in mm.

sample	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	total
1	1	1	12	16	50	58	57	46	30	27	10	4	1	2	2	317
2	-	-	3	11	14	12	18	7	3	1						69
Total	1	1	15	27	64	70	75	53	33	28	10	4	1	2	2	386

Table IV — Quartz content

sample	A	Bf	Bf-m	Bm	Bm-c	Bc	B/Cm	B/Cm-c	B/Cc	Cm	Cc	total
1	-	40	25	117	110	10	7	4	3	3	1	317
2	-	2	8	26	29	-	2	-	-	1	-	69
Total	-	42	33	143	139	10	9	4	3	4	1	386

Table V — Colouring

sample	R	Br	Bl	G	R/Br	R/Bl	R/G	Br/Bl	Br/G	Bl/g	total
1	5	7	7	-	4	37	7	249	1	-	317
2	2	1	1	-	2	5	2	55	-	-	69
Total	7	8	8	-	6	42	9	304	1	-	386

Decorative motifs: The following are distinguishable:

1. Incised line and dashes:
2. Horizontal band of incised hatching in one direction:
3. Diagonal/chevron band of incised hatching in one direction:
4. Band of equally spaced incised cross-hatching:
5. Band of unequally spaced incised cross-hatching:
6. Band of incised hatching and dashes:



7. Incised herring bone band:

8. Incised herring bone line:

9. Incised herring bone with U-shaped incision between components: (cf. 65/72)

10. Band of diagonal incised hatching in two directions:

11. Band of vertical and horizontal incised hatching:

12. Vertical slashes just below the rim:

13. Punctation marks just below the rim (cf 65/72):

14. Punctation marks just below the rim with colour burnish:

15. Incised chevron, (?) cf. Badfontein:

16. Multiple bands of incised hatching - one horizontal, the others diagonal:

17. Band of dashes:

18. Uncertain - trace on sherd edge:

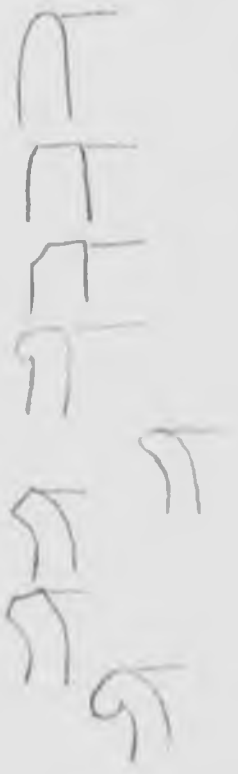
In nearly all cases, decoration is confined to the body of the pot between 3 and 10 cm. below the rim. A number of sherds are decorated on the rim, the rim punctates (13 and 14) are obvious. Four sherds with motif 2 are also decorated just below the rim.

Table VI — Decorated sherds 9/72, Site A. June excavations

Motif	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Number	23	41	-	14	6	3	1	3	2	7	2	1	3	2	3	3	1	23

Rim Morphology: Rim sherds were analysed into 12 possible variants:

1.	Straight - round	57
2.	Straight - squared	8
3.	Straight - bevelled	2
4.	Straight - beaded	34
5.	Everted - round	5
6.	Everted - squared	0
7.	Everted - bevelled	0
8.	Everted - beaded	0
9 - 12	inverted round, squared, etc.	0
	total:	106



Two peaks are visible when plotted and are easily seen in the figures. The peaks are formed by high frequencies of straight-round rims and straight-beaded rims, together, these comprise over 80% of the total. Straight rims, as a group, comprise 95%. Neither group correlates perfectly with graphite burnish or any particular mode of decoration. This is complicated by the problem of whether all burnished sherds come from decorated vessels and whether any of the so called undecorated rim sherds are from decorated pots. Certainly a large number of undecorated rims are broken just below the rim, and, if one bears in mind that decoration is usually 3-10 cm. below the rim, the possibility that, at least, some of the undecorated rims came from decorated pots is very strong; perhaps as much as 50%.

Affinities: The second assemblage described above has strong affinities with other Lowveld groups in the North Eastern Transvaal. Both shapes are found at Phalaborwa and the range of motifs is very similar. From Professor van der Merwe's description (no illustrations

unfortunately) (van der Merwe and Scully, 1971) it seems that all the motifs from Harmony are present at Phalaborwa but that the reverse is not the case. However, the assemblage of ceramic material from Phalaborwa comes from several separate sites and covers a longer range of time than that from Harmony Site A, and, therefore, the greater variety of material at Phalaborwa is to be expected. From Professor van der Merwe's comments it would appear that there are several differences, the most important of which is in rim morphology. At Phalaborwa few beaded rims are present and their place is taken by slightly everted rims. The difference is small but distinct. (See rim morphology above).

Comparisons with Eiland site 4/74 III 0-90 cm. can be made. The Eiland material virtually duplicates that from Harmony as can be seen in table VII.

Table VII

Pottery class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
Harmony:	23	41	-	14	6	3	1	3	2	7	?	1	3	2	3	3	3	23	148
Eiland:	21	24	-		69	21	1	-	-	7	-	-	-	-	-	-	-	15	171

No figures are available for pottery from Phalaborwa but van der Merwe's description (van der Merwe and Scully, 1971) indicates that the pottery assemblages from the Phalaborwa sites and Harmony must be very similar. A pot found with a burial at Ellerton Mine (Wells 1935) is difficult to place but may belong to a Venda complex influenced by Northern Sotho or originally from the south (Krige, 1937).

Mason (1968) compares pottery from the Phalaborwa site of Nareng with modern pottery he collected from Tshimbupfe in southern Vendaland. Krige makes the interesting point that Tshimbupfe Venda with some other southern Venda groups appear to have come from Holoedi traditionally situated in the Pilgrims Rest district and close to Buffelbuck Ridge where the Phalaborwa appear to have come from. (Krige 1937, Du Toit 1967, van der Merwe and Scully 1971). Common origins probably reflect the real reason why the pottery is so similar.

B. Metal artefacts

A single item of metal was recovered from square Af spit 4. It is made of copper (or an alloy). The artefact is tube shaped, made from a sheet of metal 0,62 mm. thick; the maximum diameter at one end is 4,7 mm. at the other end 3,1 mm. At the latter end is a piece of iron which is held in place by the narrowness of the tube. The length is 93 mm. The join has been smoothly accomplished and is in a quarter spiral. The function of the artefact is unknown.

C. Glass beads

Two glass beads were found near the surface, one in Aa, the other in Aj, the colours are white and green respectively, both are snapped canes.

1. Aa spit 1, ash. Opaque white glass, not perfectly cylindrical, maximum length 4,6 mm., maximum diameter 4,9 mm., perforation diameter 1,6 mm. This bead resembles fairly closely Schofield's description of Pedi white Thaxa beads (Schofield 1938, 1958).

2. Aj spit 1. Opaque olive green glass, slightly weathered. Maximum length 9,3 mm., maximum diameter 6,6 mm., perforation diameter 1,9 mm. This bead may resemble Pedi green Thaxa beads but is bigger than those measured by Schofield (1938, 1958). The beads are nothing like Venda, Mapungubwe or Zimbabwe beads (Beck 1971, van Riet Lowe 1955, Davison 1972, Schofield 1938, 1958).

D. Spindle Whorls

Two examples came from excavated deposits, the first from Ae, spit 2, the other from Aj, spit 4.

1. Ac spit 2. This example is made on a sherd with a line of cross-hatching and graphite burnish on one side. The edge has been ground smooth all round, though this did not result in a perfectly circular whorl.
Diameter: 61,1 - 57,5 mm., perforation is off-centre, 22 mm. from one edge, 32 mm. from the opposite one; the perforation is cylindrical and measures 7,[illegible] mm. in diameter.

2. Aj spit 4. This example is made of soapstone and has one flat face and one curved. Part of one edge is broken. Maximum diameter is 63,4 mm. thickness at the perforation is 15,5 mm., perforation is central and slightly conical, started from the flat side, diameter on the flat face 9,6 mm., on the curved face 7,9 mm. Manufacture was by careful chipping with an adze, the flat face appears to have been ground flat and the edge shows battering.

Two sherds, one from Ab spit 3, the other from Ac spit 3, also have a ground edge and may be remnants of two other whorls. A further soapstone whorl was picked up by one of the Koekemoer children. The whorl has a truncated lenticular section and a cylindrical section perforation. Maximum diameter is 68,9 mm., maximum thickness at perforation 14,6 mm., perforation diameter 8,9 mm. This example was polished on both faces and on the edge.

Affinities: numerous spindle whorls have been found in Iron Age contexts. Those known are restricted to Rhodesia and the Northern Transvaal and have been tabulated by Huffman (1971, table 2). Examples from Zimbabwe shown to me by the curator, Mrs. L. E. Hodges, in December 1972 are about half the size of the Harmony specimens and may have been top whorls used in a game played by youths. Ethnographically, spindle whorls are known from the Eastern Transvaal. Duggan-Cronin (1935) photographed a Pedi youth using one to spin wild cotton into thread.

E. Soapstone strainer

The single example comes from Aa spit 3. This is an apparently unshaped piece of soapstone, probably a fragment of a very much larger artefact. In its present state it has 10 unbroken perforations and traces of 4 broken ones. Perforations are slightly conical, all having been bored from the same face. The largest hole, which shows much wear, measures 6,0 mm. in diameter, the smallest, 3,7 mm. Holes appear to be placed almost at random though two lines, at right angles to one another, are apparent. A suggestion that the artefact may have been used for drawing wire can be ruled out, as the stone is very soft. It may be the perforated base of a soapstone bowl used in the salt making process, very much like those of pottery or gourd, known from Rhodesia (Reynolds 1968, H. J. B. 1940), and Zaire (Nenquin in Shinnie, ed. 1971).

F. Worked bone and bone artefacts

1. Disc bead — Seven specimens were found:

Ab spit 3	-	1 (broken)
Ad spit 2	-	1
Ac spit 4	-	5
		7

Two sherds, one from Ab spit 3, the other from Ac spit 3, also have a ground edge and may be remnants of two other whorls. A further soapstone whorl was picked up by one of the Koekemoer children. The whorl has a truncated lenticular section and a cylindrical section perforation. Maximum diameter is 68,9 mm., maximum thickness at perforation 14,6 mm., perforation diameter 8,9 mm. This example was polished on both faces and on the edge.

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1. Disc beads. Seven specimens were found:

Ab spit 3	-	1	(broken)
Ad spit 3	-	1	
Ac spit 4	-	5	
		7	

The material used is Achatina shell ? save one which is made of bone (R. G. Welbourne, pers. comm.). Only the example from Ac (of bone) is completely finished, the others have all been perforated but still have irregular edges and are of many sizes.

Ad spit 3	max. dia.	9,0 mm.	perforation dia.	2,6 mm.
Ab spit 3		12,4 mm.		2,0 mm.
Ac spit 4,a		13,7 mm.		2,3 mm.
	b	15,2 mm.		1,9 mm.
	c	14,8 mm.		2,1 mm.
	d	17,0 mm.		2,8 mm.
	e	14,2 mm.		1,8 mm.

Bone or shell disc beads are common finds on Iron Age sites. Sites include Robertsdrift 40/50 (Derricourt and Evers in press), Matendere, Nubvumi, DhloDhlo, Chiwona, Ndanga cave, Zimbabwe (Caton Thompson 1971), K2 and Mapungubwe (Gardiner 1963), Klipriviersberg (Mason 1962). (fig. 79)

2. Abraded river mussel shells:

Ad spit 3	- 1	Ag spit 1	- 4
Ad spit 5	- 1	Ag spit 2	- 1
Ae spit 3	- 1	Ag spit 4	- 3
Af spit 3	- 2	Ah spit 1	- 3
Af spit 6	- 3		

Total: 19 (complete shells and fragments)

Abrasion is restricted to the edges as if the shells had been used as scraping tools. Van der Merwe and Scully (1971) report similar examples from sites at Ihalahorwa and say that these shells are still used by potters as a smoothing tool. The use at Harmony may have been restricted to scooping salt from evaporation bowls and scraping salt adhering to the bowl away from the edge. Similar tools were found at Eiland.

3. A bone spatula was recovered from Af spit 3. It appears to have been made from part of a long bone and is broken at one end. At the other end it narrows to a rounded point and becomes much thinner.

Maximum breadth	-	28,3 mm.
Breadth at point	-	9,4 mm.
Maximum thickness	-	7,3 mm.
Thickness at point	-	1,8 mm.

In cross section it is convex on one face and slightly concave on the other. (fig. 79)

4. Two bones show abrasion marks on one edge. One is from Ad spit 2, the other from Ag spit 2. This type of bone tool is the most common found on Iron Age sites in the Transvaal. They are generally referred to as bone polishers or skin rubbers, though their use is, in fact, conjectural. (Derricourt and Evers, 1973).

5. Thirteen bones show scars indicative of butchering techniques. A phalanx, from Aj spit 2, has been perforated and split open to extract the marrow. Similar specimens also come from Robertsdrift (Derricourt and Evers 1973) and Badfontein (Evers in press).

A metapodial has been broken mesially and the proximal end has been perforated longitudinally. This may have been for the extraction of marrow. The piece comes from Af spit 6.

A tortoise carapace has a single chopmark cutting in from one edge to the central long suture. This comes from Ac spit 3.

Three long bone fragments, from Ah spit 1, Ag spit 3 and Ac spit 3, have been flaked and chopped. The last has particularly deep chop scars. A fragment of rib from Ag spit 2 was cut obliquely at one end and cut straight across at the other.

Six vertebrae (two from Ag spit 2, the rest from Ag spit 3), show chop and break marks, of which three types are discernible. The first shows scars from the separation of ribs from vertebrae, the second the separation of vertebrae from one another and the third axial splitting.

Chops and breaks on the one hand, indicate crude butchering techniques used for dividing the beast into portions, on the other hand, they show evidence that marrow was extracted, and that even the minute amounts found in the phalange were considered worth the effort of extracting. Bones were used as tools probably only as the occasion arose and these were then abandoned.

G. Animal bone foodwaste

The most important point that arises out of Mr. R.G. Welbourne's analysis of the animal bone foodwaste from the salt factory (see Appendix C.) is that the animals represented are all from wild species. Some bones are classified as cf. cattle, or cf. sheep/goat, but apparently, could just as well belong to wild species. There is no evidence to suggest that the people of this site were exploiting these animals in any systematic fashion (e.g. herding), and one must, therefore, suppose that the animals were hunted. From the minimum

number analysis, it appears that a wide variety of animals were hunted and that, of these, the large and medium sized antelope and zebra provided the biggest amount of animal protein; this was supplemented by small mammals, tortoise and giant land snail. The river mussel is not an edible species and must, therefore, have been gathered for its uses as a tool.

The lack of domestic stock is somewhat unusual for an Iron Age site (the artefacts are unquestionably Iron Age). While the ratios of domestic stock killed, to wild animals killed, varies quite considerably, domestic stock has certainly been present on every other Iron Age site known from Southern Africa. A possible explanation can be put forward.

Faunal remains from habitation sites at Phalaborwa analysed by B. M. Fagan and M. Bisson (van der Merwe and Scully 1971) are composed of 75 per cent cattle and sheep/goat and the remainder wild animals. Cattle remains have been found at the habitation site 50/74 on Harmony about 1½ Km. from the salt factory. The salt factory at Harmony has no domestic stock preserved, a fact echoed at the Eiland salt works. From this it appears that meat from domestic stock was not eaten at salt works; why? Modern ethnographic studies indicate that salt making is the prerogative of women only (Grey 1946, Witt 1966, Evers pers. observation). The men who showed me the Sautini site, where salt is made today, assured me that they would not go to the works while salt was being made. It is probable, therefore, that as salt making was so restricted to women that objects of peculiarly male rights (domestic stock) were excluded because they might have interfered magically with the salt making. Another explanation may come from the fact that salt making is a dry season activity and that domestic stock were possibly not killed at that time. That the 9/72A salt works was worked in the dry season is shown by the presence of the kudu baby which R. Welbourne assures me was ca. 6 months old when it died. Kudu, he also told me, drop their young ca. December which would mean the period of salt working was between May and July. The element of chance that the salt works at Eiland and Harmony were worked when no domestic stock was being eaten

in the village can probably safely be ruled out. At Eiland the lack of domestic stock holds true for five separate stratified salt working mounds covering three Iron Age traditions.

H. 'Daub'

The name 'daub' may well be a misnomer. What is meant by the term are numerous small pieces of irregularly shaped semi-fired mud. Some pieces, particularly from Ad and Af are mud 'fossils' of sticks, the rest are irregular. They occur in all squares and are tabulated in the table VIII by weight. They are probably the result of ant activity (cf. Shaw, C. T., 1961).

Table VIII

Weight in grammes:

Aa	-	268	Ag	-	1491
Ab	-	436	Ah	-	239
Ac	-	2941 (1949 in ash)	Aj	-	363
Ad	-	553 (523 in ash)	Ak	-	1323
Ae	-	584 (389 in ash)	Al	-	41
Af	-	1654			

Total weight: 9893 g.

The great majority of fragments come from squares with much ash: Ac - Ag and Ak. Ag has ash in patches nearly all over the unit, the plots of Af show daub principally in the west where the ash is found and the same distribution round or in ash is true for Ak. In addition all pieces have ash on them suggesting a strong positive correlation between ash and daub. The figures given for Ac - Ae are probably, therefore, typical.

What is striking is the resemblance of some of the daub to mud covered grass and twigs which have been burnt out. The daub may represent the results of ants attacking twigs and grass in the deposit incorporated during the filtering process.

I. Soapstone vessels

Fragments of vessels have been recovered from all squares. Unfortunately the vessels have only survived in a very fragmentary state, save four from Ah and one from Af. These alone allow some ideas

on shape to be drawn. Rim fragments also occur in other units but work at the soapstone bowl factory precludes any suggestion that inferences on shape could be made from them. However, a few broad conclusions can be reached.

Bowls are wide and shallow and have nearly vertical sides and curved or flat bases. From the nearly complete examples both oval and probably circular examples occur. Bowls are generally smoothed on the inside with a rubbing stone but still bear the marks of the adze on the exterior. A few exceptions to the last are known, as a number of bowls do not appear to have been prepared on the outside and one example from Ah was smoothed on the outside as well. These remarks are borne out by the study of the four complete vessels found by the resort owners at the resort and by examining broken examples at the soapstone bowl factory.

Twenty-four exterior fragments have been blackened by fire and it is interesting to note that the four complete examples from the resort all have blackened exteriors. The nearly complete bowl from Ah is another of these with a blackened exterior and the fact that it was found on top of an ash pile over a red patch of earth (probably, therefore, a fireplace), adds potency to the argument that these bowls were used on fires, probably as evaporation pans.

None of the examples from this site has a hole in the base like the one illustrated by Mason (1962), however, numerous examples have been recovered from sites across the Makhutswi. This type of bowl is traditionally linked with salt manufacture and they must have been used as lixiviation vessels. Those from site A all seem to have been evaporatior vessels, with the exception of one described below. The four bowls from Ah belong to two types as set out for examples from the soapstone bowl factory. Three are of the sub-rectangular type, the fourth is eliptical on the inside and sub-rectangular on the outside. Maximum measurements for the interiors are at the mouth, the exteriors are very irregular by comparison. Heights of vessel walls, measured from the inside, are between 50 and 150 mm.

The example from Af is clearly a platter and as such may have been used for serving meat or other food stuffs.

Finds per unit are given in the catalogue.

J. Other stone artefacts

These can be divided into six basic categories:

1. Red ochre, a small fragment was found in Ad.

2. Quartz flakes, usually found in final spits were found in Aa - Ae, Ah - Ak. They are all irregular in shape and probably belong to a previous Stone Age occupation. None shows the type of wear found on Iron Age examples from Olifantspoort and Kaditshwene (Mason, 1968).

3. Heat spalls and heat spalled stones are found in all squares. They were plotted and then usually thrown out. They were presumably fire stones and were all derived from river stones.

4. Unspalled river stones. Some are undoubtedly fire stones, others show evidence for use as grinders or polishers. The grindstones are not common and are recognisable by a well defined, smooth, flat surface on an otherwise curved rock. Part of a lower grindstone was recovered from Ag spit 3.

5. Two types of hammer stone were noted. One, made of quartz, with a lenticular section, has batter marks round the edge. The other, a diabase spheroid, has two adjacent incipient dimples in a manner reminiscent of those from the copper mine.

6. Nodules of a variety of rocks, in particular quartz and granite appeared in the excavations. Neither of these materials occurs in the immediate vicinity of the site and, therefore, must have been imported. One of these, from Ad, contains mica and may have been derived from the copper mine.

Individual finds are catalogued.

5. Finds, April excavations

No additional types of finds were made during the test excavations and, therefore, finds are merely catalogued.

6. Site A as a salt manufacturing site

The interpretation of Site A as a salt making site is based on several pieces of circumstantial evidence which together make a substantial case.

1. The site is located within 400 m. of a mineral spring and within 600 m. of a group of sites on the opposite bank which are traditionally regarded as being the major centre of salt manufacture on this part of the farm.

2. On the south bank, salt appears on the surface after the rains, in a manner very like that at Eiland, an undoubted salt making site. The chances are that at some time in the past, this

phenomenon also occurred on the north bank not far from site A. The spring is on the north side of the river.

3. Soapstone bowls are present at all known salt producing sites in the Eastern Transvaal Lowveld, they are rare at habitation sites. These resemble, very closely, those found at Harmony. It is, therefore, not unreasonable to suppose that they fulfilled the same purpose.

4. The deposits at Harmony and Eiland are virtually identical, especially with regard to ash lenses and artefacts, apparently trodden into the mud as they were broken and lixiviation took place.

5. The soapstone strainer found in Aa spit 3 is of a type related to those connected with salt production in Rhodesia, though the raw material is not the same.

6. Ash piles at site A are too numerous and too haphazardly scattered to represent the remains of a normal Iron Age living site.

7. The lack of domestic animals, the small size of the mound, the small number of soapstone vessels and of pottery containers and finally the thickness of the deposit suggest a fairly shortlived occupation. This coincides neatly with ethnographic and historical evidence which states that salt is produced during a limited period of the year.

7. Other sites in the salt factory area

1. Area D. In May 1972 three isolated soapstone bowls were uncovered during dam building operations. Further excavations and probing in July failed to reveal any other artefacts.

2. South bank of the Makhutswi river, east of the Kuanyane confluence. A number of mounds were discovered on an exploratory tour of this part of the south bank. Mounds 2-4 and 9 have a scatter of pottery and soapstone on the surface very like that found at site A. Mound 3 has a series of piles of mud and pebbles that may be the remains of huts, but which are probably dumps of salt leached soil.

Mounds 5-8 and the immediately surrounding area has a scatter of pottery of a markedly different sort, related to ware found on Mr. Klapwijk's farm at New Agatha. Pottery from both sites bears

a very strong resemblance to the Early Iron Age Kwale ware from Southern Kenya (Soper, 1967). The site at Harmony has been given the number 65/72 and was investigated fully in January 1973 (Evers 1973).

3. South bank of the Makhutswi river, west of the Kunyane confluence. Two sites were noted with ash, soapstone and some plain body sherds. The ware of the sherds is the same as that from site A.

4. On the low ridge to the north of site A, two smelting sites have been reported. One was destroyed several years ago, the other was shown to me in October 1971 but I failed to re-locate it for excavation owing to the very heavy undergrowth resulting from the good rains during the summer of 1971-1972.

V CONNECTIONS BETWEEN THE THREE SITES

Direct connections between the three sites are, at best, tenuous, though those between the salt factory and the soapstone bowl factory appear to be good. Much may be clarified when the results of the C^{14} determinations from the copper mine and the salt factory are known. In May 1974 a habitation site was found that relates to all three industrial localities.

1. The copper mine - salt factory

Unfortunately, few common objects were found at these two sites. Two decorated sherds are known from the copper mine and smelting sites, both fall within the range found at the salt factory.

At both sites animal bone foodwaste was recovered. In both cases all bones were found to be of wild species but samples are small, and the correlation meaningless.

The single metal find from the salt factory is made of copper, or a copper alloy. Copper is, however, readily obtainable in the Lowveld and the source need not necessarily be the Harmony copper mine.

On the basis of the above evidence, no real conclusions may be reached. N. J. van der Merwe (van der Merwe and Scully, 1971) has shown that the pottery of the Later Iron Age in the Lowveld has a very long history, ca. 1 000 years. However, the same population group may well have worked both sites.

2. The copper mine - soapstone bowl factory

No direct relationship can be postulated. No metal tools have been found at the soapstone bowl factory, no soapstone artefacts have been found at the copper mine. In any case, in the event of the latter state occurring, there are two sources of soapstone closer to the mine than the main soapstone outcrops. (see fig. 1).

3. The salt factory - soapstone bowl factory

Relationships between these two sites are unquestionable. Not only are soapstone artefacts and vessels found at both sites but the typology of vessels is very similar and the evidence for the manufacturing process shows that the same techniques were used.

The main and subsidiary bowl making sites are the closest to the salt factory by several miles and occasional finds of bowl fragments have been made between the two main sites.

4. Habitation site - industrial sites

During the trip made to re-excavate the copper mine tailings I was shown a locality with ash, querns, rubbers and slag on the surface. A close examination revealed soapstone bowls, daga and copper ore. Test excavations were carried out at two localities, 50/74A and B at both of which small areas of daga floor were uncovered. On the floors was pottery identical to that found at the salt factory excavations 9/72A, upper and lower grinding stones, charcoal, soapstone, copper ore, one small piece of slag and a cattle tooth. I was able to map the area roughly and found that the archaeological occurrences were in a roughly oval ring about 80 m. long and 50 m. wide. The site is to be excavated when time and funds permit. The importance of the site is obvious; it contains remains indicating contact or possible contact between it and the three industrial sites: ore from the copper mine, soapstone bowls from the soapstone bowl factory and pottery identical to that excavated from the salt factory. The habitation site also has soapstone bowls in common with the salt factory.

The position of the habitation site is also interesting in that it is roughly midway between the three industrial sites:

1,6 Km. from the salt factory

1,9 Km. from the soapstone bowl factory

0,9 Km. from the copper mine.

The three measurements were taken off an aerial photograph supplied to the owners of the Kampvuur Vakansie-oorde by the South African Trignometrical Survey. I walked the distance between the salt factory and the habitation site. The walk through dense bush took me forty minutes and could have been accomplished a great deal faster during Iron Age times owing to path networks undoubtedly set up by the members of the community.

This information allows me to conclude that all three industrial sites are well within the exploitation territory of the habitation site as defined by Higgs, Jarman et al[1], a fact amply confirmed by the finds at 50/74 documented above. It does not necessarily mean that the community living at 50/74 were exploiting the industrial sites throughout their

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1) Higgs and Vita Finzi 1972, Vita Finzi and Higgs 1970, Jarman 1972

period of productivity. The lack of radiocarbon dates gives no time depth to the archaeological data recorded from Harmony. This is all the more unfortunate as N. J. van der Merwe (Stuiver and van der Merwe 1969, van der Merwe and Scully 1971) has demonstrated the long time depth of the Phalaborwa culture (VI 1 C) to which these sites are clearly related.

VI HARMONY, THE ARCHAEOLOGICAL AND HISTORICAL CONTEXT OF THE INDUSTRIAL SITES

1. The archaeological background; the Iron Age of the Eastern Transvaal

As far as work to date is concerned the Eastern Transvaal can be divided into two regions:

1. the north-eastern Lowveld, bounded to the west by the line of the Drakensberg, to the east by the Lebombo, to the north by the Letaba River and to the south by the line of latitude 24° 30' S. This is an arbitrarily defined area and reflects the distribution of archaeological research up to 1974.

2. The Eastern Transvaal escarpment zone near Lydenburg, bounded by the line of the escarpment in the east, the Komati River in the south, the Steelpoort River in the west and the Spekboom River in the north. This is again an arbitrarily defined area.

The escarpment zone north of the Spekboom River and the Lowveld zone south of 24° 30' S. are archaeologically unknown. This is especially unfortunate as it is from the latter zone that some of the north-eastern Lowveld tribes are believed to have come.

1.A The north-eastern Lowveld

Archaeological research has been largely confined to the farms surrounding the modern town of Phalaborwa (Schwellnus 1937, Hall 1912, Trevor 1912, More 1974, Stuiver and van der Merwe, N. J. 1968, van der Merwe, N. J. and Scully 1971, van der Merwe, D. S. 1937, Mason 1962, 1965, 1967, 1968b). Concentration of work has been on mining and metal working though more recently N. J. van der Merwe has been engaged in excavating habitation sites in addition to metal working sites. Elsewhere in the north-eastern Lowveld ork has been more scattered; Bates, 1947, wrote a preliminary description of salt works at Eiland which I subsequently dug in January 1974, he also described smelting sites, a shell midden and Stone Age sites from adjoining farms. The pottery Bates described includes all three Iron Age traditions recognised at the Eiland salt works in the January 1974 excavations. Van der Merwe, D. S. (1937) also described mines and smelting sites on the farm Maranda adjoining the Leydsdorp town lands. Wells (1935) described a grave with cloth, pottery and copper

ornaments from Ellerton mine. The cultural affinities of this burial cannot be determined at present but probably belong to the Phalaborwa tradition. Klapwijk, M. (1973, 1974 and pers. comm.) has a fine range of archaeological material from the district, principally from near Tzaneen. On his own property he has excavated two sites, one belonging to the Early, the other to the Middle Iron Age.[1] These are discussed below.

So far, archaeologists have recovered remains of three Iron Age traditions in the north-eastern Lowveld:

1. An Early Iron Age tradition called (for the purpose of this discussion) the 'Silver Leaves tradition' after the name of M. Klapwijk's property where a habitation site with this pottery was first found. Remains of the tradition have subsequently been found at Harmony 65/72, Eiland 2/74, 4/74, 6/74 and at Landraad near Gravelotte. A single sherd representing the tradition from the Limpopo Mouth in the Department of Archaeology collection.
2. A Middle Iron Age tradition, referred to here as the 'Eiland tradition', has been found at Eiland and Silver Leaves (Klapwijk, 1973) and resembles M3 pottery from Mapungubwe (Fouche 1937, Klapwijk 1973).
3. A Later Iron Age tradition called by van der Merwe the Phalaborwa Culture, referred to here as the 'Phalaborwa tradition' to maintain terminology, (van der Merwe and Scully 1971). Most of our information on the north-eastern Lowveld Iron Age is ascribable to this tradition and it is in this tradition that the Harmony sites can be put.

1.A (i) <u>The Silver Leaves tradition</u> The sites referred to above fall into two classes: a habitation site represented by the type site, Silver Leaves; salt works represented by Eiland, Harmony 65/72 and Landraad. There are some differences in the pottery assemblages which can probably be referred to differences in activity and age.

At Silver Leaves the archaeological material was dug out of pits exposed in a road cutting. Finds include pottery, slag, charcoal and ash, suggesting that the pits were used as rubbish disposal. The vessels are of two shapes, flaring necked jars and inturned bowls with simple dentate stamp decoration and bevelled or fluted rims. The occurrence has been dated in Pretoria as follows: Pta - 901 1680 ± 55 B.P. (A.D. 270) and Pta - 914 1620 ± 50 B.P. (A.D. 330) (Klapwijk 1973).

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1) See definitions

The Harmony 65/72 and Landraad occurrences are surface features with weathered pottery all falling into the class of jars. Decoration is made with a single stylus as it probably is also at Silver Leaves (personal observation) and occurs in two places, in a line just below the rim and in spaced groups of diagonal lines from the shoulder to the belly. The latter may also be done by broadline incision. Very few bevelled or fluted rims were seen (Evers 1973). At Eiland immense concentrations of sherds (± 1300 per m^3) from jars were found in ash piles often stratified below Eiland and Phalaborwa tradition levels. Jars are essentially similar to those from Harmony 65/72 with minor differences in decoration (e.g. two lines of punctates below the rim) and some graphite burnish. Discussion between Klapwijk, Huffman, T. N. and Evers in October 1973 brought a consensus of opinion that the Harmony 65/72 sherds were probably slightly later than the Silver Leaves occurrence and may date to about 600 A.D. This could also apply to Eiland. The lack of bowls from Harmony 65/72 and Eiland may reflect the specialist activity at these sites. An interesting find, made both at Eiland and at Harmony, was sherds in very small quantities identical to sherds found at the Lydenburg Early Iron Age site 57/73 (see section 1.B (1)). This should suggest some trade connection (pots for salt?) and is discussed in section 1.C.(ii) below.

Affinities for the Silver Leaves tradition can only be given broadly. There are resemblances in the pottery between the Silver Leaves tradition and that at Kwale (Soper 1967), Nkope (Robinson 1970), Broederstroom (Mason 1973, 1974a, 1974b) and K2D ware (Schofield 1948). There is possibly also some resemblance to Beaumont's Castle Cavern pottery dated to A.D.400 (Beaumont and Vogel 1972). Resemblances probably reflect common origin for all the traditions mentioned rather than derivation of one from another. An interesting feature is the easterly distribution of these traditions in Africa though attempts to link this with Bantu linguistics are probably premature at this stage.

1.A (ii) The Eiland tradition This tradition is very imperfectly known; the information is derived from a small test excavation on Silver Leaves (M. Klapwijk 1973) and from my own excavations at the Eiland salt works. The Silver Leaves site produced pottery and charcoal which gave a date Pta - 911 850± 50 B.P. (A.D. 1100). An examination of pottery from Silver Leaves and Eiland by Klapwijk and Evers in January 1974 showed that the two are indistinguishable. At Eiland a large stratified sample was recovered from trench 4/74 III 90-145 cm. and contained pottery and animal bone foodwaste. R. G. Welbourne's report on the foodwaste shows that all the animals were wild and parts of the body analysis demonstrates convincingly that all food was brought to the site. The pottery is still being analysed but appears to consist of slightly carinated deep bowls and pots with wide mouths and no necks. Decoration is above the carination and consists of several motifs which are not mutually exclusive:

1. hatching either on the rim or as a chevron pattern below the rim;
2. an irregularly horizontal incised line scored with gashes;
3. herring bone designs in bands, segments of circles or in panels.

The last is most skilfully done and is apparently the most common form on preliminary analysis. Affinities are with M3 ware from Mapungubwe (Fouche 1937) and with sites on the Central Plateau near Potgietersrus (Mason pers. comm.). Some features like the carination and the segment of circle design are reminiscent of Tonga pottery near Sodwana Bay in Northern Natal (R. Gaisford, pers. comm.).

1.A (iii) The Phalaborwa tradition This tradition is by far the best known in the Iron Age of the north-eastern Lowveld largely owing to the work of N. J. van der Merwe (van der Merwe and Scully 1971, Stuiver and van der Merwe, N. J. 1968), Mason (1965) and Evers (excavations at Harmony and Eiland); and to the pioneer work of Schwellnus (1937), D. S. van der Merwe (1937), Bates (1947), Hall (1912) and Trevor (1912). N. J. van der Merwe's definition of the Phalaborwa Culture is confined to an area within 13 miles (21 Km.) of Phalaborwa, in which area all slags and ores appear to be derived from the Phalaborwa mines. My definition of the Phalaborwa tradition is wider than this and is taken to include all sites in the north-eastern Lowveld with pottery, furnace types and habitation sites

similar to those described by van der Merwe (van der Merwe and Scully 1971) from Phalaborwa. My definition does not have the tribal connotations specified in that of N. J. van der Merwe. The Phalaborwa tradition has five types of site associated or probably associated with it; these are habitation sites, mines, smelting sites, salt works and soapstone bowl factories.

1.A (iii) a. Habitation sites The koppies at Phalaborwa, the Black Hills at Eiland and the Harmony investigations have produced evidence of habitation. At Eiland two huts have been excavated; at one the floor was only very patchily preserved and remains of pottery (a single vessel of M.1 type (Fouche 1937))and animal bone food waste were recovered. At the other hut, preservation of the daga floor was much better and evidence was recovered to show a central fire bowl and pole and daga walls, much like those described for Phalaborwa (van der Merwe and Scully 1971). Only tuyeres were found in the hut and their relative position suggests that the structure was used as a forge for the iron produced at the nearby furnace. The cultural status of this village is in doubt owing to the lack of pottery.

The Harmony settlement is again not fully excavated but appears to be oval in shape with the central area clear. The presence of slag and copper ore suggests that smelting was carried on at the village.

N. J. van der Merwe's excavations at Phalaborwa (van der Merwe and Scully 1971) have provided the greatest amount of evidence. Settlements occur in two ways both associated with koppies. One type is found on terraces on the lower slopes of koppies, generally one hut per terrace. The other occurs round the base of koppies on open ground. In both cases huts are small 7 - 10 ft. (1,2 m. - 3 m.) across, with a central firebowl set in the daga floor and pole and daga walls. Associated with huts are pottery, animal bone foodwaste, metal objects and grinding stones. Glass beads occur with the terraced sites and are apparently nineteenth century in date. The sites on open ground have no glass beads and dates from Kgopolwe III suggest an early date ca. 1000 A.D. Faunal remains analysed by

M. Bisson and B. Fagan show that cattle and sheep/goats were important accounting for about 75 per cent of the assemblage, the remainder is composed of antelope, zebra and small animals. Smelting sites are generally away from but nevertheless close to villages and van der Merwe (van der Merwe and Scully 1971) suggests this may merely have been because it was desirable to keep the heat associated with smelting away from the huts.

1.A (iii) b. Mining Mines have been reported from a number of places in the north-eastern Lowveld (Trevor, 1912, Hall 1912, Schwellnus 1937, Mason 1965, D. S. van der Merwe 1937, N. J. van der Merwe and Scully 1971, Stuiver and van der Merwe 1968 are the most important). All authorities feel that the Phalaborwa occurrences (farms Loole, Wegsteek, Schiettocht in particular) are by far the most extensive and the most important. Other centres in the Lowveld appear to have been at Gravelotte (More 1974, Bamford pers. comm.) and Leydsdorp (D. S. van der Merwe 1937) with scattered mines elsewhere (Trevor 1912) among which Harmony may be included. All mines reported, with the exception of those on the farm Maranda near Leydsdorp (D. S. van der Merwe 1937) are copper mines, those on Maranda were gold. Only those at Phalaborwa, however, have been at all adequately described. Mines described by Hall (1912), Trevor (1912, Mason (1965) and van der Merwe (1971) fall into four types: open cast, open stope, adit and shaft and drive and/or underground stopes. Figures for relative frequency are not available and as Lolwe, the chief hill with mines, has now been destroyed, no figures of this sort will ever be available. All authors refer to the great numbers of mines present and to their great size. Few seem to have been deeper than 20 ft. (ca. 6 m.) though this is probably an underestimate, as some have been found as deep as 70 ft. (ca. 23 m.) (van der Merwe and Scully 1971). Shaft diameters appear to have been as small as 20 in. (0,50 m.) which is considerably smaller than that at Harmony where measured examples were over twice as big. In all cases where copper mines have been found in the Lowveld the ores were the copper carbonates, azurite and malachite,and in all cases ore was removed in two ways;

by fire setting and with the use of an iron gad and a stone dimple faced hammer.

Comparisons with gold, iron, tin and copper mining in the Transvaal, Botswana and Rhodesia (Baumann 1919, Trevor 1912, Mason 1962, Steel 1974, Hanisch 1974, Stanley 1910, Summers 1969, Evers and van den Berg 1974) show that the Phalaborwa complex contains all types of mine except alluvial workings which are restricted to gold in any case. It appears that the type of working relates more to geological features of each occurrence rather than to cultural ties. Summers (1969) who describes mines from Rhodesia, Botswana and Messina has divided his mines into three classes:

Class 1 A open stopes + occasional shafts
Class 2 shafts and underground stopes
Class 3 alluvial workings.

From the detailed descriptions of individual Rhodesian mines (Summers 1969) and those from Phalaborwa (Hall 1912, Trevor 1912, More 1974, van der Merwe and Scully 1971) in most cases only the ore body was removed, creating stopes as narrow as 50 cm. Open stopes are always associated with near vertical ore bodies; shaft and underground stope systems are not. Thus at Umkondo (Summers 1969) the ore body was nearly horizontal; at Harmony the vein of copper bearing rock dips at ca. 50°. At Phalaborwa the situation must have been more complex and from mine classes one can reconstruct ore body occurrences as: narrow vertical bands or streaks worked by open stoping, nearly horizontal occurrences near the surface worked by open casting, deep nearly horizontal occurrences worked by adits or by shafts and drives or by shafts and round underground stopes. Miners were obviously able to cope with numerous different types of geological occurrence.

A second point of comparison which shows the very wide distribution of similar techniques is the fact that in all Transvaal and Rhodesian mines studied in detail, fire setting and/or iron gads and dimple face hammer stones have been found. Timbering has been found in a wide variety of contexts - Harmony, Umkondo, Gladstone Mine (Summers 1969) are examples.

A find of a branch of Euphorbia ingens in a working at Phalaborwa led More (1974) to suggest that branches of this tree were used as torches as suggested by van Warmelo (1940).

The finds of female and male skeletons in mines (e.g. Aboyne and Umkondo mines (Summers 1969)) are another pointer that van Warmelo's account of the copper mines of Musina (1940) has great technical and some social relevance to Iron Age archaeology.

1.A (iii) c. Smelting sites Two types of smelting site occur in the north eastern lowveld. Van der Merwe feels that one was used for copper smelting, the other for iron. Kusel (1974, n.d.) disputes this saying that slag from one example of the copper furnaces was shown to have no trace of copper on analysis. His assertion of iron as being the metal worked is not supported by supplying the analysis table. This is important as copper slags contain appreciable quantities of iron but generally considerably less than an iron slag; the iron content of copper slag is in the order of 0 - 30 per cent; for an iron slag it is generally over 50 per cent (H. Friede, pers. comm.).

The Harmony smelting sites fall into van der Merwe's copper smelting class, a class first described by Schwellnus (1937). Furnaces are small, ca. 0,40 m. in height and diameter, with a single tuyere entrance. There is tendency for the base to be larger than the top and for the structure to be built at least partly below the surface. Both of these features are recorded at Harmony (viz. the depression in front of C VI) and also occur at Thalaborwa (van der Merwe, N.J., pers. comm.). Few examples of this type of furnace have been found and this is probably due to their small size and their partial burial. The amount of slag near the examples at Harmony suggest that they were used once only.

The iron smelters are much bigger, often over 1,0 m. in diameter, have three slit-like tuyere entrances running nearly the full height of the furnace as at Mareng (Mason 1965). The sides between the tuyeres appear to have been banked up and the furnace was also partly dug into the ground. This has two functions, to act as insulation and to prevent the clay walls from cracking too much. The floors are either of clay or natural soil and slope in towards the centre where a medicine hole is located. An interesting example with funnel shaped tuyere entrances was excavated near the Black Hills habitation site 7/74 at Eiland in January 1974. This furnace type is

widely distributed in the Lowveld from Phalaborwa to the Zoutpansberg (Kusel 1974, n.d.) and is often referred to as a Venda furnace. The ephithet 'Venda' may be a misnomer as the distribution of the furnaces extends far south into Sotho country and Krige (1937) points out that some of the Venda clans particularly in the south of Vendaland are of southern and possibly Sotho stock. The furnace type may have been carried from south to north by these clans who became absorbed into the Venda tribe. Apart from this there is sufficient diversity in furnace types in the Transvaal to suggest that classes have cultural significance. Unfortunately, to date there is insufficient data for direct conclusions. The only two remotely well studied areas are the north-eastern Lowveld (Schwellnus 1937, Mason 1965, Kusel 1974, n.d., van der Merwe and Scully 1971, Bates 1947, Stuiver and van der Merwe 1968, D. S. van der Merwe, 1937) and the southern and south-western Transvaal (Mason 1971, Mason 1962, Mason 1972[1], Kusel 1974, n.d.). The two areas have different furnace types from each other and are culturally separate though related broadly.

1.A (iii) d. Metal work Metal work is not well published in this part of Africa with the exception of some hoes described by Klapwijk (1974) and some metal objects illustrated by Mason (1962).

N. J. van der Merwe (1971) lists from his excavations at Phalaborwa arrows, spears, gads, chisels, adzes, hoes and small tools that were made in iron and are more common than copper objects in the form of wire, beads, bracelets or the lerale or copper currency rod. Only one copper object was found at Harmony (Chapter IV 4. B); Wells (1935) mentions that the woman in the Ellerton Mine burial had masses of coiled copper wire anklets on the legs. Klapwijk (pers. comm.) has skirts made of bent copper beads collected from Modjadji's kraal and suggests that they may have been heirlooms. One thing is certain and that is that copper appears to have been used for personal adornment and for exchange purposes in the form of Marale and possibly also as wire (cf. Rhodesia, e.g. Garlake 1973). Iron also seems to have been used for exchange, generally as hoes (Schwellnus 1937, Lindblom 1926, Paver 1933, Klapwijk 1974).

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1) in Die Vaderland, 23rd November, 1972

Schwellnus (1937) mentions a find of a hoard of iron hoes bunched together in fives, the exchange unit, in the Northern Transvaal but does not give further details. Metal working also appears to have regional and possibly cultural ties as shown by Mason's comment on hoes from Louis Trichardt district which are distinct from north-eastern Lowveld examples (Mason 1962) and equally distinct from those on the escarpment near Lydenburg (Evers excavations 1971-3). Shape classification and trace element analysis of slags, ores and metals should enable a worker to set up trade patterns.

1.A (iii) e. Saltworks Only two salt works have been excavated though other examples are known. The excavated sites are Harmony 9/72A and Eiland 1/74, 2/74, 3/74, 4/74, 6/74. Other reported sites include Landraad (van der Merwe, N. J. pers. comm.), Rhoda (Mason 1962, van der Merwe, D.S. 1937), Loole (Schwellnus 1937, Mason 1962) and Sautini (Witt J. 1966, Kusel, pers. comm., van der Merwe, pers. comm., Evers personal observation). The two excavated sites show a remarkable number of similarities and some of these can also be seen at the un-excavated sites. Points of similarity include the deposit (a mixture of sand and clay or silt with lenses of sandier material and of ash); the presence of soapstone bowls, the faunal assemblage including no domestic animal remains and at Eiland, where a skeletal part analysis was undertaken, only certain parts of the body; the distribution of remains in the deposit seemingly random except that at Eiland hearths were distinguishable.

Much of the above can be explained by reference to published accounts of salt making (Junod 1927, Witt 1966) and to observations made by Kusel and van der Merwe (pers. comm.) at Sautini which were confirmed by my examination of recently abandoned filters and hearths there in January 1974 (see fig. 86).

The important features of salt making at Sautini are as follows:

1. Salt making is done by women only.
2. Women come daily from surrounding villages bringing food and utensils with them. They never sleep at the site.
3. They make sacrifice to ancestral spirits at a special place, in this case at a dead Marula tree (Sclerocarya caffra), which consists of food and drink placed on sherds and firewood.

4. They make a filter out of Mopane (Colophospermum mopane) stakes, withies and bark into which grass and a sun dried clay funnel is placed.
5. Salt is scraped off the surface together with clay and is mixed with sand to aid the filtering process. This mixture is placed in the filter, a pot is placed underneath.
6. Fresh water obtained from the river is poured over the sand/salt/clay mixture until the water pouring through the filter is no longer salty. This may be repeated several times until the brine is clean. The leached sand/clay mixture is dumped round the filter and builds up a mound.
7. The brine is boiled down in pots on a nearby fire until most of the water has been driven off. It is then removed, the salt is scraped out and made into cakes which are then allowed to bake in the sun or are lightly fired to give them a hard outer crust for easy transport.
8. Nowadays salt is not made for normal use but is widely traded over the Lowveld for ritual purposes.
9. A tithe of the salt is paid to the chief who owns the salt works in recognition of his ownership.
10. Broken pots and animal bone foodwaste are left lying around and mixed up with the mounds of filtered soil.

Junod (1927) records variations in the filter whereby a pot with a specially made hole in the bottom is placed on a frame like that described above. Grass is laid over the hole and filtering proceeds as before. This may be reflected on t outhern bank of the Makhutswi River at Harmony where soapstone bo deliberately perforated in the base have been found. Junod also reco that the ashes of certain grasses and compositae are filtered for sal in the same way as saline earth but that this salt is only used when other sources are not available.

The archaeological finds at Harmony and Eiland salt works fit the ethnographic model neatly. The lack of habitation remains at both sites is in accordance with daily visits, as is the distance between the village and the salt works at Harmony. The faunal assemblage from Eiland and probably also from Harmony is in complete accord with portions of meat

being brought to the site for consumption rather than with animals having been killed and butchered at the site. The distribution of sherds and ash piles or hearths at the two archaeological sites agrees with that noted at Sautini; and finally the deposit found at the sites is identical with that at Sautini. At Eiland mound-like stratification is observable but this was not the case at Harmony where deposits in any case are only one third as deep as those at Eiland or Sautini. The size of the mound made in one season's salt making at Sautini shows too that depth of deposit is no criterion of great length of occupation at archaeological salt works.

Salt undoubtedly played an important part in internal trade during the Iron Age as good salt deposits are few in South Africa as they are in Central Africa (Fagan 1969a, 1969b) and in West Africa (Davidson 1963, Bovill 1970).

1.A (iii) f. Soapstone bowl factories In addition to the soapstone bowl factory sites on Harmony 2/4 (Chapter II) only two other factory sites have been recorded, though neither has been visited by myself. Mason (pers. comm.) and More (1974) mention a factory site on Sheila 10. KU; Mason's photographs show it to be essentially similar to that on Harmony. Mr. G. Catto (pers. comm.) told me of another factory site on Kondowie 741 LT, 17 Km. from the salt site at Eiland. The Sheila site is close to both the Rhoda 9KU and the Loole salt works and must stand in much the same relation to them as the Harmony sites to each other. In all cases wood working techniques like those described for Harmony appear to have been used (cf. Mason 1962). Soapstone bowls appear to be very closely connected with salt production (Mason 1962). Van der Merwe (van der Merwe and Scully 1971) record no soapstone objects from habitation sites, none were found at the Eiland Black Hills 7/74 site and only three at Harmony 50/74 village. At the salt sites, however, finds of soapstone are numerous.

1.A (iii) g. Burials Few burials have been recorded in the north-eastern Lowveld. D. S. van der Merwe (1937) and Scully (van der Merwe and Scully 1971) record Sealeng hill as the royal burial place for the Phalaborwa chiefs. No excavations are permitted and no details are therefore available. Wells (1935) describes the burial of a young

woman and foetus from Ellerton mine. The body had copper anklets, woollen (?) cloth preserved in contact with the copper, pottery and animal bones associated with the grave. The pottery is difficult to attribute to any group, but the known association of extensive copper workings with the Phalaborwa tradition suggests attribution to this tradition. The skull showed the young woman to be predominantly 'Bantu' with an admixture of 'Bush-Boskopoid' ancestry suggesting that the individual falls within the range of the South African Bantu speaking Negro. Glass was also associated and indicates a relatively late date.

At Harmony 33/74 a pot burial was exposed during the construction of a reservoir. The pot is a typical Phalaborwa tradition vessel, with a hatched band just above the belly, and was covered with a lid. Inside was an infant tentatively aged by tooth eruption by R. Welbourne to be about six months old. The find was made in May 1974.

1.A (iii) h. Dating Dating of the Phalaborwa tradition is of immense importance for several reasons. Firstly, the available dates suggest a long time range of ca. 1000 years for the tradition. Secondly, the descendants of the Phalaborwa tradition communities still live in the north-eastern Lowveld today and some oral tradition has been gathered (e.g. Krige 1937, van Warmelo 1944, Du Toit 1967, van der Merwe and Scully 1971). Quite how far back the oral tradition can be pushed is extremely important and will be discussed later. Thirdly, questions of internal exchange and trade with foreigners on the East Coast can be raised and the time depth possible for this must be discussed.

Table IX gives the published radiocarbon dates for the Phalaborwa Culture.

Table IX

Site	Laboratory reference	Radiocarbon years B.P.	error ±	Calendar years A.D.	Association
Kgopolwe III	Y 1662 •	820	80	1130	hut floor
	Y 1639 •	850	60	1100	hut floor
	Y 1637 •	910	60	1040	hut floor
	Y 1638 •	990	80	960	hut floor
Loolekop	GrN 4215•	160	30	1790	adit mine
	Y 1635 •	950	60	1000	mine shaft with circular chamber
	Y 1636 •	1180	80	770	mine shaft with horizontal gallery
Harmony	RL 207	690	90	1260	copper mine tailings
Molotho	Y 1661 •	60	120	1890	copper furnace
Nareng	GrN 4928 ••	110	25	1840	iron furnace
	Y 1767 ••	160	60	1790	iron furnace
Kgopolwe IV	Y 1658 •	280	60	1670	iron furnace
	Y 1657 •	520	60	1430	iron furnace
Tshankare	Y 1766 ••	290	80	1660	iron furnace
	Y 1769 ••	90	60	1860	iron furnace
	GrN 4929 ••	110	40	1840	iron furnace
Matsepe	Y 1660 •	80	60	1870	iron furnace
Harmony 9/72A	RL 206(1)	320			salt works

Notes

(1) A further sample from this site has been submitted, for which a date is still awaited.

• Source - Stuiver and van der Merwe 1968.

•• Source - Derricourt, R. M. 1973, derived from Fagan, B. M. 1969 Radiocarbon dates for sub-Saharan Africa VI J. Afr. Hist. 10:149-169 Harmony dates are otherwise unpublished.

Additional sources of dating from archaeological sources are scanty:

1. van der Merwe (1971) states that some of the terrace habitations at Phalaborwa have glass beads of nineteenth century date and that he does not expect dates for terraced sites to go back further than one or two centuries.
2. The association of M 1 pottery with the Eiland Black Hills habitation site 7/74 suggests a date of ca. 1400 for the site and for the nearby iron furnaces.
3. The glass remains from the Ellerton burial (Wells 1935) suggest a post 1800 date.

The above evidence shows some important lacunae. Villages date to ca. 1000 A.D. and ca. 1800 A.D. Copper smelting furnaces to the nineteenth century, mines to before 1300 and after 1750, iron smelters from 1400-1900. The gaps undoubtedly reflect the type of distribution of dates that can be expected with so few readings. The dates for copper mining and for the copper furnace suggest that copper working was carried out probably for the whole period 1000 A.D. - 1850 A.D. contemporarily with iron smelting; the combination of all dates shows the north-eastern Lowveld to have been occupied presumably continuously from ca. 1000 to the present by a population that is essentially the same as the present day one.

Date Y - 1636 for the Loolekop mine is undoubtedly too early for the Phalaborwa Culture as it stands. There are two possible reasons for the high reading; firstly that the date is correct and refers to Early Iron Age mining presumably by the Silver Leaves Tradition population. This is not too far fetched as copper has been recovered from Early Iron Age contexts in the Transvaal, at Lydenburg (von Bezing and Inskeep 1966) and Broederstroom (Mason 1974) both dating to ca. 500 A.D. (Inskeep 1971, Mason 1974a, 1974b). Secondly the date may have been done on wood much older than the working of the mine. Scully (1971[1]) records that wood from two types of hardwood trees Mokhwalo (? Acacia nigrescens) and Mususu (? Combretum imberbe) are used for making charcoal for smelting. It is equally possible that they were used for fire setting. Both are fairly slow growing, particularly the latter, and both resist weathering markedly when dead. It is therefore quite possible that the date recorded is ca. 200 years too early. The same criticism may be levelled at any of the mine dates, the furnace dates and possibly even the village dates. Nevertheless the present radiocarbon record implies an

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1) with N. J. van der Merwe

impressively deep timescale for the Phalaborwa tradition. The date for the Eiland tradition at Silver Leaves requires comment in the light of the Phalaborwa dates. Either the Phalaborwa dates are too early or there was some considerable overlap between the two traditions lasting as much as 1-200 years. On examining the oral tradition (van der Merwe and Scully 1971, Krige 1937, Du Toit 1967) on arrival the BaPhalaborwa had to fight for possession of their present location. Whether this oral tradition can be pushed back as far as 1000 A.D. is debatable but Scully is not pessimistic.

It is difficult to place the Harmony sites in the scheme presented. The A.D. 1260 date for the mine is a single date and susceptible to all the sources of error for single dates. The indeterminate date, RL 206, suggests a date ca. 1600 or earlier for the salt site. All three industrial sites by their nature could have been worked over a considerable time period, perhaps as much as two or three centuries of intermittent exploitation. The village 50/74, however, does not have the amount of surface indications that would suggest long occupation. Two possible models can be postulated from this:

1. That the sites were in fact worked heavily for a short time period, perhaps 20 years, by the community inhabiting site 50/74. When the copper mine was exhausted the community moved away.

2. That the industrial sites were exploited more intermittently over a much longer time period, possibly measurable in centuries, but that the community exploiting them moved to new village sites close by now and again.

Neither hypothesis can at present be proved and on the basis of purely archaeological evidence neither seems the more likely. However an old man, Aaron, about 65-70 years old, employed by the Kampvuur Vakansie-oorde Bpk., told me that when his grandfather was a boy, Unit 22 at the copper mine was still open; he did not know whether mining was still done then. The above suggests that Unit 22 was still open ca. 100 years ago. The presence of timbers in the stope also indicates no great age, perhaps a maximum of 200 years. This would mean the mine was still in production about 1750 A.D. If the 1260 A.D. date is even remotely correct (i.e. to within three times the statistical error) this would mean production of copper lasted for ca. 400 years. All this is speculation but does at least point towards the second model being more correct.

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1.B The Eastern Transvaal Escarpment near Lydenburg

Published archaeological research has been confined almost exclusively to the area between Lydenburg, Machadodorp and Nelspruit (Laidler 1932, van Hoepen 1939, Trevor 1912, Mason 1962, Evers 1973, Inskeep 1971, von Bezing and Inskeep 1966). Just outside the above mentioned area Aylward (1886) unwittingly provided some archaeological information while reinforcing the fortifications of Burgersfort, and from nearby Dearlove (1935) described pottery and skeletons.

So far only Early and Late Iron Age traditions have been identified. The first is known from four localities, only one of which is excavated and is here referred to as the Sterkspruit tradition after the farm where the first finds were made. The second is known from numerous sites, only three of which have been excavated, and is referred to here as the Badfontein tradition after the farm Badfontein where excavations were first carried out in 1971.

In both cases our knowledge is considerably more restricted than for those traditions just described in the north-eastern Lowveld.

1.B (i) The Sterkspruit Tradition Four sites are known, two of them from two or three surface sherds, one from an extensive sheet erosion surface and the last from excavations. The first two sites are known from the farm Friedenham 282 JT north of Nelspruit and from farm Klipspruit 89 JT in the Bad[illegible] basin about 20 Km. south of Lydenburg. The sheet eroded site is that of Sterkspruit described by von Bezing and Inskeep (1966); the excavated site is just over the ridge from the Sterkspruit site and is known at three localities 57/73, 58/73, 59/73 and was dug in November 1973 by myself with the help of R. Welbourne.

The Sterkspruit site produced pottery, ostrich egg shell, copper and iron beads, slag, tuyeres, grinding stones and parts of seven terracotta heads. R. Inskeep showed me photographs of these in Oxford in July 1973. The pottery according to T. Maggs (pers. comm. and 1973) has very strong affinities with NC 3 pottery from Natal.

My excavations at 57/73, 58/73 and 59/73 produced pottery in large quantities, much of which could be reassembled to form nearly complete vessels. A number of vessel shapes are present including necked pots, deep bowls, carinated bowls, open dishes and some very small jars. Decoration generally consists of broad line incision in a wide variety of motifs including herring bone, triangles and hatched bands.

A number of motifs may be found on the same vessel. The pottery was found associated with hearth areas and with pits about 0,9 m. in diameter and at least 0,60 m. in depth. The only three bone fragments preserved were teeth belonging to cattle and sheep/goat. Locality 58/73 is a burial site with Early Iron Age pottery like that from 57/73 and Sterkspruit. This is to be excavated in September 1974. Locality 59/73 is another living site area probably connected with 57/73 though the two are about 1000 m. apart; Early Iron Age sites are known to be large, e.g. Broederstroom (Mason 1973, 1974a, 1974b).

The stronger affinities are undoubtedly with NC 3 from Natal where similar motifs and vessel shapes are found. A single radiocarbon date from Sterkspruit was done on charcoal that may be associated with the heads; the reading gave 1460 ± 50 B.P., A.D. 490 (Pta - 328) and is probably a valid one.

1.B. (ii) The Badfontein Tradition Preliminary work was done by Laidler (1932) on pottery from near Machadodorp, van Hoepen (1939) and Mason (1962) on stone wall sites and Dearlove on skeletal material from near Burgersfort. Mason (1968) conducted an aerial photography survey of part of the Transvaal including this area and counted ca. 1800 stone wall sites. Re-examination of the photographs confirms his impressions of large terraced sites and puts the 1800 sites into their proper perspective. The figure represents homestead units within larger settlements and is undoubtedly a gross underestimate as such. Repeated re-examination of the photographs in conjunction with field trips shows that there are at least sixty large village sites averaging ½ - 1 Km.^{2} in area in a belt eight miles wide between Lydenburg and Machadodorp. Settlements consist of up to 140 homestead units, more usually ca. 50. Terraces are found between homesteads and trackways lined with stone walls lead through the terraces between homestead units and the outside of the settlement. Excavations at Badfontein 45/71 and 44/71 produced no hut floors, but a quantity of pottery and metal objects was retrieved, in association with cattle, sheep/goat and some wild animal bone foodwaste. Excavations at Lydenburg sites 60/73, 61/73 produced good evidence of hut floors with additional metal, pottery and animal bone foodwaste. The hut floor excavated at 61/73 consisted of a circular inner cell paved with flat slabs of baked shale and an outer verandah with a daga floor, daga kerbs and a hemispherical daga lined fire bowl. The inner

cell presumably originally was also daga paved. Pottery and a grindstone were located close to the edge of the inner cell suggesting that they might have been kept outside under the eaves. The 61/73 site fortunately also has the ideal plan for stone walls which is reproduced with minor modifications at all other homesteads. It is composed of an inner circular enclosure with two opposite entrances, one joined with parallel walls to the outside of the unit, the other opens into the hut area. Round the central enclosure and contiguous to it are smaller enclosures whose use is not yet known. Huts are found between these enclosures and an outer ring wall which surrounds the whole unit.

Pottery falls into three main types. Plain, small bowls generally fairly roughly made which by analogy with Pedi practice (Quin 1959) were probably used for cooking; large and small pots with low necks with either a row of punctation marks just below the rim on a matt vessel or the same decoration with a line of incised chevrons on the shoulder and colour burnish using graphite and red ochre. This ware is identical to that described by Laidler (1932) who felt that they belonged to two separate phases, now known not to be true, and by Dearlove (1935).

Dating evidence relies almost entirely on the single date obtained for Badfontein 45/71: RL 205 270 ± 90 B.P. (1680 A.D.). This is not an unlikely date but merely means that the settlement can be dated to any time within the last 500 years or so (Vogel, J.C. 1971). An end date of ca. 1890 can be given for the Badfontein tradition. Ethnohistorically the Pedi appear to have arrived in the Eastern Transvaal in ca. 1650. A date previous to this is probable for the Later Iron Age, perhaps as early as 1500. This is in broad agreement with Mason's dating of the Later Iron Age in the Southern and Western Transvaal (1974a.).

Iron mining is known from Lydenburg where a mine was discovered by Evers, van den Berg and Welbourne in 1973 and from Malelane near Nelspruit (Trevor 1912). Smelting evidence is present in the form of slag from the Lydenburg sites but at present no furnace has been excavated. Metal tools are varied including hoes, adzes/axes, pins and chisels of various sorts. Gold mining is probably also associated with the Badfontein tradition with mines at Pilgrims Rest (alluvial, C. Foster, pers. comm.) Waterval-onder and Roos Senekal (Trevor 1912) and Barberton (Thain 1974, Mylurgh 1949). At Barberton open stopes and shafts with drives are

mentioned, elsewhere open stopes appear to have been used. Dearlove (1935) described skeletons and pottery from the farm Goudmyn 337 a few kilometers south west of Burgersfort. The pottery description fits that given above for sites at Lydenburg and Badfontein demonstrating cultural affinity possibly on the level of tradition (see section 2 below). The skeletons are 'Bantu'.

Pottery and settlement pattern is very similar to that observed among modern Pedi (Monnig 1967, Quin 1959),
There are also sites relating to the nineteenth century which have been studied by Evers and Mason (1962). That studied by Mason is the site of Mapochstad where in association with stone walls Mason found glass beads, gun parts and imported pipes together with bangles of copper and an iron adze, typical Iron Age artefacts. The site was destroyed in 1883 (Mason 1962). The other sites are all caves and include Slabberts Cave, Skull Cave, Brooklands Cave near Sabie and Mbobo Mkulu near Ngodwana. All contain animal bones, generally cattle, some human bone, pottery, either plain or decorated like that from Badfontein and in some cases, e.g. Slabberts Cave, grass matting. Brooklands is unusual in having the main cavern full of stone walls, probably mainly stock pens but others are probably defensive. Sherds come from both small and extremely large vessels (capacity up to 50L) which suggests preparations against attack in troubled times like those that existed during the Difaqane and the rise to power of the Swazi during the nineteenth century. Copper was also associated with Iron Age remains at Brooklands Cave.

1.C Summary and archaeological evidence for Iron Age trade

1.C (i) Sequence correlation The two regions, the north-eastern Lowveld, and the Eastern Transvaal escarpment have provided regional sequences which can be broadly correlated as set out in figure 87. The two Early Iron Age traditions can be correlated relatively on the presence of Sterkspruit tradition sherds in a Silver Leaves tradition assemblages at Harmony 65/72 and Eiland 2/74. The dates from Silver Leaves and Sterkspruit are also of the same magnitude. The date from Badfontein falls into the Phalaborwa tradition period and must be contemporary with at least the later part of the Phalaborwa tradition. By analogy with the sequence established at Eiland and that established by Mason (1974a) for the

Magaliesberg valley there is probably a further Iron Age tradition to be discovered which will fit chronologically between the Sterkspruit and Badfontein traditions.

1.C (ii) Trade In sections 1A and 1B of this chapter reference has been made on a number of occasions to trade and trade materials; the archaeological evidence for this may now be set out. Following the example of B. Fagan (1969) the evidence will be discussed by material; salt, copper, iron, soapstone, imported exotic goods, other possible trade items.

1.C (ii) a. Salt The evidence for salt trade is largely circumstantial at present and relies unfortunately on negative circumstances. Our knowledge of Iron Age salt making is restricted archaeologically to the north-eastern Lowveld though no doubt other places in the Transvaal, e.g. salt pans at Zoutpansberg and Pretoria (Mason pers. comm.) and other thermal springs, were exploited. If one examines the distribution of known salt sites in the north-eastern Lowveld it becomes obvious that sites are 30-70 Km. apart. However, the Geological map of South Africa (1970, 1:1 000 000) indicates a number of thermal springs in the Eastern Transvaal, at least some of which must have been exploited. Proof of this lies in the fact that the Eiland, Sautini and Harmony salt works are located at thermal springs. The only tangible evidence so far for trade lies in the Early Iron Age where Sterkspruit tradition sherds have been found in Silver Leaves tradition layers at salt sites. There are comparatively few thermal springs on the Escarpment and one can appreciate that Early Iron Age colonizers might not have known the country as well as their later Iron Age descendants. To date no salt works is known from the Escarpment and one must at present conclude that salt was obtained largely by trade, possibly from the north-eastern Lowveld.

1.C (ii) b. Copper Evidence in the archaeological record for copper trade is more tangible. The discussion of mining above shows that copper mining is very common in the north-eastern Lowveld and non-existent on the escarpment; and that it appears to cover a considerable length of time.

The Sterkspruit site has copper beads associated with Early Iron Age artefacts and a mid first millenium A.D. date. Our present

knowledge suggests that the copper must have come from the Lowveld. That this is not impossible is shown by the presence of Sterkspruit sherds in the Lowveld in Silver Leaves tradition levels at Harmony 65/72 and Eiland 2/74, and the date for Lolwe (770 A.D.). Copper was otherwise used for copper ornaments like those associated with the Ellerton burial (Wells 1935) or was cast into ingot form called Lerale (or Marale: plural). These are rods of copper with bulbous ends often with rod-like projections from the bulb. Finds have been described from Phalaborwa (Lindblom 1926, Thompson 1926, More 1974) but have been found over a fairly wide area. Thompson (1949) mentions lerale from Sekororo's tribe near Trichardtsdal were obtainable in the 1890's for the payment of one pound. He also mentions a mine on the Makhutswi River (Makudzi in the text) which is almost undoubtedly the Harmony copper mine. In the collection of the Department of Archaeology, University of the Witwatersrand are two marale from Northampton farm ca. 40 Km. south of Phalaborwa and the same distance from Harmony. Lindblom (1926) also refers to another lerale from among the Balemba to the north of Phalaborwa. Marale are scarce and many must have been destroyed.

Other tangible sources are Mapochstad and Brooklands cave where copper or copper alloy ornaments have been found. In both cases however two possible sources are postulable: the north-eastern Lowveld and Delagoa Bay where historical sources indicate that English copper was in heavy demand (Smith 1969, 1970). The material from Mapochstad is more probabl. European owing to the late date (Mason pers. comm.). Copper production however lasted to at least 1869 in the north-eastern Lowveld (Baines 1968, Paver 1933, Thompson 1926).

1.C.(ii) c. Iron The large quantities of iron work found in the north-eastern Lowveld (Klapwijk 1974) and the regularities displayed in hoe manufacture to set patterns (Klapwijk 1974, Dicke 1926) bears out the importance of iron working in possible trade patterns in the region. The Eiland smelting site 5/74 has no known close ore body and the analysis of the slag (Kusel, roneoed sheet) shows a strong titanium content suggesting a source in the Murchison Range about

40 Km. to the south. Klapwijk (1974) also recognised three examples in his collection as coming from outside the district, purely on plan form. One is identical to some illustrated by Mason (1962, fig. 241) from Louis Trichardt district, the sources of two are so far untraceable. Evidence for iron trade is derived largely from the historical record (Dicke 1926, Schwellnus 1937).

1.C (ii) d. Soapstone Soapstone may have been traded over small distances in the north-eastern Lowveld. It has so far not been found on the escarpment near Lydenburg. Soapstone objects from near Pietersburg (Mason 1962, D. S. van der Merwe 1937) are probably also made from locally available raw material. Bates (1947) suggested that the soapstone vessels from Eiland may have been made at Harmony. This however is unlikely as there is a known worked soapstone outcrop at Kondowi (G. Catto, pers. comm.) only 17 Km. from Eiland as opposed to the distance of 80 Km. separating Eiland from Harmony.

1.C (ii) e. Imported exotic objects A number of artefacts may be categorized under this heading. The cloth from the Ellerton burial (Wells 1935) is probably imported as the fibre is animal derived. Mason (1962) felt it might have been made locally as artefacts such as spindle whorls are known from the Northern Transvaal. Despite the presence of spindle whorls from Harmony and Eiland I feel the Ellerton fabric was imported as native spinning and weaving in Southern Africa appears to be exclusively associated with cotton (Wells 1935).

Glass beads have been found at a number of sites and are all imported. Sites at Thalatorwa (van der Merwe and Scully 1971) and Harmony (9/72A) have yielded beads. Heirloom beads are recorded from among the Pedi (Schofield 1938, 1958, Davison 1972), the Lovedu (Davison 1972), the Venda (Schofield 1938, 1958, van Riet Lowe 1955, Davison 1972) and reveal a large number of varieties in colour, size and relative importance. Beads have also been found on Escarpment sites, at Mapochstad (Mason 1962) and Badfontein 45/71 and further into the interior, e.g. Robertsdrift (Derricourt and Evers 1973) though in each example

a case may be made out for their arriving relatively recently (i.e. late nineteenth century.

Mason (1962) has recorded Chinese ceramic ware from Middleburg, west of Machadodorp, which undoubtedly reflects trade contacts with the East Coast.

Paver (1933) records a Portuguese or eastern Matchlock from the Komati valley and finds of pistols from caves near Modjadji's kraal (Klapwijk, pers. comm.) suggest that Paver's example is not isolated.

1.C (ii) f. Other materials As Fagan (1969a, b) points out, Iron Age trade was not restricted to those articles listed above. Trade in poles, thatching grass, food, drink and materials derived from animals - ivory rhinoceros horns and karosses are all attested from the historical record. They are all, however, with the possible exception of the ivory, unlikely to be preserved or recognisable as trade objects in the archaeological record.

1.C (ii) g. Trade in the Eastern Transvaal archaeological record and Harmony

The Harmony sites provide two materials of especial importance in the Iron Age trade, copper and salt. No copper objects with the exception of that found at the salt works can be said to be made of Harmony copper. However, trace element analysis of Harmony ores and slags plus analysis of copper objects from the north-eastern Lowveld may provide an answer. Until that time any remarks on Harmony's position must be pure speculation. Historical sources will be discussed in sections 2 and 3.

For salt, trade can only be safely postulated for the Early Iron Age though it is probable that salt was widely traded throughout the Iron Age.

2. The Ethnohistorical background to the Iron Age of the Eastern Transvaal

Discussion of the ethnohistorical background will be divided into the regions discussed for archaeology for purposes of clarity and because to some extent the histories of the two areas are different.

2.A The north-eastern Lowveld

Studies of the ethnohistory have been made by Krige (1937) who briefly describes the history of all tribes in the area, van Warmelo (1944) who examines those tribes along the Drakensberg foot hills and Du Toit (1967) and Scully (van der Merwe and Scully 1971) who discuss the Phalaborwa only. The tribes of the north-eastern Lowveld are all Sotho and are linked by a number of dialect features such as the- in place of se- in words like seped'i; in the northern Lowveld this becomes thepedi (Krige 1937, van Warmelo 1944). Any study of the tribes of the north-eastern Lowveld is hampered by the incredible complexity of the situation. Krige (1937, p. 327) writes:

"The Sotho of the Northern Transvaal are an enormously complex group of tribes. Very diverse as to ancestry, and lacking the homogeneity of the Venda, they are divided into numerous small independent tribes, which unlike the Venda usually have distinctive names. Each tribe consists of individuals of widely different ancestry, indicated by the tribal origin or foreign totem of the individual. These individuals make up various constituent groups which are attached to the nuclear ruling group, from which the tribe often takes its name and identity but which is usually greatly outnumbered by the other constituent groups except perhaps in the district of the Chief..... It is necessary to emphasise that the little we know of these tribes is limited to the nuclear ruling groups. Sometimes accretions to the tribe readily assignable to such well known tribes as the Kxatla, Venda, Tokwa or Lobedu can be identified; ..... This complexity and confusion everywhere appears to antedate the migrations of the nineteenth century which have made their contribution to the inextricable tangle and to the difficulty of reconstructing historical inter-relations." (My underlining).

The history of the following tribes is of interest here: the Phalaborwa, the Mahlo section of the Narene, the Thabina, the Koni, the Khuba.

2.A (i) The Phalaborwa The two most useful studies are those of Du Toit (1967) and Scully (van der Merwe and Scully 1971). Ultimate origins appear to have been in Bokhalakha (Rhodesia) from which they moved south and east settling in the Pilgrims Rest area or further south before retracing their steps north to their present location and area of influence which is roughly circumscribed by a 25 Km. radius from the town of Phalaborwa. This occurred during the reign of Malatjie II who belongs in a group that Scully refers to as, "A brief list of Mythological Ancestors." (van der Merwe and Scully 1971, p.187). The genealogy of the Phalaborwa is divided into three groups of names: Seven names going back from Makushane II (died 1964) with praise songs and a complexity of details; a second group of seven names probably only recited by royal genealogists and which Scully feels is probably a telescoping of a much longer list. The reduction to seven or to a standard number, Scully states, is widespread in Africa. The third category includes the "mythical ancestors". The telescoping of the longer list is an important point that must be born in mind when one examines the archaeological evidence that suggests that the ancestors of the present day population must have been in the north-eastern Lowveld as long ago as A.D. 1000. An point of interest and great importance is that accession to the chieftaincy was very often disputed and resulted in frequent displacement of settled groups. Which must have added greatly to the present complexity of tribes. Conflict with Lobedu in 'early' times is also noted both from Lobedu and Phalaborwa sources.

2.A (ii) The Mahlo section of the Narene

The Thabina the Koni and the Khaha The sources for these tribes are two (Krige 1937, van Warmelo 1944). Conflicting reports are presented on origins but the consensus of opinion in Krige's mind points to an origin to the south with the possibility of an ultimate origin in Rhodesia. (Bokoni or Bolosdi). Narene chiefs all govern with the name Sekororo, though are given their private names in genealogies. The present location is in the foothills of the

Drakensberg south of Trichardtsdal and north of the Olifants River, but their influence extends along the Makhutswi River towards Mica, including the area of the Harmony sites. The first of the nine chiefs listed by van Warmelo, Ramahlo, apparently lived on a hill called Thukatse on Solati Ranch, ca. 10 Km. from the Harmony sites. Without allowing for telescoping of the genealogy and by allowing a generous twenty-five years reign as average, Ramahlo may have lived ca. 1760. If one allows for telescoping of genealogies this date may be pushed back a bit further, perhaps to 1700. Another informant of mine, Jeremiah, who claimed to be a cousin of Sekororo, told me that his (Jeremiah's) grandmother lived on the southern bank of the Makhutswi close to the Harmony salt works and exploited the salt occurrence. Bearing in mind also the tentative end date for the Harmony copper mine of ca. 1750 there is a distinct possibility that tribesmen under the chieftaincy of Ramahlo were exploiting the Harmony industrial sites. Whether they were the only people to do so is another matter which is made extremely complex by the narratives of the Thabina, the Koni and the Khaha all of whom at one time or another claim to have controlled the area round Leydsdorp, only 20 Km. north of the Harmony sites and who appear to have displaced each other in that area, the Thabina moving west to their present location in the Thabina River valley, the Koni to north of Tzaneen and the Khaha, more recently, west to the Drakensberg foot hills between the Thabina and the Narene. It is quite possible that at the same time as these displacements the Narene displaced other tribes exploiting Harmony resources, or took part in a similar succession of displacements. Difficulty lies in several areas: The archaeological material of traditional types (pottery, metal tool typology, etc.) is almost identical over the north-eastern Lowveld as far as it is known to date. Sophisticated analyses of ware, trace elements, etc. in pottery, slags, ores and metal products are in their infancy in South Africa and the results so far obtained are still difficult to interpret because of the lack of well dated archaeological sites; Several hundred C^{14} dates are necessary. From the ethnohistorical

side good data exist only for the nineteenth and possibly the last years of the eighteenth century. Beyond that are a few memories possibly chronologically inaccurate and certainly with great gaps between them, which are extremely difficult to fit into historical accounts based on European philosophy of history (cf. E. A. Ruch 1973). For these reasons ascribing archaeological material to any tribe is an extremely hazardous process and the suggestion that the Harmony sites may have been exploited by the Narene is merely an educated guess. Van der Merwe (van der Merwe and Scully 1971) ascribes his archaeological sites to the ancestors of the present Phalaborwa tribe on rather firmer grounds based on detailed slag and ore analyses. The Musina tradition (van Warmelo 1940) suggests they were not the only exploiters of the metals near Phalaborwa.

2.B The Eastern Transvaal Escarpment

Ethnohistorical studies of the Eastern Transvaal escarpment again present problems; not least of which is the fact that the ethnohistorical sources deal with areas peripheral to the archaeologically studied area; that is they are about tribes who lived west of the Steelpoort River (the Pedi) round Pilgrims Rest (the Pulana and the Kutswe) or to the south east round Nelspruit (the Pai). In places Pedi sources cover the archaeologically studied area, but this is late in Pedi history, about 1780 onwards.

The following sources are available: Pedi history is based on the tradition of Ka'lolo (Winter 1912) with additions by other workers (Hunt 1931, Monnig 1967, Quin 1959). Ziervogel (1954) is the only source available for the Kutswe, Pulana and Pai and the evidence presented is meagre probably reflecting the tribal disturbances of 1820-1860 when first Mzilikazi and then the Swazi rampaged through the area.

2.B (i) The Pedi Pedi occupation of the Steelpoort River valley, on the basis of the oral tradition, probably dates back to at least 1650. On arrival the Pedi found two groups of tribes, the Roka and the Koni who lived to the north and to the east of the Pedi settlement. The Pedi grew in power and wealth and during the reign of Moukangoe (1700?) overthrew the paramountcy of the Roka tribe, the Mongatana. Mampuru, regent for Moukangoe in his old age and for his grandson Moroamotshe, initiated a series of raids on local Koni tribes

subjugating them. One of these, at a place called Kutoane by Hunt (1931), is described as being beyond Lydenburg (1912). Hunt places it in the Badfontein valley but it is more likely to be at Ngodwana where equally large Iron Age settlements of this period are known and where the name is the same (Ngodwana is the Swazi form). Moroamotshe (eighteenth century) built a new village on the farm Goudmyn which must be the same site as that from which Dearlove's skeletons and pottery came (Dearlove 1935). Other references to the area east of the Steelpoort deal largely with the Ohrigstad area north of Lydenburg, in connection with succession to Moroamotshe which was disputed by Dikotope and Thulare, two of his sons. Thulare emerged as victor and set up the first of the two Pedi empires which lasted from sometime during the eighteenth century to his death just before Mzilikazi broke away from Shaka and destroyed the empire in the 1820's. Thulare is important for having had secret white visitors brought to his capital by his son Makgeru; these are reported to have been trade missions. The oral traditions mention extensive raiding towards the Waterberg but make little mention of Pedi dominance of the escarpment zone around Pilgrims Rest where gold was undoubtedly being mined. This is especially important for any discussion of Pedi or Eastern Transvaal trade and shows an important gap in our knowledge of Eastern Transvaal oral tradition.

2.B (ii) Kutswe, Pai and Pulana Ziervogel is our only source for these tribes and all the historical information he gathered relates to the nineteenth century, more particularly to small movements of the tribes during and after the 1860's when Swazi's were expanding their control of territory in the Eastern Transvaal and were raiding along the escarpment as far north as Tzaneen. All these tribal groups originate in the south; the Kutswe and Pulana moved north to Pilgrims Rest and are still dominant in the area. Pulana make a brief appearance in Pedi history (Winter 1912b) as auxilliaries of Kabu a nephew and rival of Sekwati in the post-Mzilikazi period. Quite what status they held (subjects, vassals, allies, etc.) in the pre-Mzilikazi era is unknown but knowledge of their status is of great

importance. Perhaps the status of Makopole, chief of the Tshianyana, a Koni tribe at Lydenburg, and Mo'labini chief of the Maepa, a Koni tribe at Ohrigstad, who appear to have been independent politically but possibly occasionally paying tribute, is an indication of Pulana status (Winter 1912a). The nature of Pedi hegemony is especially important to establish in view of Legassick's suggestion that trade may have played an important part in setting up the Pedi empires (Legassick 1969).[1]

2.C Ethnohistorical and historical sources of the Transvaal Interior for Iron Age trade

Sources for trade cover a fairly wide area of the Transvaal (Wilson and Thompson 1969, Legassick 1970) but are difficult to push back far into time. All our historical records in the Transvaal interior or the Northern Cape (Wilson and Thompson 1969 summarise those that are relevant to our problem) date to the nineteenth century with the exception of Wikar (Wilson and Thompson 1969) who deals with the late eighteenth century and is concerned with trade between Khoi Khoi and Thlaping. This account is important as it gives a list of materials traded: Thlaping brought tobacco, ivory spoons, bracelets, copper and iron beads, glass beads, copper earrings and bracelets, knives, spears, axes and awls and skins which they exchanged for livestock. All of these with the exception of glass beads are local products, the beads undoubtedly come from the east or west coasts (Schofield 1938) where they are mentioned in historical sources as being one of the major trade items (see section 3 below). Wilson and Thompson provide other information on internal trade: Campbell felt that the Thlaping obtained raw iron and copper from the Hurutshe; the Bagamalete made iron implements which they bartered for cattle with the Rolong, Thlaping, Ngwaketsi and Hurutshe after 1843. In the north-eastern Lowveld Marale and iron hoes seem to have been used extensively in exchange, particularly for marriage payments (Schwellnus 1937, Lindblom 1926, Dicke 1926, Moro 1974, Klapwijk 1974). These were apparently especially important in those areas where tsetse fly infestation prevented cattle herding and the use of cattle for marriage payments.

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1) There is however a possibility that Makopole was a son of Thulare (Nassie 1905) which would indicate strong Pedi control of the whole escarpment.

Beads appear to have been important in the Eastern Transvaal escarpment among the Pedi. Schofield (1938, 1958) shows that Pedi beads can be divided into two classes: Thaxa beads worn only by the royal family and beads which could be worn by indunas and people of lesser rank but which were none the less highly prized. It is beads of the second class which appear to have been recovered from archaeological sites, e.g. Mapochstad (Mason 1962) though I noted on page 42 that the beads from Harmony 9/72A might possibly belong to Thaxa class. In the Pedi oral tradition beads go back to the time of Moukangoe, dating possibly as early as 1730 (Winter 1912a) and beads appear on several occasions thereafter: A Mokoni gave Moroamotshe a bag of beads (date mid-late eighteenth century) (Winter 1912a); at the end of the cannibal period, about 1830 cannibals sent to Kabu two girls and many valuable beads to ask for peace (Winter 1912a); Sekwati, on his return from the Zoutpansberg sent the Koni chief Marangrang royal beads as a gift (Hunt 1931, Winter 1912b). Beads were therefore important in diplomatic transactions, a factor which could signify several things: that beads were rare and therefore highly prized or restricted to certain persons and highly prized as an indicator of status. This is a point which I will come back to. Still on the subject of beads Schofield (1938 and 1958) constantly compares classes of beads found either in archaeological or ethnographic circumstances and suggests the same source of supply.

Beads were not the only exotic goods highly prized in Iron Age times and which were used in historical or ethnohistorical sources for the Interior. Cloth is another article featured, unfortunately only from nineteenth century sources. Winter (1912b) describes how Potgieter removed all pieces of thin cloth from Sekwati's men while on a raid to the Zoutpansberg (1840's) and further states that these pieces of cloth were brought by Makoapa from Delagoa Bay. Presumably at least some of these clothes belonged to commoners and illustrate the range of trade items in this part of the world. Arbousset and Daumas (1968) and Legassick (1969) state that Pedi visitors to the southern Sotho in 1837 wore bead collars and bracelets and that Sekwati had purchased a red scarf from Matleka middlemen plying the trade between Delagoa Bay and the interior. The

Koni of Mametsa (van Warmelo 1944) mention black men coming from Delagoa Bay with two types of beads, Thaxa beads of all colours, Mabetlwa or hexagonal blue beads and with blue and red cloth. The route crossed the Lebombo mountains at Maphisane, a Portuguese who lived in one of the passes.

On the mechanisms of the trade there is much evidence from the interior, a knowledge that included too the source area of the exotic goods, beads and cloth, that reached the interior (Legassick (1969) mentions the case of Joseph Arend who, in 1818, reached a Kwena-Modimosana nation in the Pilansberg, Magaliesberg area who gave him a description of trade at a place which must be Delagoa Bay. Bronkhorst (Chase 1969) while in the Zoutpansberg area on a reconnaissance trip with Potgieter writes:

> "We also spoke with the servants of the town's inhabitants who come there to barter elephants teeth for beads, linen and other wares; they also informed us of there being ships waiting for elephants teeth. The people from that town spoke Portuguese". (Chase 1969, p. 73).

The Koni of Mametsa refer to the Mpfumo from Delagoa Bay as the purveyors of trade items (van Warmelo 1944). Smith (1970) shows the Mpfumo to have undergone a severe struggle in local politics about 1780 and that they were boosted by Portuguese subsequently. The oral tradition of the Koni of Mametsa probably reflects nineteenth century trade therefore. Dicke (1926) describes the importance of Tsonga middlemen in east coast trade both with reference to trade routes, for which he cites Louis Trigardt's journal as his source and to the establishment of the Maluleke Tsonga chieftainship in the Klein Letaba area, just north of the north-eastern lowveld as defined for the purpose of my discussion (see VI 1). The fighting and siting of the chieftainship was apparently designed to control local trade routes and depots. If this is indeed the case it shows how very well Tsonga traders knew the Eastern Transvaal and its trade potential. Bronkhorst (Chase 1969) refers to Tsonga (Knobnose kaffirs) as the traders; a fact also mentioned by Arbousset and Daumas (1968) in connection with Pedi trade. Other tribes however do appear to have traded directly with Delagoa Bay without using Tsonga as intermediaries. Hunt (1931 and Winter (1912a) both state that

Thulare sent his son Makgeru to Delagoa Bay, secretly, for trade purposes. There is also a tradition mentioned by both authors that Makgeru brought white men to see Thulare. Mason (1962, p. 431) states that,

"Sekalela, a Shangaan man over 90 years of age now living near Chuniespoort, told me that in his father's time Bapedi chiefs sent age-grade regiments to barter with east coast traders."

Here the problem of the definition of 'Bapedi' arises; does this refer to the chiefs of the Maroteng clan who ruled the Pedi nation from 1600 or so to the present? Or does it refer to any of the small chiefdoms of Koni or Roka descent who are nowadays collectively referred to as Pedi? If it does indeed refer to the Maroteng clan why then is not trade mentioned more clearly in the oral tradition? A possible solution to the last question might be that trade was too commonplace, apart from Thulare's which has special significance, to have appeared in the oral record. Certainly Winter (1912b) states that Sekwati went on elephant hunting expeditions with Hendrik Potgieter, and that he sent him a peace offering of elephant tusks which arrived days after Potgieter's death. Ivory is a commodity that figures high in trade transactions in the interior (e.g. Chase 1969, Dicke 1926) and at Delagoa Bay (Smith 1969, 1970, Axelson 1973). Pedi ivory may well have been sent down towards the coast with age regiments for trade purpose. It is interesting to note that these age regiments probably refer to initiation schools and that the heads of these schools were always royal (Monnig 1967) thus keeping control of trade in royal hands. That tribesmen from the interior did come down to the coast for direct trade is confirmed by historical sources from the coast (Smith 1970). Smith mentions the rise of the Kosse on the Komati river who successfully prevented interior tribesmen from reaching the coast during the eighteenth century. Perhaps this last evidence shows that Pedi age regiments did not reach the coast itself but had to deal with Kosse intermediaries. The evidence is overwhelming that Tsonga, at least some of whom were from Delagoa Bay, were largely responsible for conducting the trade and purveying goods from the coast to the interior and vice versa.

Delagoa Bay was certainly not the only coastal entrepot that dealt with the trade of the Transvaal Interior. Smith (1970) states that Inhambane shared the Delagoa Bay hinterland and in many respects was the more important of the two. Ethnohistorical material really does not always relate strongly to either Inhambane or Delagoa Bay. A good example of this comes in Bronkhorst's account of a recconnaisance trip to the Zoutpansberg (Chase 1969) cited earlier (page 86). Smith also shows that there was direct contact between Tonga from Inhambane and from Delagoa Bay when he writes that, "During the Dutch period, for instance, it was observed that people from the Ronga chiefdom of Manhice went to Inhambane in the months of the dry season and returned with hoes, axes and assegais, which in turn were traded with the other peoples of the bay. Portuguese traders, both black and white, were also allowed to pass along the coastal trade routes and thus direct the flow of goods towards a point of embarkation of their choice." (Smith 1970, p. 279). Smith (1970) also points out that Tsonga from Sofala were trading with 'Machicosse' who in turn also traded with Delagoa Bay during the Dutch period (1721-1730). Evidence for the Delagoa Bay trade is however more readily available than that of Inhambane owing to the work of A. Smith (1969, 1970). Messina and the area north of the Zoutpansberg appear to have come under the greater influence of Inhambane and Sofala (van Warmelo 1940, Diche 1926 et al).

2.D Ethnohistorical evidence for trade and the Harmony sites

Direct correlations along these lines are impossible. A few remarks can however be made. Firstly, Thompson (1949) clearly states that there was a copper mine near the Makhutswi River in the control of Sekororo of the Narene (Mahlo section) and that Marale could be bought from him as late as the 1890's. It is not unreasonable to suggest that the mine Thompson refers to is the Harmony mine. If so, how did Sekororo come to possess the Marale? Was it by virtue of owning the mine and that Marale were royal possessions as More (1974) suggests? Or did he obtain these as marriage payments for his daughters from nearby chiefs?

In which case the copper source was probably not the Harmony mine. How far copper from Harmony took part in the coastal trade can only be discussed after an examination of the coastal trade has been made (section 3).

As for salt, Wilson and Thompson (1969) in one reference clearly show that salt was an Iron Age trade commodity: among the Lobedu an orphan usually hired out his services to carry salt or iron ore from far countries to acquire bride price. The Lobedu live immediately north of the Groot Letaba River and may have obtained salt from works like those of Harmony and Eiland for Lobedu use. Whether other Sotho tribes in the north-eastern Lowveld used the same mechanism of trade is unrecorded and is probably not important. Salt as a local trade is undoubtedly not concerned with the coast or Tsonga middlemen except in so far as Tsonga middlemen may have carried salt as a trade article for short distances.

That the Harmony sites were connected directly or indirectly with coastal trade is indicated by the two beads from site 9/72A. As mentioned before these appear to have affinities with Pedi Thaxa beads as described by Schofield (1938, 1958) and it is interesting that an oral record of the importing of Thaxa beads into the north-eastern Lowveld exists (van Warmelo 1944). It would, however, be rash on the basis of two beads and some speculation on copper trading to state that these beads reached the Harmony community directly from the coast.

3. The South East Coast trade of Africa

The study of the exploitation of the south-eastern coast by non-African peoples is of importance for two reasons, first to try and give a fuller time dimension for long distance trade and to fill out details of trade commodities that reached the coast during Iron Age times and which are not preserved in archaeological sites or not mentioned by ethnohistorical or historical sources of the interior.

3.A Chronology of European and Asian contacts with the South East Coast of Africa

Two peoples are in the main concerned, the Portuguese and the Arabs. Portuguese exploitation can be given a very precise starting point owing to preserved records and can be regarded as having continued unbroken to the present day in general though at Delagoa Bay there were some breaks during the eighteenth century. Arab trade according to Axelson's sources does not appear to have penetrated much further south than Sofala as far as settlement on the east coast is concerned. Establishment of an extensive Sofala trade can probably be linked with the rise of Kilwa which is dated to the first years of the fourteenth century (Chittick 1971) and which coincides with the most important period of Zimbabwe (Garlake 1973, Huffman 1974, 1973). The first Portuguese expedition to reach the eastern coast was that of Vasco da Gama 1497-1498 (Axelson 1973). Sofala was occupied in September 1505 and first attempts to bypass Muslim traders was in the following year. References to exploitation of the coastline south of Sofala start with da Gama's first voyage when da Gama found black men with much copper which they wore on their legs, arms and hair at the mouth of a river between Delagoa Bay and Inhambane (Wilson and Thompson 1969, Axelson 1973). This was not exploited however. In 1545 João de Castro recorded that, sometime previously, Jorge Telo sent Lourenco Marques from Sofala to discover two rivers south of Cape Correntes (Inhambane) which had rich foodstuffs. Lourenco Marques found at the mouth of what is probably the Limpopo River, natives who showed him copper, who said they had mines and that they could sell him as much as he wanted. At the mouth of the Rio de Lagoa he saw many elephants and was offered ivory for a few beads (Axelson 1973, Smith 1970). De Castro undertook to order that the vessel be sent to investigate the copper which was in great demand in India and to explore the coastline further. Nothing is known of the further

exploration but it is known that nearly every year ships did visit Delagoa Bay and Inhambane to trade for ivory (Axelson 1973). Smith (1970) outlines further exploitation as follows:

Up to 1590 ships visited every year; after this date visits were made only alternate years with some gaps. From 1597 and especially from 1680 English traders visited the Bay until the early eighteenth century and in fact in 1703 their competition forced the Portuguese to discontinue their voyages. Between 1721 and 1730 the Dutch occupied the Bay but the station closed down owing to Dutch-Black hostility, disease and a cut down in trade owing to wars in the interior. Inhambane was permanently occupied by the Portugese in 1731 and had been visited by Portuguese ships between 1703-1731. After 1750 Inhambane was the most important trading station south of the Zambezi though English, French and Dutch traders found the Delagoa Bay profitable during the mid-eighteenth century. In 1777 the Austrians tried to set up a permanent trading depot at the bay but were soon ousted by the Portuguese. The Portuguese did not manage to monopolize the Delagoa Bay trade from 1782-1796 while they were in occupation and there was another break 1796-1803 following the French destruction of the fort in 1796. In 1803 the Portuguese re-occupied Delagoa Bay and maintained an almost complete monopoly during the nineteenth century.

Before Portuguese exploitation of the south east coast Arab penetration south of Sofala appears to have been minimal. Portuguese noted no attempts to proselytize the Tonga round Inhnmbane as they had found at Sofala (Axelson 1973) and Axelson (1973) mentions Arab voyages to a mineraliferous zone a months journey south west of Sofala which may be the Limpopo valley. This may explain why Lourenco Marques found blacks at the mouth of the Limpopo willing to trade in copper.

3.B <u>Trade articles at Delagoa Bay; some details of transactions</u>

By far the most important commodity obtained by European traders at Delagoa Bay was ivory (Axelson 1973, Smith 1969, 1970) though other materials such as skins and rhinoceros horns were also important. Metals were comparatively rare and were indeed imported from English traders from before 1622 (Smith 1970), particularly brass and copper. Amber also appears to have been exported by Africans. Prior to the eighteenth century there is no

record that the Portuguese obtained copper, tin or gold at Delagoa Bay (Smith 1970). During the Dutch occupation the records of Jan van de Capelle provide a wealth of information (Smith 1970, Theal 1888, 1902, Mason 1962). In 1722 the Dutch obtained 490 pounds (222,7 Kg.) copper and two tons of ivory. In 1725, 300 pounds (136,3 Kg.) of copper. Tin was bought in 1723 and 1726; in the latter year 56 bars of tin were exchanged for 103 pounds (46 Kg.) of beads. Tin undoubtedly came from the Rooiberg workings (Baumann 1919, Mason 1962). Gold is mentioned as available in very small quantities on two occasions. Smith (1970) mentions that iron tools were bartered at Inhambane and Delagoa Bay (see page 88).

European traders provided beads; Schofield (1958) mentions that beads of all colours were sent to Delagoa Bay for trade, though Smith (1970) remarks that the type of bead was important as particular beads were useful inland for inter-tribal trade. This may well be reflected in the names given for Venda and Pedi heirloom beads (Schofield 1938, 1958). Cloth was also sent into the interior from the coast, a fact picked up in the ethnohistoric record (see section 2.C). English brass and copper were very popular though Dutch copper was unacceptable (Smith 1970). Blue coral (Smith 1970) was also traded by the English for ivory.

The trade situation between Europeans and the Transvaal interior may be summed up by Arbousset and Daumas writing of Pedi visitors to the southern Sotho: "Their ornaments consist of ..... collars and bracelets of blue, red and yellow beads of Portuguese manufacture, proving that they have communication with the traders at Delagoa; but this is only by means of natives belonging to other tribes, as they have assured us ..... the Matlokas procure copper, beads and stuffs at Laurent Marques and go to exchange these for ivory, horns, cattle and furs in the Interior." (Legassick 1969, p. 108, Arbousset and Daumas 1968, p. 180).
Smith (1970) suggests that the lack of metal traded at Delagoa Bay before 1703 might indicate that the bay's hinterland did not as yet include the Eastern Transvaal. Certainly it is interesting to note that the earliest records for glass beads in the Eastern Transvaal are eighteenth century both ethnohistorically (Winter 1912a) and archaeologically (van der Merwe and Scully 1971).

A very interesting historical and trade question now arises, unfortunately hampered by the lack of well published records for Inhambane. (Judging from Axelson's (1973) treatment, however, ivory was very much the major commodity the Portuguese sought.) The questions raised are: did the Portuguese deliberately omit references to transactions in metals from their records in an effort to keep the trade secret as Summers (1969) suggests they did for gold? Or was copper a substance traded almost exclusively inland, as marriage payments or in exchange for cattle, with a small amount reaching the coast for cloth or beads, as suggested by van Warmelo's account of the copper miners of Musina (1940)? Copper was certainly prized in the interior as the importing of English brass and cop suggests. Its occurrence in ingot form of relatively standard weight (Thompson 1926, Hanisch 1974, Lindblom 1926) and as ornaments suggests tha it must have played an important part in local trade. The standard weight of the lerale or the musuku (the Messina ingot) would have been necessary for easy transactions in marriage payment just as much as it would have been the commercial exchange. Copper also figures as a metal connected with ritual in the Southern African Iron Age for which witness is given by the finds of bronze weapons at Khami (Robinson 1959) and Zimbabwe (Garlake 1973) in contexts suggesting ritual use, and in the fact that the musuku (Hanisch 1974, Thompson 1926) occurs in two forms, the 'commercial ingot' which is pure copper, and the ritual one which has a core of sand or stone. The anomaly of a group of people importing copper in large quantities on one hand and exporting it on the other seems strange. The Dutch record of intermittent copper supplies reaching Delagoa Bay from the interior cannot be ignored.

4. Correlations and Summary - Harmony, Iron Age archaeology, ethnohistory and trade

In summary the Harmony archaeological record consists of four components: a habitation site, a copper mine, a soapstone bowl factory and a salt works, all of which appear to have been worked by a community. Dating of the sites is very difficult: archaeological correlations with Eiland and Phalaborwa put them into the Phalaborwa tradition which covers a period of ca. 1000 years. The individual dates for the copper mine and the salt works and some local oral tradition suggest that the sites were exploited over a period of as much as four hundred years

from about 1400 A.D. to sometime in the nineteenth century.

Within the Phalaborwa tradition comparisons between the Harmony industrial sites and other industrial sites known suggest that those at Harmony were small especially the salt works and copper mine as compared with Eiland and Phalaborwa. Our lack of knowledge concerning other such sites however precludes stating whether in general the Harmony sites were of medium or small size. With regard to the soapstone bowl factory comparison between the main site, the other sites on Harmony 24 and the description given to me by G. Catto (pers. comm.) suggests that the main site is an extremely large one, and that its size is a reflection of the geologically suitable stone. There is a possibility therefore that bowls made at the Harmony main bowl factory may be found at sites other than the Harmony salt works and habitation site.

From the ethnohistorical point of view a case has been made out that at least during the later part of the exploitation of the Harmony sites the region including Harmony was in the control of the Narene ruled by a line of chiefs with the title Sekororo. How far back in time (beyond say 1780) Narene control of the sites can be pushed is impossible to say without extremely detailed recording of oral traditions in the area to supplement the work already done (Krige 1937, van Warmelo 1944, Du Toit 1967, van der Merwe and Scully 1971); and even then the extreme complexity and confusion of the Sotho tribes in the north-eastern Lowveld discussed by Krige (1937) is likely to obscure the picture. Van der Merwe and Scully (1971) on the basis of oral tradition and archaeological features including pottery and slag analyses are prepared to state that the Phalaborwa tribe exploited the sites near the modern town of Phalaborwa for the whole period 1000 A.D. to the present. This is not an unlikely thing to have happened but extending their argument to other areas of the north-eastern Lowveld is fraught with difficulty, not the least of which is the great similarity in pottery and other artefacts over the whole of the north-eastern Lowveld. It may happen that when more excavations have been done at a large number of sites covering the whole area that small regional differences may be apparent. The present state of research however does not permit any categoric association of tribe with archaeological site before 1800 A.D.

The question of trade is perhaps the most difficult to answer. This is largely due to the fact that archaeological, historical and ethnohistorical evidence for trade between the Eastern Transvaal and Europeans on the coast cannot at this stage be pushed back beyond 1700. The archaeological evidence rests on beads, the historical on reports of metals that can only have come

from the Transvaal interior, the ethnohistorical on records like that of the Koni of Mametsa.

There are however one or two pointers which suggest contacts between coast and interior at a much earlier date. The first pointer is the evidence provided by Vasco da Gama in 1498 and Lourenco Marques in 1544 of copper being common on the coast just north of Delagoa Bay. The source of this copper is unknown, so far no mines have been published from southern Mozambique and on the strength of this admittedly negative evidence it seems likely that the source was located in the Transvaal. Unfort ..ately there are two major sources of copper in the Transvaal which appear to have been exploited and which have had contact with the coast from the archaeological, ethnohistorical or historical record; Messina and the north-eastern Lowveld. Of these in the latter area the Phalaborwa mines are reported by Trevor (1912) to have been larger or more extensive than those at Messina. We also know from history and ethnohistory that trade routes criss-crossed the Northern and Eastern Transvaal and that several points of embarkation were used by native middlemen for selling their goods, according to their choice. On this basis both of the major sources, Phalaborwa and Messina must have supplied the coast, and their products undoubtedly shared embarkation points in the post-1700 period. It is not impossible that some copper from Harmony was taken to the coast along with that from Phalaborwa and Messina, and equally not impossible that Harmony copper was included in the transactions recorde y de Capelle (section 3.B).

One can equally well surmise that copper from the north-eastern lowveld, including that from Harmony, was used extensively in a more local inter-tribal trade much like that discussed by Wilson and Thompson (1969) between the Hurutshe and the Rolong or that which may have taken place in Early Iron Age times to provide the occupants of the Sterkspruit site with copper beads. Copper certainly was worn as ornaments as the Ellerton burial (Wells 1935) proves as do the beaded Lobedu skirts in the collection of M. Klapwijk (Klapwijk, pers. co m.) That this was common in Iron Age times is proved by burials at Mapungubwe (Fouche 1937, Gardiner 1963) finds at Olifantspoort (Mason 1973b) by similar finds in the Rhodesian Iron Age (e.g. Garlake 1973),

and by Fagan's (1969a, b) discussion of trade significance of the Ingombe Ilede burials. The Sterkspruit and Broederstroom copper finds give a depth to a possible internal copper trade of ca. 1500 years.

Salt is more difficult to discuss as it leaves virtually no tangible record in archaeology. The only possible evidence of its trade archaeologically is derived from the finds at Harmony and Eiland of Sterkspruit tradition sherds symbolising contact between two populations, at least one of which was working a salt factory. Salt trade is otherwise based on modern ethnographic reports referred to by Wilson and Thompson (1969) for the Lobedu and by Witt (1966) for Shangaans at Sautini. All the evidence however points to an internal possibly inter-tribal trade.

Insufficient is known about soapstone trade though it was noted in section 1.A (iii) f that at Eiland bowls seem to have been carried as much as 11 Km. to the salt works. A project is underway to analyse bowls and sources geochemically to try and establish better evidence.

The two glass beads from 9/72A provide the most direct evidence for contact between Harmony and the coast. They appear to belong to the thaxa class a[illegible] it has been noted (section 2.B, 2.C) that the Koni of Mametsa state that thaxa beads were imported into the north-eastern Lowveld. Whether the exchange was directly with Tonga middlemen is unknown but probably likely. The substance exchanged could be copper or salt but as the bulk of trade appears to have been in ivory, ivory is at least equally possible.

In conclusion it may be stated that an attempt to place Harmony within the broader archaeological, ethnohistorical and historical background has produced largely negative results. The sites belong to the Phalaborwa tradition in general but are difficult to date within the tradition. The Narene can probably be said to have exploited the sites during the nineteenth century and possibly a little earlier: Before that, for the greater part of the exploitation of the Harmony sites, we do not know exactly who was responsible, except that they belonged to the broad Northern Sotho group of tribes.

The Harmony Iron Age sites undoubtedly provided materials that were traded in Iron Age times but the exact nature of the trade is unknown, except that it must have formed part of the trade patterns for the Eastern Transvaal, outlined from historical and ethnohistorical sources.

APPENDIX A

THE GEOLOGY OF PORTION OF HARMONY 24, TZANEEN DISTRICT

R. van den Berg, August, 1972

E. R. P. M.

The area investigated consists of belts of sediments embedded in granitic rocks of early Precambrian age. The lithological set up is essentially similar to that of the Messina formation.

An intricate drainage pattern is developed in the area and consequently outcrops are plentiful. The vegetation consists of relatively large trees with little undergrowth and sparse grass, making geological investigations relatively easy.

Lithology

The metasediments have been granitised in varying degrees so that a transition from true granite, through granitic gneisses to schistose metasediments occurs.

The metamorphic rocks exposed in the area consist of altered shales and greywackes, essentially similar to those found in the Rhodesian gold belts. Outcrops of soapstone, probably representing metamorphosed ultrabasic material, occurs over large areas.

Structure

The area has been subjected to several periods of tectonic activity which has resulted in the highly folded and faulted nature of the strata. The major tectonic trend is roughly east-west although in places it is masked by later disturbances with different trends. This masking is most obvious on the soapstone outcrops where two sets of cleavage planes are apparent. Quartz veins in the same area are displaced by recent faulting.

An ancient copper mine runs parallel to the trend of the major tectonic event, following a fault zone. In places the fault filling is up to 1,5 m. in width and consists of brecciated shales or schists with large quantities of secondary quartz. Mineralization is considered to have been brought about by acid solutions percolating through the sheared zone. Graphic granite, books of muscovite and pegmatite material are closely associated with the fault zone. This indicates concentration and deposition of copper by acid solutions.

The copper mineralization is in the form of disseminated malachite which occurs in the country rock for a short distance on either side of the fault zone. The fault zone itself contains numerous geodes filled with quartz crystals but is barren in other minerals.

Although the structural pattern and the lithology are both favourable to gold mineralization, this mineral is conspicuous by its absence. Six samples taken as grab samples across the fault zone of the copper mine and from the tailings of the ancient workings all assayed at less than 0,5 g. per ton, four samples taken from quartz veins assayed at trace amounts.

It is considered that although the grade of the copper ore is extremely low the ancients must have worked the area for this mineral.

APPENDIX B

COPPER CONTENT OF SLAG FROM FURNACE SITE CIII, HARMONY

by H. Friede

December 1972

Determination by fusion with sodiumcarbonate and Atomic Absorption Spectroscopy % of cu. in slag - 0,39%

APPENDIX C

FAUNAL REMAINS FROM THE HARMONY 24 IRON AGE SITES

R. G. Welbourne

February 1973

Introduction: During the 1972 season of excavation on the farm Harmony 24, directed by Mr. T. M. Evers, a total sample of 11 524,4 grams of bone and other animal remains was recovered.

Site A yielded the largest sample, a total of 11 358,4 grams of bone being recovered from the test pits and grid excavation. Site B yielded only 31,0 g. of bone, Site C1, 113,5 g., site C2, 3,0 g. and Site C4, 18,5 g. This material is discussed site by site below.

Site A: Of the material, 23% by weight could be identified to species, 26% to a taxonomic group but not to species, and 51% could not be identified.

(i) The specifically identified material A total of 1 055 fragments weighing 2 533,5 g. could be identified to species. The species identified and the number of items assigned to each are tabulated below:

Species	number of items assigned	
river mussel (species uncertain)	± complete shells	5
	fragments	131
giant land snail	± complete shells	7
(Family Achatinidae)	fragments	689
	bored fragments	7
lizard (species uncertain)		2
tortoise (Testudo sp.)	bones	5
	shell	152
small bird (species uncertain)		2
vlei rat (Otomys sp.)		2
dassie (Procavia capensis)		1
zebra (Equus cf. burchelli)		20
wart hog (Phacochoerus africanus)		2
kudu (Strepsiceros strepsiceros)		1
hartebeest or tsessebe (Alcelaphus buselaphus or Damaliscus lunatus)		3
waterbuck (Kobus ellipsiprymnus)		3
reduncine, cf. reedbuck (Redunca cf. arundinum)		6
impala (Aepyceros melampus)		1
		1055

(ii) The tentatively identified material This material includes post-cranial bones and such cranial fragments as could not confidently be assigned to a species. These pieces numbered 266, with a weight of 2 976,7 g.

Taxa	number of items assigned
microfauna	4
small mammal (dassie size)	14
carnivore (small, approx. cat size)	1
(large, approx. leopard size)	1
equid	8
cf. cattle	7
cf. large antelope	107
cf. medium antelope	83
cf. sheep	29
cf. small antelope	12
	266

(iii) The unidentified material An accumulation of 2 288 fragments, 113 of which were charred, could not be identified. The weight was 5 682,2 g.

Site B: Only 11 uncharred fragments of bone weighing 31,0 g. were recovered from this excavation. None could be identified.

Site C1: Specifically identified material consisted of 10 giant land snail shell fragments weighing 33,5 g. The tentatively identified material, weighting 10,5 g., included one bone assigned to cf. large antelope, two to cf. medium antelope and one to cf. small antelope. Two unidentified fragments, both uncharred, were recovered; the weight being 10,5 g. The total from the site is 16 fragments.

Site C3: This site yielded only one bovid tooth fragment which could not be identified in any way. It weighed 3,0 g.

Site C4: The only item found was one giant land snail shell, shattered during excavation. The pieces weighed a total of 18,5 g.

Estimation of Minimum Numbers of each species: As above, this has been done separately, site by site.

(i) Site A In order to make the estimate as true as possible, tentatively identified material was used when there was no specifically identified material which may have come from the same species.

The inclusion of one small carnivore, one large carnivore and one small antelope in the list below was based on the evidence of such material.

Only one mandible specifically identified as being of an impala was recovered, but three other mandibles, identified as "cf. medium antelope" agree well in shape and size with the first. As all were right mandibles, a minimum number estimate of 4 impalas was made.

In order to estimate the minimum number of molluscs, all shell fragments were weighed and the total weight divided by an average weight for undamaged shells. All other estimates were made on the basis of specifically identified teeth or jaws.

Species or taxa	minimum number estimate
river mussel	4
giant land snail	21
molluscs	3
lizard	1
small birds	2
vlei rats	2
dassie	1
carnivore - small	1
large	1
zebra (mature adult)	1
wart hog (juvenile)	1
kudu (baby)	1
hartebeest or tsessebe (2 juveniles, 1 young adult)	3
waterbuck	1
cf. reedbuck (1 juvenile, 1 adult)	2
impala	4

(ii) Site B All that can be said is that remains of at least one vertebrate animal occur.

(iii) Site C1 A minimum of one giant land snail can be postulated. Tentatively identified bovid remains suggest a minimum of one large antelope, one medium antelope and one small antelope.

(iv) Site C3 The unidentified tooth fragment provides evidence for a possible minimum of one medium to large bovid.

(v) Site C4 Remains of only one giant land snail were recovered, so the minimum is one snail.

Comments: The five sites mentioned here fall into two functional groups (see T. M. Evers' report). Deposits at Sites A and B probably built up in or near a settlement of some kind, those at Sites C1-4 w re built up by behaviour patterns related to mining and smelting activities.

Animal remains at sites A and B are likely to have been discarded by people who hunted or collected the animals for food or other purposes. At sites C1-4, the giant land snail shells may well be of snails accidentally buried during mining activities. The antelope bones may well represent cuts of meat taken to the sites to be eaten by the workmen, but, due to the smallness of the samples, no statistically based statement can be made. Bones included are two metapodial fragments, one calcaneus and one vertebra.

Only the sample from site A is large enough for an attempt at analysis of animal food eating patterns to be made. An estimate of the total body weight of the estimated minimum number of animals from this site is tabulated below.

The small snails, vlei rats, lizard and bird are omitted, as these could have arrived fortuitously at the site.

Species or taxa	Estimated weight Kilograms	percentage
river mussel	0,120	0,001
giant land snail	0,294	0,020
tortoise	5 (5 animals)	0,339
dassie	4	0,276
small carnivore	4	0,276
large carnivore	75	5,093
zebra	300	20,353
wart hog	50 (juvenile)	3,394
kudu	25 (baby)	1,697
hartebeest or tsessebe	335 (2 juveniles 1 adult)	22,730
waterbuck	250	16,970
cf. reedbuck	130 (1 juvenile 1 adult)	8,824
impala	280	19,009
	1 473,369	100,000 %

From this list it would appear that all the animals consumed were wild animals. That may not be true. Two of the bones (third phalanges) identified as "cf. cattle" are definitely bovine in shape, being too robust for an antelope. However, they may have come from a buffalo, rather than from cattle. Thus, the people here may have had cattle, or they may not.

The 29 "cf. sheep" bones may well have come from antelopes with bones of a size similar to those of sheep and goat. At any rate, all four of the terminal phalanges found were pointed as in antelopes rather than rounded as occurs with sheep or goat.

Although probably no sheep or goat remains were recovered from the excavation, this does not mean that the people living here did not keep these animals. On the basis of material from this site, one cannot attempt to estimate the importance of domestic animal meat in the diet of the people living here, or even to know whether such meat was consumed at all.

The proportional representation of vertebrate animals is very similar to that found at other Iron Age sites in the Transvaal investigated by the writer. Tortoises, dassies, lizards and other smaller game, as well as carnivores, appear to have been eaten in a proportionately small quantity. The largest portion of meat seems to have been supplied by ungulates - zebras, wart hogs and antelopes, with antelopes being the most important contributors.

In terms of weight, river mussels and giant land snails appear to have made an infinitesimal contribution to the diet, if, indeed, they were eaten at all.

Possibly the mussel shells were collected for use in pottery smoothing, as is still done today (van der Merwe and Scully, 1971, p. 193). Of the 136 shells or shell fragments recovered the edge could be observed in only 29 instances. Twenty-four of these pieces had abraded edges, 5 had sharp unabraded edges. Thus evidence for use of these shells as tools is good.

The giant land snails may have been eaten; alternatively, the shells may have been collected to serve as (e.g.) drinking vessels, or for use in bead manufacture. Seven beads made of Achatina shell were recovered.

APPENDIX D

DATING OF 9/72, SITE A

The following determination for a sample of charcoal obtained from Ag, spit 4, has been made by Dr. C. Tucek of Radiocarbon Ltd., New York.

R L / 206 δ/C^{14} : >-39 C14 age: $>$ 320 B.P.

No estimation of historical age could be given. Reference to Vogel's C14 calibration chart (in Mason 1971, p. 60) shows that several dates could be expected. It would appear, however, that the date of Site A is previous to A.D. 1630. Further samples will be submitted.

No date has as yet been determined for the copper mine, though samples have been submitted.

APPENDIX E

THE MRUBA GAME

by M. Lewis

The game Mruba is played, according to Junod, (Junod 1927), throughout Sub-Saharan Africa. It has been recorded in the south of the U. S. A. having been carried across in the slave trade. A similar game is played in Ceylon and Polynesia and it is thought to be found in a slightly different form in China and Japan. The game is complex and great skill is required to play it well. Most adult men among the present day Bapedi play the game the favourite time, according to my informants, is about midday and towards sundown.

Mruba is played by two players, though each is always assisted by suggestions from onlookers, who invariably take sides. Two rows of holes are made in front of each player so that each player has two rows of holes opposite the same of his opponent. The number of holes in each line may vary from eight up to thirty, though always equal numbers. Usually it is confined to 8, 12 or 16. The object of the game is to remove all the opponent's stones by arranging ones own stones to fall opposite his stones in the attack lines. (See figure 31). We shall take a typical game and describe the various moves. Each hole is filled with two stones, a state called mano (Note 1), except the last hole on the left of each player's attack row, which is left empty, C1 and B8. The hole next to this contains the leader stone or dokwa (Note 2) C2 and B7.

The game commences with the mano at B6 taken up. One stone is left at B7 and B8, so that there is a mano at B7 and B8 contains a dokwa which takes the mano of C and D8 and any other of player M's choice, in this case D5.

The same move is performed by player P moving a dokwa to C1 removing A and B1 and in this case B5 mano.

Player M moves dokwa to B4 and takes C and D4 as well as C5 mano.

Player P moves dokwa to C4 and takes A and B4, as well as A5.

Player M moves A3 mano leaves 1 each in A1, A2 and B1, and takes C1 as well as D7.

Player P moves C7 mano in the same way to C3, takes B3 and A6.

Player M cannot move dokwa without losing it, so by moving mano in a series of moves from B2 to B7 to A8 leaving mano at A7 and dokwa at A6, he ensures that no stones may be taken from Player P because he is not in the attack row.

Player P now seeing possible attack at C1 and 2, escapes by taking C3 *mano*, leaving *mano* at C3 none at C2 and *dokwa* at C1 and at each of D1-5 where the move ends, taking nothing from Player M.

Player M now takes a 3 stone *mano* from A7, takes the move to A4 *dokwa*, where there is one stone, takes up 2 *mano*, drops one at A3, takes up both at A2, leaves one at A1, takes up 2 at B1, drops one at B2 and one at B3. Captures C3 *mano* as well as D5 *dokwa*.

Player P now has no *mano* (pairs of stones) and is more free to move. Player P moves from C6 to C5 takes B5 as well as A6.

Player M in a long move takes *mano* from B8 to A8 and A7 to escape Player P's potentially dangerous *dokwa* at D8. A *mano* from A3 ends the move at B5 where *dokwa* takes Player P's *dokwa* at C5 and D8.

A chase ensues, Player P moving dokwa one hole at a time and capturing Player M's *dokwa* but refraining from capturing the *mano* because these, due to their cumbersome moves, are a handicap to the other player. Eventually a situation is reached where Player M has a *dokwa* at B3, B6 and B7, while Player P has *dokwa* at D8 and C5. Since it is M's move, he cannot move without being taken by Player P at C8 and C5, thus Player M is stalemate.

It must be kept in mind that the above is a typical game between ordinary players and gives no idea of the vast variety of moves and strategies. The task of describing *mruba* is similar to describing the game of chess, a work which would run to volumes. However, a few basic rules may be discerned.

(1) The aim of the attacking *dokwa* is to take as many strategically placed stones while it is in the attack line.

(2) Moves are always in terms of taking up a *mano* and moving anti-clockwise leaving *mano* or *dokwa* behind until the last stone ends as a *dok[illegible]*.

(3) When all *mano* have been taken, the *dokwa* move only one hole at a time and are retained in the back line until they can attack profitably.

Note 1 A *mano* = any two or more stones in one hole.

Note 2 A *dokwa* = is one stone in a hole.

Acknowledgements: Freddie, Franz and Peter, and J. Swan.

Reference: Junod, H.A. (1927), *Life of a South African Tribe*, London.

APPENDIX F

HARMONY 9/72, SITE A - CATALOGUE

Site ref.	Pot Total	Plain rims	Decorated rims	Decorated sherds	Metal	Bone foodwaste (g)	worked bone - shell	soapstone bowl frags.	soapstone spindlewhorls	clay spindlewhorls	daub (g)	Strainer	Ochre	Quartz, etc. flakes	Hent axolla	River stones	Hammer stones	Manuports	Lower grind-stones	Glass beads	Achatina beads
Aa	58	3	-	4	-	365	-	32	-	-	268	1		2	1	6	1	-	1	1	-
Ab	95	2	1	5	-	254	-	40	-	1	436	-	-	9	2	3	1	-	-	-	1
Ac	195	8	9	14	-	1206	2	83	-	-	2941	-	-	6		6	-	-	-	-	5
Ad	156	4	6	5	-	928	3	114	-	-	553	-	1	4	8	4	-	4	-	-	1
Ae	139	3	6	14	-	268	1	25	-	1	534	-	-	1	2	5	-	-	-	-	-
Af	233	13	7	24	1	1089	7	127	-	-	1654	-	-	-	15	3	-	3	-	-	-
Ag	133	6	4	9	-	2121	13	45	-	-	1491	-	-	1	13	5	-	2	1	-	-
Ah	65	4	3	7	-	157	4	31	-	-	239	-	-	1	13	1	-	-	-	-	-
Aj	145	2	3	4	-	3107	1	56	1	-	363	-	-	2	13	5	-	3	-	1	-
Ak	98	6	4	6	-	1379	-	42	-	-	1323	-	-	4	1	2	-	2	-	-	-
Al	79	7	-	2	-	261	-	16	-	-	41	-	-	-	-	-	-	2	-	-	-
A/B 11	4	1	1	-	-	8.5	-	-	-	-	-	-	-	-	4	2	-	-	-	-	-
C 16	1	-	-	-	-	-	-	2	-	-	18	-	-	-	-	-	-	-	-	-	-
F 1-3	57	5	3	7	-	467	-	3	-	-	36	-	-	6	2	2	-	-	-	-	-
K/L 14	28	4	3	1	-	542	-	39	-	1	182	-	-	1	2	4	-	4	-	-	-
T 17	-	-	-	-	-	12	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX G

DATING OF 9/72, Site C, Copper Mine

The following determination for a sample of charcoal obtained from all spit levels of trench CI at the Copper Mine has been obtained.

RL/207 δ/C14: - 82 ± 10 C14 age: 690 ± 90

Historical age is given as A.D. 1260 ± 90

Comment: This date is in line with dates obtained for Phalaborwa mines by N. J. van der Merwe (van der Merwe and Scully. 1971). As the mine may well have been worked from west to east, this date from Unit 8 may indicate a middle to early period date for the mine. Further samples from Units 4 and 22 are to be submitted to test this hypothesis.

APPENDIX H

Mruba boards in the Iron Age of Southern Africa

'Mruba' is the Pedi word for the game known as 'isafuba' in Rhodesia and 'mjuba' among the Shangaan people. Variants of the game are known all over Africa (M. D. W. Jefferies, pers. comm.). A name misapplied to the game by Summers (1961) and Robinson (1959) is tsoro. Tsoro is a game closely resembling the European game of jacks or knucklebones and has nothing to do with mruba.

A number of boards have been found in Rhodesia and the Transvaal. Most references are, however, in passing; authors presumably preferring to regard them as recent owing to the immense popularity the game enjoys today. (It is, for instance, one of the favourite pastimes of African members of staff at the University of the Witwatersrand during the lunch hour.) However, a number of examples have been found in contexts that demonstrate their obvious antiquity. These examples come from two major sites in Rhodesia; Zimbabwe (Summers, Robinson and Whitty, 1961) and Khami Ruins (Robinson, 1959), and from Mapungubwe in the Northern Transvaal (Fouche, 1937). Garlake's dating of Zimbabwe suggests that the examples from that site are older than 1550 A.D. (Garlake, 1970, 1972). As his dating receives support from Huffman's pottery analysis (Huffman, 1972) this date seems to be reasonable. Known boards are tabulated in Table VIII. The picture these tables present undoubtedly does not present a true picture of the popularity of the game in Iron Age times. Most boards were probably dug into the sand for an afternoon session. Those used by Hall's labourers at Zimbabwe were of this type (Hall, 1905). Junod (1927) describes similar sand boards among the Shangaans and Gardi has illustrated one or a similar game in West Africa. (Gardi, 1969, plate 4).

The game is for men only and permanent stone boards were presumably cut in places where men were wont to spend their leisure hours.

Table VIII Mruba boards from Rhodesia and the Transvaal

Site	Stratigraphy	Remarks	Reference
Zimbabwe	No. 1 Camp ruin		Willoughby 1893
Zimbabwe	?	?	Hall and Neale 1972
Zimbabwe	S.E. Ruins outside main wall	3 sets	Hall, R.N. 1905
Zimbabwe	Surface Acropolis terrace	or the bottom of a bowl	Caton-Thompson 1971
Zimbabwe	Great Enclosure Trench 12 lev. 2-5	called tsoro stone/assoc. Class 3 pottery	Summers, Robinson and Whitty 1961
Busiwanga kopjie Ruin near Zimbabwe	West side of kopjie and summit	cut into granite/more than 30 sets	Hall, R. N. 1905
Regina Ruins	?	?	Hall and Neale 1972
Khami Ruins	Near No. 4 ruins	granite, 4 rows of 8 holes each	Robinson 1959
'near Untali'	?	'in stones'	MacIver, 1906
Defiance Ruins	?	?	Hall and Neale 1972
Mt. Chiburwe	Near Waterdere Ruins	several sets in granite	Bent 1968
Inchwe river	Near Monarch mine Tati area	Schist	Archaeol. collect. 38/68
Tati river area	?	"	" " 39/68
Golden Shoe mine	Tati area	"	" " 40/68 and 42/68
Banks of Tati river		"	Archaeol. collect. 41/68
Mapungubwe	Top of hill near wall which it pre-dates (?)	in solid rock	Fouche ed. 1937

Site	Stratigraphy	Remarks	Reference
Mapungubwe area	Ox rocks in the neighbourhood		Gardiner 1963
Mapungubwe	Various	small stone gaming pieces	Gardiner 1963 catalogue
Harmony site A	Test trench c.16 surface 10 cm.	on base of bowl	This vol. Chapter IV
Harmony soapstone bowl factory	At point L	71 holes noted remade often	This vol. Chapter II
Harmony soapstone bowl factory	Between track and outcrop AB	4 holes damaged	This vol. Chapter IV
Harmony	Near minor bowl factory 3	holes on both faces	This vol. Chapter II
Rooikoppies 44	Base of kopje which has a	on diabase or granite	J. A. Allen pers. comm.
Britz	stone wall site on the top	outcrop	- site excavated by Pretoria University Archaeology Honours class 1971.

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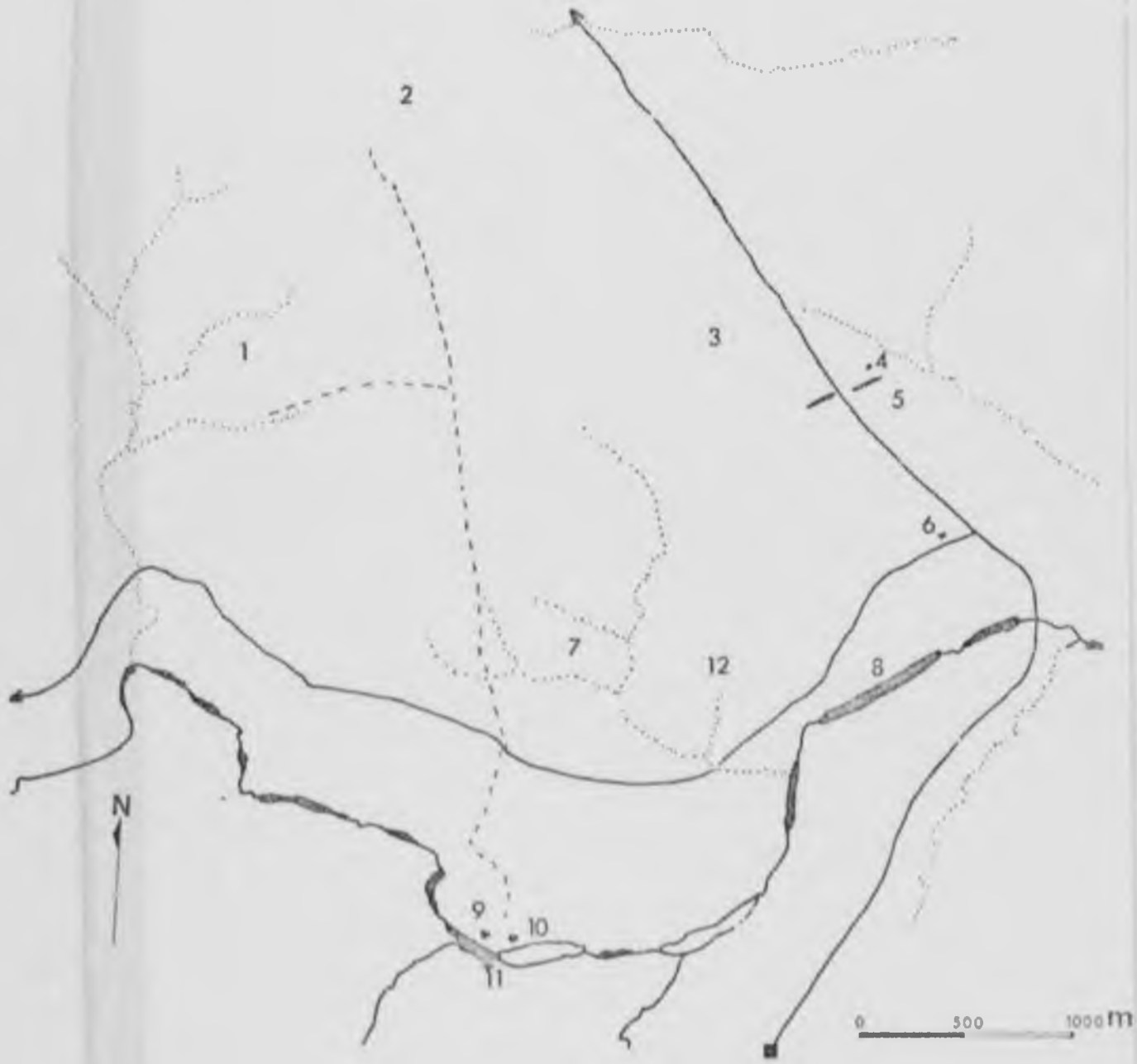
Fig. 1. Map showing distribution of sites at Harmony

key:

1. Main soapstone bowl factory
2. Soapstone bowl factory
3. Soapstone bowl factory
4. 4/73: furnaces C VII A and B
5. Copper mine
6. Slag area 6/73
7. Soapstone bowl factory
8. Makhutswi River
9. Salt factory site 9/72A
10. Salt factory site 10/72D
11. Salt factory site 65/72
12. Habitation site 50/74



MAP OF HARMONY IRON AGE SITES

Fig.1

Fig. 2 Plan of main soapstone bowl factory showing the major soapstone outcrops, quartz veins, the dyke and the plotted areas and points. Survey by R. P. van den Berg.

9/72 SOAPSTONE BOWL FACTORY

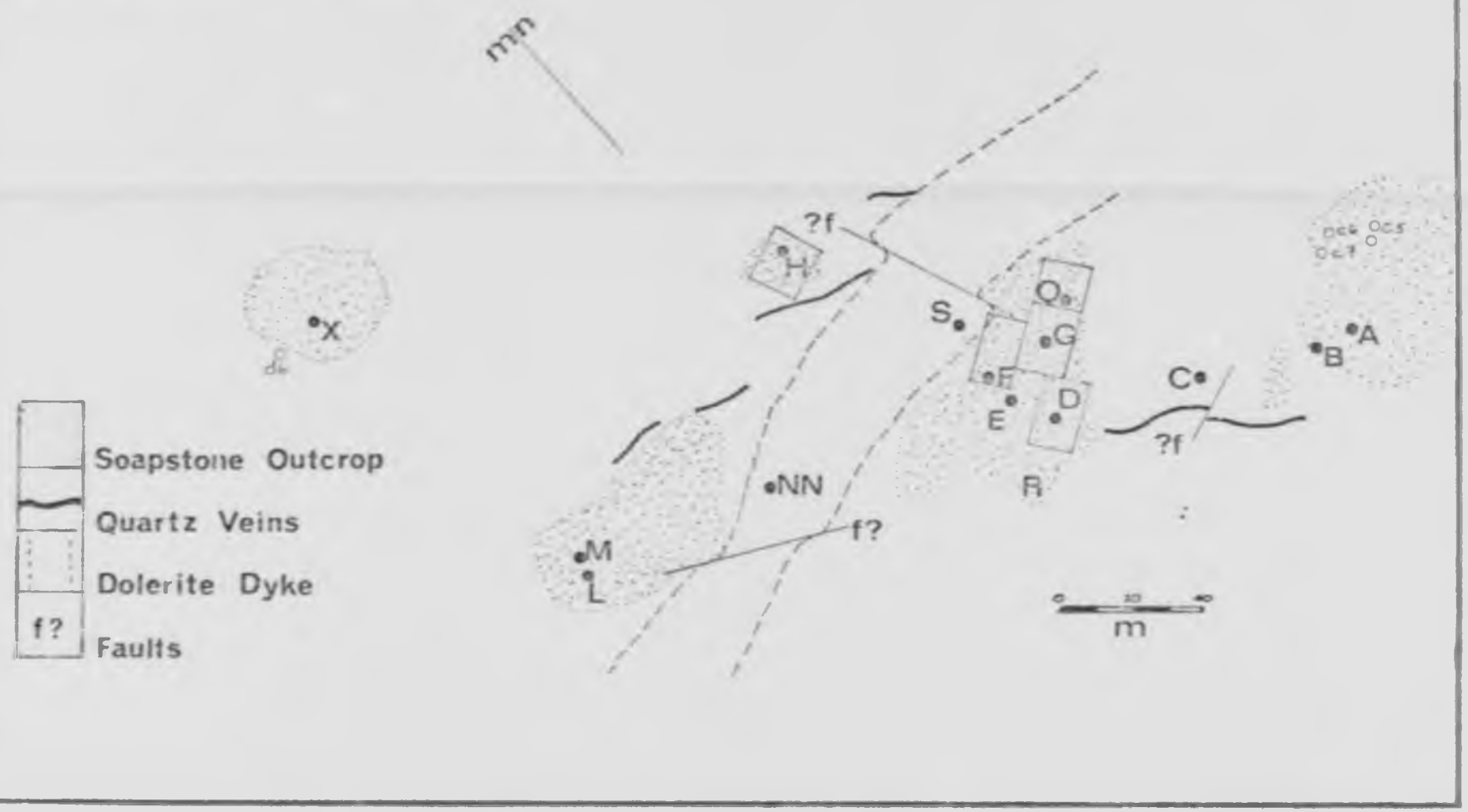
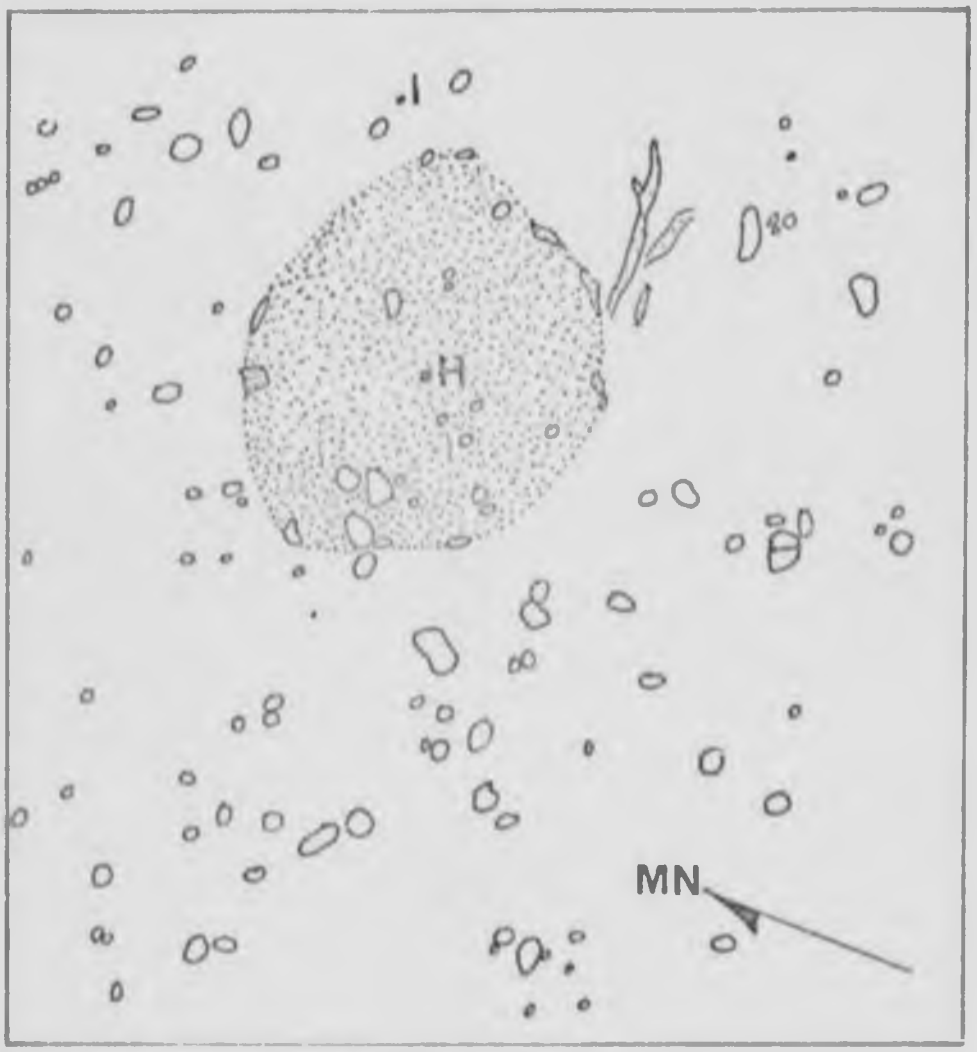


Fig.2

Fig. 3 Distribution of worked soapstone in relation to outcrops, plot H, soapstone bowl factory.

SOAPSTONE BOWL FACTORY

DISTRIBUTION OF WORKED SOAPSTONE - PLOT H



SOAPSTONE OUTCROP

QUARRY

Fig. 3

Fig. 4 Juxtaposition of plotted areas D, F, G, Soapstone Bowl factory.

SOAPSTONE BOWL FACTORY
RELATIVE POSITIONS OF PLOTS D, F AND G



SOAPSTONE OUTCROP

QUARRY

Fig. 4

Fig. 5 Distribution of worked soapstone in relation to outcrops, plot D, soapstone bowl factory.

SOAPSTONE BOWL FACTORY DISTRIBUTION OF WORKED SOAPSTONE - PLOT D

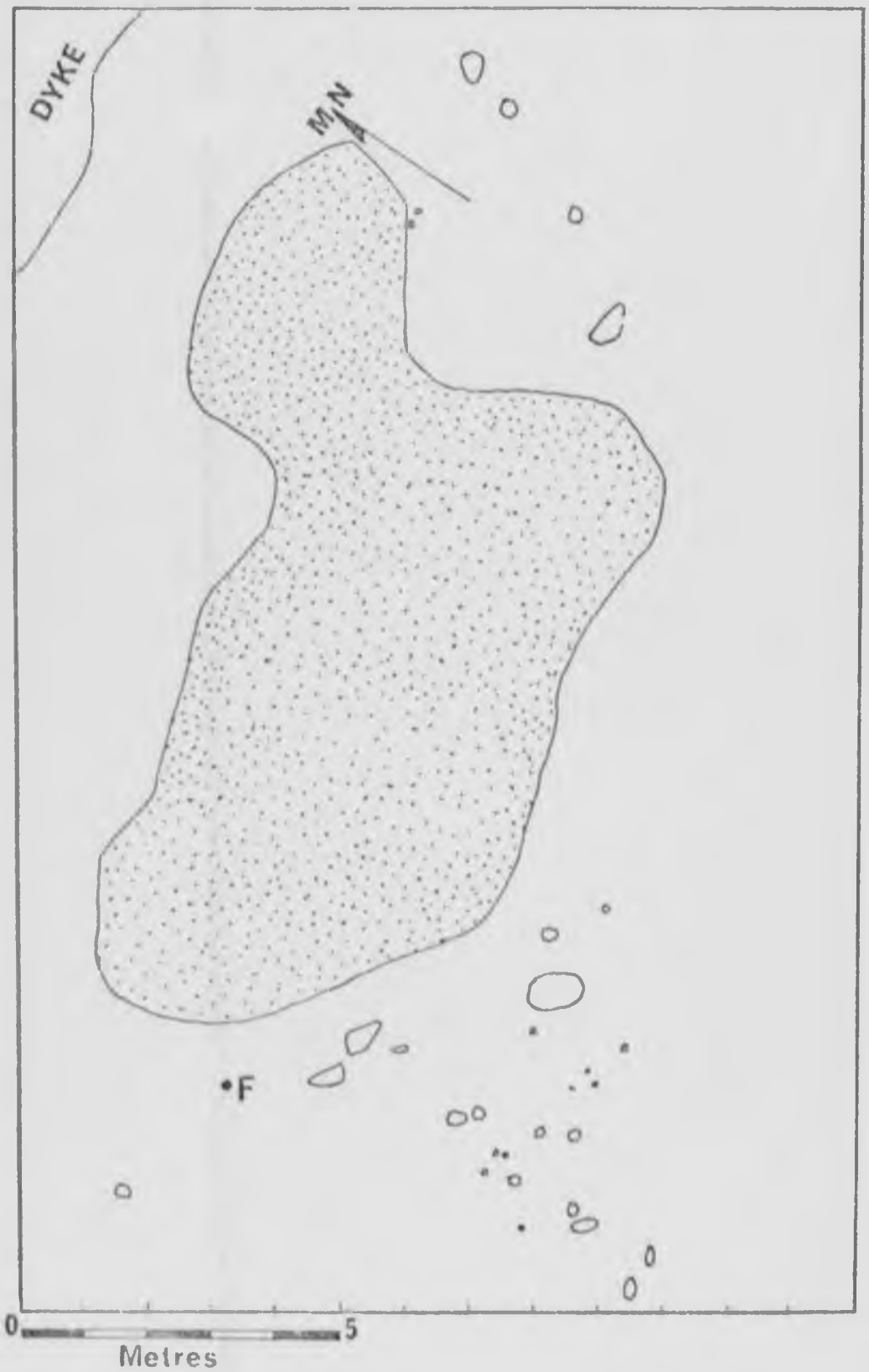


SOAPSTONE OUTCROP

Fig.5

Fig. 6 Distribution of worked soapstone in relation to outcrops, plot F, soapstone bowl factory. The paucity of worked soapstone may be due to the spotted nature of the outcrop which made it unsuitable.

SOAPSTONE BOWL FACTORY DISTRIBUTION
OF WORKED SOAPSTONE - PLOT F



SOAPSTONE OUTCROP

Fig.6

Fig. 7 Distribution of worked soapstone in relation to outcrops and a quarry, plot G, soapstone bowl factory.

SOAPSTONE BOWL FACTORY DISTRIBUTION
OF WORKED SOAPSTONE - PLOT G



Fig. 7

Fig. 8 General view of plotted area G, soapstone bowl factory. The quarried area is to the left of the sign. View from the south-west.

Fig. 9 Plotted area F, soapstone bowl factory, showing outcrops of spotty soapstone. The dyke may be seen in the background. View from the south-east.

Fig. 10 Plotted area H, soapstone bowl factory. The post is standing in the middle of a depression which probably represents the remains of a quarried outcrop. View from the north-east.



Fig 8



Fig 9



Fig 10

Fig. 11 Adze marks on a remnant part of the outcrop at H, soapstone bowl factory. The view is from the south. Scale 10 cm.

Fig. 12 Quarried outcrop at X, soapstone bowl factory. The method used is quite clear here: a ring was cut into the outcrop isolating a large chunk of material. After cutting about two-thirds of the way through a lever was used to break off the chunk leaving a broken scar in the centre of the worked area.

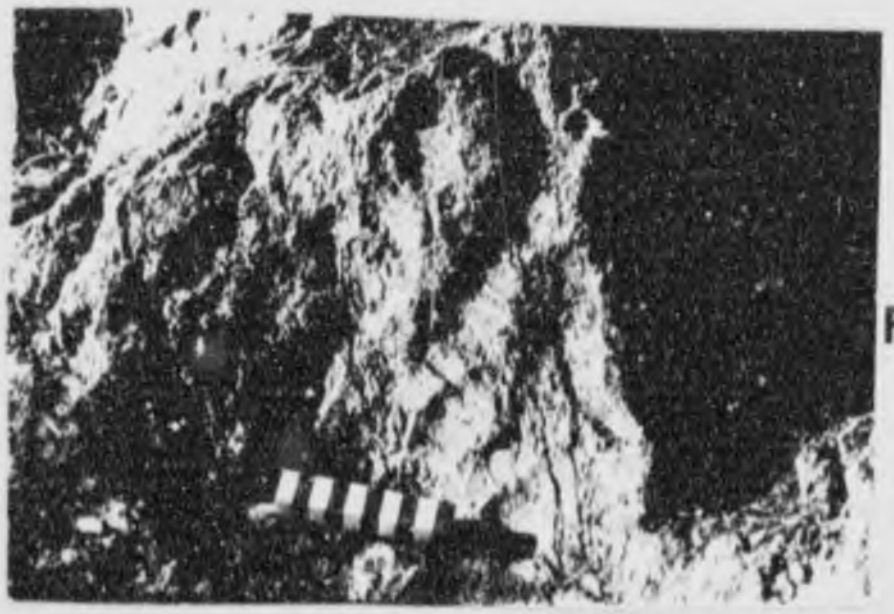


Fig 11



Fig 12

Fig. 13-14 Stages in bowl manufacture as seen at the soapstone bowl factory.

Fig. 13 Preparatory chippings in a stone at A, soapstone bowl factory. The stone was probably not worked further owing to the hardness of the material Scale 10 cm.

Fig. 14 A piece of soapstone with the first stage in bowl manufacture completed, soapstone bowl factory plot G. Here the final internal dimensions have been determined by cutting the ring seen on the stone. This example appears to have been abandoned because a piece of the edge was knocked off. Scale 10 cm.

Fig. 15 Two bowls at point C, soapstone bowl factory. The one on the right has had the preliminary ring cut deeper and part of the central portion has been removed. It is one of the rare examples of bowls with handles and was abandoned because a crack developed along its length. The second bowl has had the central portion removed but broke before the final smoothing of the interior could be carried out. Scale 50 cm.



Fig 13



Fig 14

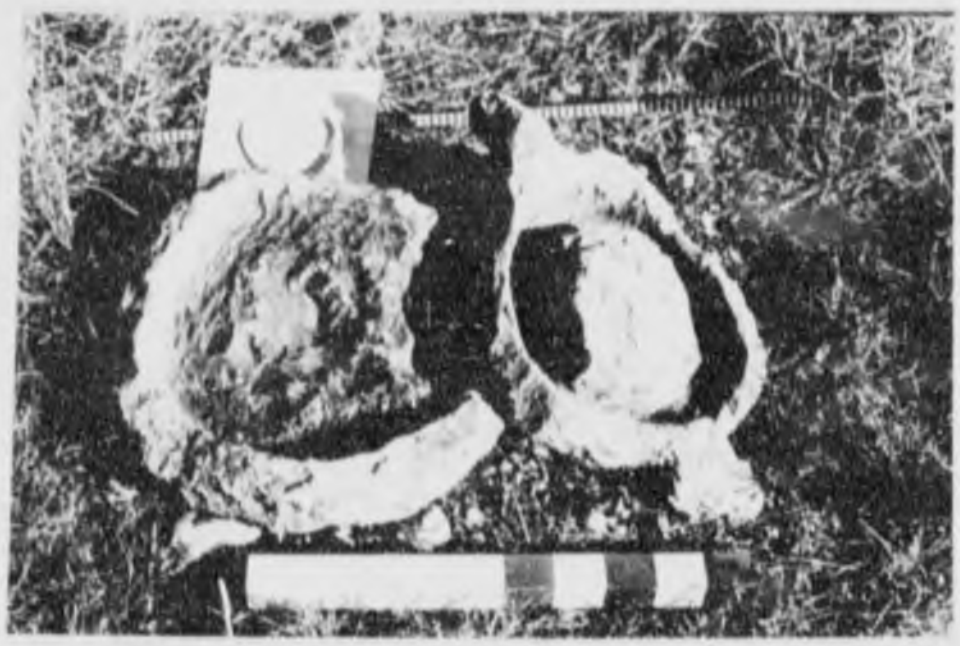


Fig 15

Fig. 16-18 Examples of bowls from the Soapstone Bowl Factory

Fig. 16 Partly completed bowl at X, soapstone bowl factory; also shown is the drilled stone d6 - scale 10 cm.

Fig. 17 Handled bowl fragment, plot D, soapstone bowl factory. Length of fragment 23 cm.

Fig. 18 Deep rectangular bowl, plot D, soapstone bowl factory. Width of bowl 17 cm.



Fig 16



Fig 17



Fig 18

Fig. 19-21 Examples of bowls from the Soapstone Bowl Factory

Fig. 19 Subrectangular whole bowl, broken in half, plot H, soapstone bowl factory. Length of bowl 38 cm.

Fig. 20 Triangular whole bowl with hole in the base, plot H, soapstone bowl factory. Length of bowl 43 cm.

Fig. 21 Sub-circular whole bowl with edge knocked off, plot G, soapstone bowl factory. Scale 10 cm.

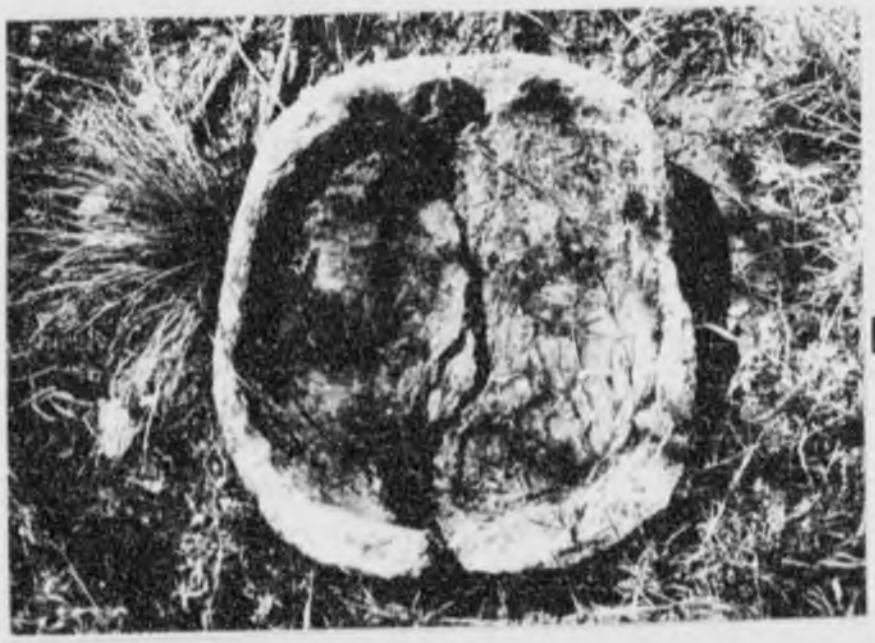


Fig 19

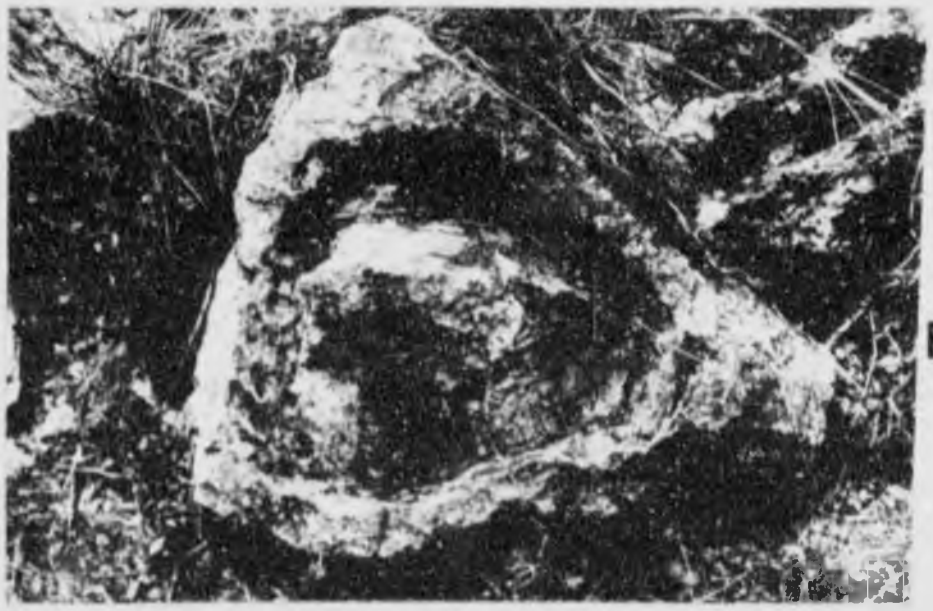


Fig 20



Fig 21

Fig. 22 Drilled soapstone c6, soapstone bowl factory. Scale 10 cm.

Fig. 23 Drilled soapstone c5, soapstone bowl factory. Scale 10 cm.

Fig. 24 Drilled soapstone C7, soapstone bowl factory. Scale 10 cm.



Fig 22



Fig 23



Fig 24

Fig. 25 Mruba board at I, soapstone bowl factory.
Scale 10 cm.



Fig 25

Fig. 26 Bar charts showing distribution of classes of worked soapstone by plotted area and in total.

Key to classes:

1. Whole bowl broken half, the halves lying next to one another
2. Whole bowl cracked
3. Whole bowl with hole in the base
4. Bowl with an edge broken off
5. Chips of undecided provenance
6. Foreign stones other than quartz and diabase
7. Adze marks on stones - parts of bowls to rocks with 2-3 chip marks
8. Whole bowls, no reason ascertainable for their being abandoned
9. Holes in soapstone (cf. Pruhn board or perforated stone)
10. Bottom or base of a bowl with sides missing
11. Bowl edge with handle
12. Bowl edge

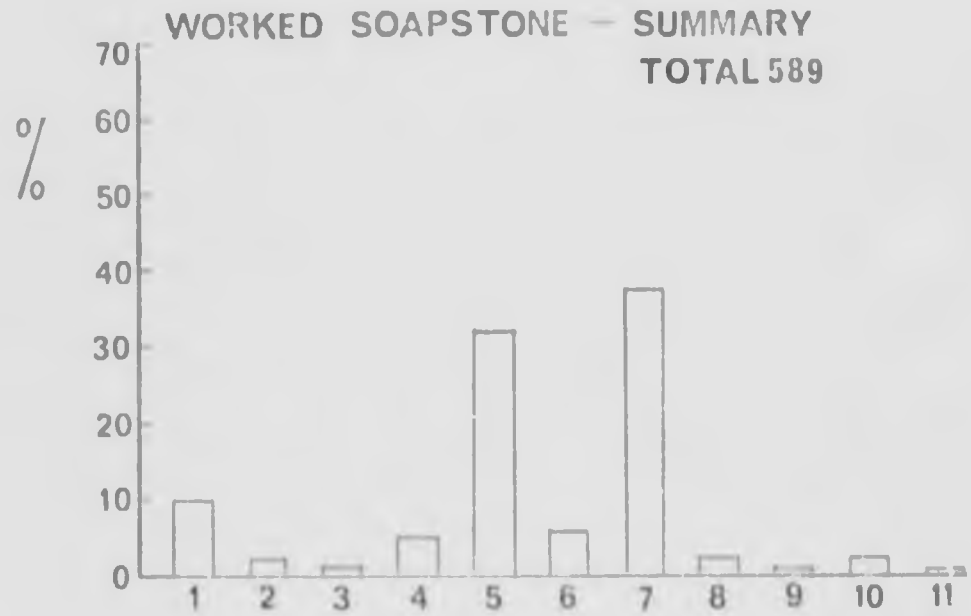

WORKED SOAPSTONE – SUMMARY
TOTAL 589
%
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
11
12
CLASS

Fig. 26

Fig.26

WORKED SOAPSTONE

H Plot. total 115 area 210 m²

D Plot. total 115 area 280 m²

G Plot. total 276 area 280 m²

Q Plot. total 83 area 156 m²

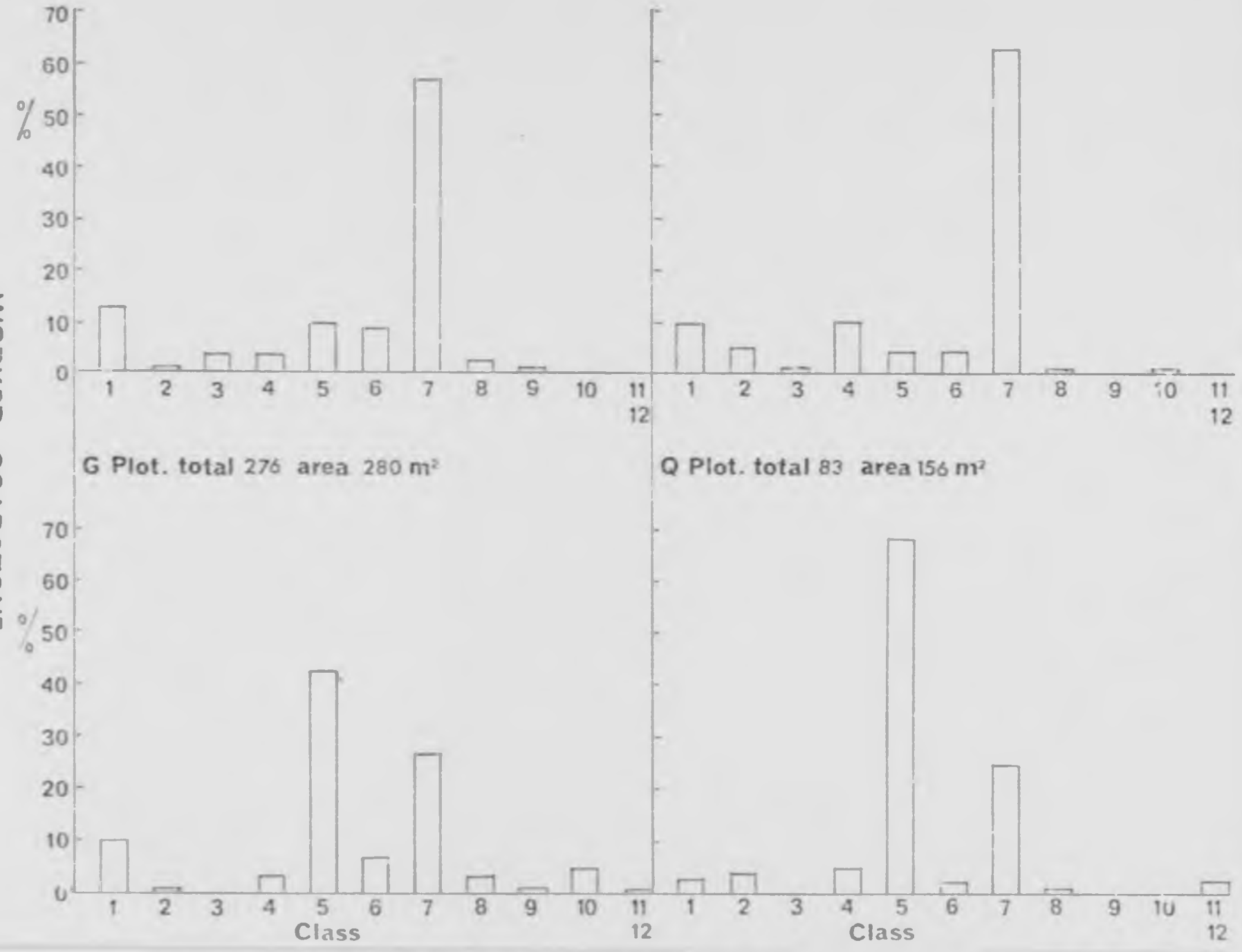


Fig. 27 Sketch plan of west section of copper mine showing positions of trenches. C II is between CI and C IV. Distance between units 10 and 11 is approximately 50 m. There may have been another unit in the road filled in when the road was made.

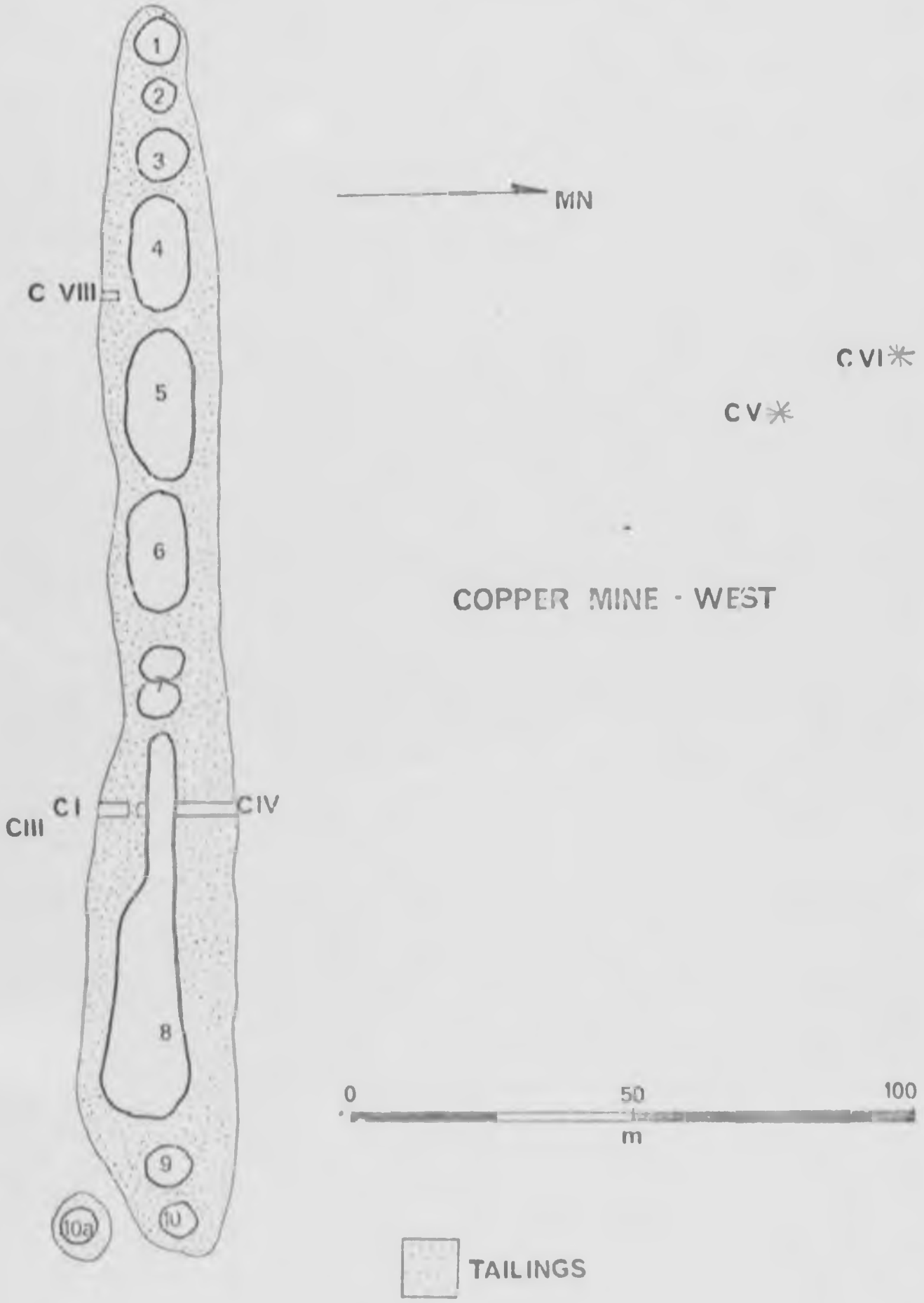

1
2
3
4
5
6
8
9
10a
10
C VIII
CIII
CI
CIV
MN
C VI
C V
COPPER MINE - WEST
0
50
100
m
TAILINGS
road

Fig. 27

Fig. 28 Sketch plan of the east section of the copper mine.
Unit 22 is the one partially cleared in January 1973.

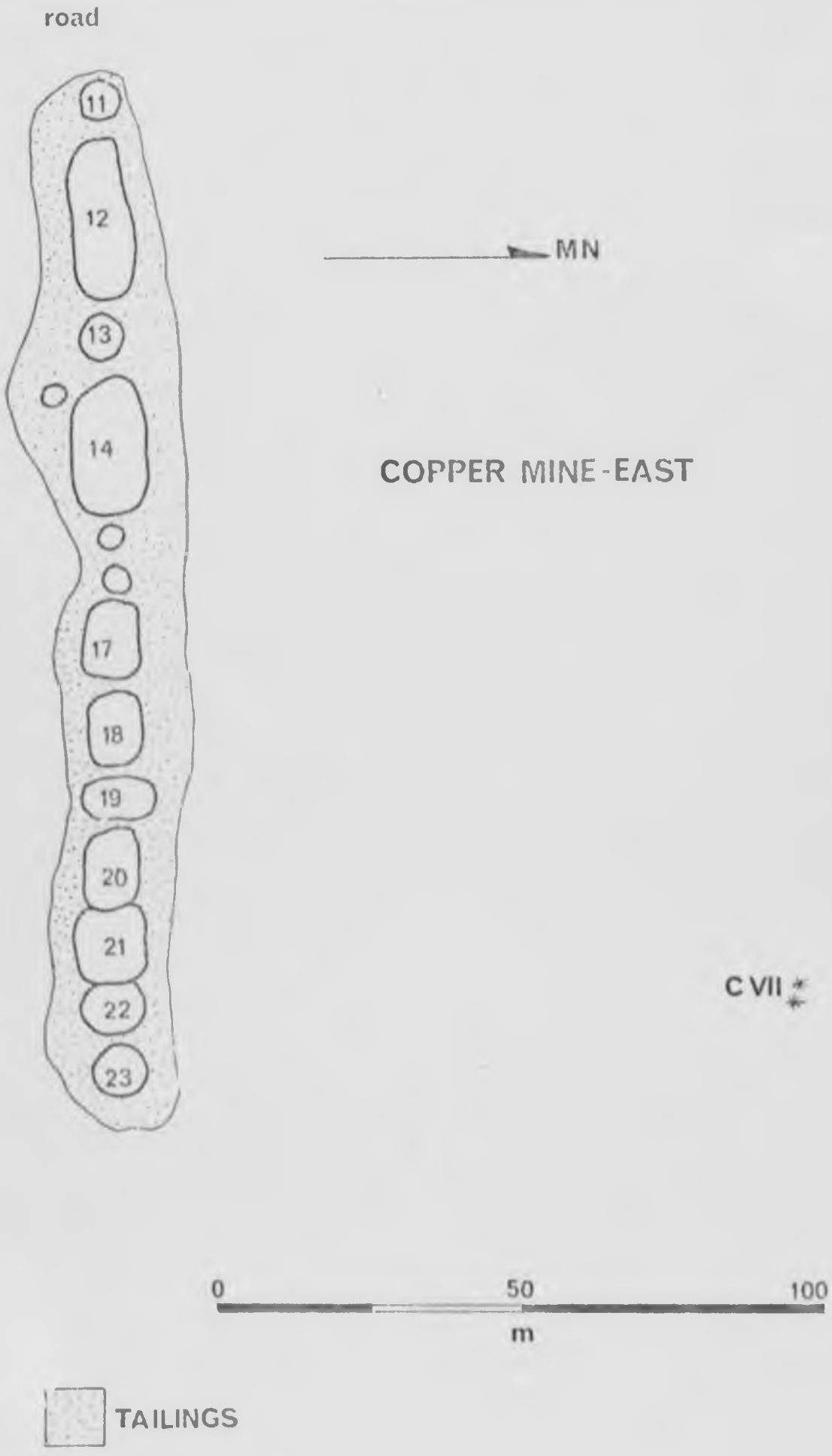

road
11
12
13
14
17
18
19
20
21
22
23
MN
COPPER MINE-EAST
C VII
0
50
100
m
TAILINGS

Fig. 28

Fig. 29-30 Photographs showing methods used to clear Unit 22, copper mine; scale - see human figures.



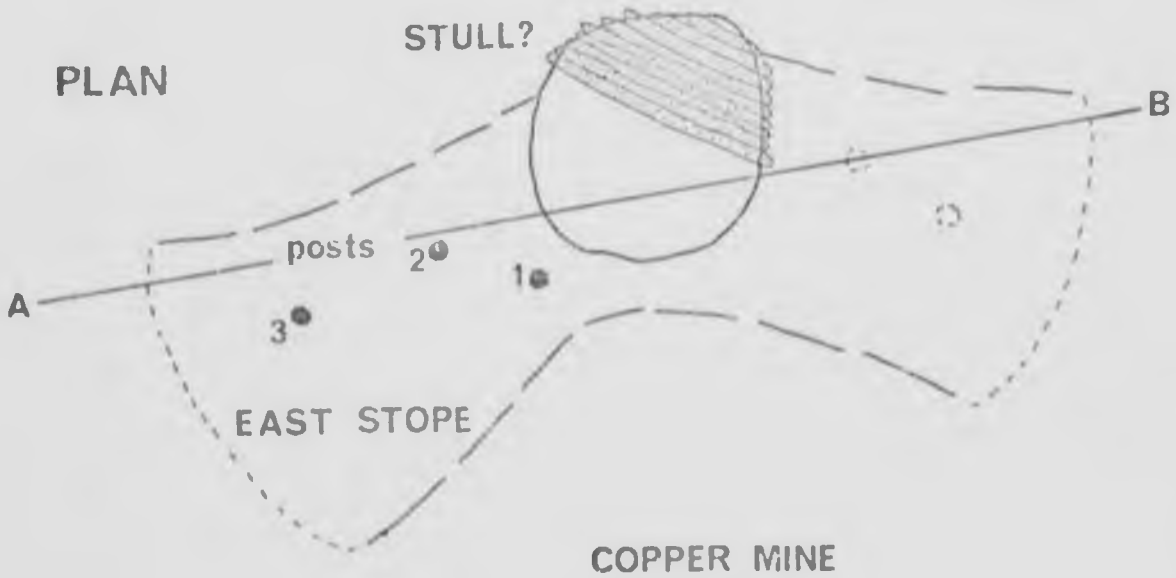
Fig 29



Fig 30

Fig. 31 Sketch plan of Unit 22 showing the shaft and underground workings. Details of the west stope are conjectural. The timbers found in the rubble may have formed a stull as reconstructed in the drawing. Conjectural section A-B through unti 22. The presence of the central truncated cone of country rock is suggested by the angle of the timbers in the east stope; the cone would not have separated the two stopes.

PLAN



COPPER MINE
UNIT 22

0 5
Metres

SECTION

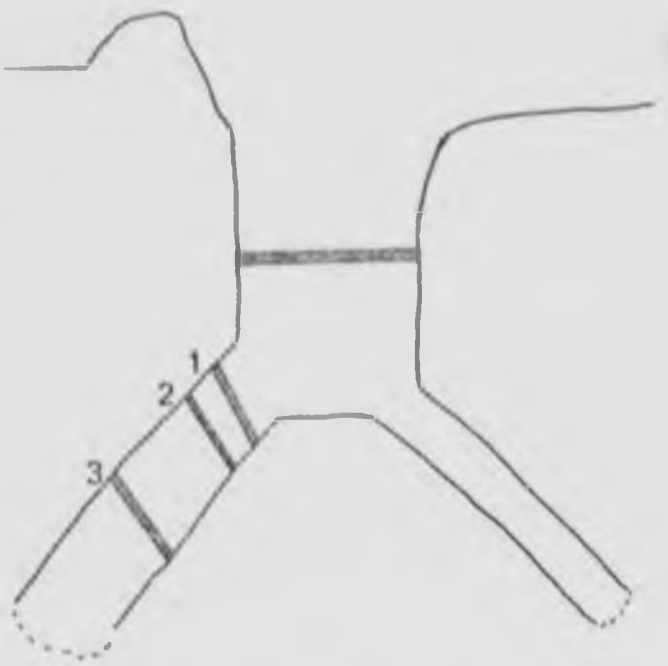


Fig. 31

Fig. 32 Section B-A of unit 72 showing rubble removed, remaining fill and position of the timbers as found. Three of these were still *in situ* as props.

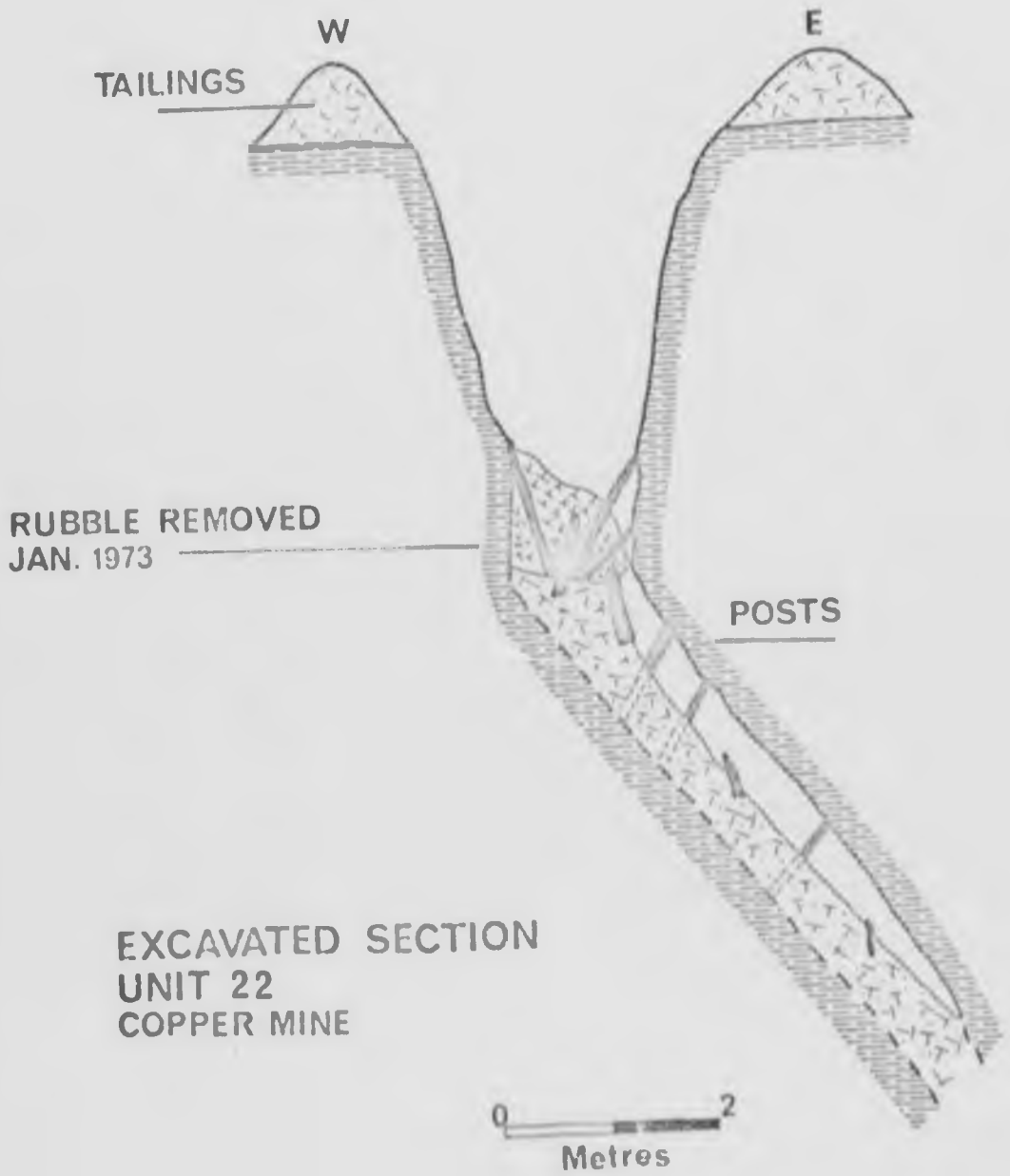

W
E
TAILINGS
RUBBLE REMOVED
JAN. 1973
POSTS
EXCAVATED SECTION
UNIT 22
COPPER MINE
0
2
Metres

Fig. 32

Fig. 33 Detail of the opening into the east stope, unit 22, copper mine, as seen behind log 1. Scale: Diameter of log - 14 cm.

Fig. 34-37 Progressive clearing of unit 22, copper mine. Scale: Distance between arrows 1,7 m. The left-hand (west) arrow is on a ledge which may have supported a main beam for a stull.

Fig. 38 General view of unit 22, copper mine at final limit of clearing. Scale: Distance between arrows 1,7 m.



Fig 33



Fig 34



Fig 35



Fig 36



Fig 37



Fig 38

Fig. 39 Interior of the east stope, unit 22, copper mine, from the base. Post 3 is shown by the broken stump in the foreground. Posts 2 and 1 are visible in the middle and background.
Scale: Distance between the arrows 73 cm.

Fig. 40 Detail of contact between post 2 and the hanging wall, east stope, unit 22, copper mine. Bark is still preserved on the post.
Scale: Diameter of the post 13 cm.

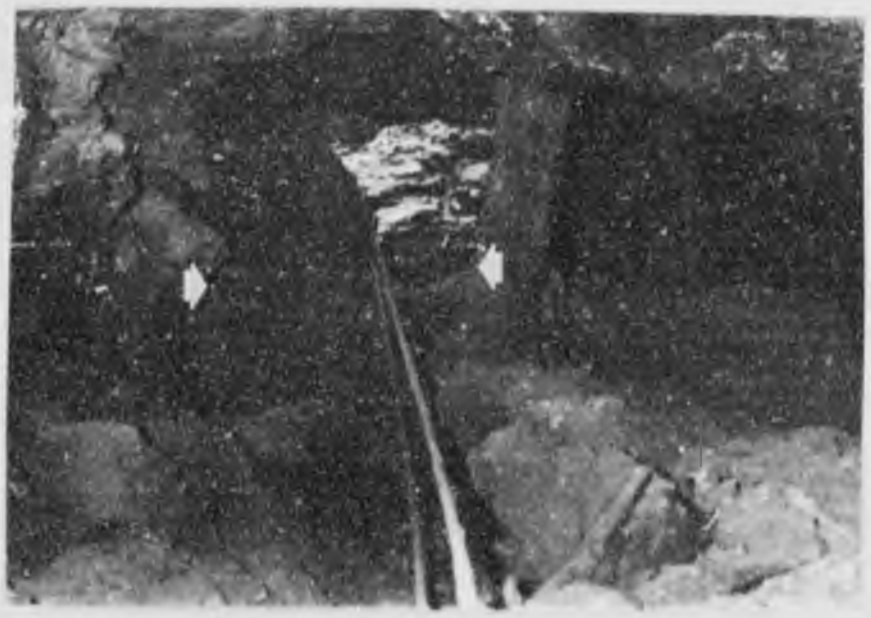


Fig 39



Fig 40

Fig. 41 View of Trench CI at unit 8, copper mine taken in July 1972. The west face was left sloping out at ca. 70-80° to preserve the wall of the trench intact, so that it could be drawn at a later date. No photographs were taken after the final cleaning up for drawing the profile.

Fig. 42 Composite section of Trench CI drawn in October 1972. The west face of the trench was cleaned vertically before the section was drawn.



Fig 41

UNIT 8 COPPER MINE TRENCH C1

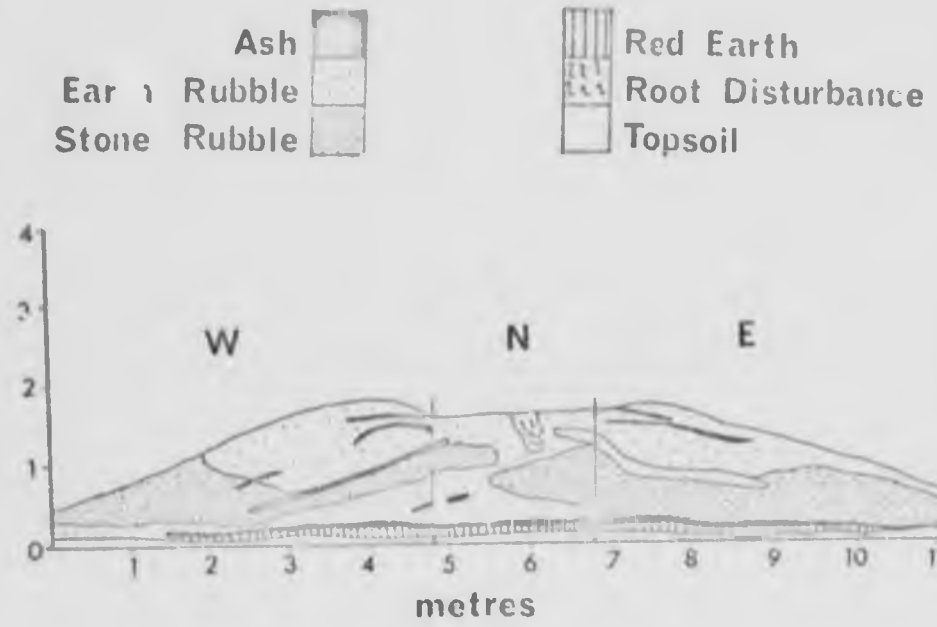


fig. 42

Fig. 43 West section of trench C IV, unit 8, copper mine.

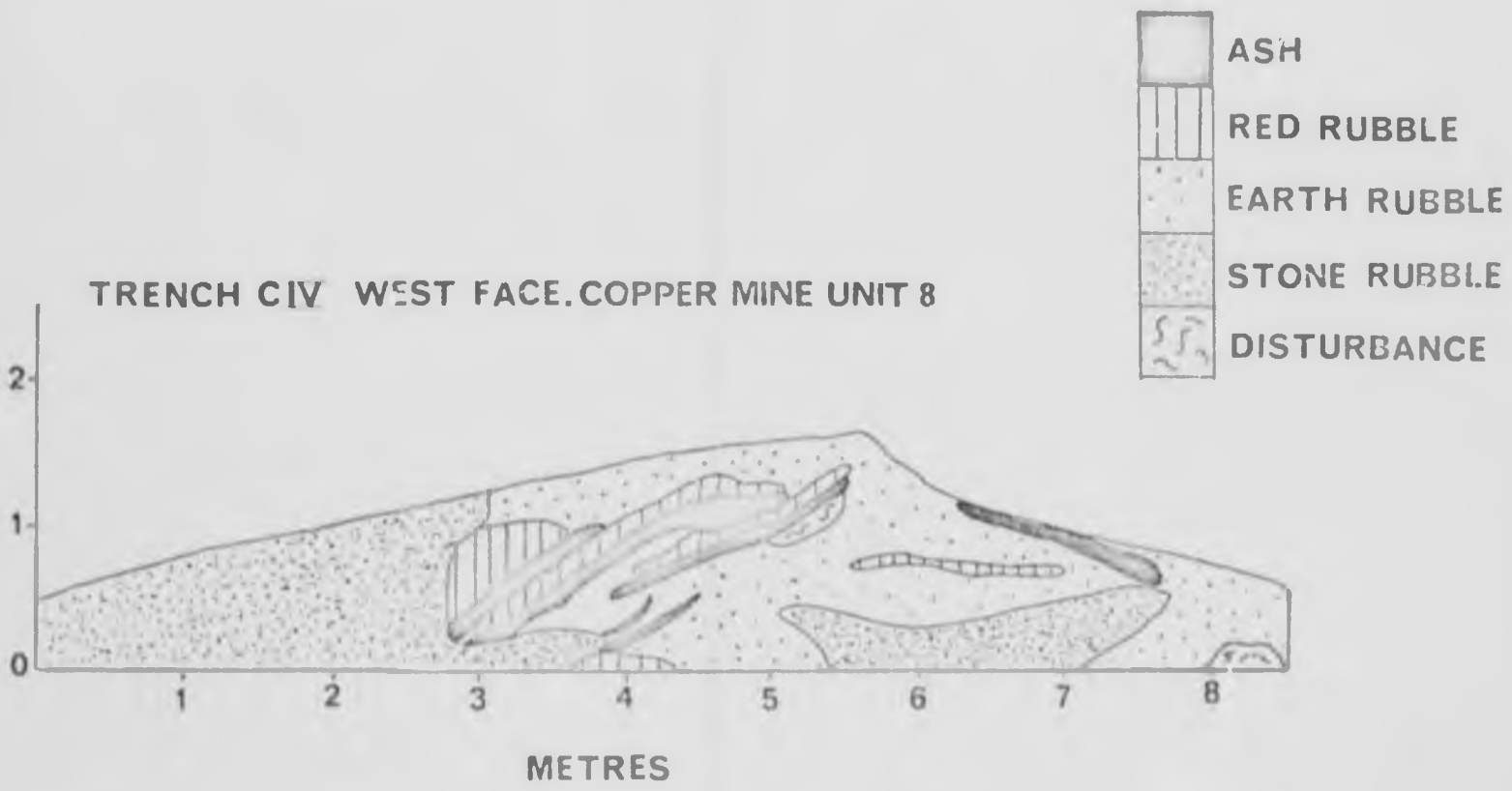

ASH
RED RUBBLE
EARTH RUBBLE
STONE RUBBLE
DISTURBANCE
TRENCH CIV WEST FACE. COPPER MINE UNIT 8
2
1
0
1
2
3
4
5
6
7
8
METRES

Fig. 43

Fig. 44 View of trench C VIII unit 4, copper mine, horizontal scale 1 m., vertical scale in feet.

Fig. 45 Detail of loose rubble deposit west section, trench C VIII, unit 4, copper mine. Vertical scale in feet.



Fig 44

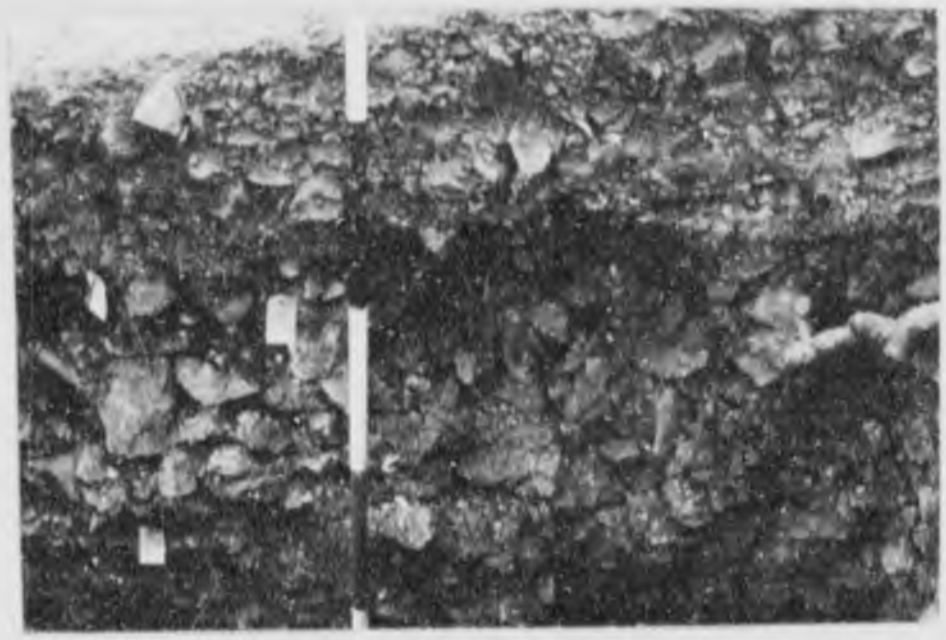


Fig 45

Fig. 46 West and north section of trench C VIII, unit 4, copper mine.

key:
1. white powdered rock
2. red earthy rubble
3. greyish boulder rubble
4. dark brown earthy rubble
5. red loose boulder rubble
6. light brown earthy rubble
7. large boulders

C VIII WEST PROFILE COPPER MINE UNIT 4

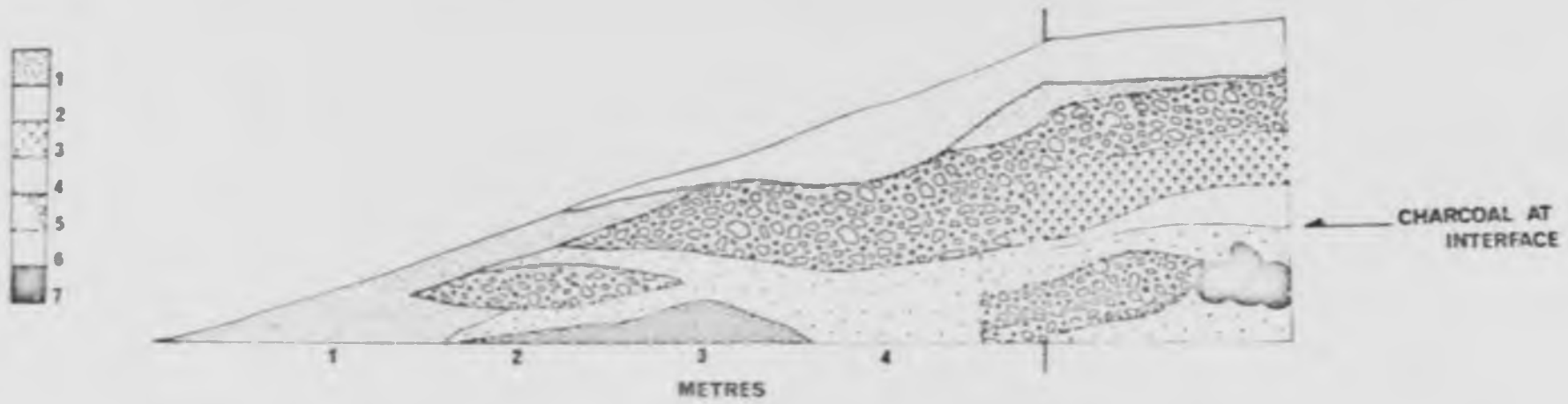


Fig. 46

Fig. 47 Dimple faced hammerstones from the copper mine. Six hammers are illustrated from different angles.

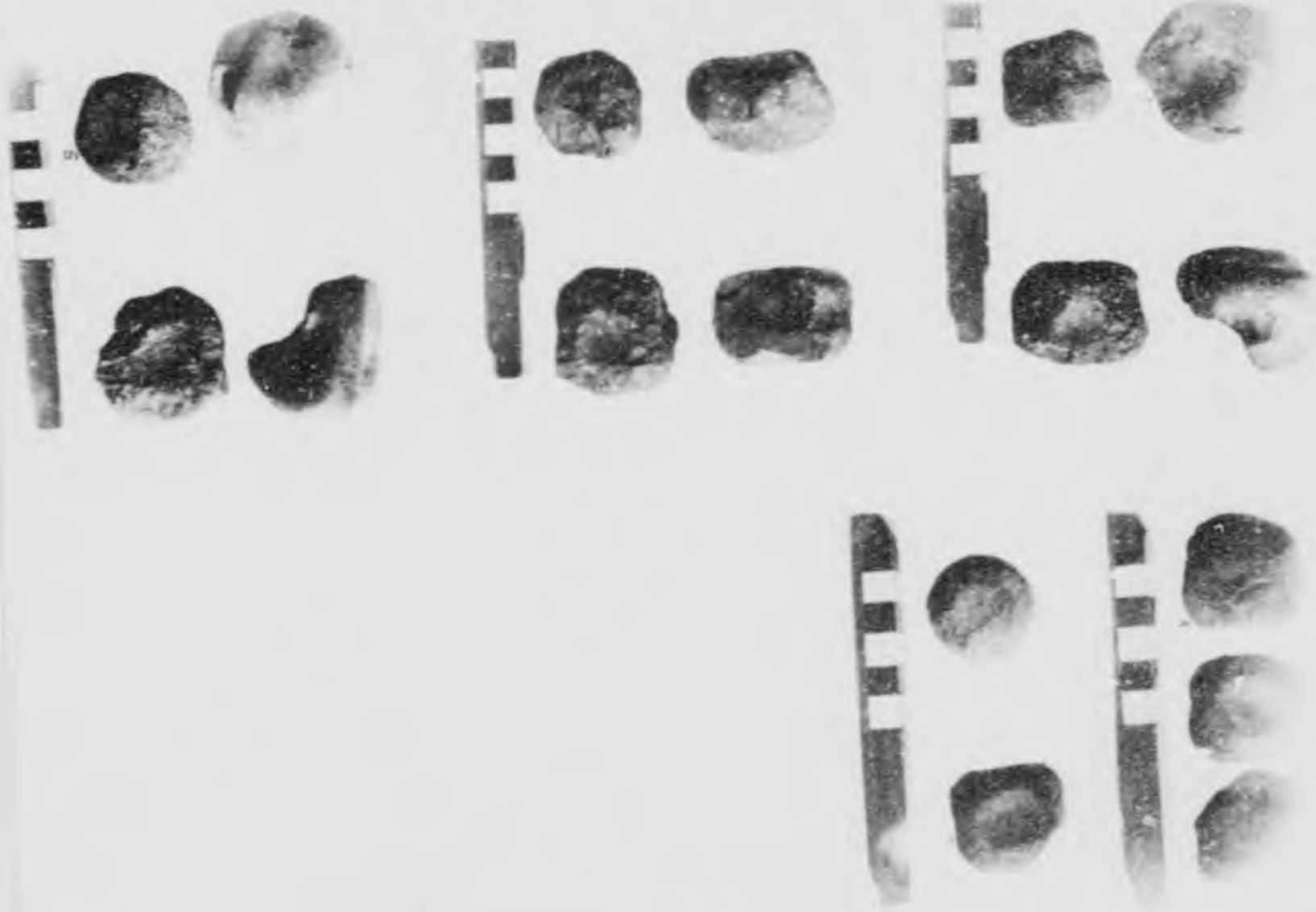


Fig47

Fig. 48-9 Excavation at CV showing distribution of clay, stones with slag adhering and tuyere fragments. The majority of tuyere fragments are in the bottom right-hand corner of figure 48. Fig. 48, depth 2 cm. Fig. 49, depth 5cm. Scale 1 m.



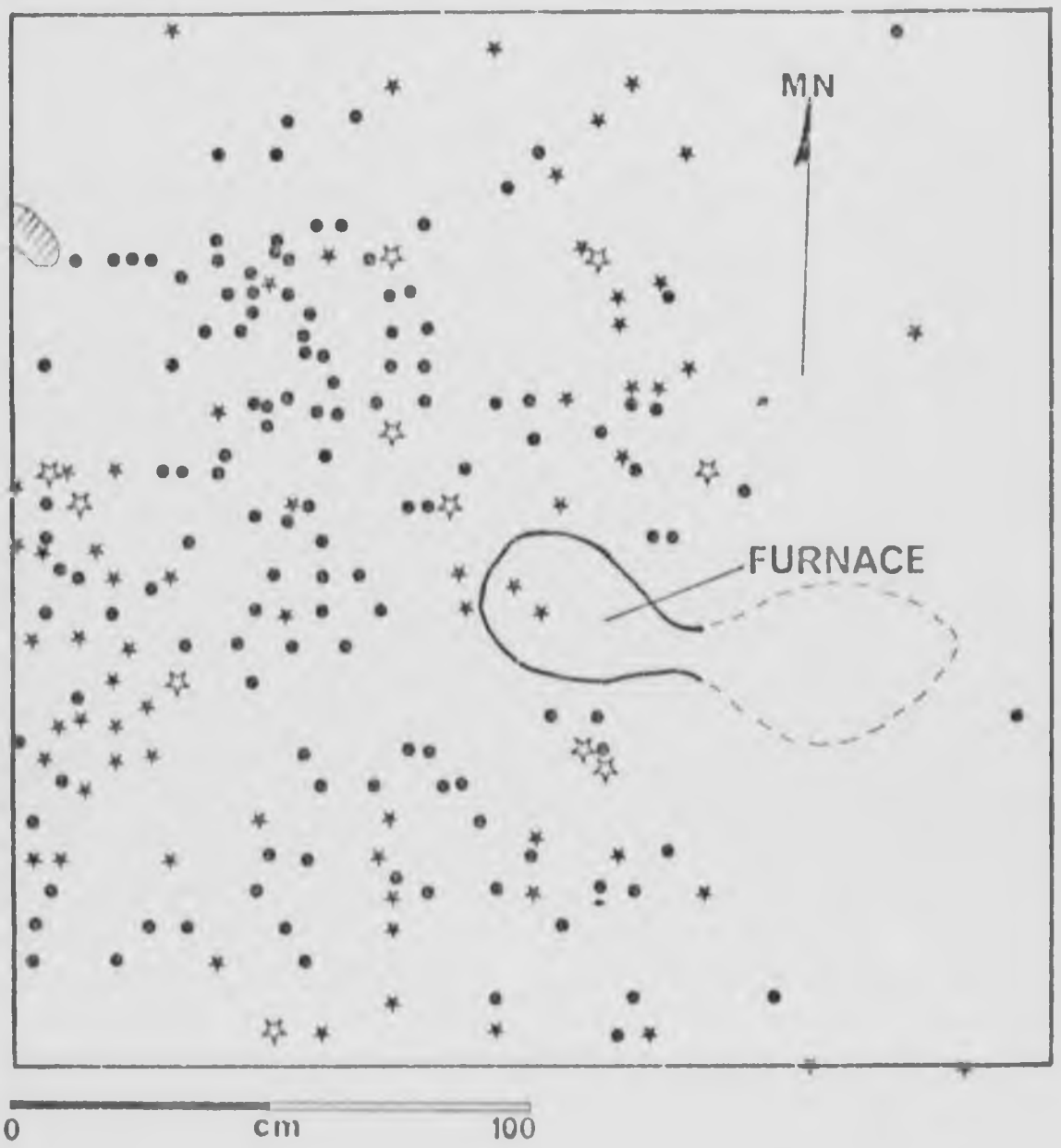
Fig 48



Fig 49

Fig. 50 Plan of excavations at Furnace C VI showing distribution of slag, clay and tuyere fragments around the furnace.

DISTRIBUTION OF CLAY SLAG AND TUYERE
AT FURNACE CVI COPPER MINE



• clay

* slag

☆ tuyere

Fig.50

Fig. 51 Plan of Furnace 3 VI, copper mine. The depression in front of the tuyere entrance and the irregular exterior surface of the wall show that the furnace must have been a hollow dug into the ground and lined with clay.

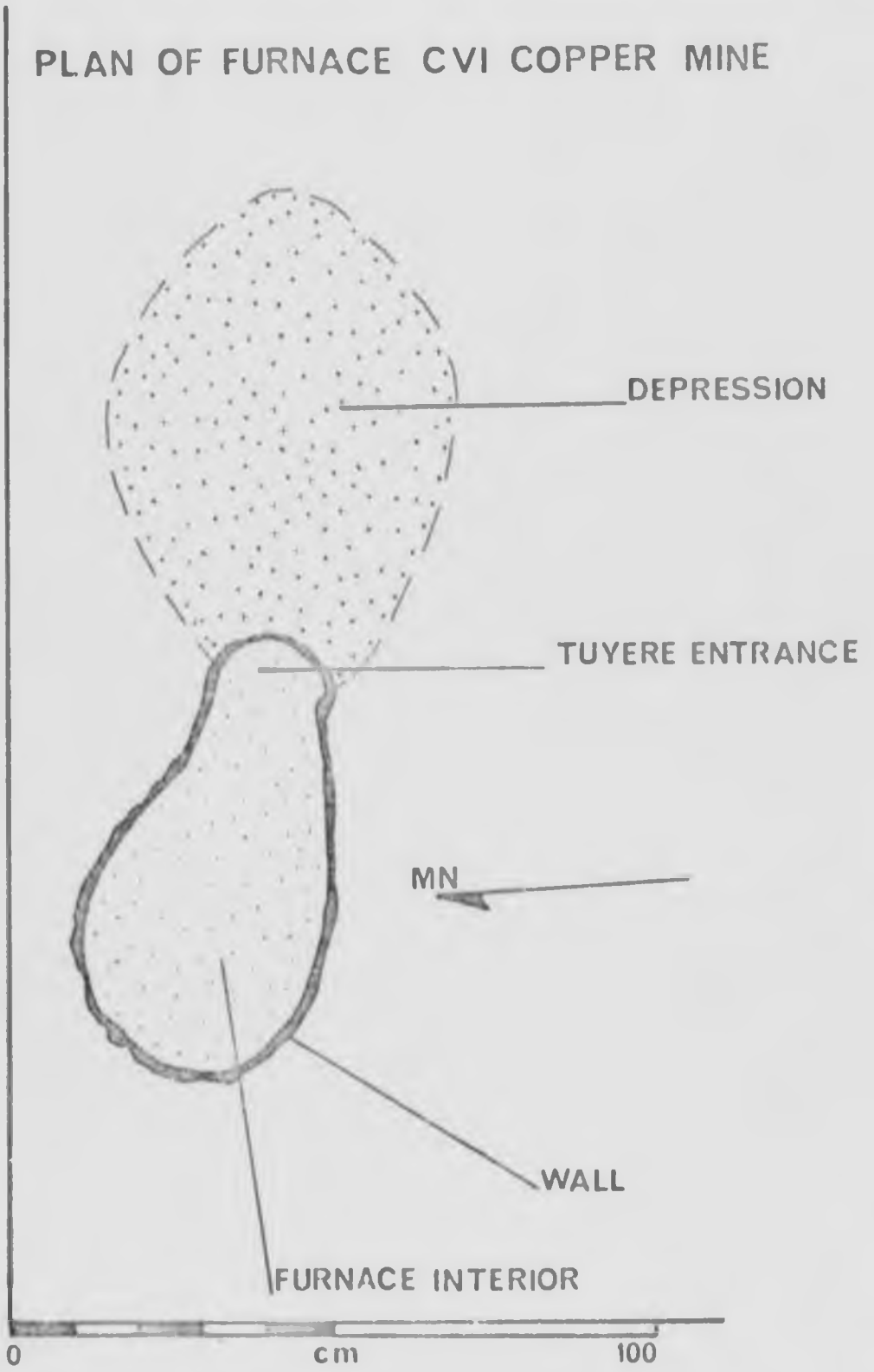

PLAN OF FURNACE CVI COPPER MINE
DEPRESSION
TUYERE ENTRANCE
MN
WALL
FURNACE INTERIOR
0
cm
100

Fig.51

Fig. 52 Furnace C VII B as found. Scale 50 cm.
View from south.

Fig. 53 Furnace C VII A as found. Scale 50 cm.
View from slightly west of south.

Fig. 54 Juxtaposition of furnaces C VII A and B.
Scale 50 cm. View from slightly west of south.

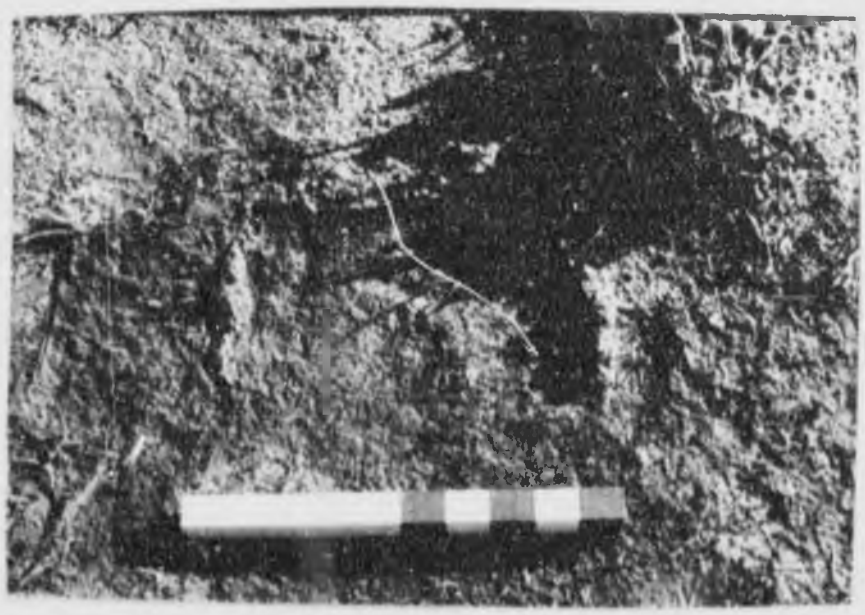


Fig 52



Fig 53

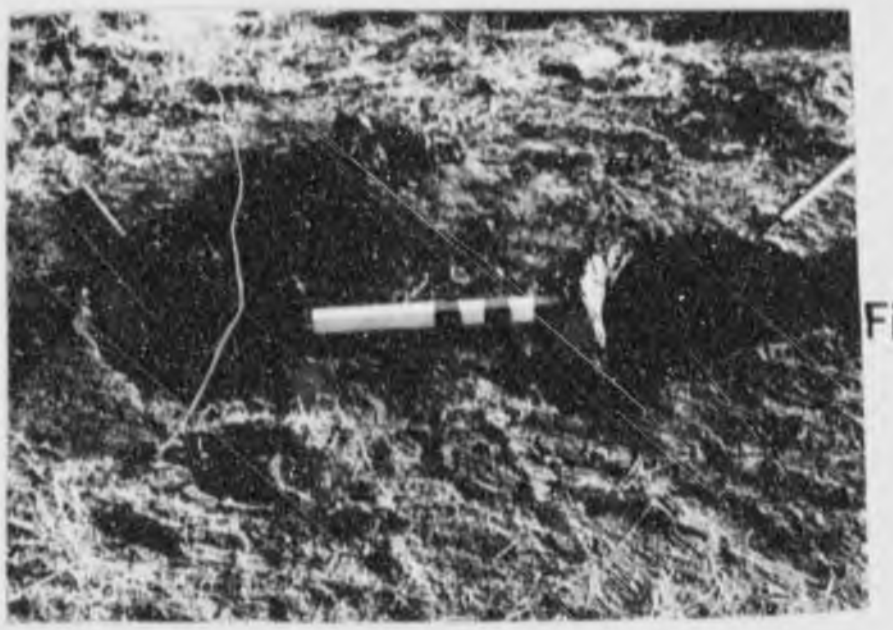


Fig 54

Fig. 55 Plans for furnace C VII A at 5 cm. and 40 cm.

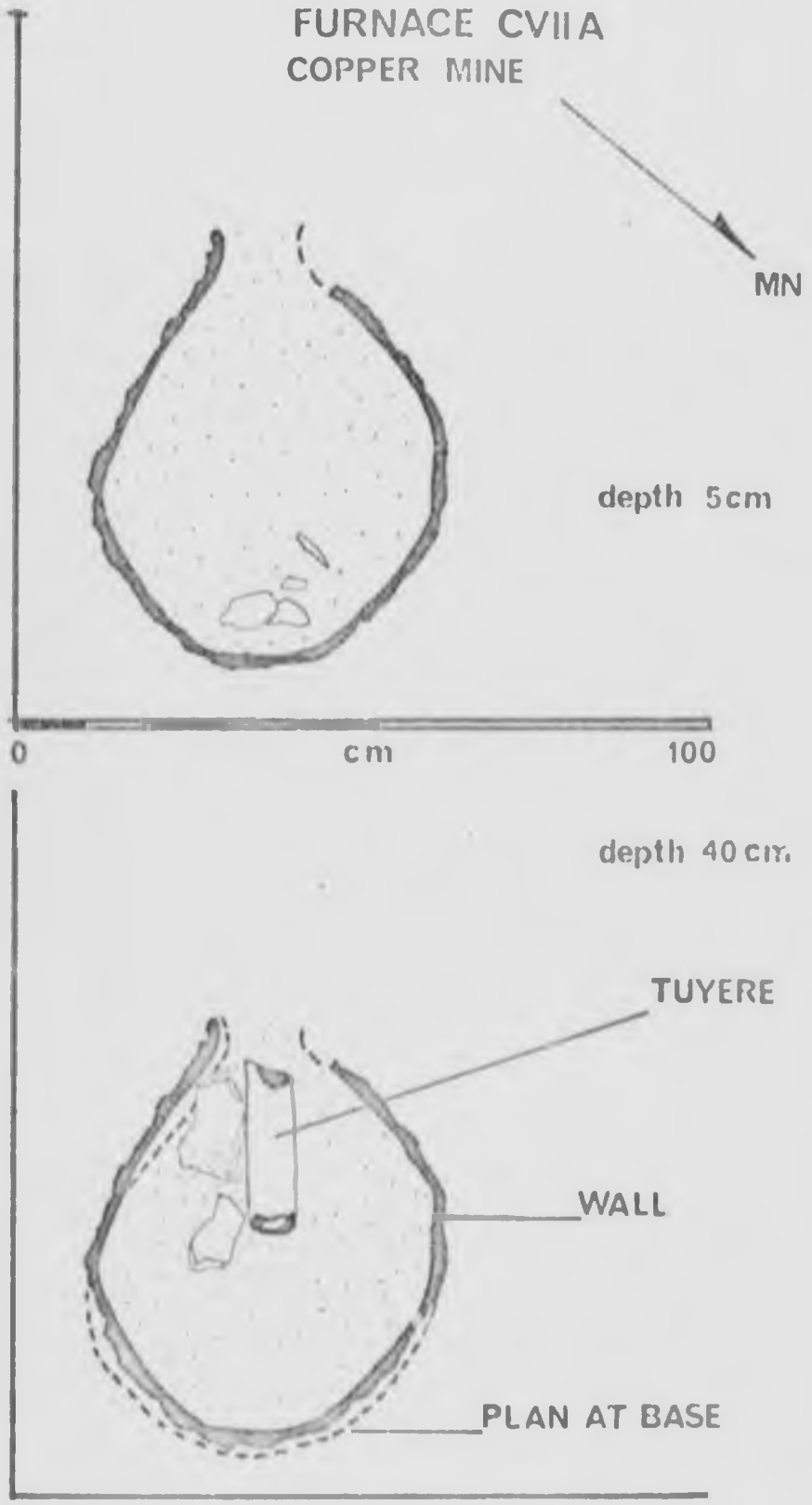

FURNACE CVIIA
COPPER MINE
MN
depth 5cm
0
cm
100
depth 40 cm.
TUYERE
WALL
PLAN AT BASE

Fig. 55

Fig. 56 View of furnace C VII A. Maximum internal width of furnace 42 cm. Tuyere entrance at the top of the photograph opens south-west.



Fig 56

Fig. 57 Plan of the excavations at 9/72A, salt factory, showing distribution of ash, red earth patches and small finds as detailed on p. 34-36.

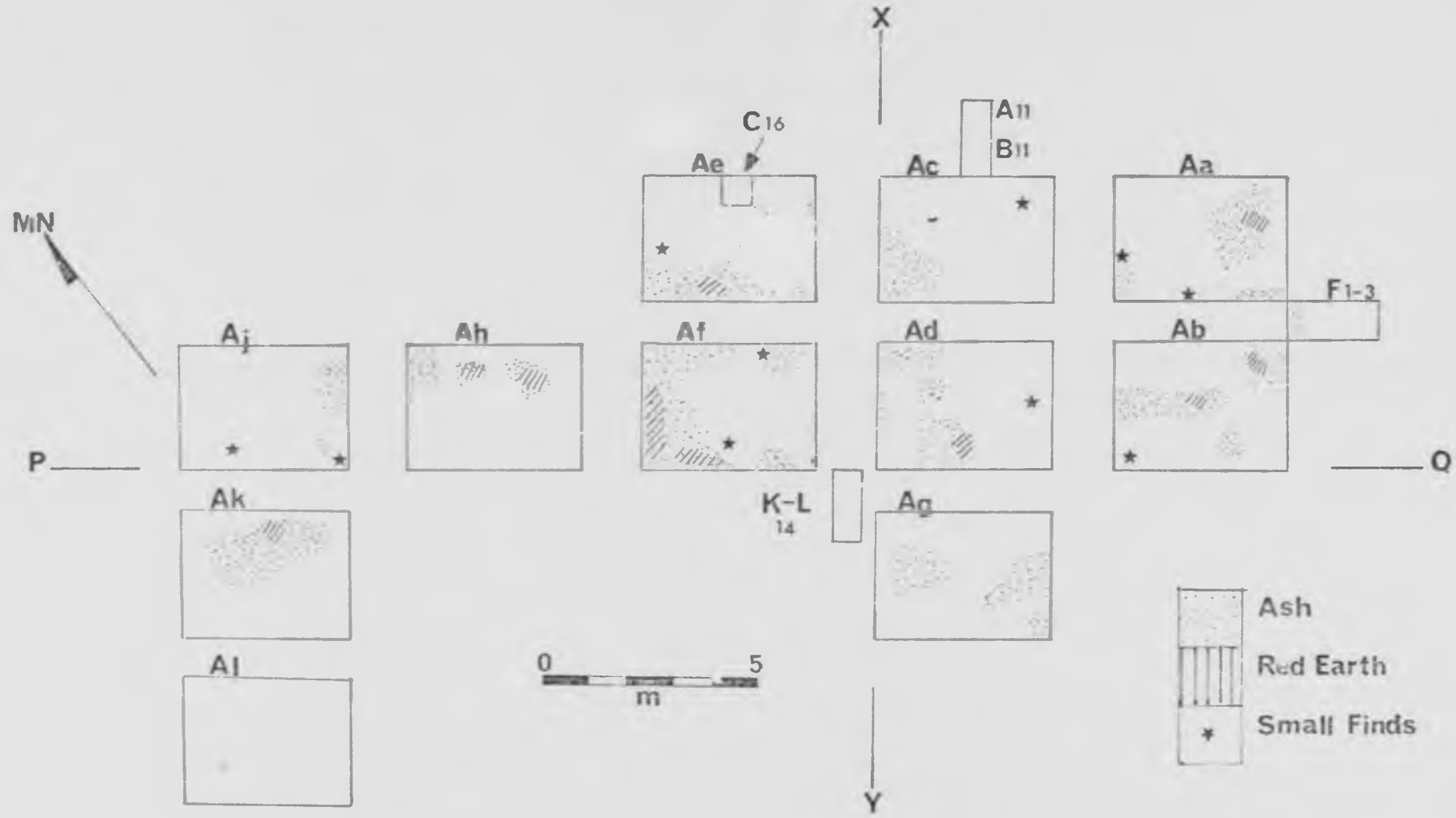
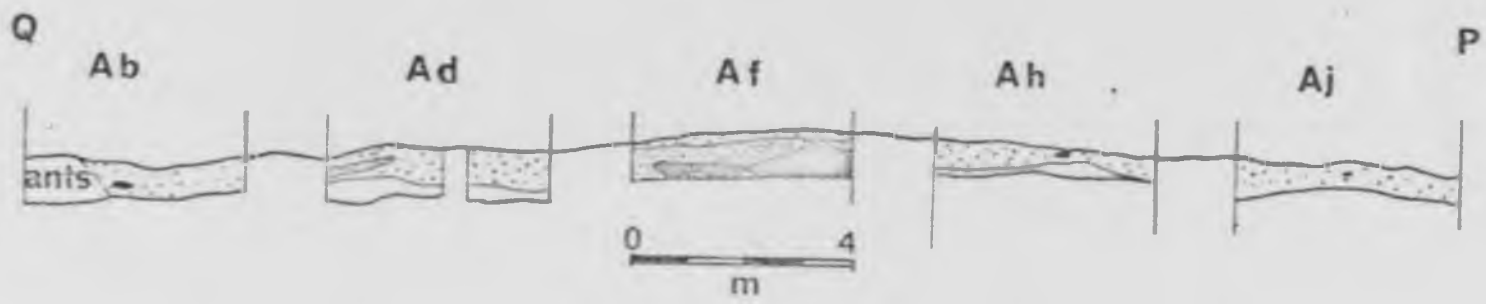


Fig. 57

SALT FACTORY SITE 9/72 A PLAN OF EXCAVATIONS

Fig. 58 Composite sections Y-X and Q-P across the excavated area, 9/72A, salt factory.



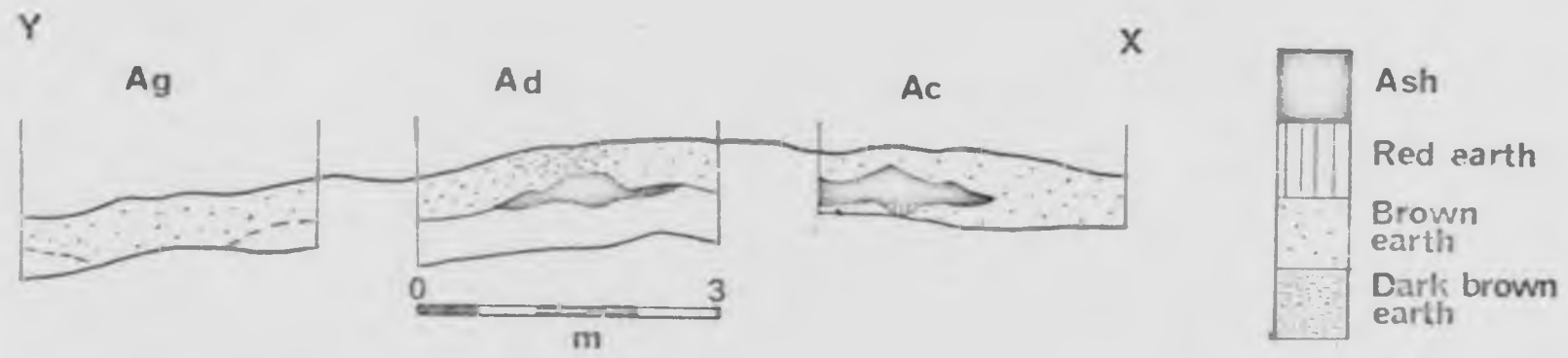


Fig.58

SITE 9/72A - SECTIONS SALT FACTORY

Fig. 59 View from north of Ad, Ae, Af at 9/72, site A, salt factory during excavation. Length of longer side of trench 4 m.

Fig. 60 General view of Aa - Ad from west of north, site 9/72A. Length of shorter side of trench 3 m.

Fig. 61 Students at work in Ah and Ag, site 9/72A. Width of excavated unit 3 m.



Fig 59



Fig 60



Fig 61

Fig. 62 Ash occurrences in A4, site 9/72A, from west. Scale: Distance between arrows 1,28 m.

Fig. 63 Bowl shaped hearth shown by ash line in east section of A6, site 9/72. Length of trowel blade ca. 10 cm.



Fig 62



Fig 63

Fig. 64 Distribution of finds in Ag spit 1, 9/72A, Salt factory

Fig. 65 Distribution of finds in Ag spit 2, 9/72A, Salt factory

Fig. 66 Distribution of finds in Ag spit 3, 9/72A, Salt factory

Fig. 67 Distribution of finds in Ag spit 4, 9/72A, Salt factory

KEY FOR FIGURES 64—67

■ POTSHERD

▲ BONE

△ SHELL

□ DAUB

● CHARCOAL



Fig.64

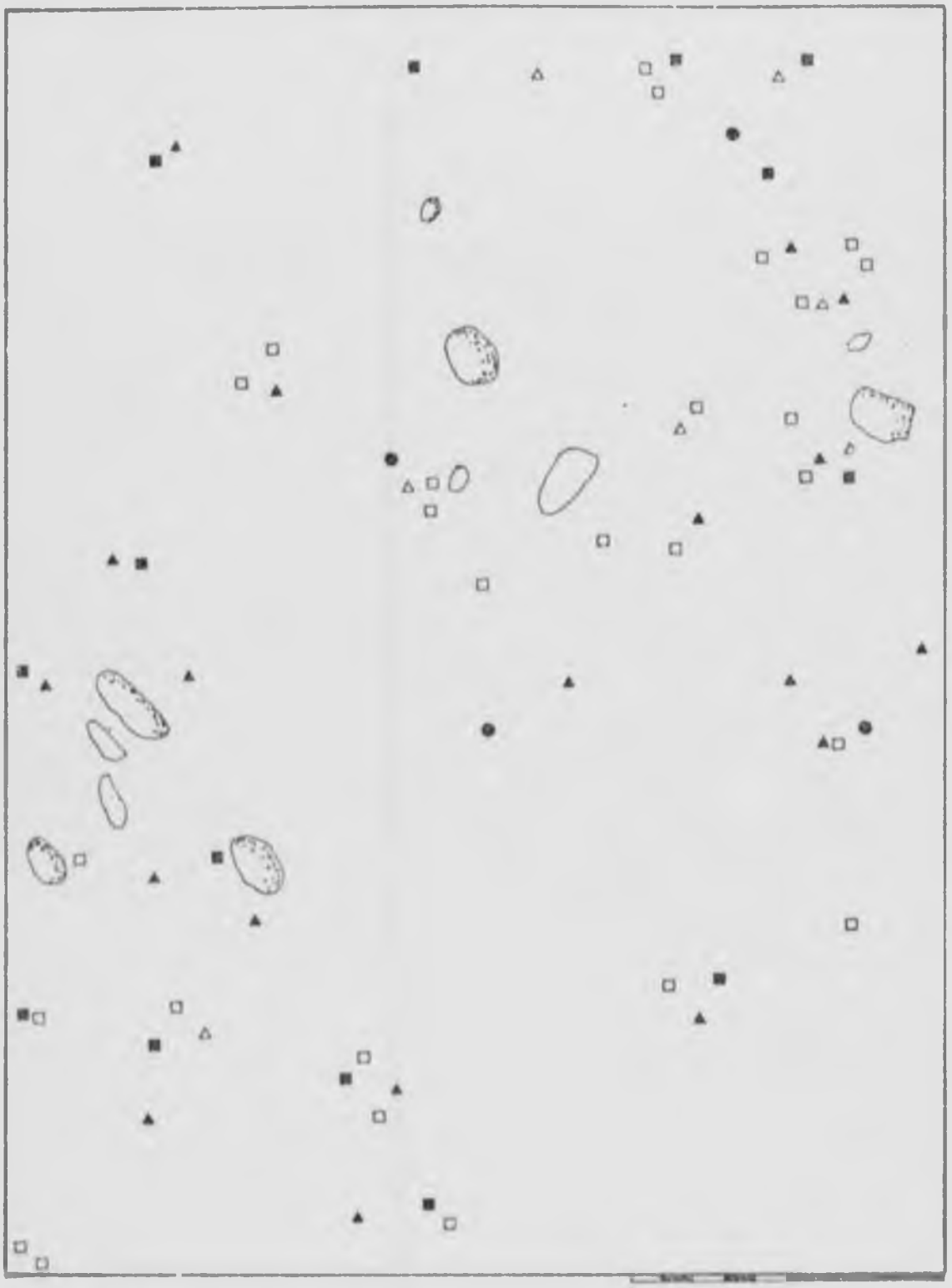


Fig. 65

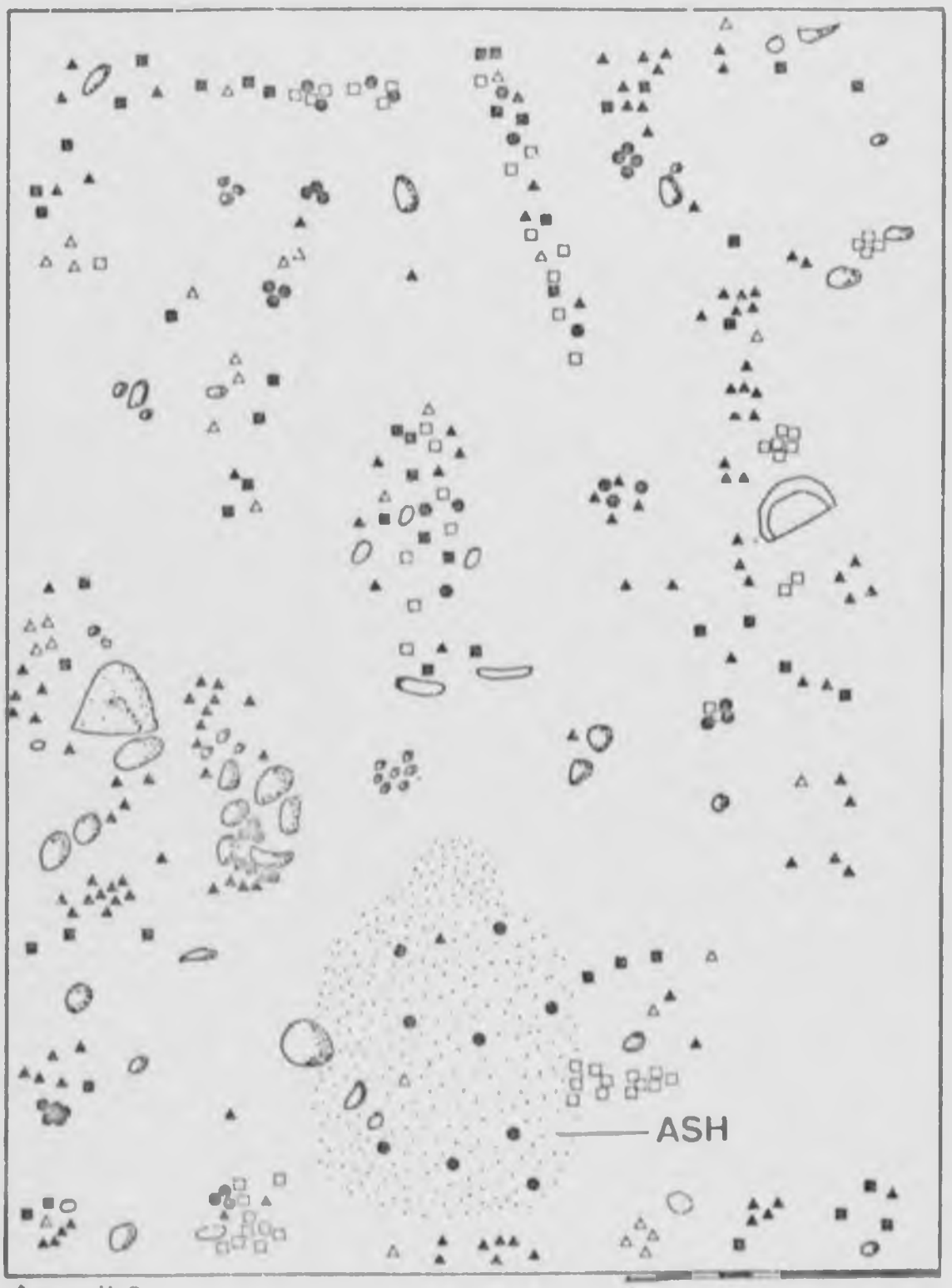


Fig. 66

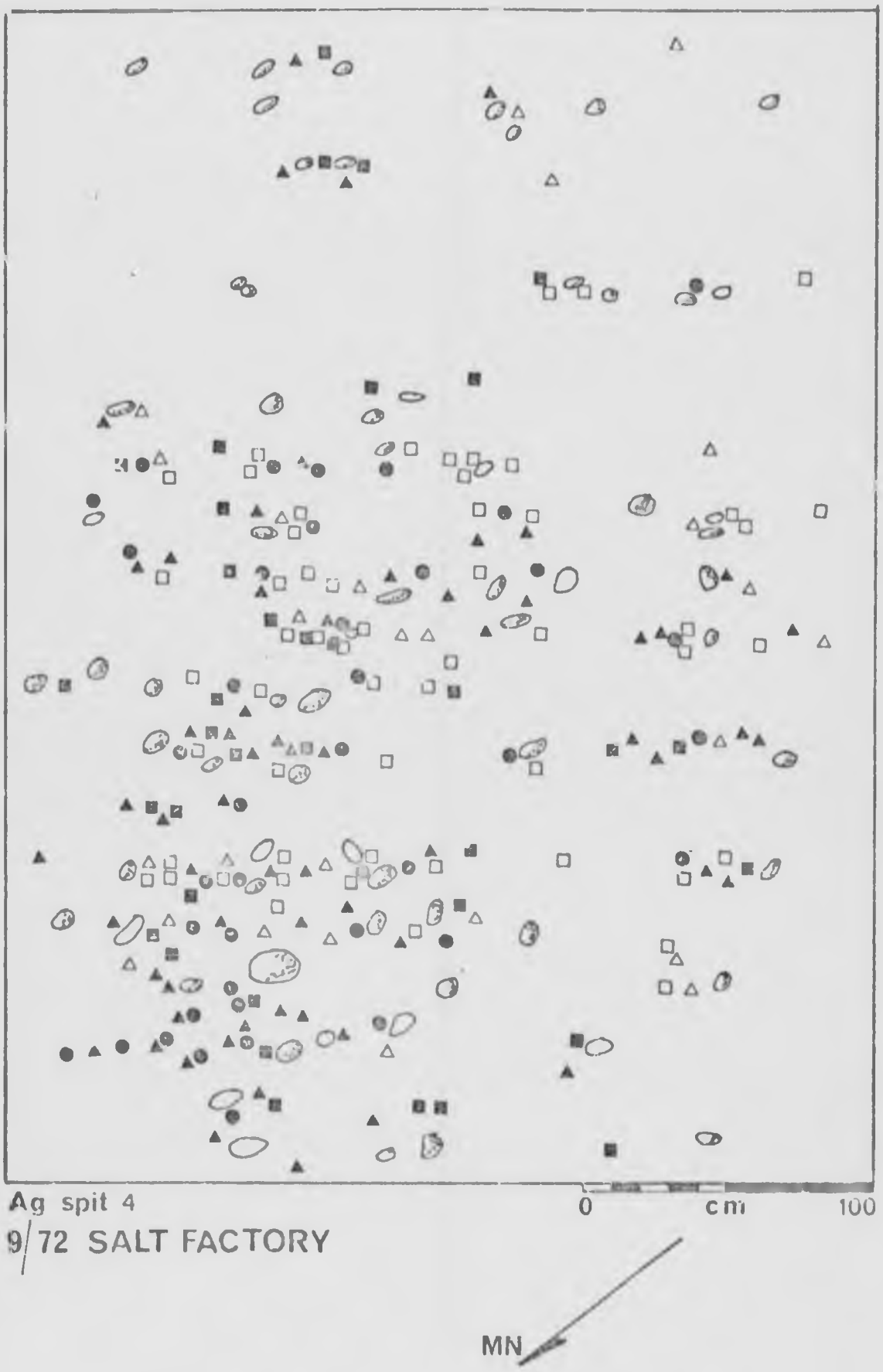


Fig.67

Fig. 68 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1-2, Class 1 decoration; 3, Class 12 decoration,
4-8 Early Iron Age - 4-6 cf. 65/72 and Eiland
Early Iron Age, 7-8 cf. 57/73 Lydenburg
Early Iron Age.

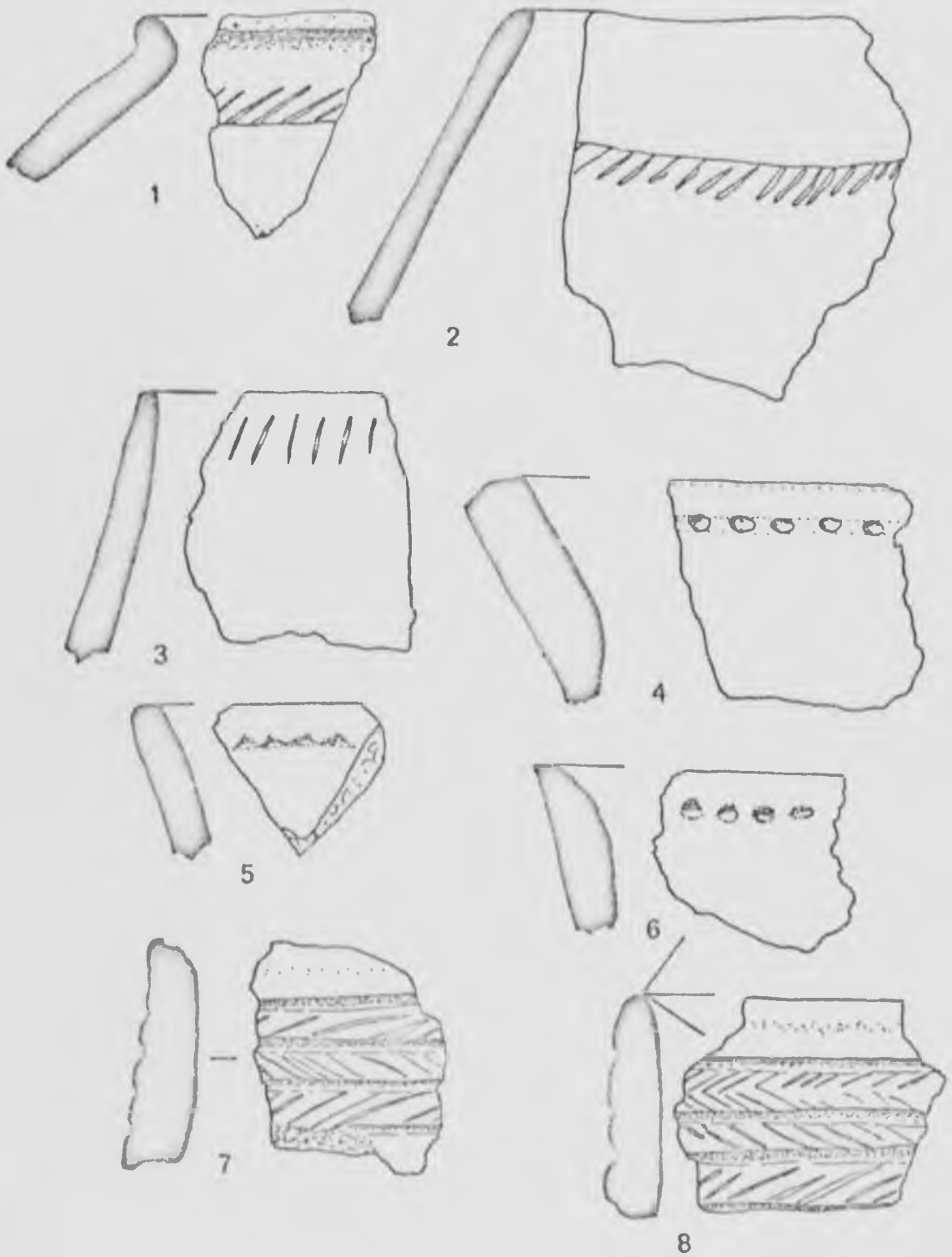
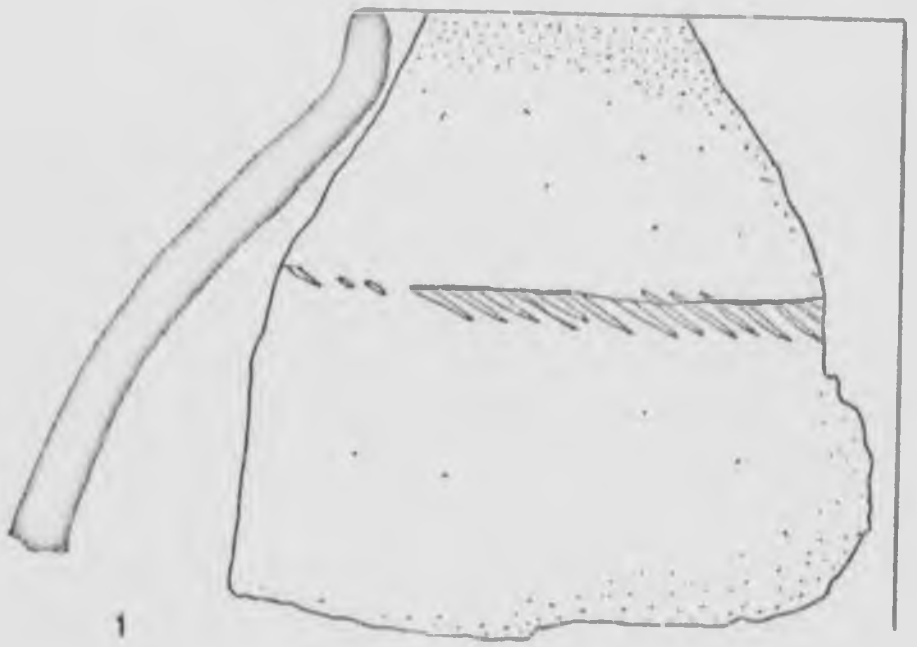
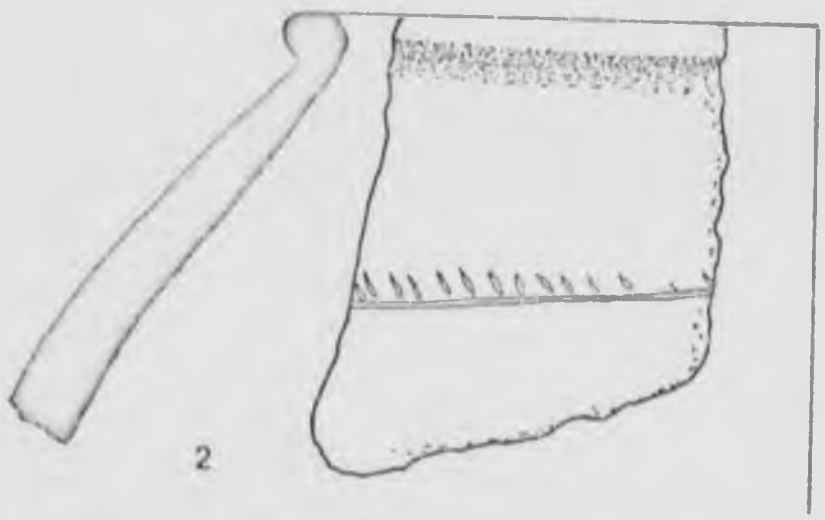


Fig. 68

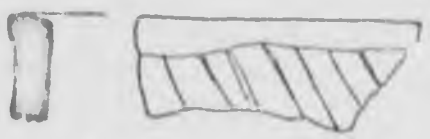
Fig. 69 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1-2, 4, Class 1 decoration; 3, Class 2 decoration.



1



2



3



4

Fig. 69

Fig. 70 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1-5, Class 2 decoration;
6-7 Class 10 decoration.

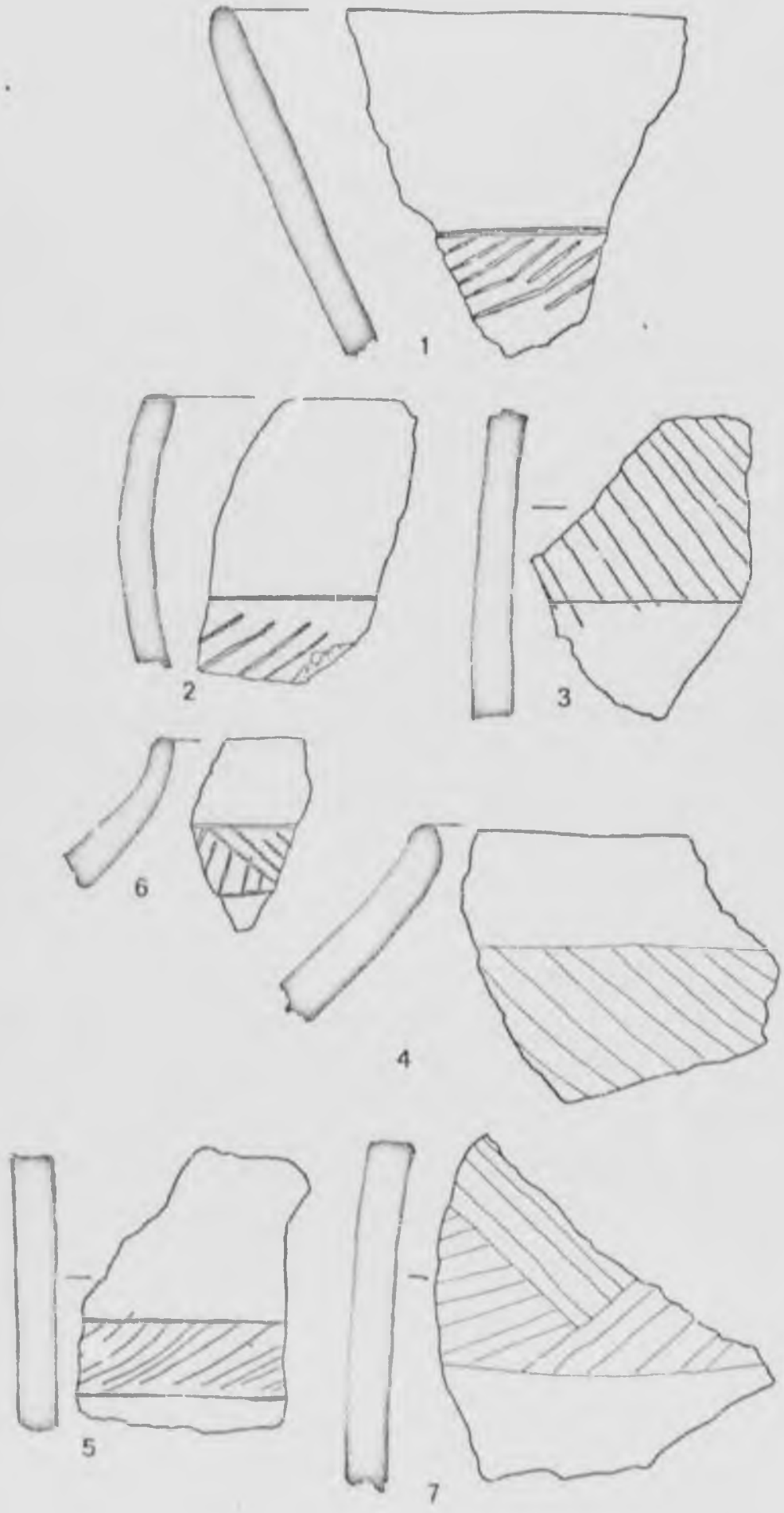


Fig. 70

Fig. 71 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
Class 2 decoration

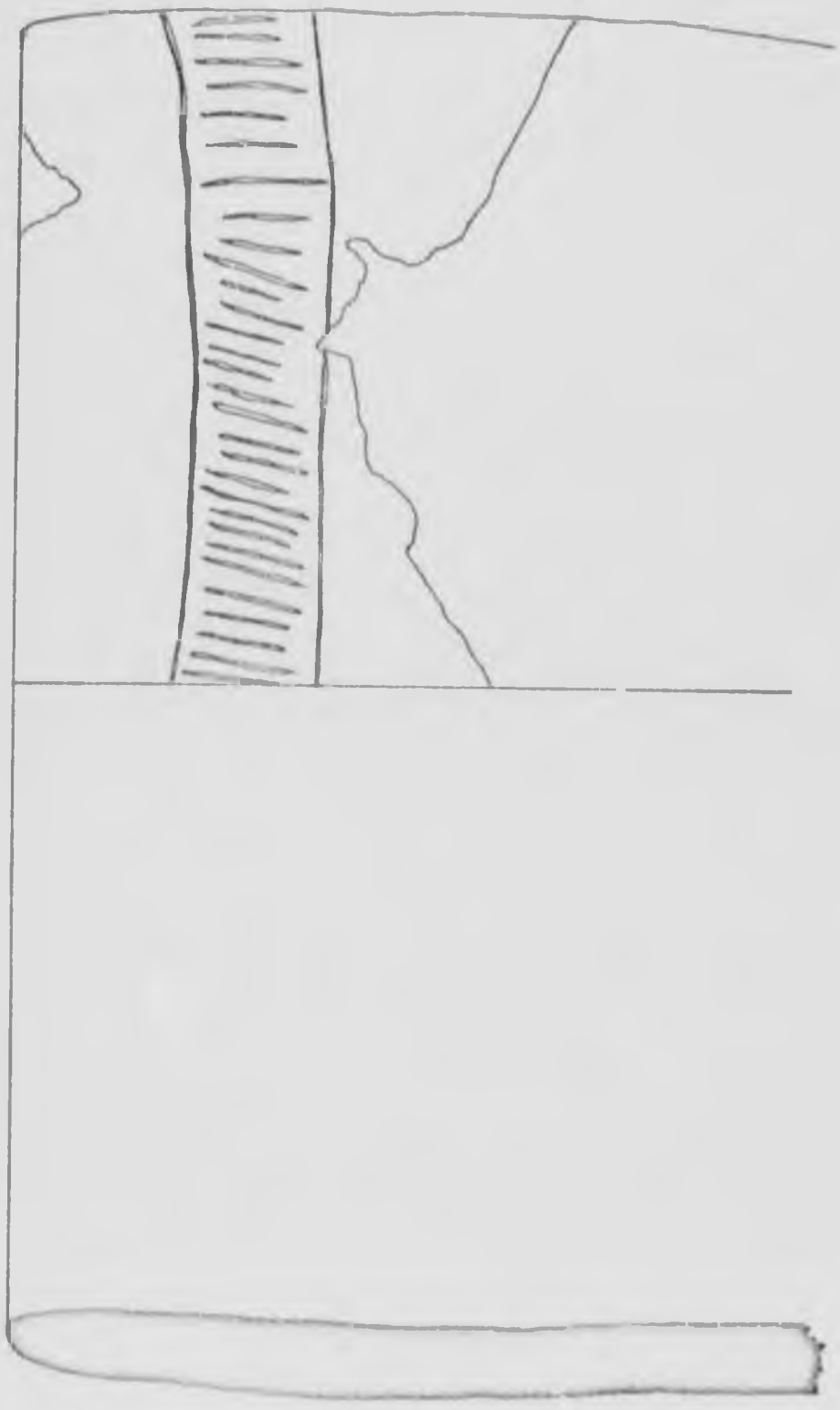
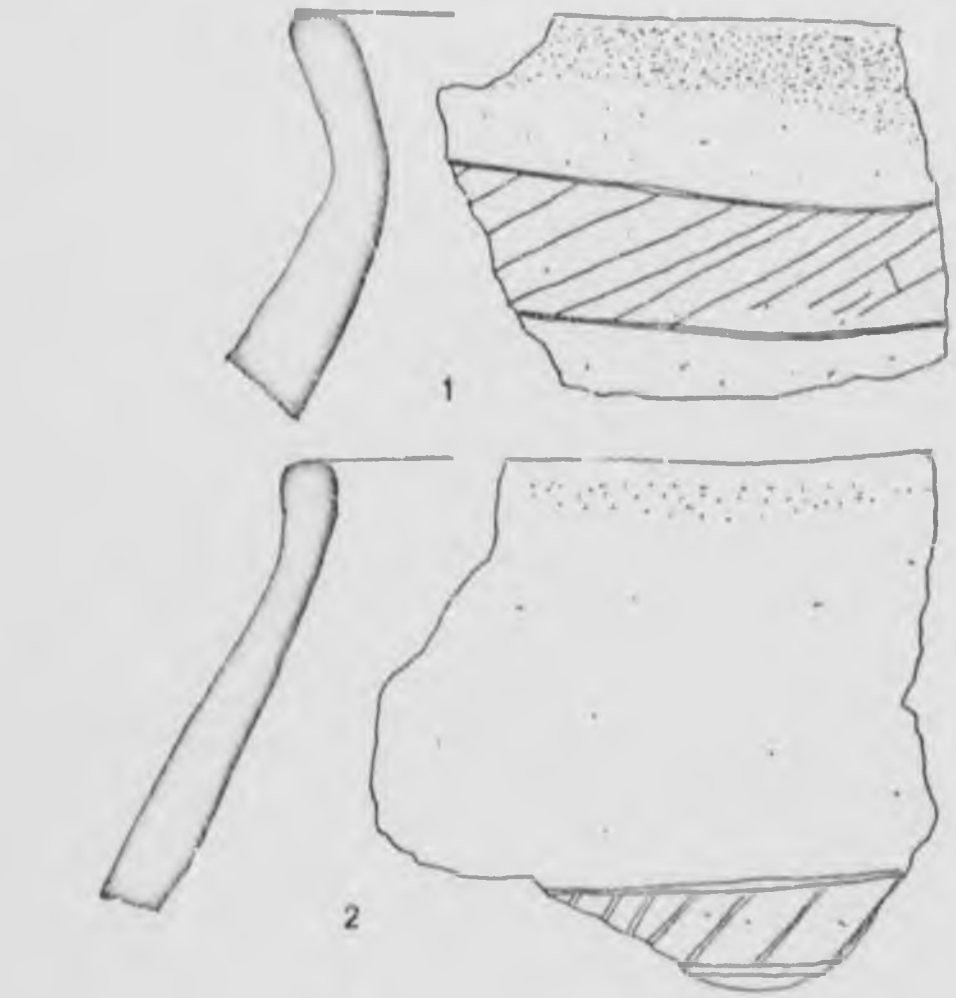


Fig.71

Fig. 72 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
Class 2 decoration.



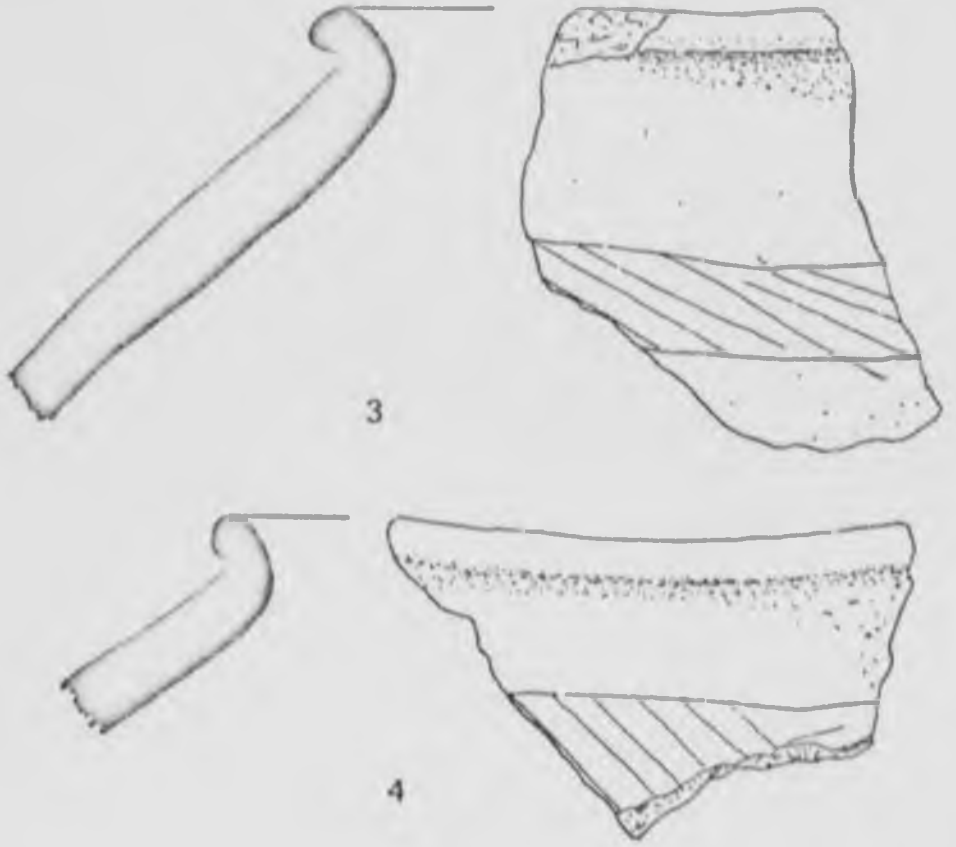


Fig. 72

Fig. 73 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1-2, Class 10 decoration; 3-4, Class 2 decoration;
5, Class 4 decoration; 6, Class 6 decoration.

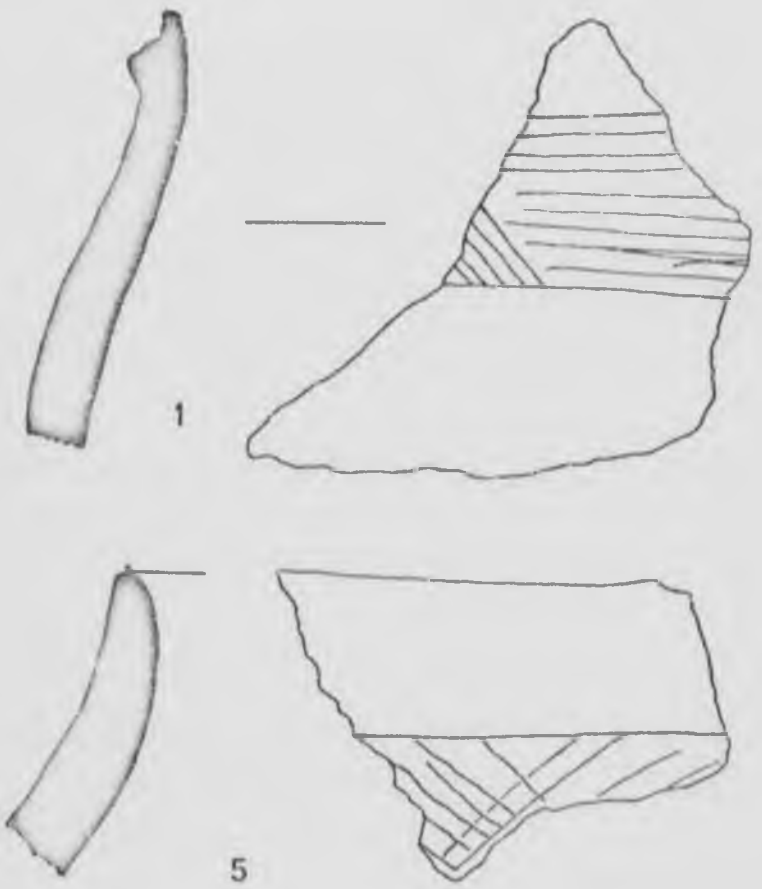


Fig. 73

Fig. 74 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
Class 5 decoration. Gb - graphite burnish.

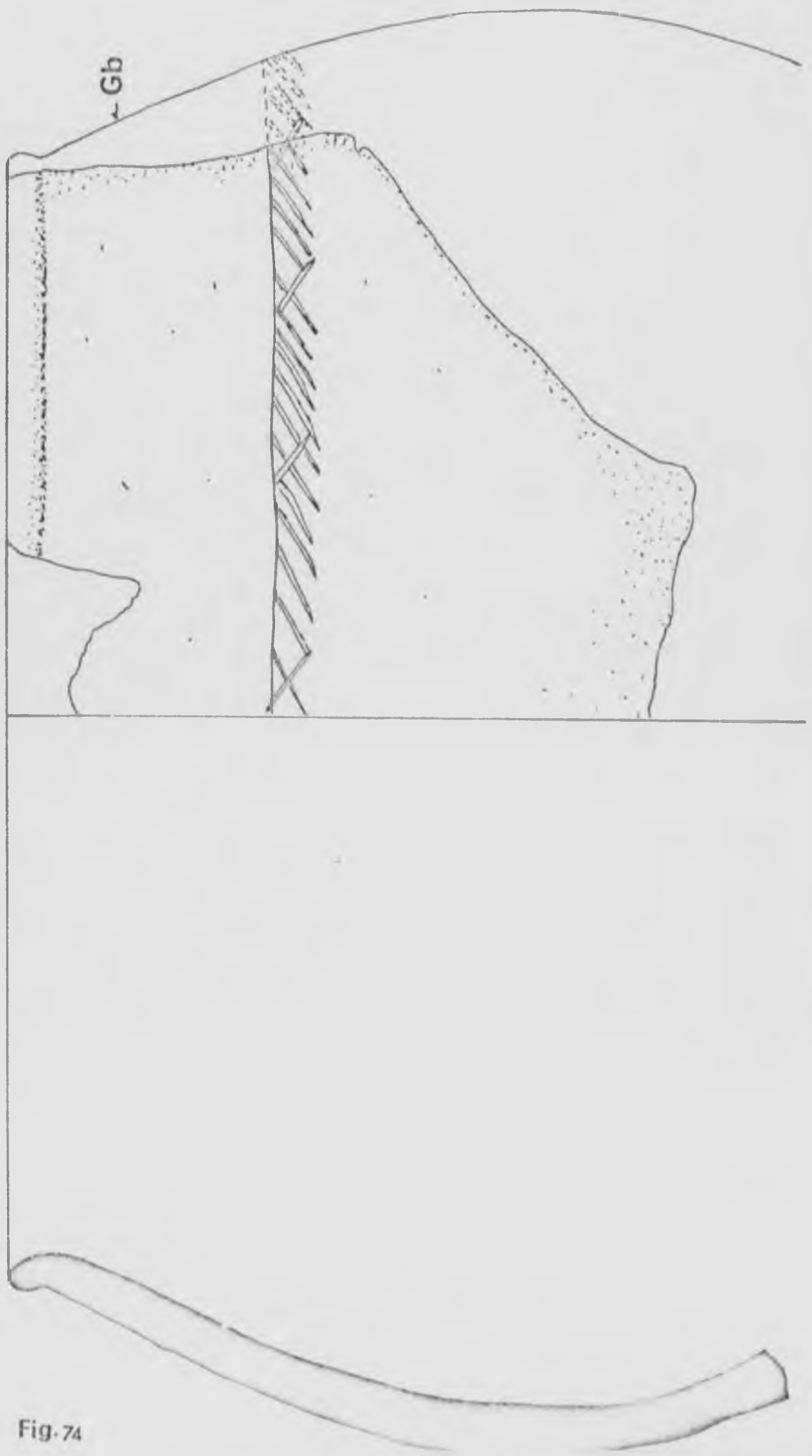


Fig. 74

Fig. 75 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1-2, Class 4 decoration; 3, mixture
between Classes 5 and 6 decoration.

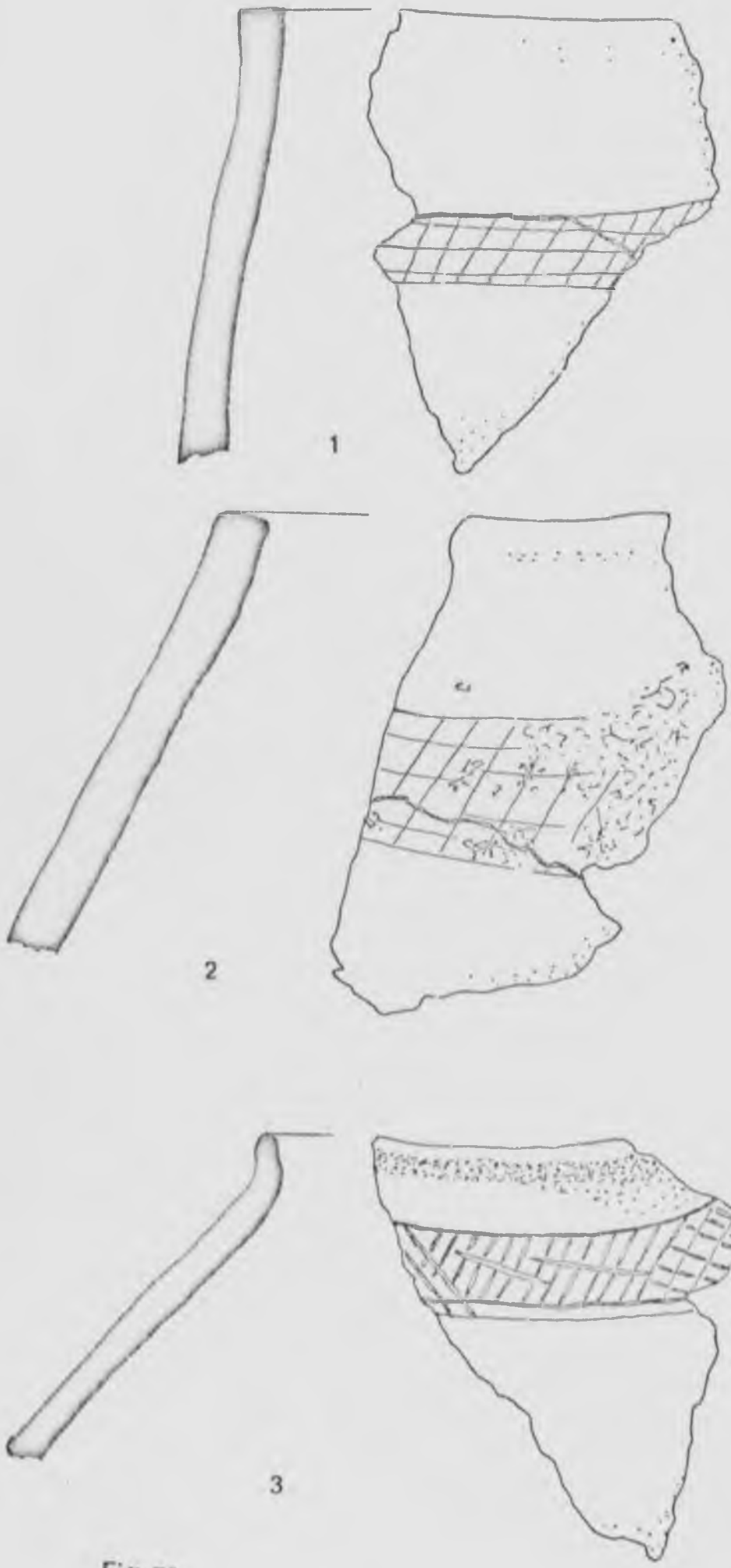


Fig.75

Fig. 76 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1, Class 14 decoration; 2-3, Class 16 decoration,
4, Class 10 decoration; 5, Class 15 decoration, 6, sherd with a line of graphite burnish.

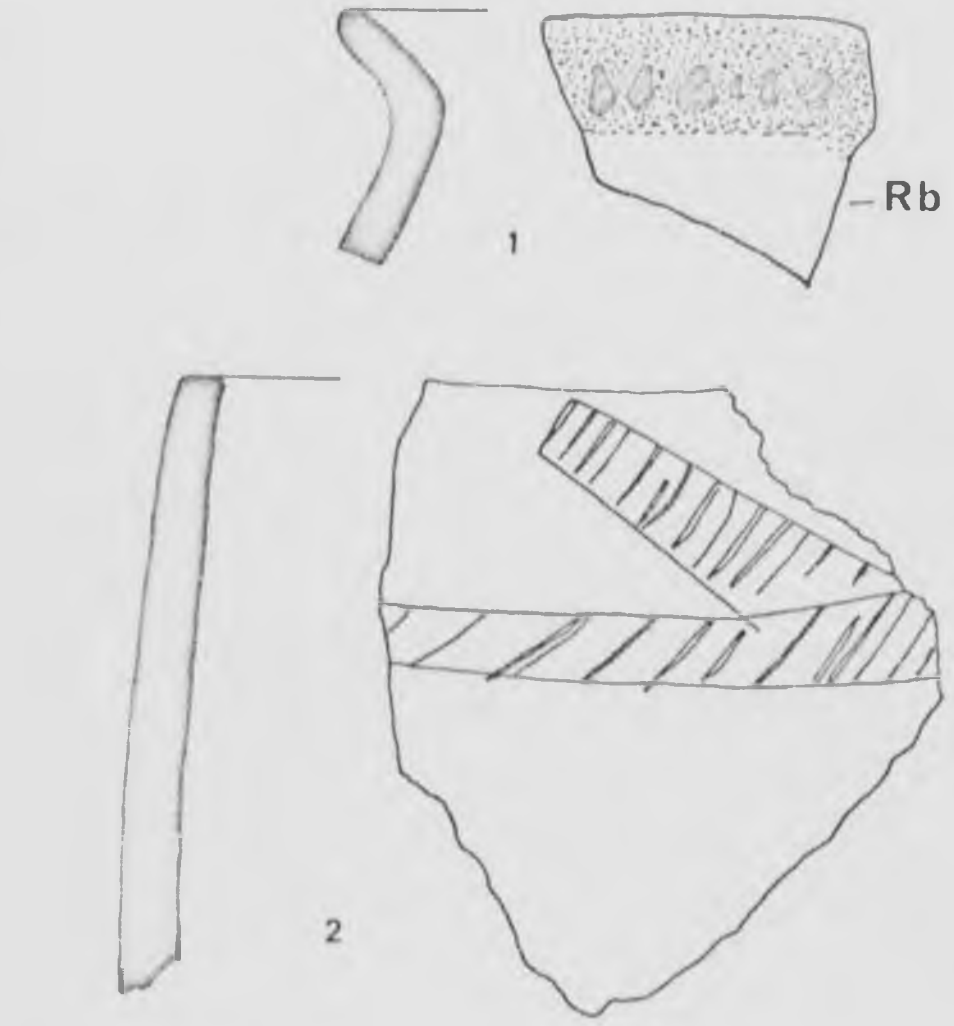


Fig. 76

Fig. 77 Pottery from excavations site 9/72A.
All drawings at 1/1 scale.
1, Class 17 decoration; 2, Class 11 decoration;
3-5, Class 8 decoration; 6, Class 7 decoration.

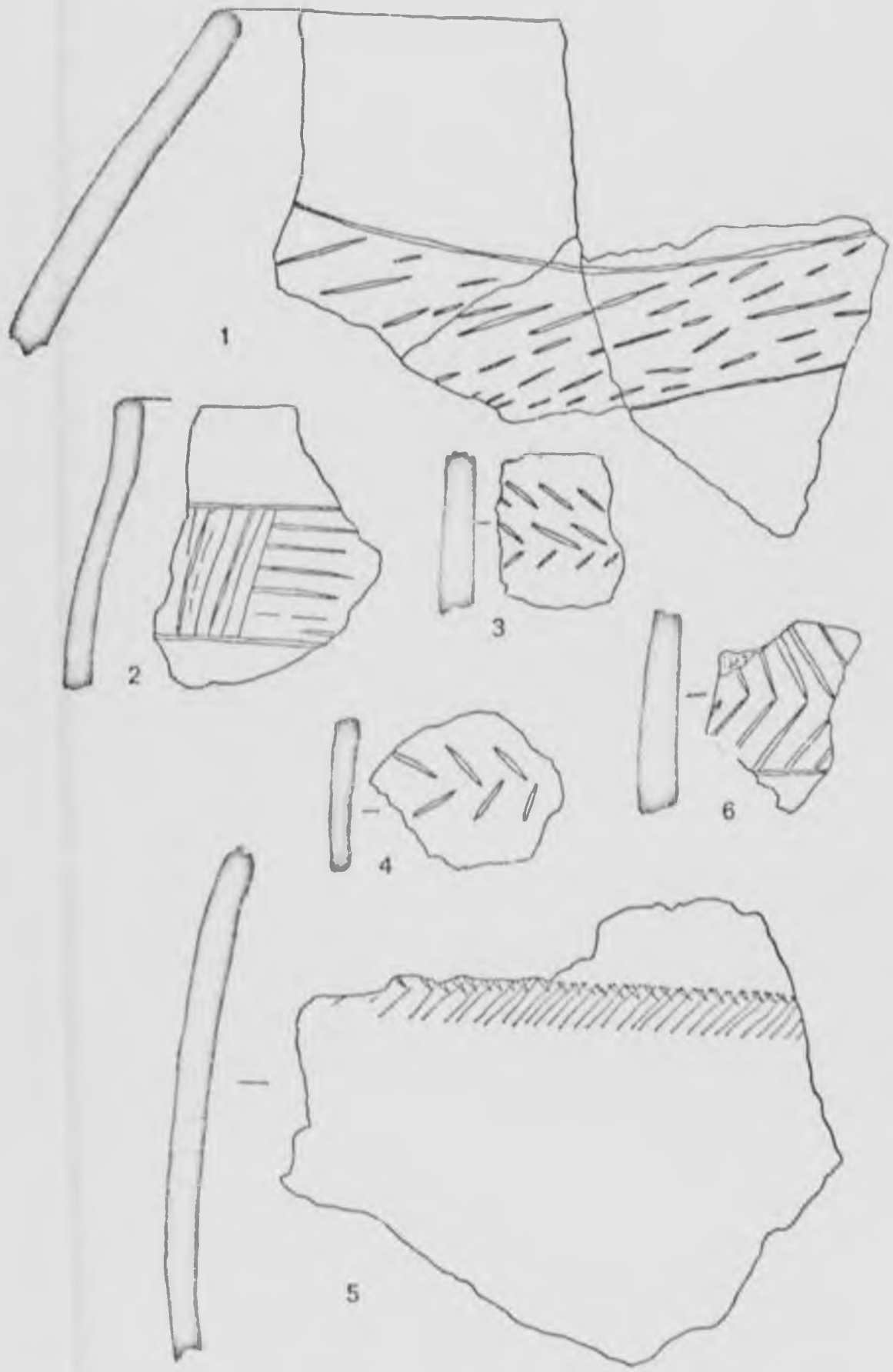


Fig. 77

Fig. 78 Small finds from excavations 9/72A, salt factory. 1, bone bead, Ad spit 3; 2, achatina shell bead Ab spit 3; 3, achatina shell beads, Ac spit 4; 4, glass bead Aa spit 1; 5, glass bead Aj spit 1; 6, copper object Af spit 4; 7, bone spatula Af spit 3.

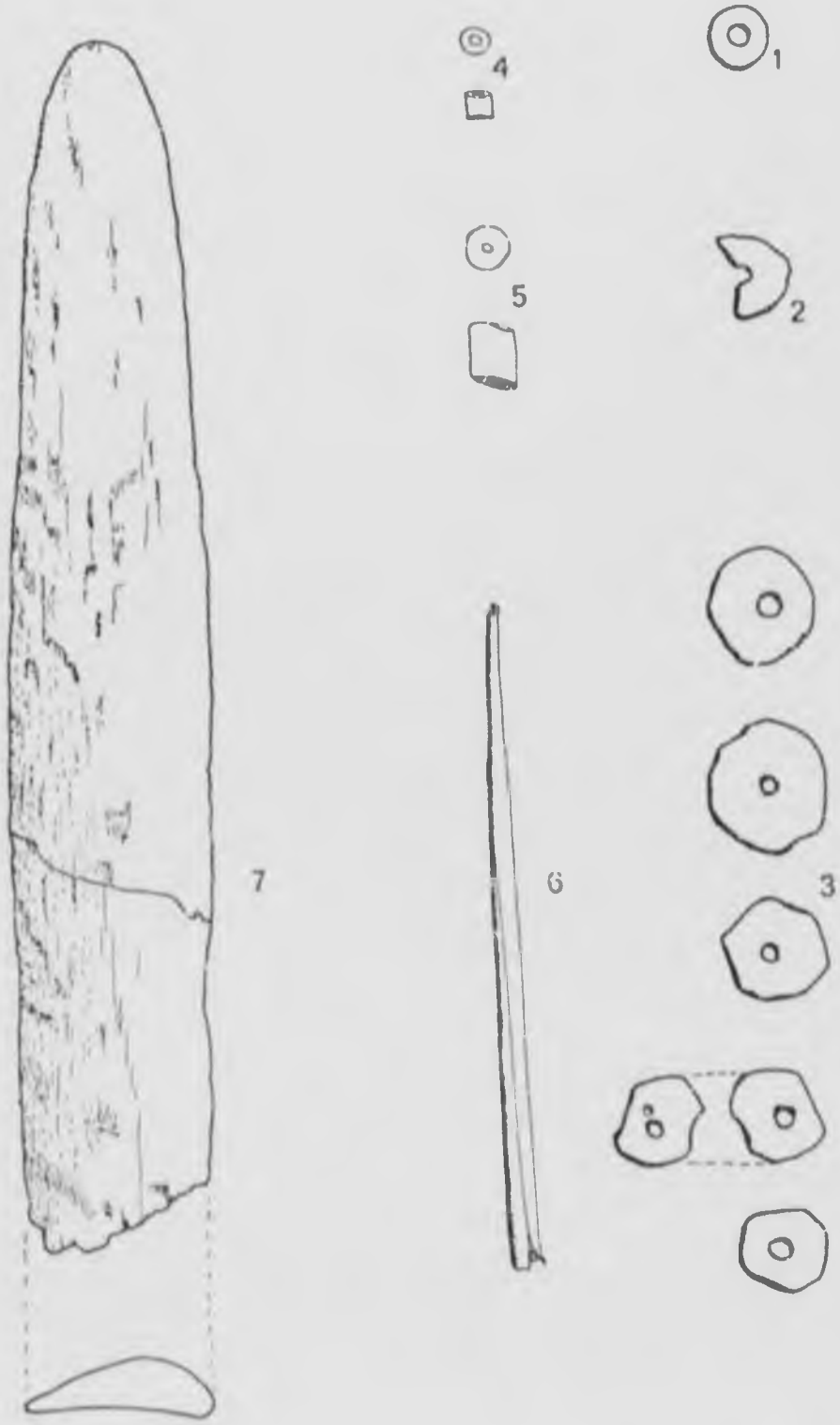


Fig. 78

Fig. 79 Small finds from excavations 9/72A, salt factory.
1, soapstone spindle whorl Aj spit 4;
2, potsherd spindle whorl Ae spit 2;
3, soapstone strainer Aa spit 3.
Scale 1/2.

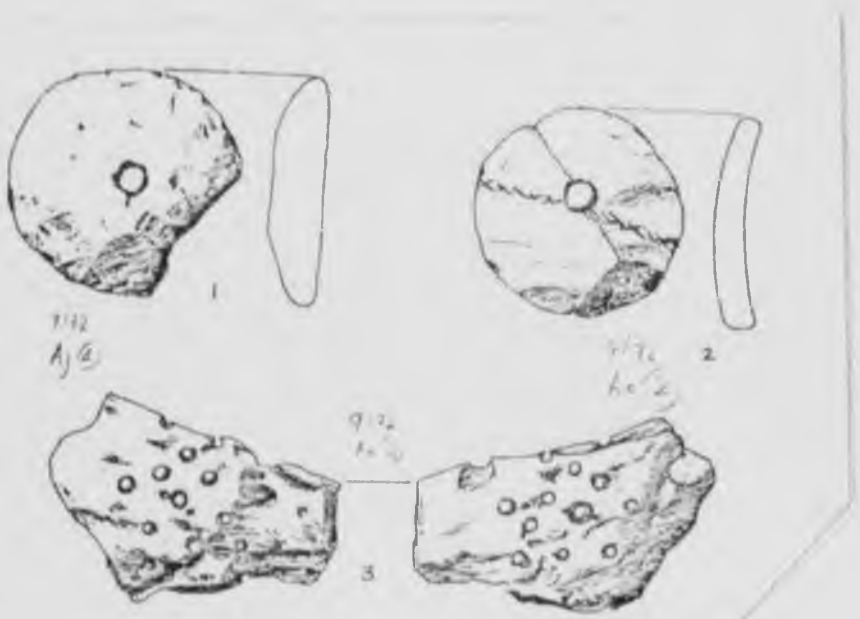


Fig. 79

Fig. 80 Soapstone bowls. 1-3 from site 10/72;
4, from point C, soapstone bowl factory;
Scale 12 ins.



Fig 80



Fig. 81 Soapstone bowls.

1, between 9/72A and resort pool;

2, 9/72A, Af spit 3;

3, 9/72A, Ah spit 1.



Fig 81

Fig. 82 Bar diagram of pottery ware using two samples from Ae and Af, 9/72A

A - no grit

B - grit present, sherd firm

C - grit present, sherd crumbly

f - fine grit

m - medium grit

c - coarse grit

fm, mc, B/C, etc. are combinations of the above symbols.

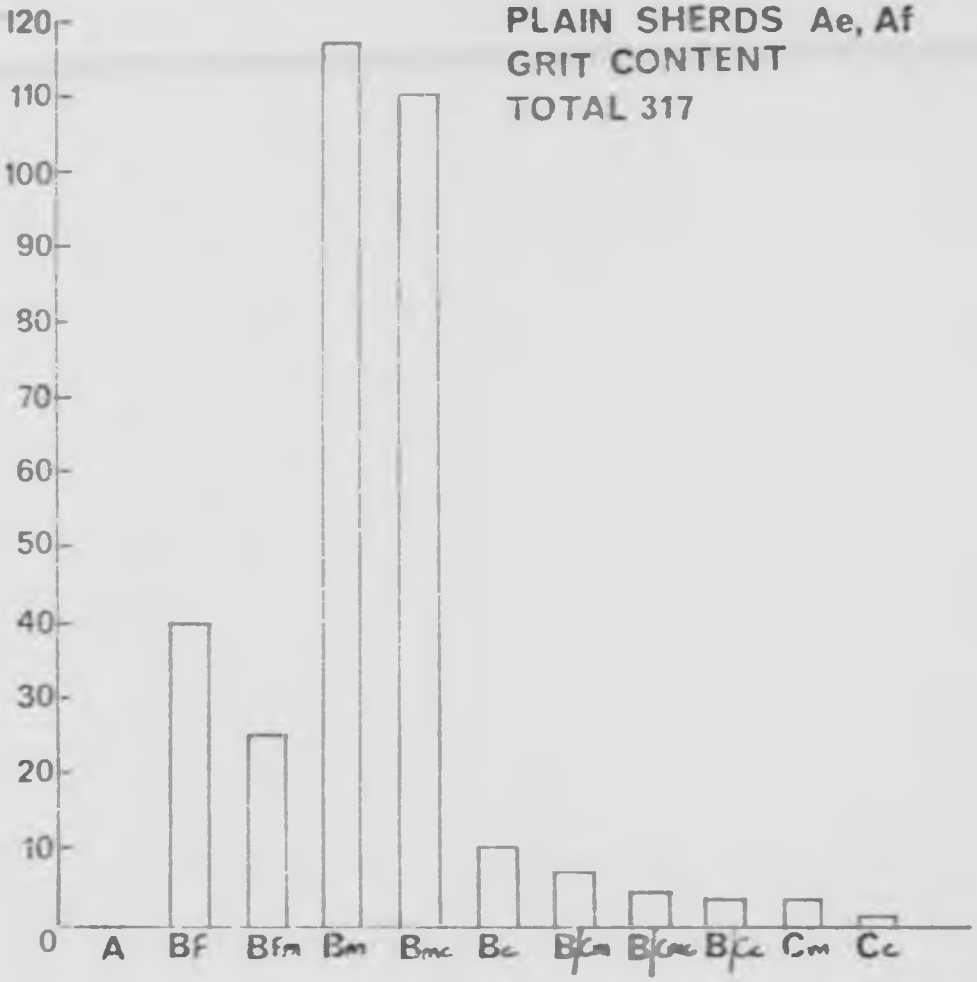

PLAIN SHERDS Ae, Af
GRIT CONTENT
TOTAL 317
120
110
100
90
80
70
60
50
40
30
20
10
0
A
BF
Bfm
Bm
Bmc
Bc
B/cm
B/cmc
B/cc
Cm
Cc

Fig.82

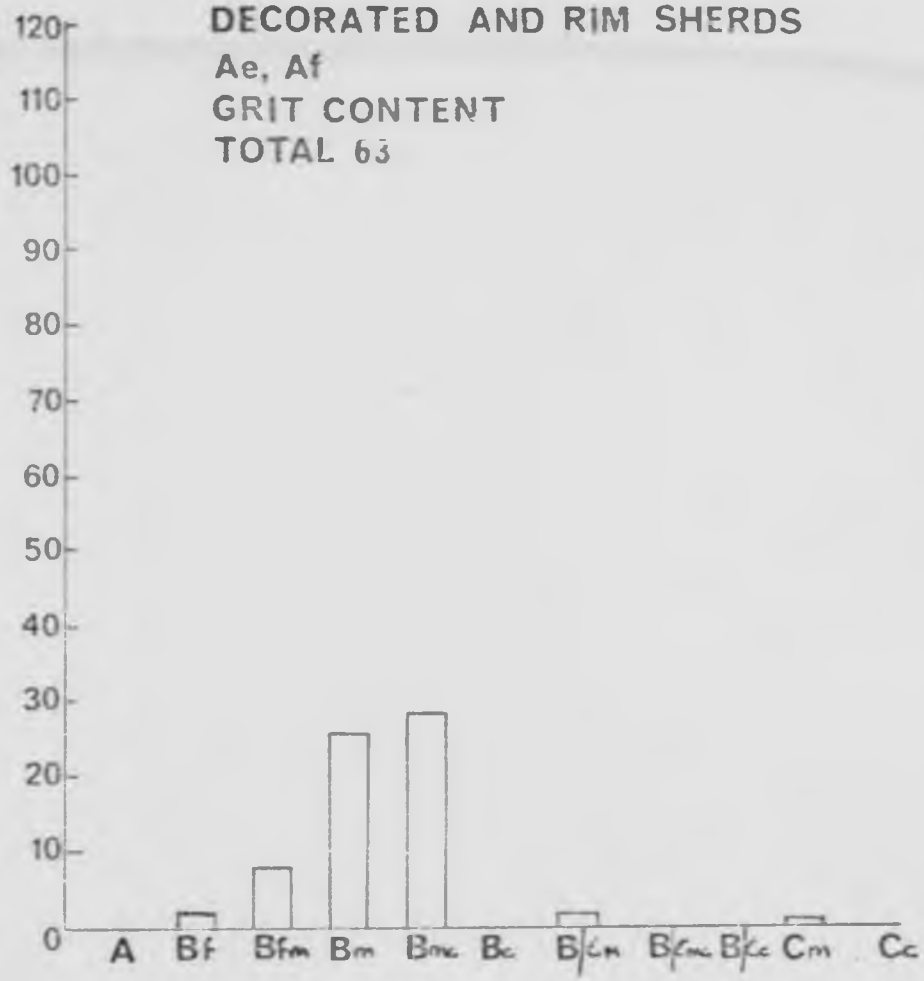

DECORATED AND RIM SHERDS
Ae, Af
GRIT CONTENT
TOTAL 63
120
110
100
90
80
70
60
50
40
30
20
10
0
A
Bf
Bfm
Bm
Bmc
Bc
B/cm
B/cmc
B/cc
Cm
Cc

Fig. 83 Bar diagram showing distribution of sherds into colour classes (two samples from Ae and Af).

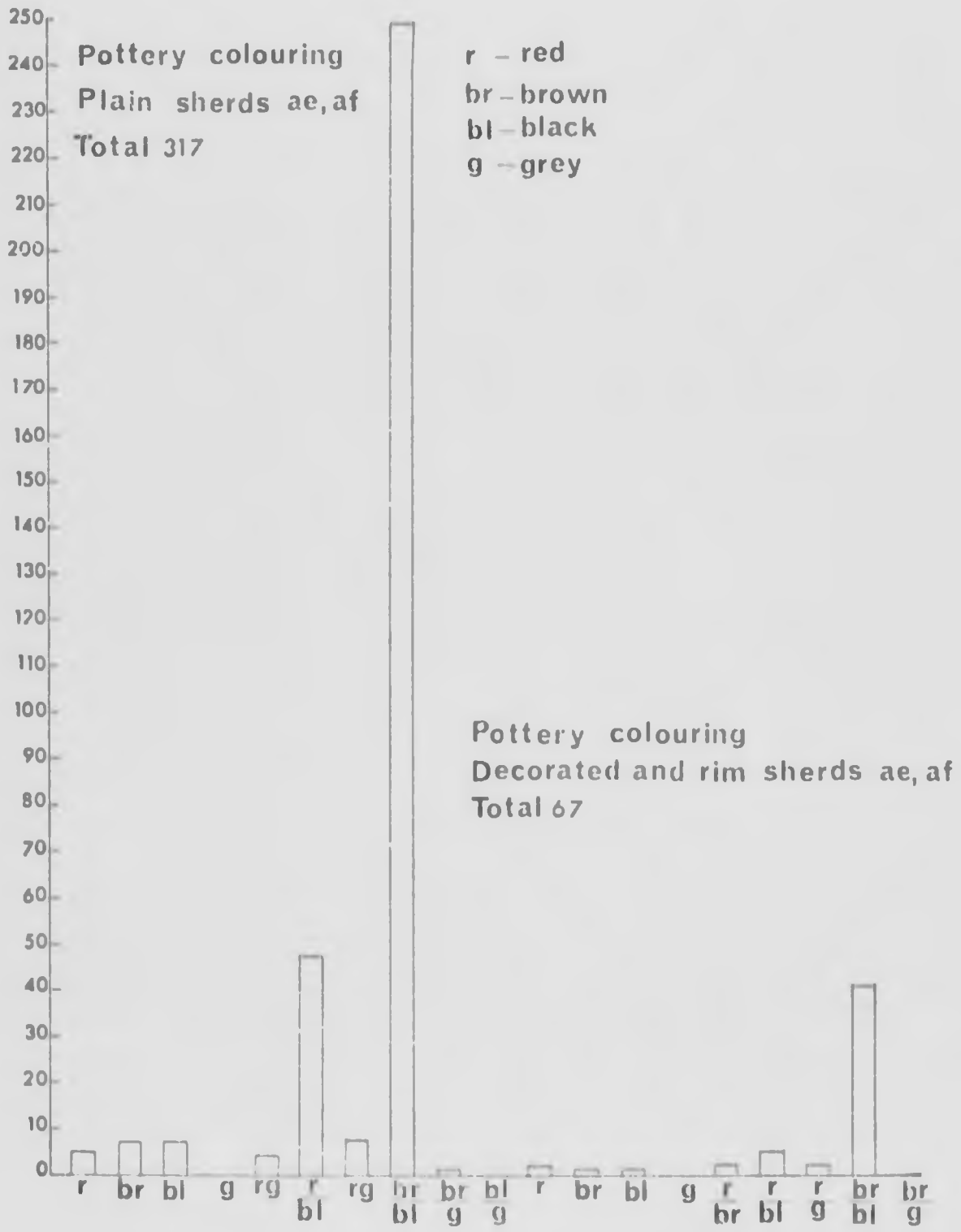
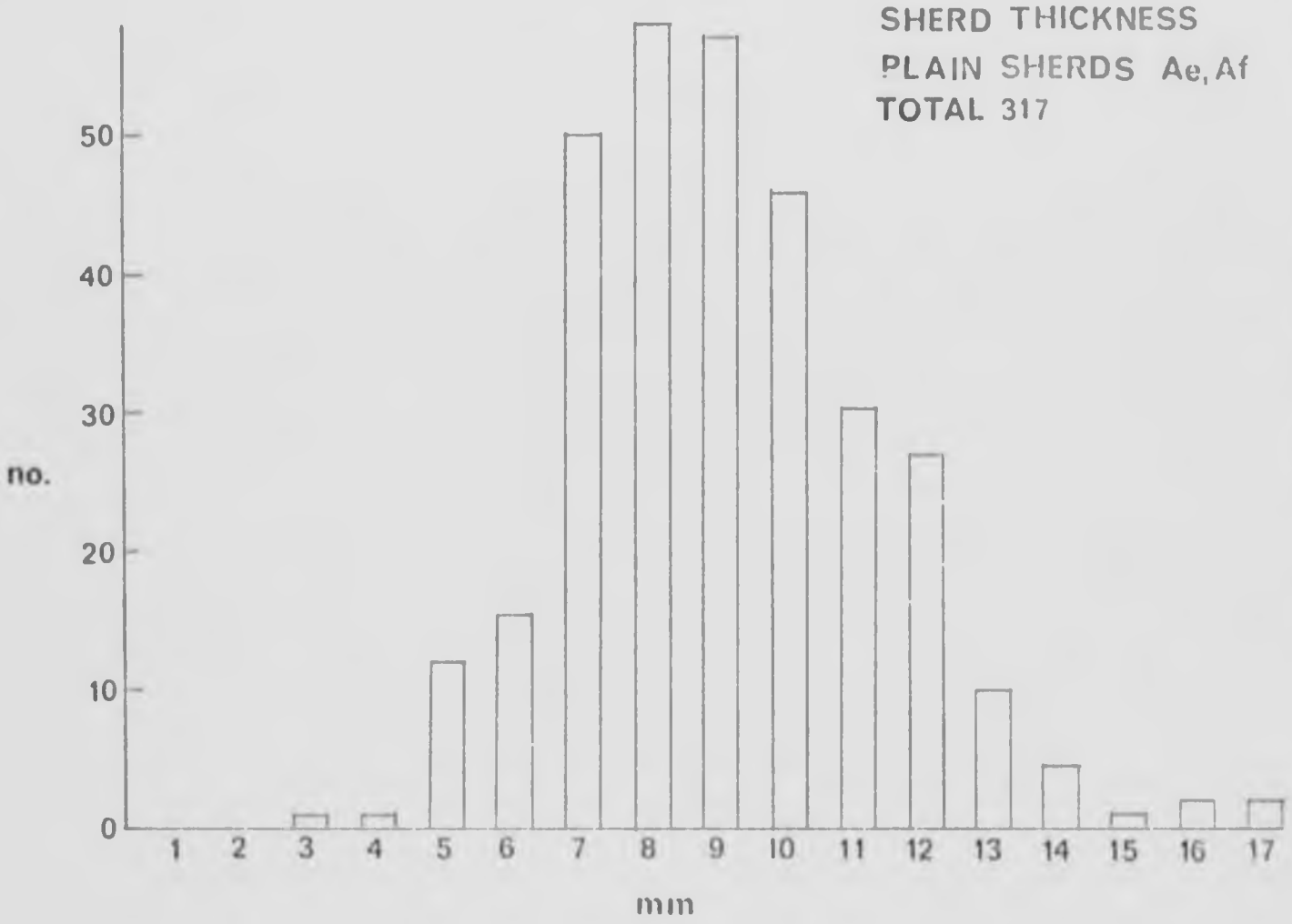

Pottery colouring
Plain sherds ae, af
Total 317
r – red
br – brown
bl – black
g – grey
Pottery colouring
Decorated and rim sherds ae, af
Total 67
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
r
br
bl
g
rg
r bl
rg
br bl
br g
bl g
r
br
bl
g
r br
r bl
r g
br bl
br g

Fig. 83

Fig. 84 Bar diagram showing distribution of sherd thickness frequencies (two samples from Ae and Af).


SHERD THICKNESS
PLAIN SHERDS Ae, Af
TOTAL 317
no.
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
mm

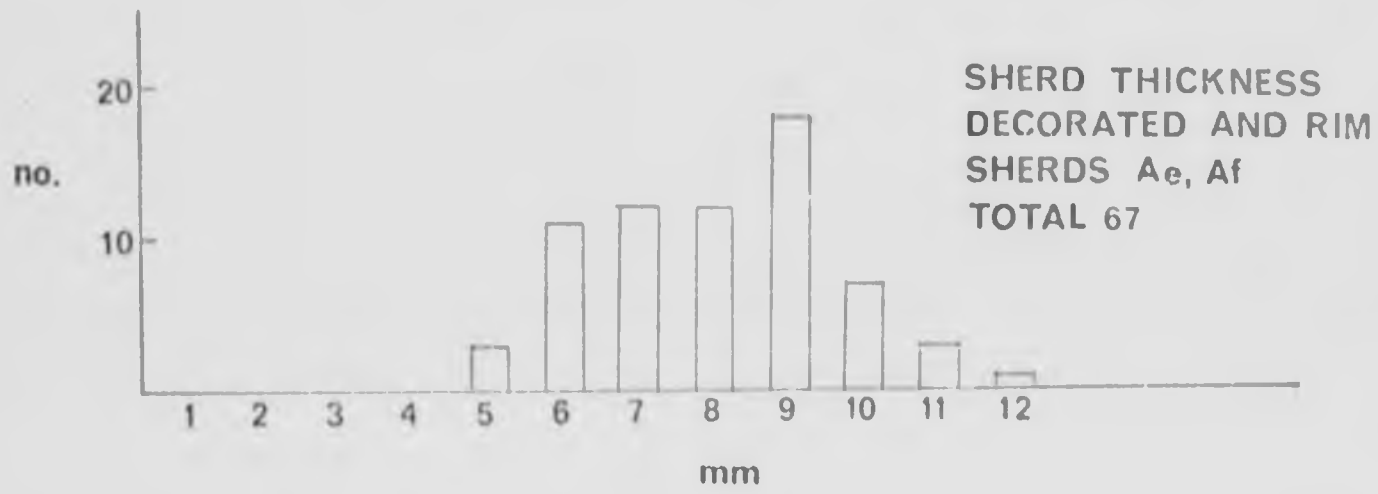

SHERD THICKNESS
DECORATED AND RIM
SHERDS Ae, Af
TOTAL 67
no.
20
10
1 2 3 4 5 6 7 8 9 10 11 12
mm

Fig.84

Fig. 85 Map showing important archaeological sites in the Eastern Transvaal.

Key to sites:

1 Mapungubwe and Bambandyanalo
2 Messina copper mines
3 Sautini
4 Eiland 1/74 - 8/74
5 Landraad
6 Phala'orwa sites
7 Sheila and Rhoda
8 Harmony
9 Silver Leaves
10 Slabberts Cave
11 Goudmyn
12 Skull Cave
13 Lydenburg 57/73 - 62/73
14 Sterkspruit
15 Sabie
16 Brooklands Cave
17 Badfontein
18 Nelspruit
19 Broederstroom
20 Klipspruit
A Johannesburg
B Ohrigstad
C Middelburg
D Pietersburg

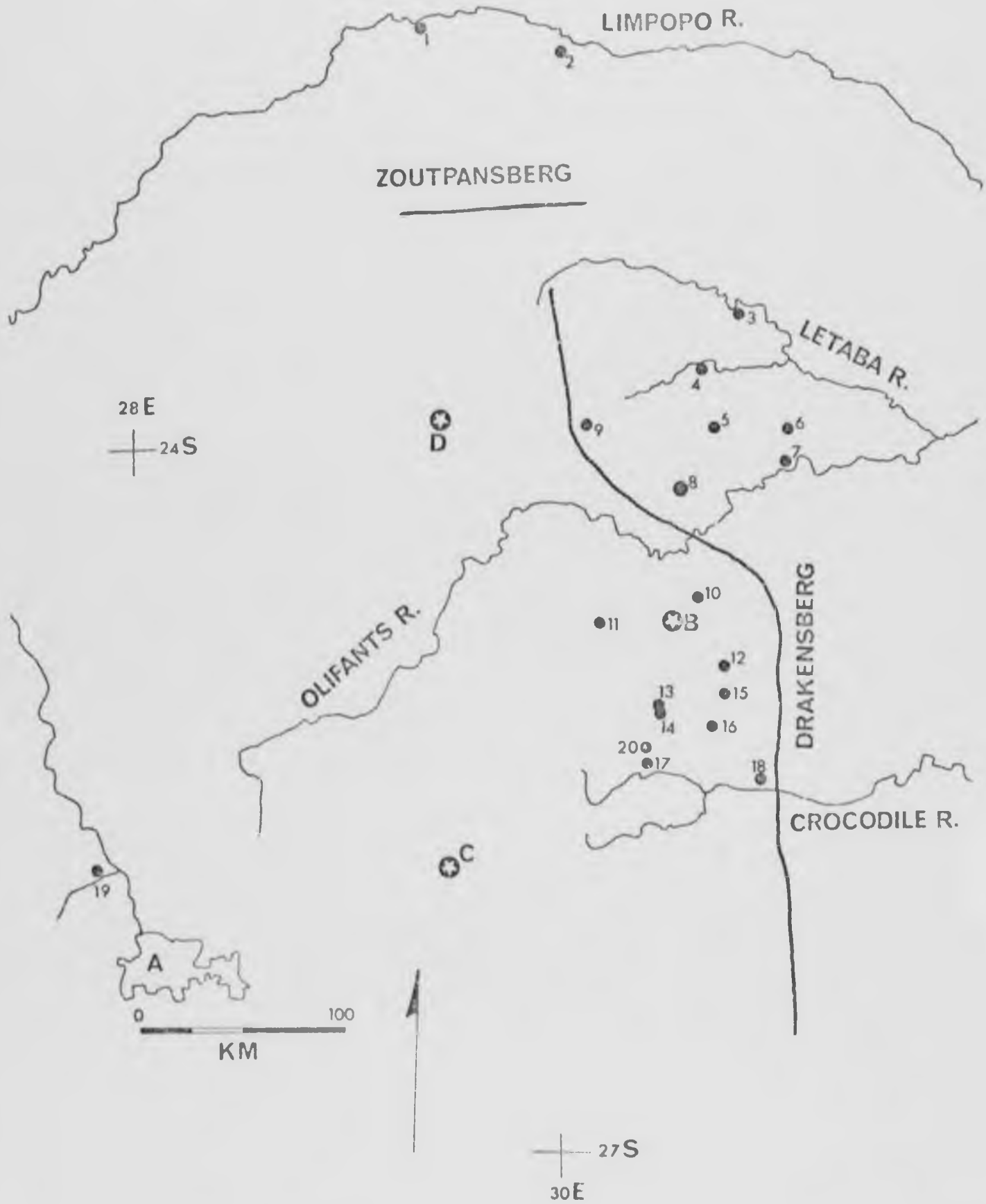

IRON AGE SITES – E. TRANSVAAL
LIMPOPO R.
ZOUTPANSBERG
LETABA R.
28 E
24 S
D
OLIFANTS R.
DRAKENSBERG
B
CROCODILE R.
C
A
0
100
KM
27 S
30 E

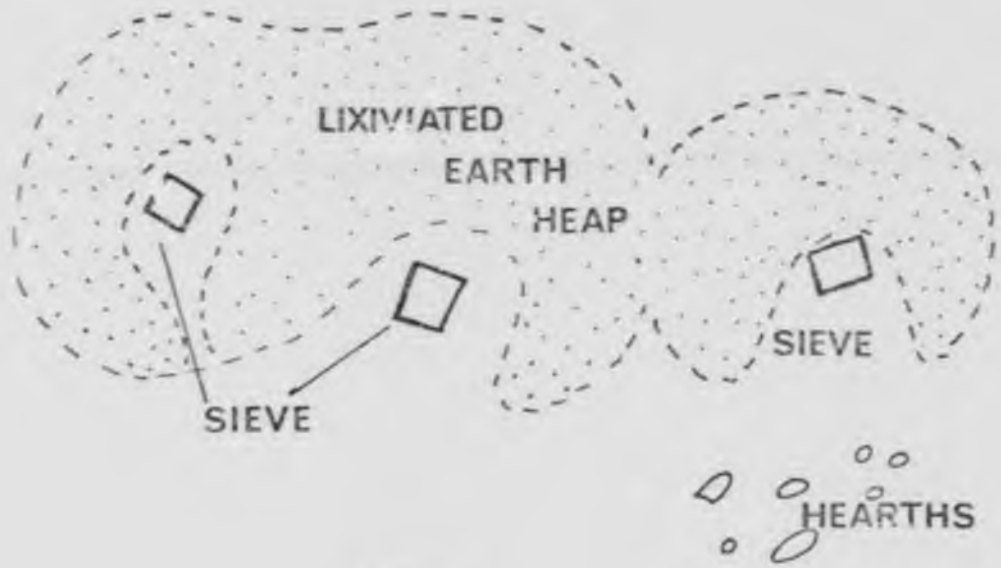
Fig. 85

Fig. 86 Plan of a Sautini salt works as seen in January 19[illegible].

N

SAUTINI JAN. 1974

PLAN OF SALT WORKS



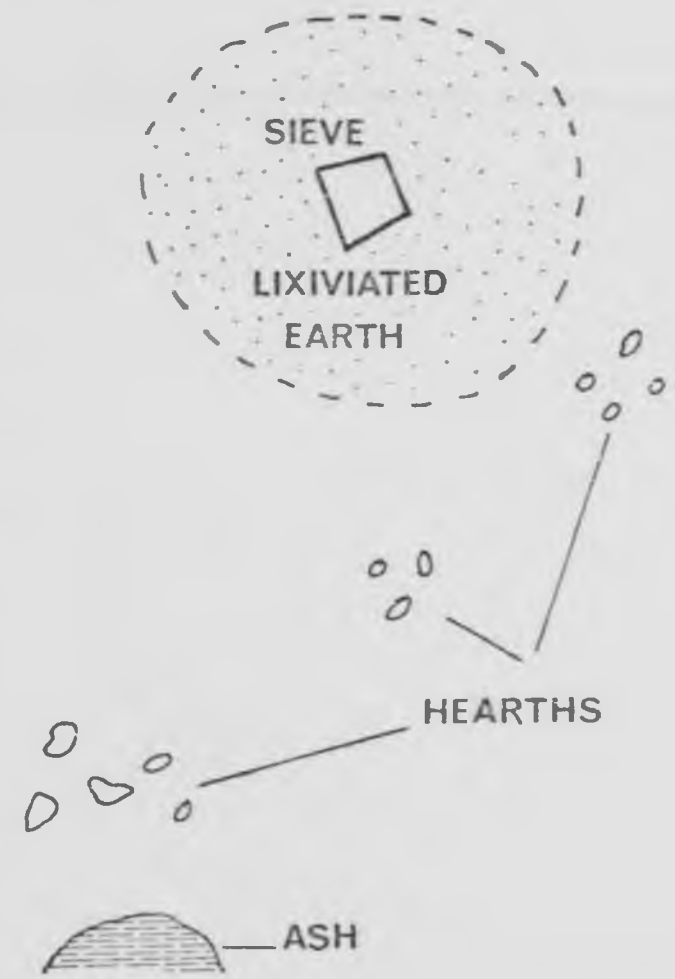


Fig 86

Fig. 87 Chronological chart correlating Iron Age sequences in the Eastern Transvaal.

CHRONOLOGY OF IRON AGE TRADITIONS – E. TRANSVAAL

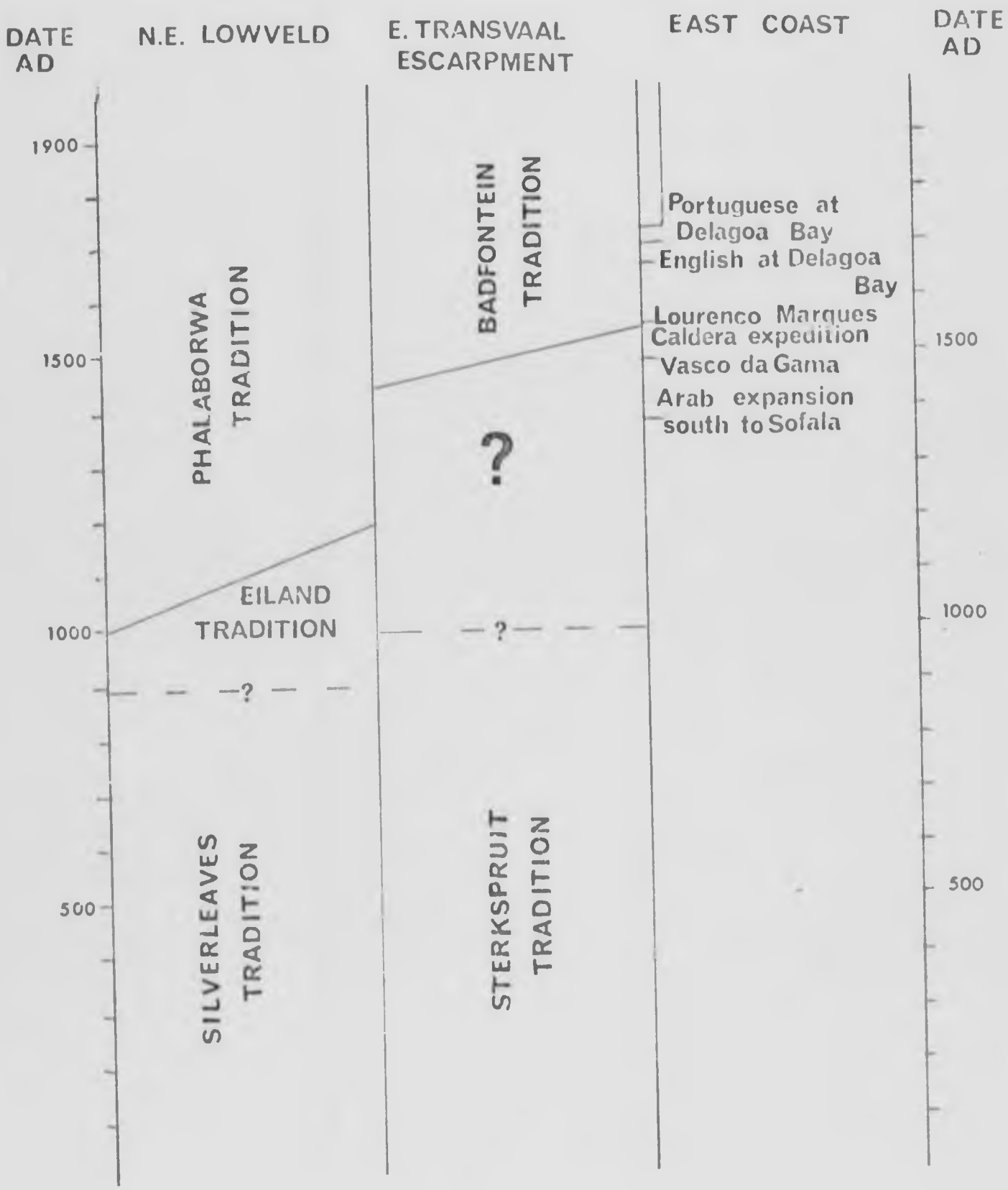


Fig. 87

Fig. 88 Map showing sites or areas connected with trade in the Eastern Transvaal and on the east coast of Southern Africa.

1 Eiland
2 Phalaborwa
3 Harmony
4 Tzaneen
5 Pilgrims Rest
6 Lydenburg
7 Sabie
8 Barberton

a Limpopo River
b Groot Letaba River
c Olifants River
d Steelpoort River
e Komati River
f Crocodile River

IRON AGE TRADE SITES - E. TRANSVAAL

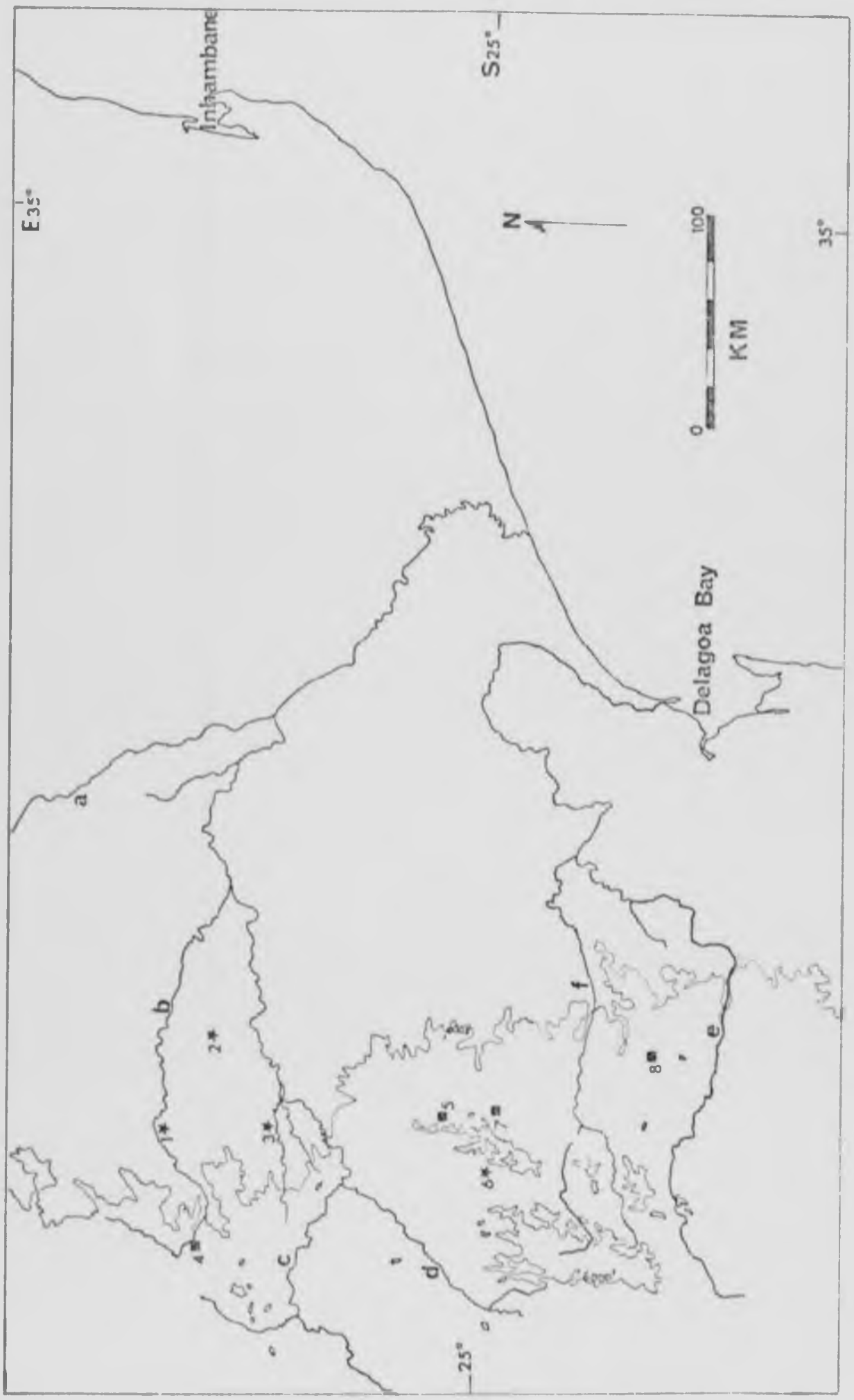


Fig.88

Fig. E. 1 Plan of an Mruba board



MRUBA BOARD

Fig. E1

Author Evers T M
Name of thesis Three Iron Age industrial sites in the Eastern Transvaal Lowveld 1974

PUBLISHER:
University of the Witwatersrand, Johannesburg
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