

# OSKRAAL WATER SUPPLY PROJECT.

## CULTURAL HERITAGE RESOURCES.

### ARCHAEOLOGICAL INVESTIGATION OF HOEKFONTEIN 432 JQ



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# OSKRAAL WATER SUPPLY PROJECT

## HOEKFONTIEN 432 JQ

(Report on archaeological excavations)

Permit no. 80/02/05/003/51

### 1. Introduction

In May 2002 African Heritage Consultants cc. was appointed to do a scoping report on the Oskraal Water Supply Project. On visiting the site it was found that a ten metre wide road had already been bulldozed and graded along the route for the pipeline. A trench for the pipeline had also been dug. The road and the trench destroyed an archaeological site of approximately seven hundred metres by ten metres (see photograph 1).

All work was immediately stopped in this specific section of the pipeline. Application was made for a permit from the South African Heritage Resource Council (SAHRA) to do a salvage archaeological investigation at the destroyed portion of the site. After SAHRA granted a permit the site was visited again. A number of human remains was visible in the trench. The finds were immediately reported to SAHRA Cape Town and North West. After permission was granted from Cape Town, Mr. C. Nienaber of the Anatomy Department of the University of Pretoria was instructed to excavate the human remains. Two test pits; one by two metres were excavated in the trench. Material was obtained for analysis and for C14 dating purposes.

### 2. Site description

The archaeological site is situated on the farm Hoekfontein 432 JQ at the northwestern part of the Swartkoppies mountain range near Makau (see map photograph 2).

The site extends from the existing water reservoir, north and northwest, and then east along the mountain for some six kilometres or more. According to Van Schalkwyk, (2000: 58 – 64) there are similar sites on top of the Swartkoppies mountain range. This section extends from east to west for about six and a half kilometre. A detailed survey of the mountain has not been undertaken. According to reports by Pistorius, (1995: 18(2): 49 - 51) similar sites also occur along the Swartkoppies mountain range north of Pretoria to Rustenburg.

The geology consists of gabbro, hyperite and norite of the bushveld igneous complex. Syenite, gabbro and diabase dykes occur sporadically in the area. To the north of the mountain a valley is formed with bush-covered savannah. The soil is heavy clay turf soil. The vegetation of the area is open savanna, dominated by *Acacia caffra*, *Acacia tortillis* and *Acacia karroo*. The dominant vegetation of the archaeological site is *Dichrostachys cinerea*. As a result of over grazing, the plants became invasive and

formed thickets to such an extent that the ground is hardly visible from the air and it is extremely difficult to walk through the dense vegetation.

### **3. Methodology**

Time to carry out an archaeological investigation was limited due to the urgency of the pipeline and the deadline for the project. Bulldozers destroyed all stonewalling and topsoil layers in the ten-metre wide road (see photograph 1). The soil and archaeological stratigraphy of the exposed trench was investigated. On average the archaeological deposits were twenty to thirty centimetres deep. In exceptional cases the deposits were sixty centimetres and even one and a half metres deep. The two test excavations pits were one metre by two metres. Nine human remains were found and excavated by the Anatomy Department of the University of Pretoria. The section of the trench where the human remains were found was near or in one of the cattle enclosures.

### **4. Results**

#### **4.1 Stonewalling**

Stonewalling extends over an area of approximately 1000 hectare. The existing water reservoir at Makau is built on an archaeological site. Along the pipeline route, the road cuts through walled enclosures. The main spatial feature of the site comprises large encircling wall enclosures with smaller circles and semi circles on the inside. In many cases walling follows the natural topography in or near the mountain. Natural boulders and inclines determine the position of the walls on the mountain slope. In the lower flat areas enclosures trend to be more circular in shape than on the incline. On average the walls are not higher than half a metre, though they might have been one or one and a half metres high originally (see photograph 3). Entrances were defined by putting large stones at the opening to the wall circles.

#### **4.2 Human remains**

Nine human remains were found, some buried in a sitting position and others on their sides (see photograph 4). A separate report by the Anatomy Department of the University of Pretoria has been compiled on the human remains (see annexure B).

#### **4.3. Excavations of test pit 1 & 2**

Two test pits were excavated in the wall of the trench, which had been dug for the water pipe. Both test pits were one by two metres in size. The excavation was done in arbitrary layers of ten centimetres each. Test pit 1 went down to a depth of 1.15 metres and consisted of a midden of layers of ash, occasionally covered with soil and clay floors. The top layers had a very high concentration of bone. In layer six two dagga pipes were found (see photograph 5 & 6).

Test pit 2 was similar to test pit 1. Again soil and clay floors covered in ash layers were found. The excavation went down to a maximum depth of 0.58 meters. The following finds were recovered:

#### **4.3.1 Pottery**

The pottery found consisted of small and fragmented pieces some of which were decorated, but the majority undecorated. A total of 684 pieces were found in test pit 1 of which 9.62% (35) were decorated. In test pit 2 a total of 498 shards were found of which only 1.2% (6) pieces were decorated (see annexure A).

The combination of decorative styles and motives included stamping and incision. One piece with wire bangle impressions was also found. In some cases combinations occur with graphite and red ochre colouring. Two potshards with specularite colouring have also been found (for detail of decorations see photograph 7). The decorations usually occur on or near the lip of the pot. The pottery resembles the so-called "Moloko" pottery, associated with Tswana settlements.

Three pieces of pottery, which had been reworked to form discs, were found. One was oval and the other two probably circular. This type of disc was normally used in clay pots with a hole in the bottom; the disc then fits over the hole. Curdled milk was poured into these pots and the disc would separate the fluid from the solid parts of the curdled milk (see photograph 6).

#### **4.3.2 Dagga pipes**

Two clay dagga pipe heads were found in layer 6 of test pit 1. The one pipe head was nearly complete. The other consisted of four pieces. Both pipe heads have the typical hourglass shape on the inside (see photograph 6).

#### **4.3.3 Faunal analysis**

The top layers of test pit 1 especially yielded many pieces of bone. The analyses of the bones were done at the Transvaal Museum. The faunal remains are dominated by domestic animals, with cattle being the largest contributor. From the sample it seems that herding took predominance over hunting and gathering (for detail see annexure C).

#### **4.4 C14 dating**

The carbon fourteen dating was done by the C.S.I.R. From similar sites excavated by Van Schalkwyk, (2000: 8:64) at Hoekfontein 432 JQ and Pistorius, (1995:123-127) on Roodekoppies 427 JQ it was deduced that the site most probably dates to somewhere between 1650 and 1800.

Four charcoal samples were analysed, which date the site from 1433 to 1900. This gives the site a much earlier date than anticipated (see annexure D).

## 5. Settlement layouts and features

According to Pistorius, (1995:18(2): 51) this complex most probably is part of the so-called Mabyanamatshwaana an early Tswana settlement. The name refers to the norite series of hills, which stretch from north of Pretoria westwards to Brits, Marikana and Rustenburg. Mabyanamatshwaana is mentioned in the oral history of the Hurutshe, Kgatla and other Tswana tribes as well as the Pedi.

The main spatial features of the stonewall settlements consist of an outer encircling wall, with a series of centrally linked enclosures and an intervening unenclosed space between these two. The outer encircling wall comprises of scallops, which contain homesteads, granaries etc. and was referred to as *Malapa*. In the centre is the cattle kraal with smaller enclosures for calves, goats and sheep. Informal gatherings of men always took place in the kraal. The outer circumference of the village was the domain of the women. The stonewall settlements at Hoekfontein are very similar to those found by Pistorius, (1995: 18(2): 54) on the farm Zwartkoppies.

The site is approximately six kilometres long by two kilometres wide. The density of the vegetation largely contributed to the preservation of the site. On the other hand it prohibits the survey of the site. There may be as many as twenty or more of the large stone encirclements. Two of the best-preserved enclosures lie to the eastern boundary of the site. However, there may also be more settlements further east. One seems to have been a major iron-working site. This is indicated by the large anvil stones, and by some of the best and most elaborate stonewalling.

The following special features were found:

### 5.1 Stonewalling

Most stonewalls are less than 0.5 metres high as many stones have been displaced or have fallen from the walls. The walls consist of neatly stacked stones on both sides of the wall. The middle of the wall is filled with rubble and smaller stones. In the case of the iron working complex to the east of the main settlement the stonewalling is very neat and of a high quality. Stones have been specially selected to fit into each other (see photograph 8). In many cases large stones form the entrance to the enclosed walls.

### 5.2 Grinding stone

Grinding stones were found throughout the complex. An interesting feature is that all grinding stones and upper grinders have been broken deliberately. This trait is found where sites were abandoned during times of conflict (see photograph 9).

### 5.3 Granary sites

There are two types of granary sites. The one consists of a small circular platform of flat stones. On top of these a grain clay pot or grain basket was

placed underneath a thatched roof. The other type consists of elongated stones planted into the ground to form pillars. On top of these pillars flat stones were placed. On top these large granaries were made of clay and cow dung. These would normally stand inside a hut (see photograph 10).

#### **5.4 Iron working**

A number of large stone anvils on one of the eastern sites were used for iron forging. Stone hammers and large ash middens occurred (see Photograph 11 & 12). Two stones for sharpening knives and spears (whetstones) were found. Indications of iron smelting were found in the form of slag in the central part of the settlement. No iron-smelting furnaces have been found as yet.

### **6. Conclusion**

The archaeological site on Hoekfontein 432 JQ is a typical early Tswana settlement site similar to those found along the Swartkoppies mountain range. The most interesting find of the site is that it dates back to the 15<sup>th</sup> century and most probably was occupied till historic times. This makes it most probably the Iron Age site with the longest period of continue occupation in South Africa.

Though the pipeline damaged the site it had a positive effect in exposing the archaeological deposits, which would have been difficult to find during normal research. The water pipeline trenches, which cut through some 700 metres of deposit made the choice of, were to excavate easy. This contributed directly to the finding of the oldest deposits and the human remains.

The pipeline also contributed to the discovery of the rest of the sites on the farm Hoekfontein, which covers an area of approximately 1000 hectares with over 470 individual sites. Only further research will uncover the complexity and extent of the settlements and there inter relationship.

### **7. References**

Pistorius J.C.C. 1995, Rathateng and Mabyanamatshwana: Cradle of the Kwena and Kgatla. *South African Journal of Ethnology* 18 (2): 49 – 64

Pistorius J.C.C. 1995: Radio – carbon dates from the Mabyanamatshwana complex. *South African Journal of Ethnology* 18 (3): 123 – 127.

Pistorius J.C.C. 1992, Molokwane and Iron Age Bakwena Village 1992.

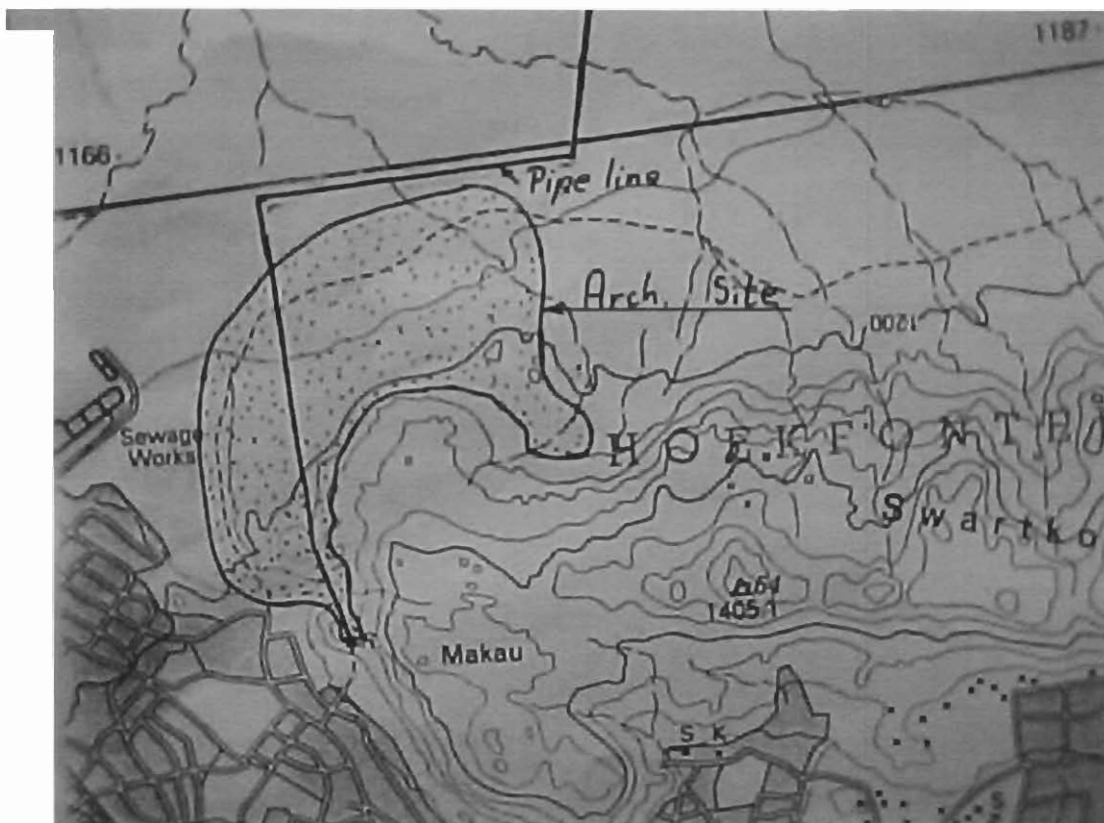
Van Schalkwyk J.A., Pelser A.J. & Teichert F. Archaeological investigation of a Late Iron Age Tswana settlement on the farm Hoekfontein 432 JQ, Odi I District North-west Province Research by the National Cultural History Museum Vol. 9, 2000: 58 – 64.

1/50 000 Map 2527 DB Brits fifth edition 1996.

## PHOTOGRAPHS



**Photograph 1:** The road and pipeline excavation through the Hoekfontein archaeological site.



**Photograph 2:** Map of Hoekfontein archaeological site.



**Photograph 3:** Stone walls, which were used to separate different family groups. On average these walls are not higher than half a metre.



**Photograph 4:** Human remains of a person who was buried in a sitting position





**Photograph 5:** Excavation of Test pit 1 where ash layers and hut floors can be seen as one generation lived on top of the other.



**Photograph 6:** In the top row are portions of three clay discs. In the second row are the two clay dagga pipes and a stone used to smoothing clay floors



**Photograph 7:** Different decorations of notshards as found in the excavations



**Photograph 8:** Stonewalls of the iron-working complex, where stones were specially selected to build walls of a high quality.



**Photograph 9:** An example of a grinding stone and upper grinder, which have been broken deliberately.



**Photograph 10:** Elongated stones planted into the ground to form pillars on which large granaries were constructed of clay and cow dung.



**Photograph 11:** Stone anvil and hammer stone used in iron forging.



**Photograph 12:** A large ash midden in the iron working settlement.

## ANNEXURE A

## ANNEXURE: A

## POTTERY ANALYSIS

## Test Pit 1

Layer	Total P/s	Decorated	Lip	Lip & Decoration	Other
1	99	2	5	-	1 Oval clay disc
2	154	-	6	-	1 Circular clay disc
3	41	-	4	-	
4	57	1	5	-	1 circular clay disc
5	41	-	2	-	
6	67	-	3	-	2 Dagma pipes
7	31	3	2	-	
8	44	1	2	3	
9	45	10	-	5	
10	14	3	-	1	
11	5	-	-	-	
12	20	4	2	2	
<b>Total</b>	<b>618</b>	<b>24</b>	<b>31</b>	<b>11</b>	<b>684</b>

## Test Pit 2

1	48	-	1	-	
2	205	-	6	-	
3	70	1	2	3	
4	48	1	5	1	
5	46	-	1	-	
6	51	-	9	-	
<b>Total</b>	<b>468</b>	<b>2</b>	<b>24</b>	<b>4</b>	<b>498</b>

## ANNEXURE B



## *The Rescue Excavation and Analysis of*

*Graves of Adults and Children from a Residential Part of an Archaeological Stonewalled Site of Sotho-Tswana Origin, tentatively dated to around 1700 AD, located on the farm Hoekfontein 432 JQ, Brits District, North-West Province on 30 and 31 May 2002.*

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Under the auspices of Business Enterprises at University of Pretoria (Pty) Ltd  
**22 October 2002**

This report covers the rescue excavation and analysis (from the sides of a construction trench dug to lay a water pipeline) of nine graves of adults and children from a residential part of an archaeological stonewalled site of Sotho-Tswana origin, tentatively dated to around 1700 AD, located on the farm Hoekfontein 432 JQ, Brits District, North-West Province on 30 and 31 May 2002. The stakeholder participation and the re-interment of the excavated remains on 24 September 2002 at the site from where they were excavated are also included.





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# *The Rescue Excavation and Analysis of*

HUMAN REMAINS UNCOVERED BY CONSTRUCTION ACTIVITIES ON THE FARM  
HOEKFONTEIN 432 JQ, BRITS DISTRICT, NORTH-WEST PROVINCE

## **1. INTRODUCTION/EVENTS LEADING TO THE EXCAVATION**

Nine graves were discovered in the walls of a construction trench dug for the laying of a water pipeline during a cultural resource management scoping done by Dr U Küsel under the auspices of African Heritage Consultants during May 2002. At the time of the scoping (which was supposed to clear the way for construction activities) a 10 m wide road along the route of the pipeline had already been graded and the trench for the pipeline dug. The road, to the side of which the trench had been dug, went through a large archaeological site in the area where the graves were found (Küsel, 2002).

All construction work was immediately stopped and SAHRA permits were applied for to enable the salvage archaeological investigation of the damaged part of the site to take place. A permit was duly granted. While Dr Küsel continued with the salvage investigation of the archaeological site, Anthropology Private Practice under the auspices of Business Enterprises at University of Pretoria (Pty) Ltd was appointed to conduct the rescue excavation of the graves.

### **1.1 Legal Compliance and Authorization**

The rescue excavation of the graves was conducted under the Act 25 of 1999 (Cultural Heritage Resources Act) Section 35 permit (Permit no.: 80/02/05/003/51) issued to Dr U Küsel for the salvage excavation of the site after it was discussed with the SAHRA National Office as well as the SAHRA North-West Province representative.

## **2. ENSURING STAKEHOLDER PARTICIPATION/SOCIAL CONSULTATION**

As soon as the human remains were uncovered, the local authorities were informed by the site engineer in charge of construction. The arrangements for excavation made with SAHRA allowed for retrospective social consultation to enable the speedy recovery of the remains. At the time of excavation, passing villagers were asked to inform the tribal authorities and several representatives of the local community attended the excavations on the second day (31 May 2002).

This led to a meeting with the local traditional leader and his council on 6 June 2002 at the Makau tribal office. The meeting was attended by Kgosi Motsepe of the Bakgatla Bamakau and members of his council, the mayor of the Madibeng Municipality and members of his council, representatives of the contractor and the heritage consultants.

At this meeting, progress was reported and a decision as to the future of the remains was requested. The community representatives indicated that the remains were to be reburied after the completion of the analysis and that the details would be finalized at a later stage.

Anthropology Private Practice was visited twice during the following months by Mr. ABC Motsepe, Chairman of the Royal Traditional Council of the Bakgatla Bamakau. At both these meetings the progress with the study of the remains and the future of the remains were considered and discussed.

After several requests for a decision on the future handling of the remains were made to the Tribal Office, correspondence via fax ensued during the week of 16-20 September 2002, instructing Anthropology Private Practice that the remains would be re-interred on 24 September 2002 during a special Heritage Day ceremony at the Bamakau Tribal Office. Correspondence ascertained that the necessary arrangements were made and that the legality of the re-burial was ensured. Confirmation of this was received together with an invitation to a meeting on 21 September 2002 to conclude detail arrangements. During this meeting, Anthropology Private Practice was instructed to prepare the remains and deliver them on the morning of 24 September 2002.

This was done and the remains were re-buried at the site from where they were excavated (Fig. 1).

**FIGURE 1**



### 3. THE REGIONAL AND HISTORICAL CONTEXT OF THE GRAVES

#### 3.1 The Location of the Site

The archaeological site is situated on the farm Hoekfontein 432 JQ at the northwestern part of the Swartkoppies mountain range near the town of Makau in the Brits District of the North-West Province. The area of the site where the graves were exposed by construction activities is situated at 24°44.12 S and 028°12.10 E (GPS).

The Hoekfontein site falls within an area known as the 'Bankeveld' - 'a narrow strip of land between the central highveld and the plateau basin of northern South Africa' (Horn 1996:26). This area is roughly demarcated by Krugersdorp in the south, the Pienaars River in the north, Bronkhorstspruit in the east and the Pilanesberg in the west.

#### 3.2 Description of the Site

The archaeological site in which the graves were found extends from the existing water reservoir just northeast of the town of Makau, north and northeast and then east along the foothills of the Swartkoppies mountain range for approximately 3 km (Küsel, 2002).

Geologically the area forms part of the bushveld igneous complex and consists of gabbro, hyperite and norite deposits with syenite, gabbro and diabase dykes occurring sporadically (Küsel, 2002). The predominant soil type is heavy clay turf.

According to Acocks (1952) the veldt type of the area is a variation of Turf Thornveld known as Norite Black Turfveld tending to be dominated by *Cymbopogon plurinodis*. *Acacia karroo*, *Themeda triandra* and *Setaria* spp. are predominant with *Sesbania transvaalensis*, *Aristida bipartite*, *Dichanthium aristatum* and *Panicum volutans* on disturbed sites. This was confirmed by observations in the field.

The site consists of a series of scalloped stonewalls and stone walled enclosures (Fig. 2). Although an extensive survey of the total site was not undertaken, evidence of habitation in the form of hut rubble and the remnants of hut and *lapa* floors in some of the enclosures or scallops, broken grinding stones and fragments of ceramic as well as indications of stock keeping activities were observed. These observations are confirmed by Küsel (2002).

FIGURE 2

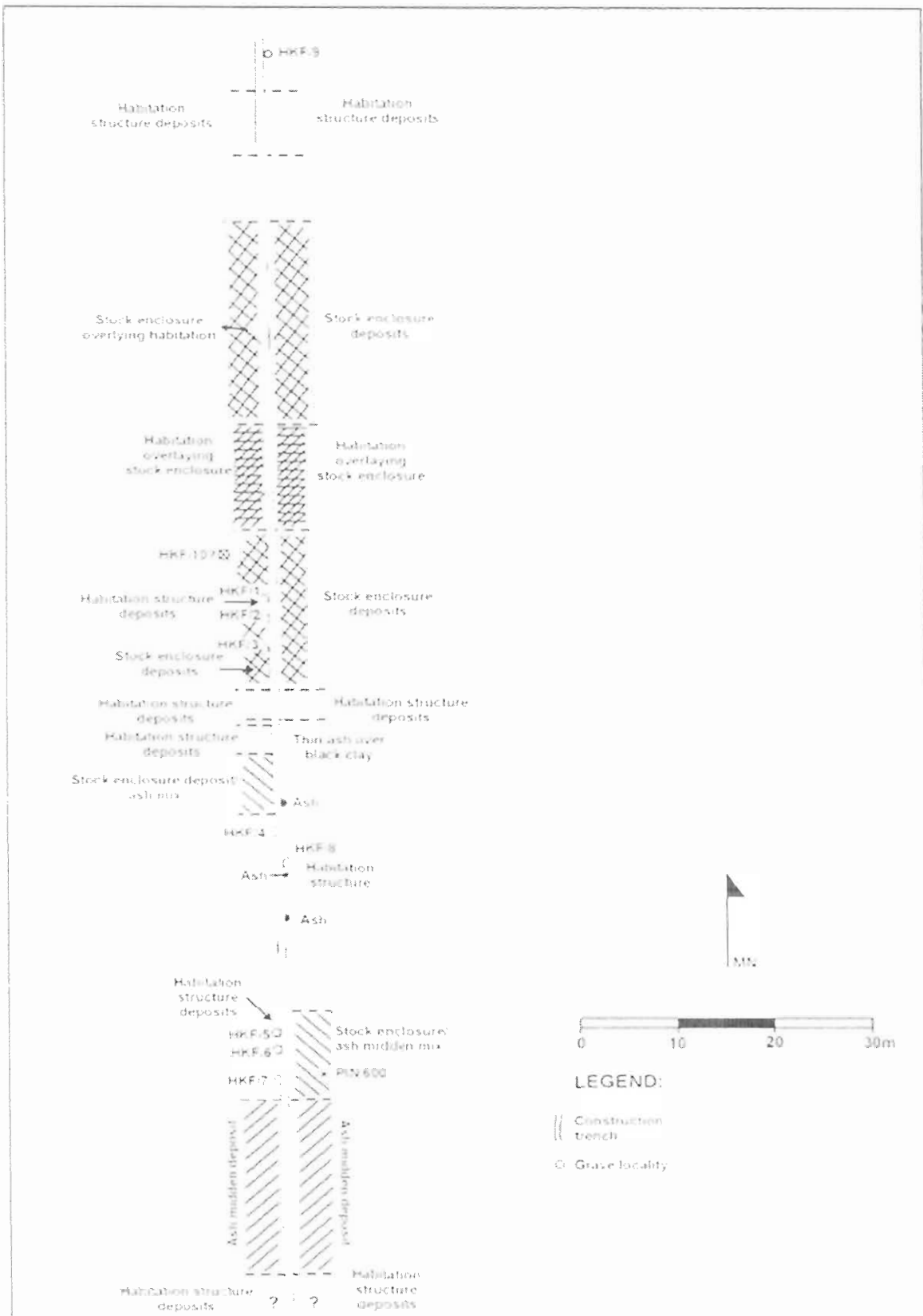


The human remains were found in what was most probably a residential part of the site. Due to the extensive disturbance of the evidence by construction activities and the lack of a comprehensive site survey and map, it is impossible to relate the location of the investigated graves with the larger settlement pattern of the site. The graves were observed to occur overlaid by archaeological deposits, but in most cases, it was impossible to relate specific graves with the micro-settlement features of the site. Where indications of specific activities could be observed these were indicated during the survey of the construction trench (Fig. 3). The reliability of these observations was compromised by the extensive disturbance of the archaeological deposits in the part of the site where the graves were exposed.

#### 3.3.3 Ethno-historical History of the Area

Archaeological surveys and previous research in the area have revealed the presence of thousands of settlements along the bases of the granite hills of the Central Bankeveld – an area between Rustenburg in the west and Onderstepoort in the east. These settlements represent the spheres of influence of Sotho-Tswana chiefdoms such as the Kgatla, the Pō, the Kwena of Mōgōpa and the Fokeng since the mid-seventeenth century (Pistorius 1997). Vanguard Sotho-Tswana groups may, however, have been present in the area from as early as the fourteenth century (Breutz 1956; Coertze 1990; Kriel 1976). The Sotho-Tswana is a distinct cultural and linguistic group within the South Eastern Bantu (Legassic, 1978) and the term is currently used to delineate a group of communities that share a common ancestry, history and cultural way of life (Pistorius (1992).

FIGURE 3





According to Van Schaikwyk, *et.al.* (2000) archaeologically similar sites to Hoekfontein occur on top of the Swartkoppies mountain range. Pistorius (1995) also found similar sites along the Swartkoppies range from north of Pretoria to Rustenburg and includes the stonewalled sites of this area in the Mabyanamatswana complex, an early site of Sotho-Tswana fission.

The Bammakau (who are still living in this area today) belong to the lineage cluster of the Bahurutshe-Bakwena, which gave rise to the Bakwena, Bahurutse and Bakgatla chiefdoms after a period of fission and secession from the original nucleus. One tradition claims that this nucleus settled at Swartkoppies (or Mabyanamatswana) under the legendary ancestor Mogale (Pistorius, 1992). Mogale and the five chiefs who succeeded him ruled in this area from 1350 to 1470 AD (Breutz, 1953a & Coertze, 1971).

Oral traditions regarding the origin and arrival of Sotho-Tswana communities south of the Mariko river not only differ, but are unclear or vague concerning migration routes, the early location of settlements and the fission of groups which in some instances led to the formation of major tribal groupings (Pistorius, 1992). In the earlier historical literature (e.g. Stow, 1905; Breutz, 1953a; 1953b & 1956) the arrival of the Sotho-Tswana peoples in South Africa is generally explained as waves and streams of migrating people.

Two explanations based on archaeological evidence to account for the origin of the Sotho-Tswana peoples have been postulated. Both these hypotheses are based on pottery typologies with little consideration of other cultural traits. The Moloko tradition which covers large parts of the historical Transvaal region has been proposed by Evers (1983). The Moloko is considered to be the representative tradition of new immigrant communities arriving in South Africa during the early second millennium. Mason (1983 & 1986) has postulated the Oori tradition in opposition to Evers' Moloko tradition. According to Mason (1983 & 1986) the Sotho-Tswana culture originated in the central, southern and western parts of the historical Transvaal as a product of local development in an Early Iron Age setting (Pistorius 1992).

According to Pistorius (1998) the area where the towns of Brits, Mmakau and Mothutlong are today, has been occupied by the Bakwena Bamôgôpa and the Bakgatla. Both groups have, since their original occupation of the Bankeveld, splintered into numerous clans. When the Bakgatla divided, clans such as the Bamosêlha and Bamotsa moved out of the Bankeveld, while the Bagakgafela settled in the Pilanesberg. The Bammakau and Baseabê remained behind (Breutz 1986). The original settlement pattern of these clans was disturbed by the incursions of *inter alia* the Matebele of Mzilikazi between 1827 and 1836 (Pistorius 1997).

The mega-settlements disappeared and were replaced by small groups of extended families - some of which eventually became farm labourers when white farmers started to settle in the area during the first half of the nineteenth century (Bergh 1992).

#### 4. METHODS OF EXCAVATION

During the first site visit on 2002/05/20 the walls and sides of the construction trench cutting through the Hoekfontein site were thoroughly surveyed for indications of the presence of human remains and graves. Where these were encountered, they were clearly marked and left *in situ* for rescue excavation.

During the following 10 days, the location of each grave found during the survey was cleared of excess deposit thrown up from the trench so that the surface of each of the grave locations was clear of overburden. This was done under the supervision of Dr Kusel (the CRM archaeologist for the site).

The aim of the rescue excavation was the *in situ* exposure of the burial and associated artefacts (Nienaber and Steyn, 1999). The focus was on accurate and complete documentation (Nienaber, 1997). Various methods for the excavation of graves have been proposed by different authors (Hester, 1975; Joukowsky, 1980; Krogman and Iscan, 1986; Morse, 1978) but all stress the need for adequate workspace around the exposed remains and a systematic approach to the removal of individual bones. The archaeological method, including extensive test trenching to prevent damage to the remains, was employed. This approach was largely similar to that of forensic archaeology where buried body cases are concerned. The approach was adapted for each situation since graves vary in shape, size, depth and content (Nienaber, 1999). The methods used in forensic archaeology are discussed by Steyn, *et.al.* (2000). At Hoekfontein most of the graves were partially exposed by the construction activities. The graves were located on the edge of the construction trench and it was possible to expose them from the top and at least one side.

In each case the surface features of the grave were cleaned and documented where these survived the disturbance of the site by the construction work. Hereafter the cultural material associated with the surface features were documented, collected and catalogued where necessary to enable the further excavation of the grave. The surface features were removed through excavating according to the archaeological method and all observations regarding construction, materials and characteristics of the surface features were documented where these could be observed.

After the removal of the surface features the extent of the burial pit was ascertained through excavation and observation of differences in the matrix. After the indications of the presence and characteristics of the burial pit were documented the in-fill was excavated to expose the human remains and associated cultural materials.

At this stage care was taken to leave as much of the skeleton as possible uncovered in order to protect the remains from damage by excavation and to preserve the integrity of the context of the skeletal elements and possible associated cultural remains. The extent and characteristics of the burial pit was now documented and the workspace was assessed and enlarged if not sufficient. This was only done after documentation of the features of the burial pit and without sacrificing any vital information.

The remains were then uncovered, starting from the middle and working outwards. This method again ensures the minimum disturbance of the remains and associated cultural materials. As soon as the skeleton was uncovered it was documented *in situ*, removed and packed for analysis. A further test trench of 15 cm deep was dug in the area directly underlying the location of the remains to ensure that all possible remains and artefacts were found and recovered.

## 5. EXCAVATION OF GRAVES

### 5.1 GRAVE HKF/1

#### 5.1.1 Description of Grave

This grave was located in the western wall of the construction trench cutting through the archaeological site (Refer Fig. 3) and was therefore damaged and exposed on the eastern side. The grave was located in a deposit of stock enclosure debris with no remains of habitation in the close vicinity thereof. It was therefore most probably located in a stock enclosure. The western half of a round burial pit, approximately 50-55 cm in diameter could be observed on the cleared surface of the side of the construction trench.

The skull of the buried individual was located approximately 44cm below the present surface. It was located right on the edge of the trench and the front part was destroyed by the construction activities. The rest of the remains seemed to be relatively undisturbed. The grave was 87 cm deep (the level of the bottom of the feet).

Large rocks were found on the floor of the burial pit next to both the ankles of the skeleton. On the southern side of the grave, the rock was directly adjacent to the right ankle, but on the northern side, the rock was some 15 cm away from the ankle of the skeleton.

Due to the nature of the disturbance of the grave, the remains were exposed on the eastern side and could be observed *in situ* after they were cleaned. The skeleton was in a tightly flexed sitting position, leaning to the north. Due to the disturbance of the skull and the damage caused by the construction activities, it was not possible to reconstruct the position of the skull with any certainty. The partial skull however, did indicate that it was facing northeast. The mandible had fallen open and was therefore preserved undamaged. The lower limbs were tightly flexed with the knees at the sides of the skull. The ankles were flexed 90° with the feet next to each other on the bottom of the burial pit. The upper limbs were between the thorax and the lower limbs with the hands between the ankles. The right hand was in front of the left tibia and the left hand just in front of the pelvis (Fig. 4).

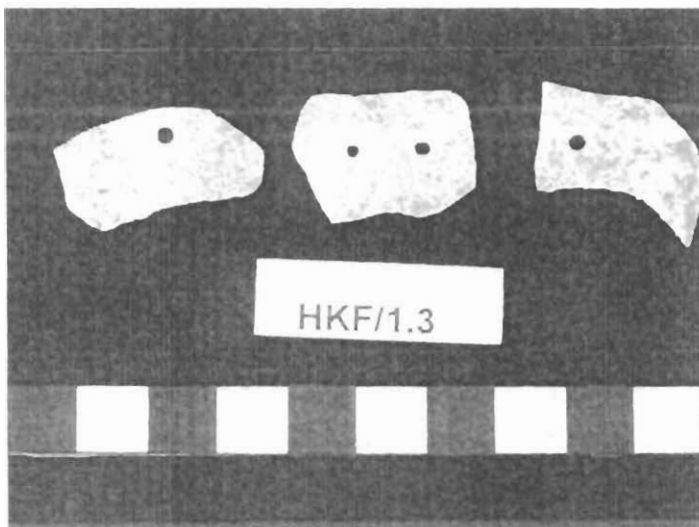
FIGURE 4



A potsherd with lip-edge (HKF/1.1 (Refer Table 1)) was found just south of the skull and just below the present (disturbed) surface. Traces of graphite were found on the skull and in its vicinity. At the left wrist, a piece of badly corroded metal was found (HKF/1.4 (Refer Table 1)). Three roughly rectangular pieces of ostrich eggshell were found at the throat of the skeleton (below the mandible and in front of the vertebral column (HKF/1.3 (Refer Table1))). These were most probably around the neck of the individual at the time of burial.

One of the ostrich eggshell pieces had small holes on both sides while the other two only had a hole on one side (Fig. 5). The two smaller fragments fit together to form a rectangular object similar to the larger one. Around the feet and on the bottom of the grave lumps of ochre were found.

FIGURE 5



#### 5.2 Grave HKF/2

5.2.1 Description of the grave

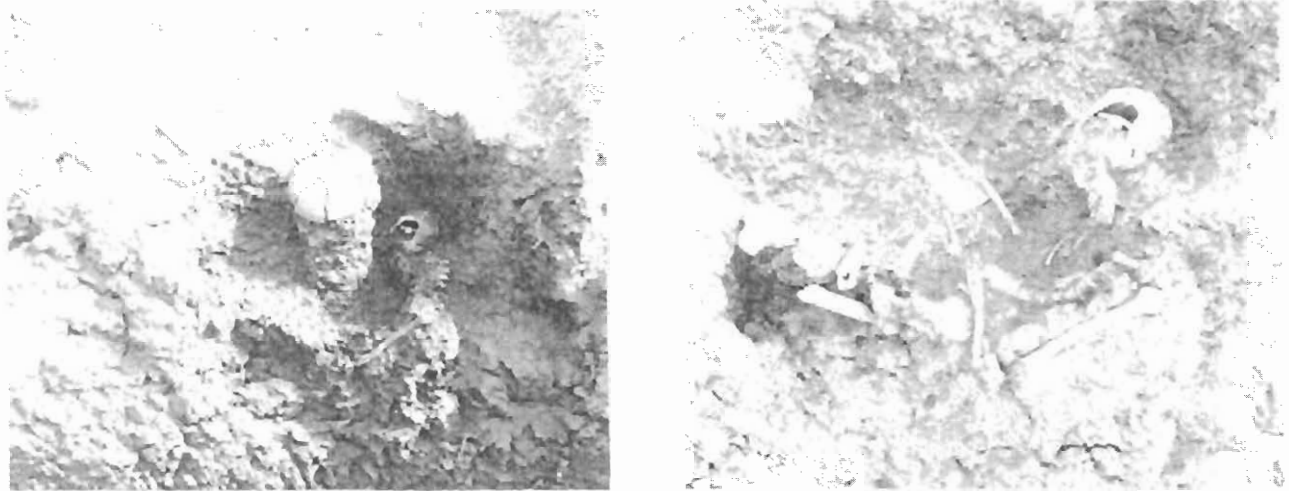
This grave was located in the western wall of the construction trench (Refer Fig. 3) and was therefore damaged and exposed on the eastern side. Hut rubble and ash, as well as stock enclosure elements were observed in the vicinity of the grave. It was therefore most probably located in a residential area of the site.

The extent of the burial pit could not be defined. The remains were found in an area approximately 50 cm in diameter and approximately 18 cm below the present (disturbed) surface. The remains were directly below fragments of a ceramic bowl and three flat rocks. No definite organization in the position of the rocks could be observed. A rock occurred just to the right of the pelvis of the skeleton on the bottom of the grave.

The skeletal remains seemed to be relatively undisturbed. The skeleton was in a horizontally flexed position reclining on its back. It seems as if the body was placed in a shallow bowl shaped burial pit with the legs flexed and the head resting on the side of the pit. The neck was flexed to the right so that the skull rested on the right shoulder. The skull faced north. Although both lower limbs were flexed, the left leg was flexed to the extent that the left knee

formed the highest skeletal element in the grave. The left arm was next to the thorax and was flexed at the elbow so that the left forearm rested on the abdomen. The right arm was next to the right side of the thorax with the elbow only slightly flexed (Fig. 6).

**FIGURE 6**



Fragments of a broken shallow ceramic bowl (HKF/2.1 (Refer Table 1))(Fig. 7) were found in the upper part of the grave (in the area over the abdomen of the buried body). A small copper ring, most probably an earring, (HKF/2.2 (Refer Table 1)) was recovered from the left side of the skull (Fig. 8).

**FIGURE 7**

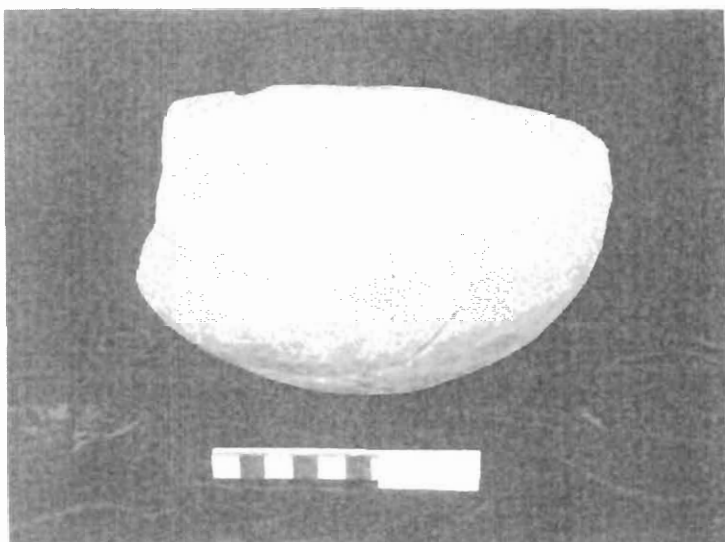


FIGURE 8



FIGURE 9 GRAVE HKF/3

#### GRAVE HKF/3 (Fig. 9)

This grave was also exposed on the eastern side by the construction trench (Refer Fig. 3). It was dug through a hut floor that occurred below a layer of stock enclosure deposit. Due to the nature of the overlaying deposits and the excavation conditions (rescue excavation in a badly disturbed part of the site) it is difficult to assign this grave to either the habitation or stock enclosure areas of the site. Since the burial pit was dug through the hut floor it is possible that the individual was buried while this part of the site was used as a stock enclosure.

The burial pit was roughly oval in shape, and could be clearly defined once the overburden of up cast from the trench was removed. It was oriented north south and was approximately 55 cm long and 50 cm wide. Three flat rocks and the fragments of a broken ceramic bowl were found at the top of the grave. No pattern in the placing of the rocks could be observed.

The remains were in primary context and the skeleton was in a flexed sitting position, oriented north south (with the skull at the northern side). The neck was rotated so that the skull faced west and downwards, while the lower limbs were flexed with the feet on the bottom of the grave next to each other. The knees were wide apart (the left knee in front of the thorax and the right knee to the side of the sitting skeleton). This could be due to the right lower limb slumping sideways during decomposition.

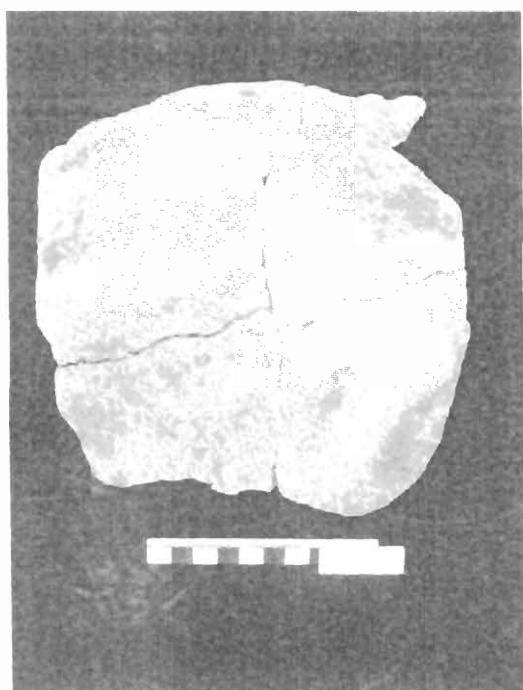
The whole body has slumped and collapsed somewhat (also probably during decomposition) so that both shoulders and ankles were slightly to the west of the pelvis. Both arms were in front of the thorax with both hands at the right foot between the two ankles (Fig. 9).

FIGURE 9



Apart from the fragments of the ceramic bowl (HKF/3.8(Refer Table 1))(Fig. 10) found on top of the remains several other potsherds were found in this grave (Refer Table 1).

FIGURE 10





#### 5.4 Grave HKF/1

This grave was located in the western wall of the construction trench cutting through the archaeological site (Refer Fig. 3) and was therefore damaged and exposed on the eastern side. A thin ash layer overlaid the grave. The disturbance of the site by construction activities made it difficult to assess the ash deposit occurring in this location with any certainty. Although difficult to assess, the ash most probably represented the remains of an ash midden into which the grave was dug. The shape and extent of the burial pit could not be observed.

The skull was found approximately 50 cm below the present surface and the deepest extent of the human remains at approximately 70 cm.

The remains seemed to be relatively undisturbed but both feet were destroyed by the construction activities. The skeleton was oriented along a northeast line. The individual was buried in a flexed sitting position, but had collapsed during decomposition (the thorax to the front and the knees to the left). The skull came to rest between the legs, on its right side and facing in a northwesterly direction. Both upper arms were next to the thorax with the forearms folded across the chest with the right hand at the left elbow and *vice versa*. The folded forearms were between the thorax and the flexed lower limbs (Fig. 11).

FIGURE 11



No cultural remains were found associated with this skeleton.

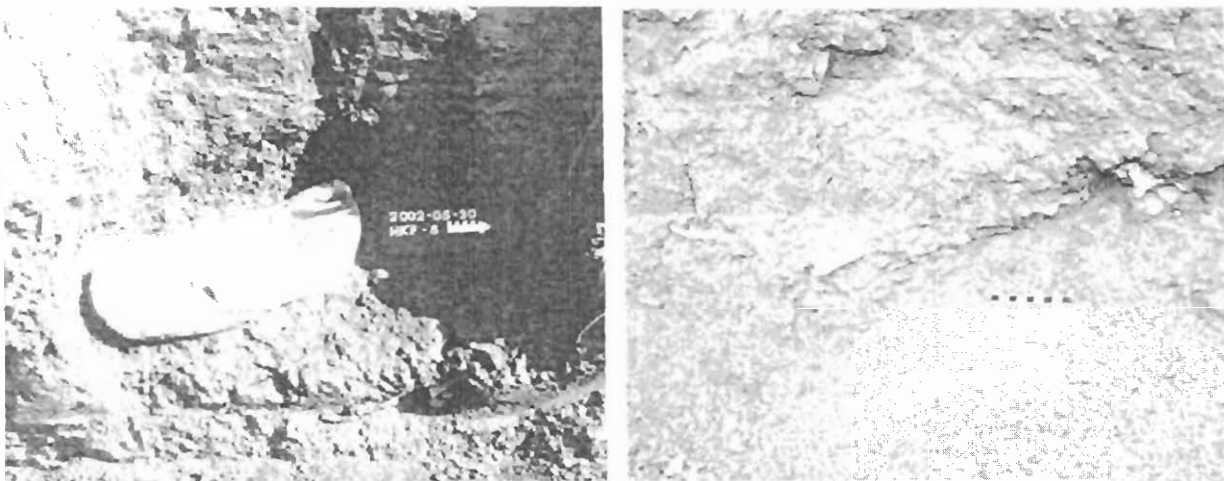
## 5.5 Grave HKF/5

This grave was located in the western wall of the construction trench cutting through the archaeological site (Refer Fig. 3) and was therefore damaged and exposed on the eastern side. A thin layer of stock enclosure deposit overlaid the location of the grave. Due to the depth of the grave and the construction damage to the site, it is impossible to state whether the grave is associated with the stock enclosure deposit on the surface of this location. No indications of the shape and extent of the burial pit could be observed.

The human remains were found at a depth of 1,18 m below the present (disturbed) surface. A large flat rock (76 X 34 cm X 22 cm thick) occurred partially above and just to the west of the remains.

All of the eastern part of the skeleton was destroyed by construction activities. The greater part of the limbs and skull were found as small bone fragments in the bottom of the construction trench. The remaining *in situ* remains were poorly preserved and fragmentary. Due to the extensive damage to the remains, the best reconstruction of the burial position that can be offered is that it was most probably buried on its right side in a tightly flexed fetal position (Fig. 12).

FIGURE 12



No cultural remains were found associated with the skeleton.

### 5.6 Grave HKF/6

The grave was located on the western edge of the construction trench (Refer Fig. 3). It was exposed and badly damaged on the eastern side. Due to the extensive disturbance of this part of the site, no overlaying deposits nor the shape and extent of the burial pit could be observed. The remains occurred down to a depth of 97 cm below the present (badly disturbed) surface.

Only a partial vertebral column, a fragmented pelvis, some ribs and a fragment of proximal femur were still *in situ*. The rest of the grave and remains were destroyed during the digging of the construction trench. This individual was most probably buried in a flexed fetal position. The remains were oriented north south with the skull on the southern side of the grave (Fig. 13).

**FIGURE 13**



No cultural remains were found associated with the skeleton.

### 5.7 Grave HKF/7

This grave was located in the western wall of the trench (Refer Fig. 3). It was exposed on the eastern side, but relatively little damage to the remains occurred (Only the skull was partially exposed by the construction activities).

Due to the disturbances in this part of the site, no cultural deposits associated with the locality of the grave could be identified and the shape and extent of the burial pit could not be observed.

The skeletal remains were found at a depth of approximately 90 cm below the present (disturbed) surface. A rock was found slightly above and next to the skull.

The individual was buried on the left side in a tightly flexed fetal position. It was oriented along a northwesterly line with the skull at the southeastern side of the grave and facing west. The upper limbs were flexed at the elbows with the hands resting in front of the face. The lower limbs were also tightly flexed with the feet on top of each other (Fig. 14).

FIGURE 14



A string of ostrich eggshell beads (HKF/7.2 & 7.3 (Refer Table 1)), coloured pink, was found at the pelvis of the skeleton (Fig. 15 & 16). The pink colouring of the beads is most probably due to ochre placed in the bottom of the grave at the time of burial. Small pieces of graphite were found just above the skull. A corroded metal ring (HKF/7.4 (Refer Table 1)) was found around the ankle of the skeleton (Fig. 17 & 18).

FIGURE 15



FIGURE 16

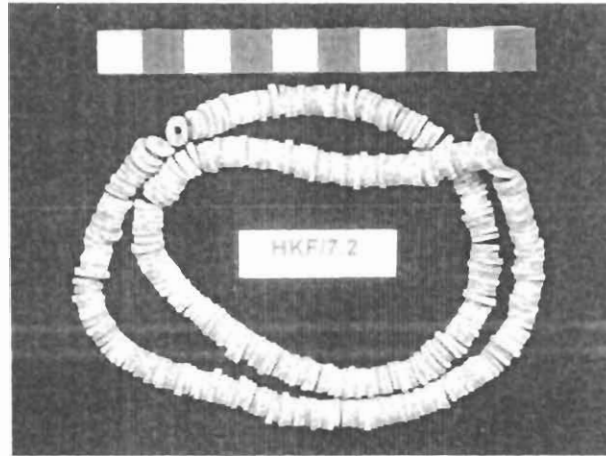


FIGURE 17

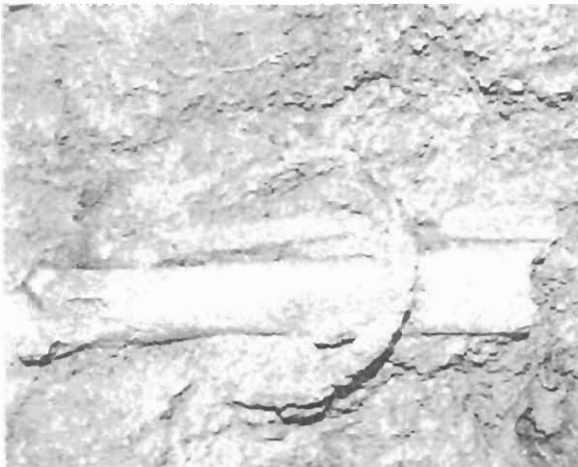
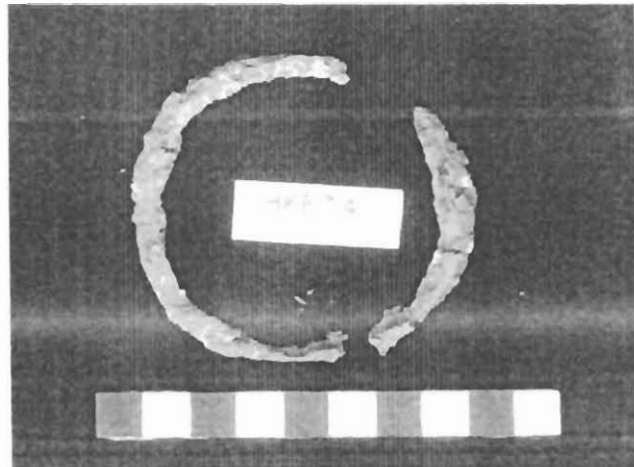


FIGURE 18



### Site Grave HKF/8

The grave was located in the western wall of the construction trench (Refer Fig. 3) and was severely damaged on the eastern side. No cultural deposits associated with the locality of the grave could be identified, and the shape and extent of the burial pit could not be observed.

The skeletal remains were found at a depth of 46 cm below the present (disturbed) surface and the total depth of the grave was approximately 75 cm.

The overall preservation of the remains was poor. This, in addition to the damage from construction activities, made the accurate documentation of the burial position difficult. Since teeth and neck vertebrae belonging to the individual were found in the bottom of the grave, the body had most probably collapsed during decomposition. The remains were found in a tightly flexed sitting position, but slumped to the left side and with the skull facing west. Both lower limbs were tightly flexed with the upper limbs between them and the thorax of the skeleton. The left elbow was at the left knee, but the position of the right upper limb could not be ascertained. The feet were most probably next to each other in the bottom of the grave. This could not, however, be ascertained with certainty (Fig. 19).

FIGURE 19



Figure 19: Human remains in grave.

No cultural remains were found associated with the human remains.

#### GRAVE 20: HKF/9

Figure 20: Grave 20.

This grave was located on the eastern edge of the construction trench (Refer Fig. 3). It was exposed on the western side by the construction activities. Apart from the vertebral column and pelvis that were destroyed, relatively little damage occurred to the remains.

Due to the disturbance of the grave by the grading of the road running parallel to the trench on the eastern side, no cultural deposits associated with the grave could be identified and the shape and extent of the burial pit could not be observed.

The skeletal remains were found just below the present surface and it was not possible to determine their original depth.

The remains were found on the left side in the fetal position. It was oriented north south with the skull at the northern side of the grave. The neck was flexed and the skull rotated so that it faced diagonally downwards in a southeasterly direction. Both upper limbs were tightly flexed at the elbows with the hands in front of the face. The lower limbs were also tightly flexed to the extent that the knees were just below the hands. Both feet were resting on their left sides with the left foot to the front and on top of the right foot (Fig. 20).

**FIGURE 20**



In front of the tibiae two small ceramic pots (HKF/9.1 & 9.2 (Refer Table 1))(Fig. 21 & 22) were found. The larger pot (HKF/9.2) was upright and the smaller one (HKF/9.1) inverted and right next to the right tibia (Refer Fig. 20). A metal blade (HKF/9.5 (Refer Table 1))(most probably iron)(Fig. 23), approximately 10 cm long, as well as a badly corroded metal fragment (HKF/9.6 (Refer Table 1)) were also found in direct association with the remains (Refer Fig. 20). Fragments of *achatina* shell were found under the right femur in the vicinity of the skull.

FIGURE 21

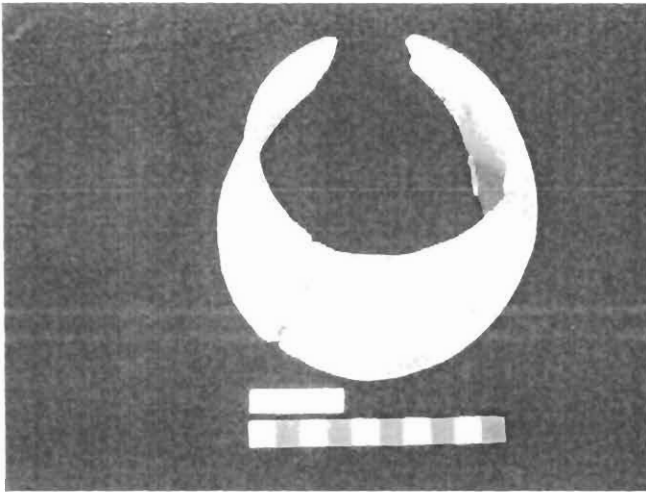


FIGURE 22

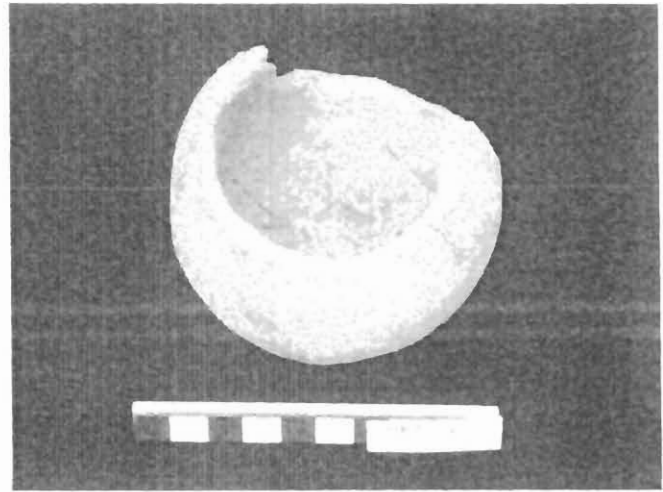


FIGURE 23

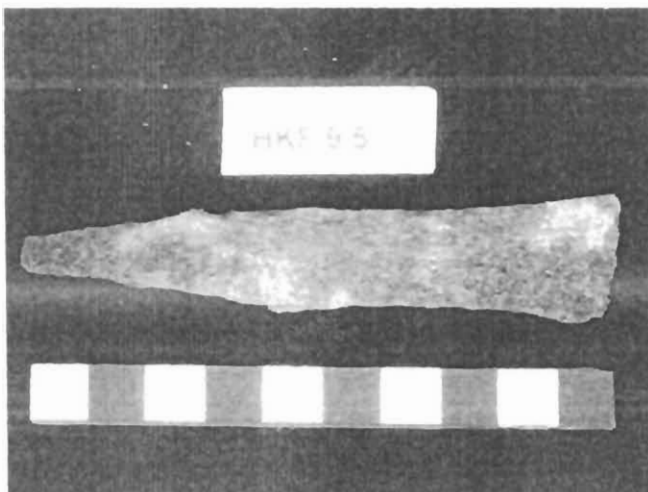


Figure 23: Structure HKF/10 (a) and (b)

A pit-shaped structure visible in the western wall of the trench was investigated. Dr. Küsel indicated this structure as HKF/9 during his initial survey for graves exposed by the digging of the construction trench. This structure was not a grave and was most probably a filled-in springhare burrow. The number HKF/9 was allocated to the structure described in this report, and not to the structure indicated as HKF/9 by Küsel. The investigations of Küsel's structure HKF/9 were documented as HKF/10(a) of this investigation since it was not a grave.

Human bones were also found on the up cast from the trench. All these dumps were surveyed and all human remains were collected under the number HKF/10.



It is impossible to say whether these remains represent the remnants of one or more graves that was located in the middle of the construction trench, and was therefore totally destroyed by the construction activities, or whether these bones originated from the damaged parts of the excavated graves described in this report.

## 6. METHODS OF SKELETAL IDENTIFICATION

All the skeletons were cleaned, reconstructed as far as possible, studied and measured. In the analysis of the skeletons, standard anthropological techniques and measurements were used. South African data were used as far as possible for the determination of the demographic characteristics (age, sex, population group). Age was determined in the juveniles mostly with the help of dental eruption and development and epiphyseal closure (Ferembach *et al* 1980; Buikstra & Ubelaker 1994, Krogman & Iscan 1986; Scheuer & Black 2000). In the adults a variety of methods were employed, including sternal ends of ribs (Oettlé & Steyn 2000), cranial suture closure (Krogman & Iscan 1986), and general degeneration.

Sex was determined using the non-metric characteristics of the pelvis, mandible (Krogman & Iscan 1986; Loth & Henneberg 1996) and skull (Ferembach *et al* 1980, Krogman & Iscan 1986), as well as metric data from the humerus (Steyn & Iscan 1999) and femur (Iscan, unpublished data). Population affinity was assessed with the help of non-metric and metric data from the skull and mandible (De Villiers 1968; Iscan & Steyn 1999). For purposes of determining ante-mortem stature, the formulae for South African Blacks, developed by Lundy & Feldesman (1987), were used.

Pathological changes to the bones were assessed in each case, although it was not attempted to make a specific diagnosis in each case. Information from textbooks by Ortner and Putschar (1981), Steinbock (1976) and Aufderheide & Rodríguez-Martin (1998) were used. No special investigations, such as X-rays, were employed.

## 7. ANALYSIS OF REMAINS

### 7.1. Skeleton no. 1 (sk1)

#### 7.1.1. Description

This skeleton was nearly complete, but needed a lot of reconstruction resulting from damage by the machinery. The skull was partially reconstructable, but missed the orbits and zygomae and parts of the parietals and occipitals. The mandible was complete. Several vertebra, ribs, hand- and foot bones were preserved. All the major long bones were represented, although only the right humerus and both ulnae were complete.

The individual was an adult, and all the permanent teeth had erupted. However, the teeth did not show much wear. All the epiphyses had been obliterated, except for the medial ends of the clavicles, which were partially closed. These features indicate an age of about 20 - 30 years.

The individual was clearly a male. All pelvic characteristics indicated a male - narrow sciatic notches, triangular pubic bones, a narrow subpubic angle and absence of pre-auricular sulci. The mandible was robust, with a square chin and flexed ramus. The glabella was well developed, although the orbital margins were sharp (a female characteristic).

#### 4.2.3.3. Cranial characteristics

The shape of the skull as well as the degree of prognathism clearly indicated an individual of South African Negroid descent. Cranial and postcranial measurements that were possible can be seen in Tables 1 and 2. An unusual feature of this skull was the presence of a metopic suture. Antemortem stature was calculated to  $163.3 \pm 3.643$  cm with the help of the radius.

#### 4.2.3.4

A full set of teeth was present, except for the lower right third molar, which had probably not developed. No signs of dental decay or abscessing were found, and the teeth were worn to a degree where only small dentine patches were observable on some of the teeth. Slight tartar deposits were present.

#### 4.2.3.5

No signs of disease could be observed, and there were no cribra orbitalia.

#### 4.2.3.6

The remains were those of a 20 - 30 year old male of South African Negroid descent. He was about 163 cm tall. No signs of disease were observed.

### 2.3.3.3. Burial chamber HKF/2

#### 4.2.3.6

The condition of the remains was good. The skull vault was recovered in addition to portions of the maxilla and mandible. Postcranial bones were retrieved in various states of preservation and included the clavulae, scapulae, humeri, forearms (radii and ulnae), ribs (29 fragments from the right rib cage and 38 fragments from the left rib cage), vertebrae, sacrum, pelvis, femora, tibiae, fibulae, as well as hand and foot bones.

All the epiphyses were fused, including the synchondrosis spheno-occipitalis and the sternal end of the clavicae. Minimal dental wear was noted on the M1's but no dental wear was observed on the M2's and the M3's. The left pubic symphysis was between a phase 2 and a phase 3. All the cranial sutures were open. From this evidence, it was suggested that the individual had been a young adult between 25 and 35 years of age.

A high forehead, round vault, sharp orbital margins and small mastoids were observed on the skull. A nuchal bun was noted on the posterior aspect of the skull but it was not pronounced. No ramal flexure was present. The iliac blades of the pelvis were flared, the sub-pubic angle was wide and preauricular sulci were present on both os coxae. From these features, it was suggested that the remains had been those of a female individual.

All the teeth were present. Dental wear was minimal on the molar teeth. No enamel hypoplastic lesions or carious lesions were observed.

Alveolar prognathism was observed in the maxilla, which suggested that the individual had been of South African Negroid descent.

Using the maximum length of the humerus, it was estimated that the individual had been  $151 \pm 3.715$  cm in length (humerus length = 289 mm).

Subperiosteal lesions were noted on the superior aspect of the skull and may have been caused by a treponemal infection. Caries sicca, a bony lesion that is indicative of syphilis, was noted around the bregma and between the parietal bones of the skull of HFK/2. The frontal bones, parietal bones and nasal cavities are the most likely locations for the observation of syphilitic lesions in the skull (Aufderheide and Rodriguez-Martin, 1998). No other syphilis-like lesions were noted.

HFK/2 had suffered from a treponemal infection, which could have been either non-venereal syphilis (yaws) or venereal syphilis. Worldwide, venereal syphilis is more prevalent than yaws - a disease observed in sub-tropical environments with poor hygiene - but on dry bone, the manifestations of these two diseases are similar (Aufderheide and Rodriguez-Martin, 1998).

Other types of non-venereal syphilis are pinta and bejel. These are primarily observed in South America and in the eastern Mediterranean/southwest Asia, respectively and can most likely be excluded in this case.

The remains were those of a South African Negroid female who had been between 25 and 35 years of age and approximately 151 cm tall. She may have suffered from a treponemal infection, as indicated by lesions found on the skull.

### 7.3. Subject identified as HKF/3

#### 7.3.1. Introduction

Preservation of the remains was fair. Portions of the cranial vault, maxilla, and mandible had been reconstructed but the facial bones had extensive postmortem damage. Postcranial bones included the left clavicle, scapulae, humeri, ulnae, radii, ribs, vertebrae, pelvis, the left tibia, hands and feet with varying degrees of preservation. No sacrum or fibulae were recovered.

#### 7.3.2. Age

Only the vertebral arches and the epiphyses of the head of the femur were fused. All other long bone epiphyses were unfused. Both permanent and deciduous dentition was observed in the maxilla and mandible. The permanent teeth had no dental wear. The lower right deciduous canine, upper right deciduous first molar, and lower right deciduous first molar were being extruded by incoming permanent teeth. Third molar tooth germs were noted in the mandible. From this evidence, it was suggested that the individual had been between 10 and 12 years of age.

Due to the young age of the individual, sex could not be determined.

#### 7.3.3. Teeth

All the permanent teeth were present, although not fully erupted, except for the upper and lower M3's. The lower right deciduous C, the upper right deciduous M1, and the lower left deciduous M1 were in the process of being shed. Dental wear was moderate on the deciduous teeth such that only slight dentin patches were observed. Little dental wear was observed on the permanent teeth. Enamel hypoplastic lesions were observed on the upper central incisors and the lower left and right canines. No dental caries were noted.

Stature could not be determined due to the young age of the individual.

No trauma or pathology was observed.

The remains were those of a child who had been between 10 and 12 years of age. Due to the young age of the individual, neither sex nor stature could be determined. No trauma or pathology was observed.

#### 1.1.3. Burial chamber HKF/4

This skeleton was well preserved, although considerable damage was present in the cranium of which only part of the skull cap and maxilla could be reconstructed. The mandible was virtually complete. All long bones were represented and all were complete except for the right radius, left ulna, right tibia and right fibula. Several vertebrae, ribs and hand and left foot bones were present. The os coxae were preserved but broken.

The bones were clearly those of an adult. All epiphyses were closed, and a full set of permanent teeth was present. Considerable wear was present on the teeth. The cranial sutures were open as far as could be seen, and the bones were in good condition with only slight arthritic changes starting to appear on some of the vertebrae. No sternal ends of ribs were present. These features indicate an adult of between 35 and 50 years of age.

The os coxae had wide sciatic notches and prominent and wide pre-auricular sulci. Both pubic bones were damaged. The orbital margins were sharp, but the glabella was fairly developed. The mandible was gracile with a pointed chin, and the mastoids were small. These features indicate a female.

Although no cranial measurements could be taken, the degree of prognathism and the shape of the nose indicated a person of South African Negroid origin. The mandibular and long bone measurements are shown in Tables 2 and 3 respectively. Antemortem stature was calculated with the use of the combined lengths of the femur and tibia, and is estimated to have been  $148 \pm 2.497$  cm.

#### Teeth

A full set of permanent dentition was present, and there were no signs of tooth decay or abscessing. The teeth were very worn, to a level where large dentine patches were visible especially on the first molars. This was more pronounced on the right side of the mouth. Small tartar deposits were present on some of the teeth. Enamel hypoplastic lesions were present on the lower first premolars and canines.

#### Vertebrae

Very early osteophytic lipping was present on some of the vertebral bodies and the left humeral head. No other signs of pathology could be observed.

#### Other bones

The remains were those of a 35 - 50 years old female of South African Negroid descent. She was about 148 cm tall. Except for early osteophytic lipping on the vertebrae and humerus, no signs of pathology could be found.

#### 1. Skelera remains HKF/5

##### Other bones

Preservation of the remains was poor. Only a few cranial fragments were recovered. Fragmented remains were identified from the left clavicle, right scapula, sternum, right humerus, right ulna, left ulna and radius, pelvis, sacrum, femora, and the tibia. No hand bones were found but a right talus, left calcaneus, left talus, one cuneiform and one phalanx was recovered. Forty-eight rib fragments were retrieved along with 14 vertebral bodies from the thoracic and lumbar vertebrae.

##### Age estimation

All the epiphyses were fused and the pubic symphysis was estimated to be between a phase 2 and a phase 3. No osteophytes were noted on the vertebral bodies. Due to the poor preservation of the remains, it was not possible to use other age estimation techniques. From this evidence, it was suggested that the individual had been a young adult between 20 and 30 years of age.

##### Sex estimation

Condition of the remains was so poor that an estimation of sex was tentative at best. The sciatic notch of the pelvis was wide and the inferior pubis ramus thin and gracile in appearance. Neither the humeral nor the femoral shafts were robust in appearance. The femoral head diameter was 42mm, which was neither small nor large. From these features, it was tentatively proposed that the individual had been female.



## 2.7 Skeletal remains HKF/7

### 2.7.1

The remains were of fair preservation. Of the skull only fragments were recovered, although the mandible was in tact. Pats of both clavicae, scapulae and os coxae were found as well as both patellae. Some of the vertebrae were recovered in tact, and several others were fragmentary. Several rib fragments were also recovered. The epiphyses of the long bones were unfused and all long bones were represented, although not all were complete. Most of the hand and foot bones were present. Many of the bones needed reconstruction.

### 2.7.2

The individual was clearly a juvenile, as could be seen from the unfused epiphyses. A mixed dentition was present. Of the deciduous teeth only the upper four molars, lower left first and second molar and lower right second molar were still present. The permanent incisors were fully erupted, but the second molars were still not in the tooth sockets. The canine roots that were visible were not completely formed. These features indicate an individual of about  $9 \pm 1$  years. The diaphyseal lengths of the long bones can be seen in Table 3.

No attempt was made to determine the sex.

### 2.7.3

As mentioned before, a mixed dentition occurred with deciduous molars still in the sockets and fully erupted incisors and first permanent molars present. The canines were erupted but not completely developed. No signs of caries or abscessing were observed. Enamel hypoplastic lines were present on the upper canines and lateral incisors and lower canines.

### 2.7.4 Pathology

Cribriform orbitalia could be observed in the orbit that was preserved. Although not extensive, the lesions were active. No other signs of disease could be observed.

### 2.7.5

The remains were those of a child of about  $9 \pm 1$  years old. Enamel hypoplastic lesions and cribriform orbitalia were present.



## 7.8 Skeletal remains HKF/8

### 7.8.1 Introduction

The skeleton was poorly preserved, and only a few cranial fragments, shafts of long bones, vertebral and rib fragments and hand- and foot bones were present. Two deciduous teeth and one germ of a permanent first molar were found.

### 7.8.2 Description

The skeleton was clearly that of a child, as could be seen from the small size of the remains. A fully developed deciduous canine (?upper) and upper right lateral incisor were present, as well as a partially developed lower first permanent first molar. This indicates an age of about  $3 \pm 1$  years.

### 7.8.3 Anthropological observations

Sex is very difficult to establish in a pre-adolescent child, as none of the secondary sex characteristics have started to develop. No attempt has been made to determine the sex of this individual. Similarly it was not possible to determine the population affinity, due to the young age and poor preservation.

### 7.8.4 Dental observations

The few teeth seem healthy, and there are no signs of caries or enamel hypoplasia. It was not possible to measure any of the long bones, and no signs of disease could be observed.

### 7.8.5 Conclusions

Only two deciduous teeth and one germ of a permanent first molar were found.

### 7.8.6 References

The remains belonged to a child of about  $3 \pm 1$  years. No signs of disease could be observed.

## 7.9 Skeletal remains HKF/9

### 7.9.1 Introduction

The skull had been severely damaged by the bulldozers, and a large amount of small pieces was present. The mandible, however, was in tact. All long bones except for the right humerus and femur were represented, although only the two radii were complete. Only a few cervical vertebrae were present, and the pelvis was completely absent. Some rib fragments, hand and foot bones were preserved.

## 8.7

In the mandible the full set of permanent teeth was present, but in the maxilla the third molars were not fully erupted. The epiphyses of the distal radius, medial clavicle, distal ulna, distal and proximal femur and proximal tibia were unfused, while that of the distal humerus, proximal radius and proximal ulna were fused. A clear epiphyseal line was present at the distal tibia. These features indicate an age of about 15 to 17 years.

## 8.8

Sex is very difficult to determine in a subadult individual, more so in this case because the pelvis is absent. The bones were delicate, which may very tentatively indicate a female, but no firm conclusion could be made. Diaphyseal long bone measurements are shown in Table 4, and mandibular measurements in Table 2.

## 8.9

The upper central and left upper lateral incisors had been lost post-mortem, but otherwise all the teeth were present. There were no signs of dental decay or abscessing. Slight wear facets were visible with small patches of dentine exposure on some of the canines and incisors.

## 8.10

No signs of disease or trauma could be observed.

## 8.11

The remains were those of an individual of about 15 - 17 years old, who was very tentatively diagnosed as female. No signs of disease were observed.

## 8. DATING

Samples of human bone from all nine individuals were submitted to the CSIR for radiocarbon dating.

Relative dating through comparison with other sites in the vicinity as well as indications of the age of the site from ethno historical sources indicates a date of around 1700 AD for the Hoekfontein site. Ceramics from the Moloko and Oori traditions found with the human remains and in other parts of the site support this conclusion.

## 9. SYNTHESIS OF RESULTS

The remains of nine individuals were recovered. Some other loose human bones, away from the formal graves, were also retrieved but these could not be positively associated with the graves. Of these nine individuals, 4 were adults and 5 juveniles.

The adults, with the exception of one, were all assessed to have been female, and they varied in age from 20 to 50 years. The juveniles were 3 years, 3 - 6 years, 9 years, 10 - 12 years and 15 - 17 years respectively.

The remains that could be studied indicated a South African Negroid population affinity. The two females were roughly 148 and 151 cm tall and the male 163 cm. Although rather short, these all fall within the quoted ranges for South African blacks (Tobias 1972).

The only specific disease that could be identified was in skeleton HKF/2, which showed signs, which could possibly be attributed to treponemal disease. Reports of the presence of this disease in the same vicinity also came from Mabyanamatswaana (Pistorius & Steyn 1995) and Maroelabult (Steyn et al. n.d.). This, however, is most probably the earliest date so far in this area for treponemal disease. Only one individual (skeleton HKF/7) showed signs of cribra orbitalia. Cribra orbitalia are usually indicative of anaemia, which may be the result of nutritional deficiencies but may also indicate the pathogen load an individual has to cope with (Stuart MacAdam 1987, 1992).

Three of the individuals, out of a total of 7 with teeth, showed signs of enamel hypoplasia. Enamel hypoplasia is usually associated with episodes of disease and malnutrition during childhood (Goodman & Rose 1990). This may indicate that hardship and disease were common in childhood in this particular population.

It is interesting to note that none of the individuals showed any signs of tooth decay or dental abscesses. Their diet was therefore probably not very high in the softer carbohydrates.

Predominantly two burial styles, with some variation, were recorded. Most of the individuals were either buried in a flexed sitting position or in a flexed foetal position on one of the sides. One individual (HKF/2) was found reclining on the back. It is unknown whether this posture was the result of the collapse of the body during decomposition or whether it was deliberate. If the former is true this individual could also be included in the flexed sitting position category. One other outstanding variation was the very deep grave of HKF/5 (lying on the side in the foetal position) when compared to the other excavated individuals. Although it was very difficult to accurately establish the depth of the burial pits due to the extensive disturbance of this part of the site, this grave was clearly deeper than the others. It also had the largest rock of all those recovered from the graves.

Among adults excavated only HKF/5 was buried in the foetal position lying on the side (that is if HKF/2 is included as flexed sitting burial position). Two of the excavated children or

juveniles were buried in the flexed sitting position, while three were buried in the flexed foetal position lying on the side. It therefore seems as if there is no relationship between burial position and age among the excavated individuals. Since the adult male as well as one of the adult females were buried in a flexed sitting position, no distinction in burial practise was indicated by the sex of the individual.

No clear distinction between adults and children or sexes could be made on account of the cultural materials associated with the remains. Only two adults had rocks in the bottom of the graves, while two adults and two children had flat rocks on top of the remains or in the top of the grave. Two adults, one adolescent and two children had ceramic pots or bowls above the remains in the grave. Two individuals, one child and one adult had graphite on the skull and ochre in the bottom of the grave – it might be significant that graphite and ochre only occurred together. The sex of the child associated with graphite and ochre could not be determined accurately, while the adult individual associated with these features was male. It is possible that this might be a sex specific burial practise. Two adults and one child had items of personal adornment associated with the remains. Ostrich eggshell beads were only found with one child and fragments of ostrich eggshell were found with the adult male. Only the adolescent female (HKF/9) had a metal hoe blade and fragments of *achatina* shell in the grave.

Only in the location of graves does a possible distinction emerge. It is most probable that the grave of the male individual was associated with stock enclosure deposits while the other graves were mostly associated with habitational remains. This can be correlated with the ethnographically known practise of men being buried in cattle kraals, while women and children are buried among the houses and *lapas* of the settlement.

Although no clear pattern of differences in burial practise and style could be discerned from the available evidence, apart from the location of graves correlating to sex in adults, it is possible that aspects such as social status, affinity to specialist groups or clans within the community or other factors that could not be recognised from the current limited investigation might account for the differences. At this stage differential dating for the graves is also not available. Secure dating might allude to the reasons for difference in burial practice.

## 10. CONCLUSION

The excavated remains were those of one male, a number of females and small children. Associated archaeological deposits and features and the location of the graves in the site point to a probable habitation area provenance.

This would correlate with the female and child representation since it is known that women and children are buried among the huts of the village. The site, and therefore the graves, have definite Sotho-Tswana origins and are tentatively dated to around 1700AD. Archaeologically the remains most probably belong to the Mabyanamatswaana group of sites. This site complex was an early site of Sotho-Tswana fission, especially for the different Kgatla groups that later formed separate tribes. The ceramics from the site support this interpretation. It can thus be said that the remains excavated were those of early Kgatla people which were probably the ancestors of, amongst others, the BaMakau people living in the area today.

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#### Literature Cited

- Acoks, J.P.H. 1952. Veld Types of South Africa (Third Edition, 1988). *Memoirs of the Botanical Survey of South Africa* No. 57.
- Aufderheide, A.C. & Rodriguez-Martin, C. 1998. *The Cambridge Encyclopedia of Human Paleopathology*. Cambridge: Cambridge University Press.
- Bergh, J.S. 1992. Die vestiging van die Voortrekkers noord van die Vaalrivier tot 1840. *Historia*, 37(2): 38-42.
- Breutz, P.L. 1953a. *The Tribes of Rustenburg and Pilanesberg Districts*. Pretoria Government Printer.
- Breutz, P.L. 1953b. *The Tribes of the Marico District*. Pretoria: Government Printer.
- Breutz, P.L. 1956. Stone kraal settlements in South Africa. *African Studies*, 15: 157-175.
- Breutz, P.L. 1986. *A history of the Botswana and origin of Bophuthatswana*. Margate: Thumbprint.
- Buikstra, J.E. & Ubelaker, D.H. 1994. Standards for data collection from human skeletal remains. *Arkansas Archaeological Survey Research Series* No. 44.
- Coertze, R.D. 1971. *Die familie-, of erf- en opvolgingsreg van die Bafokeng van Rustenburg*. Pretoria: SABRA.
- Coertze, R.D. 1990. *Bafokeng Family Law and Law of Succession*. Pretoria: SABRA.
- De Villiers, H. 1968. *The Skull of the South African Negro*. Johannesburg: Witwatersrand University Press.
- Evers, T.M. 1983. 'Oori' or 'Moloko'? The origins of the Sotho/Tswana on the evidence of the Iron Age of the Transvaal. *South African Journal of Science*. 79(7): 261-264.
- Ferembach, D., Schwidetzky, I. & Stloukal, M. 1980. Recommendations for age and sex diagnoses of skeletons. *Journal of Human Evolution*. 9:517-549.

- Goodman, AH & Rose, JC. 1990. Assessment of systemic physiological perturbations from dental enamel hypoplasias and associated histological structures. *Yearbook Phys Anthropol* 33:59-110.
- Horn, A.C. 1996. Okkupasie van die Bankeveld voor 1840 n.C.: 'n sintese. *Suid-Afrikaanse Tydskrif vir Etnologie*, 19(1): 17-27.
- Hester, T.R. et.al. 1975. *A Guide to Field Methods in Archaeology*. Palo Alto.
- Işcan, M.Y. & Steyn M. 1999. Craniometric assessment of population affinity in South African Blacks and Whites. *Int. J. Legal Med* 112(2):91-97.
- Joukowsky, M. 1980. *A Complete Manual of Field Archaeology*. Engelwood Cliffs.
- Kriel, J.D. 1976. *Die funksionering van die politieke en judisiële organisasie van die Tlôkwa van Qwaqwa*. M.A.-verhandeling. Pretoria: Universiteit van Pretoria.
- Krogman, W.M. & Iscan, M.Y. 1986. *The human skeleton in Forensic Medicine*. Springfield: Charles C. Thomas.
- Küsel, U. 2002. *Oskraal water supply project. Cultural heritage resources. Archaeological investigation of Hoekfontein 432JQ*. Unpublished report.
- Legassic, M. The Sotho-Tswana Peoples before 1800. In: Thompson, L. (ed.). 1978. *African Societies in Southern Africa*. pp. 86-125. London: Heinemann.
- Loth, S.R. & Henneberg, M. 1996. Mandibular ramus flexure: a new morphologic indicator of sexual dimorphism in the human skeleton. *American Journal of Physical Anthropology* 99:473-485.
- Lundy, J.K. & Feldesman, M.R. 1987. Revised equations for estimating living stature from the long bones of the South African Negro. *South African Journal of Science* 83:54-55.
- Mason, R.J. 1983. 'Oori' or 'Moloko'? The origins of the Sotho/Tswana on the evidence of the Iron Age of the Transvaal. *South African Journal of Science*. 79(7): 261.
- Mason, R.J. 1986. *Origins of black people of Johannesburg and the Southern Western Central Transvaal AD 350-1880*. Johannesburg: University of the Witwatersrand.

Morse, D. (ed.). 1978. *Handbook of Forensic Archaeology and Anthropology*. Tallahassee.

Nienaber, W.C. 1997. Exhumation and Reinterment of Burgher C.G. Naude. *South African Journal of Culture History*. 11(1):123-133.

Nienaber, W.C. 1999. *A Multidisciplinary Approach to Burials and Burial Practise During the South African War (1899-1902)*. Paper presented at the 4<sup>th</sup> World Archaeological Conference, Cape Town: University of Cape Town, 10-14 January 1999.

Nienaber, W.C. and Steyn, M. 1999. Exhumation and Analysis of the Remains of a Black Native Participant in the Anglo-Boer war (1899-1902), KwaZulu-Natal. *South African Journal of Culture History*. 13(2):94-110.

Oettlé, A.C. & Steyn, M. 2000. Age estimation from sternal ends of ribs by phase analysis in South African Blacks. *Journal of Forensic Sciences* 45(5):1071-1079.

Ortner, D.J. & Putschar, W.G.J. 1981. *Identification of pathological conditions in human skeletal remains*. Washington, D.C.: Smithsonian Institution Press.

Pistorius, J.C.C. 1992. *Molokwane an Iron Age Bakwena Village. Early Tswana Settlement in the Western Transvaal*. Published by Author.

Pistorius, J.C.C. 1995. Rathateng and Mabyanamatshwana: Cradle of the Kwena and Kgatla. *South African Journal of Ethnology* 18(2): 49-64.

Pistorius, J.C. & Steyn, M. 1995. Iron working and burial practices amongst the Kgatla-Kwena of the Mabyanamatshwaana complex. *Southern African Field Archaeology* 4(2): 68-77.

Pistorius, J.C.C. 1997. The Matebele village, which eluded history (Part 1). *South African Journal of Ethnology*, 20(1): 26-38.

Pistorius, J.C.C. 1998. EmHlahlandlela: Matebele village in the Bankeveld. *South African Journal of Ethnology*, 21(2): 86-96.

Scheuer, L. & Black, S. 2000. *Developmental juvenile osteology*. San Diego: Academic Press.



- Steinbock, R.T. 1976. *Paleopathological diagnosis and interpretation*. Illinois: Charles C. Thomas.
- Steyn, M. & Iscan M.Y. 1999. Osteometric variation in the humerus: sexual dimorphism in South Africans. *Forensic Science International* 1999 106(2):77-85
- Steyn, M., Nienaber, W.C. and Iscan, M.Y. 2000. Excavation and Retrieval of Forensic Remains. In: Siegel, J.A., Saukko, P.J. and Knupfer, G.C. (eds.). *Encyclopaedia of Forensic Sciences*. Sidcup: Academic Press : 235-242.
- Steyn, M., Nienaber, W.C., and Meiring, J.H. In print. An assessment of the health status and physical characteristics of an early 20<sup>th</sup> century community at Maroelabult in the North West Province, South Africa. *Homo*.
- Stow, G.W. 1905. *The Native Races of South Africa*. London: Sonnenschein.
- Stuart-Macadam, P. 1987. Porotic hyperostosis: new evidence to support the anemia theory. *American Journal of Physical Anthropology* 74:521-526.
- Stuart-Macadam, P. 1992. Porotic hyperostosis: a new perspective. *American Journal of Physical Anthropology* 87:39-47.
- Tobias, P.V. 1972. Growth and stature in Southern African populations. In Vorster, D.J.M. (ed.) *Human Biology of Environmental Change*. London: International Biological Programme, pp. 96-104.
- Van Schalkwyk, J.A., Pelsler, A.J., and Teichert, F. 2000. Archaeological investigation of a Late Iron Age Tswana settlement on the farm Hoekfontein 432 JQ, Odi 1 District North-West Province. *Research by the National Cultural History Museum* 9: 58-64.

**TABLE A**

Accession list of the finds reported from graves at Hoekfontein.

ACCESSION NUMBER	DATE	SITE	GRAVE	ARTIFACT	QUANTITY	DESCRIPTION
HKF/1.1	2002/05/30	Hoekfontein	1	Ceramic	1	One undecorated potsherd with a shallow outcurving lip. Dimensions: length - 143mm; breadth - 131mm; average thickness of lip - 5mm; average thickness of body - 12mm
HKF/1.2	2002/05/30	Hoekfontein	1	Graphite		Graphite sample
HKF/1.3	2002/05/30	Hoekfontein	1	Ostrich eggshell	3	Three ostrich eggshell fragments with holes bored, two pieces form one fragment. Dimensions: 24mm x 17mm, holes spaced at 5mm; diameter of holes - 2mm; 27mm x 28mm, holes spaced at 6mm; diameter of holes 2mm; average thickness - 1mm
HKF/1.4	2002/05/30	Hoekfontein	1	Metal	2	Two metal (iron) fragment
HKF/2.1	2002/05/30	Hoekfontein	2	Ceramic	7	Seven undecorated potsherds forming a near complete bowl. Dimensions: mouth - 250mm; height - 93mm; depth - 85mm; average thickness 16mm
HKF/2.2	2002/05/30	Hoekfontein	2	Metal	1	One metal ring-like object (possibly copper). Dimensions: 15mm x 16mm; thickness - 3mm
HKF/3.1	2002/05/30	Hoekfontein	3	Ceramic	1	One undecorated potsherd. Dimensions: length - 33mm; width - 27mm; average thickness - 8mm
HKF/3.2	2002/05/30	Hoekfontein	3	Ceramic	1	One undecorated potsherd. Dimensions: length - 26mm; width - 21mm; average thickness - 9mm
HKF/3.3	2002/05/30	Hoekfontein	3	Ceramic	1	One undecorated potsherd. Dimensions: length - 38mm; width - 32mm; average thickness - 11mm
HKF/3.4	2002/05/30	Hoekfontein	3	Ceramic	1	One undecorated potsherd. Dimensions: length - 55mm; width - 45mm; average thickness - 9mm
HKF/3.5	2002/05/30	Hoekfontein	3	Ceramic	1	One undecorated potsherd. Dimensions: length - 54mm; width - 45mm; average thickness - 10mm

ACCESSION NUMBER	DATE	SITE	GRAVE	ARTIFACT	QUANTITY	DESCRIPTION
HKF/3.6	2002/05/30	Hoekfontein	3	Ceramic	1	One undecorated lipped potsherd. Dimensions: length - 53mm; width - 46mm; average thickness of lip - 6mm; average thickness of body - 8mm
HKF/3.7	2002/05/30	Hoekfontein	3	Ceramic	3	Three undecorated potsherds forming one large sherd. Dimensions: length - 235mm; breadth - 195mm; average thickness - 15mm
HKF/3.8	2002/05/30	Hoekfontein	3	Ceramic	6	Six undecorated (three lip fragments) forming partial pot. Dimensions: length - 185mm; breadth - 210mm; average thickness of lip - 5mm; average thickness of body - 11mm
HKF/5.1	2002/05/30	Hoekfontein	5	Metal	1	One metal (iron) fragment
HKF/7.1	2002/05/31	Hoekfontein	7	Ceramic	1	One undecorated potsherd. Dimensions: length - 39mm; width - 31mm; average thickness - 8mm
HKF/7.2	2002/05/31	Hoekfontein	7	Ostrich eggshell beads	329	329 whole OEB with red ochre stains. Dimensions: average diameter - 4mm - 5mm; average thickness - 0.5mm
HKF/7.3	2002/05/31	Hoekfontein	7	Ostrich eggshell beads	28	28 OEB fragments with red ochre stains
HKF/7.4	2002/05/31	Hoekfontein	7	Metal	2	Two metal (iron) sample fragments. Dimensions: length - 70mm, average thickness - 7mm; length - 142mm, average thickness - 5mm
HKF/9.1	2002/05/31	Hoekfontein	9	Ceramic	5	Five undecorated (four lip fragments) forming half a pot. Dimensions: mouth - 75mm; height - 97; width - 116; average thickness of lip - 5mm; average thickness of body - 5mm
HKF/9.2	2002/05/31	Hoekfontein	9	Ceramic	3	Three undecorated lipped fragments forming near complete pot. Dimensions: mouth - 64mm; height - 80mm; depth - 70mm; average thickness - 2mm
HKF/9.3	2002/05/31	Hoekfontein	9	Ceramic	3	Three undecorated (one lip fragment) forming partial pot. Dimensions: width - 131mm; height - 96mm; depth - 87mm; average thickness - 6mm

ACCESSION NUMBER	DATE	SITE	GRAVE	ARTIFACT	QUANTITY	DESCRIPTION
HKF/9.2	2002/05/31	Hoekfontein	9	Ceramic	3	Three undecorated lip-aid fragments forming near complete pot. Dimensions: mouth - 64mm; height - 80mm; depth - 70mm; average thickness - 3mm
HKF/9.3	2002/05/31	Hoekfontein	9	Ceramic	3	Three undecorated (one lip fragment) forming partial pot. Dimensions: width - 131mm; height - 96mm; depth - 87mm; average thickness - 6mm
HKF/9.4	2002/05/31	Hoekfontein	9	Ceramic	1	One decorated potsherd. Dimensions: length - 21mm; width - 18mm; average thickness - 6mm
HKF/9.5	2002/05/31	Hoekfontein	9	Metal	1	One metal (iron) fragment, possible adze or blade. Dimensions: length - 110mm; minimum and maximum width - 4mm & 21mm; average thickness - 5mm
HKF/9.6	2002/05/31	Hoekfontein		Metal	1	One metal fragment with hole. Dimensions: length - 29mm; width - 12mm; diameter of hole - 3mm; average thickness - 3mm

**TABLE B**

Cranial and Mandibular measurements of individuals from Hohefontein (Sulikstra &amp; Upreti 1997)

CRANIAL DIMENSION	HKF/1	HKF/2	HKF/3	HKF/4	HKF/9
Max. cranial length	±197.0	190.0			
Max. cranial breadth		135.0			
Maxillo-alveolar breadth	62.0				
Minimum frontal breadth	105.0	97.0			
Upper facial breadth	±111.0				
Nasal breadth	27.0			28.0	
Frontal chord	118.0				
Parietal chord	132.0				
Occipital chord		105.0			
Mastoid length		25.0	11.0		
Chin height	35.0	30.0	24.0		31.0
Height of mandibular body	28.0	32.0	24.0	31.4	29.5
Breadth mandibular body	14.0	15.0	11.0	12.3	15.0
Bigonial width	± 94.0			90.6	91.9
Bicondylar breadth	122.0	113.0			
Min. ramus breadth	41.0	37.0	29.0	39.0	39.5
Max. ramus breadth	48.0	44.0	35.0	46.3	44.0
Max. ramus height	63.0	60.0			
Mandibular length	83.0	75.0			
Mandibular angle	116	124			

**TABLE C**

Long bone measurements of adults from Hoakfontein (Bakstra & Lindeaker 1994)

\* indicates Right Side

DIMENSION	HKF/1	HKF/2	HKF/4	HKF/5
<b>Clavicle</b>				
Maximum length	131.0*	125.0		
Diameter: antero-posterior	13.0*	11.0		12.0
Diameter: supero-inferior	11.0*	10.0		7.0
<b>Humerus</b>				
Max. length	337.0*	289.0*	295.5	308.0*
Epicondylar breadth	61.0*	54.0*	54.5	58.0*
Vertical diameter of head	49.0*	35.0*	36.0	41.0*
Max. diameter at midshaft	21.0*	21.0*	20.0	21.0*
Min. diameter at midshaft	17.0*	15.0*	15.5	14.0*
<b>Radius</b>				
Max. length	254.0*	235.0	234.0	
Diameter: antero-posterior	12.0*	11.0	11.0	
Diameter: medio-lateral	15.0*	15.0	13.0	
<b>Ulna</b>				
Maximum length	273.0	249.0	256.0*	
Diameter: antero-posterior	16.0	14.0	11.0*	12.0*
Diameter: medio-lateral	15.0	13.0	15.0*	13.0
Physiological length	271.0	225.0	233.0*	
Min. circumference	38.0	34.0	29.0*	27.0
<b>Sacrum</b>				
Anterior length		95.0		
<b>Os coxa</b>				
height		175.0*	186.0	
Iliac breadth			131.0	95.0
Pubis length	79.0*	126.0*		
Ischium length		72.0*		
<b>Femur</b>				
Max. length	470.0		397.0	
Bicondylar length			395.0	
Max. diameter of head	45.0	37.0	39.5	42.0*
Ant-post subtrochanteric diam.	26.0	23.0	23.0	24.0
Med-lat. subtrochanteric diam.	33.0	29.0	28.0	32.0
Ant-post midshaft diameter	29.0	25.0	27.0	27.0
Med-lat midshaft diameter	27.0	25.0	22.0	24.0
Midshaft circumference	87.0	80.0	80.5	82.0
<b>Tibia</b>				
length		354.0*	338.0	
Max. proximal epiph. breadth	80.0	65.0*	63.5	
Max. dist epiph. breadth		41.0*	43.0	
Max. diameter nutrient for.	38.0	33.0*	30.5	
Med-lat. diameter nutrient for.	26.0	24.0*	19.5	
Circumference nutrient for.	98.0	88.0*	80.0	
<b>Fibula</b>				
Max. length			333.5	
Max. diameter midshaft	14.0	13.0	13.5	
<b>Calcaneus</b>				
Max. length	80.0	67.0	70.5	77.0
Middle breadth	40.0	36.0	39.0	35.0

**TABLE D**

Long bone measurements of juveniles from Hoekfontein. All long bone lengths were measured without epiphyses

\* Measured on the right side # proximal epiphysis attached, distal not

DIMENSION	HKF/3	HKF/7	HKF/9
<b>Clavicle</b>			
Length	101.0	97.0	
Diameter ant-post	5.0	7.0	
Diameter sup-inf	7.0	5.0	
<b>Humerus</b>			
Length	219.0	206.0	
Epicondylar breadth	40.0	35.0	
Diameter midshaft max	9.0	14.0	18.0
Diameter midshaft min	6.0	11.0	14.0
<b>Radius</b>			
Length	171.5*	157.0	235.0#
Diameter ant-post	8.0*	8.0	11.5
Diameter med-lat	11.0*	10.0	14.0
<b>Ulna</b>			
Length	188.5*		251.0#
Diameter ant-post	10.0*	9.0	11.0
Diameter med-lat	9.0*	8.0	15.0
Minimum circumference	27.0		38.0
<b>Os coxae</b>			
Iliac breadth	95.0	94.0*	
<b>Femur</b>			
Length		295.0	
Epicondylar breadth		51.0	
Ant-post subtrochanteric		17.0	
Med-lat subtrochanteric		23.0	
Diameter midshaft ant-post	17.0	18.0	24.0
Diameter midshaft med-lat	17.0	18.0	23.5
Circumference	55.0	55.0	75.0
<b>Tibia</b>			
Length		252.0*	
Prox epiphyseal breadth		43.0*	
Dist epiphyseal breadth		26.0*	
Diameter nutrient foramen max	21.0	23.0*	
Diam. nutrient for med-lat		16.0*	
Circumf. nutrient foramen	16.0	64.0*	
<b>Fibula</b>			
Length		244.0*	
Diameter midshaft max		9.0*	
<b>Calcaneus</b>			
Max length	86.0		71.0
Middle breadth	30.0		39.5

## ANNEXURE C



**Rescue excavations at the Late Iron Age site of Hoekfontein in the North West Province, South Africa: faunal analysis**

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**Introduction**

The archaeological site discussed in this report is situated on the farm Hoekfontein 432 JQ at the northwestern part of the Swartkoppies mountain range near Makau in the North West Province, South Africa. The rescue excavation was part of the ongoing Oskraal Water Supply Project conducted by Dr. Udo Küsel from the African Heritage Consultants. The site is situated on a foothill, and other Late Iron Age sites have been identified from this area. Apart from stonewalling, other finds from this excavation and survey include nine human skeletons, clay floors, bone remains, dagga pipes, Uitkomst and Moloko pottery (associated with Tswana settlements), grinding stones, granary sites, stone hammers, whetstones and iron slag. The site is approximately three kilometers in length and two kilometers wide, and dates to between 1650 and 1800 AD. The excavator awaits radiocarbon dating (personal communication, U. Küsel, 28 July 2002).

The faunal remains were retrieved from a single component 1 x 2 meter block excavation in an ash midden. The ash midden itself is about 6 meters in length and up to 1,5 meters deep. The midden was sampled in the northern end of the ash midden and excavated in 10 centimeters thick arbitrary spits. The excavator recognized 11 different layers (personal communication, U. Küsel, 19 August 2002).

More information about the excavation can be obtained from the excavator, and this report will focus on the fauna remains only.

### **The faunal sample: materials and methods**

The fauna sample was identified at the Transvaal Museum in Pretoria according to accepted procedures. The species list follow the classification presented by Meester et. al. (1986). Complete or semi-complete bones were measured with a caliper according to standard measuring points described by Peters (1986) and Von den Driesch (1976). However, the bone measurements are not listed or discussed here as this will form part of a larger project of animal sizes. Age classes used for cattle and sheep/goat are those suggested by Voigt (1983:47-48, 53). Since the excavator regarded the excavation as a single component, all 11 layers were combined for this report after each layer was analysed separately.

Number of Identified Specimens (NISP), Quantifiable Skeletal Parts (QSP) and Minimum Number of Individuals (MNI) were used to quantify the material. These methods have been defined and described by various authors with their limitations, advantages and disadvantages (e.g. those described by Grayson 1984, Klein & Cruz-Uribe 1984, Plug 1988).

### **Results**

#### **Sample size and species present**

The rescue excavation yielded a total of 1107 bone and shell fragments, of which 230 or 20,8% was identified to species or size class level. Each layer was analysed separately and combined for this report. Unidentified bone fragments was counted and weight for Table 1.

Species identified from the sample is listed in Table 2. The variety of animals identified is limited, and cattle remains dominate the sample. Sheep, goat, mongoose, shrub hare, freshwater mussel and a medium-sized carnivore were also identified.

Faunal remains have been identified from a site also on the farm Hoekfontein. Species identified from this sample includes rodent, cattle, sheep/goat, sheep, dassie, kudu, freshwater mussel, dog, medium-sized bird and bovid size class I and III (undetermined and non-domestic). (The species list in Van Schalkwyk, Pelser & Teichert 2000).

### Taphonomy

A total of 55 bone fragments or 5% of the total faunal sample was burnt. The various colours range from light brown, dark brown, black to gray-white, gray and white. These colour variations indicate the time and temperature of exposure.

Chop marks were visible on 37 specimens, cut marks on 27 specimens, carnivore chew marks on 20 specimens, and rodent gnaw marks on three.

A total of 22 bone and shell fragments was polished/modified and are listed and described in Table 3. Most of the modified bone remains are rib fragments, followed by bone flakes. These fragments were mostly polished convex at one end.

### Pathology

The five pathological specimens were all teeth from matured to aged cattle. All cases consist of excreted cementum at the roots.

The exact origin and cause of palaeopathology is not always easy to determine. According to Cappell & Anderson (1971:479), although referring to human pathology, the term odontoma is applied in a general way to any tumor-like mass developing in connection with the teeth. Odontomata presents considerable varieties of structure. And, when an odontoma consists of various structures containing enamel and cement irregularly admixed and sometimes forming a hard irregular mass, the term "composite odontoma" is applied. This is similar to the cattle teeth palaeopathology found from the Hoekfontein sample. However, Baker & Brothwell (1980:150-151) regarded camelid teeth from Ecuador with similar deformity as the result of a chronic low-grade infection rather than a tumor deformity (odontoma). According to Miles & Grigson (1990:596),

“radicular odontomes” (*Odontomes radiculaires*) formed of cementum only and attached to roots may be called “cementomas.” This condition cementomas in animals other than the horse are rare.

#### Age classification and bovid skeletal part representation and sexing

Cattle and sheep/goat age classes based on tooth wear and eruption stages are listed in Table 4. An analysis of cattle post-cranial remains indicates that 26 fragments are from young animals (juvenile and sub-adults) (or 24,3%), and 81 fragments are from adult animals (or 75,7%).

Bovid skeletal part representation was calculated and listed in Table 5. With semi-complete elements such as distal humerus and shaft, the shaft and distal articulation were counted as separate entities, but combined for this report. Bovid size class III dominates the sample (87,4%).

A cattle pelvic acetabulum/pubis is that of a male.

#### Discussion and conclusions

The site is a Tswana settlement dating from probably the time before the advent of the Difaqane, the period of unrest during the Late Iron Age. This report provides some insights into their way of life and economy. According to Schapera (1984:22), in pre-European times the Tswana kept cattle, goats, sheep, fowls and dogs.

The faunal remains from many Late Iron Age sites are dominated by domestic animals, with cattle being the largest contributor (e.g. Badenhorst & Plug 2001, Badenhorst & Plug in press, Plug & Badenhorst in press). This is also the case with Hoekfontein. Ethnographers noted that cattle were of economical, social and ritual importance amongst Bantu-speaking peoples (e.g. Bruwer, 1956, Krige 1957, Mönnig 1967, Schapera 1953, Schapera 1984).

However, sometimes the presence of tsetse fly (causing nagana which is fatal in cattle), prohibited the herding of these large domesticates. Tsetse fly has been recorded from the vicinity of the site in the 1800's (Fuller 1923). However, when the site was occupied tsetse was apparently absent.

From the sample it seems as if herding took predominance over hunting and gathering. On the other hand, this pattern might be a result of the sample size and location of the excavations. It is important to note that amongst post-Difaqane (terminal Late Iron Age) Bantu-speaking peoples, meat was not part of the daily diet (Bruwer, 1956). It is very possible that this could also be the case with the Late Iron Age people.

It seems fit to conclude that the bovidae, hare and freshwater mussel contributed to the diet of the inhabitants of the site. The mongoose and medium carnivore remains could have been eaten, although it cannot be ruled out that these animals had some ritual importance.

The scrub hare identified from the sample still occurs in the vicinity of the site today (Smithers 1983:166-167), and has been identified from other archaeological sites on the subcontinent (Plug & Badenhorst 2001:222-223).

The burnt bone fragments from the sample displayed various colour variation. These variations are related to the proximity of the heat source in relation to the bone remains, the time of exposure and the presence, absence or amount of flesh on the bone. However, since the time frame that these bone remains were exposed to coals, heat or direct flames is unknown as well as the proximity of the heat source, no interpretation can be made thereof, since a low heat temperature over a prolonged time period can produce a white colour of bone similar to a very hot heat source in a shorter period (Buikstra & Swegle 1989, Marshall 1989, Shipman 1989).

The cut and chop marks on the bone are related to slaughtering practices. Rodent gnaw marks could be of rodents entering the deposit after the site has been abandoned. Iron

Age people kept dogs (Plug & Voigt 1985), and the carnivore gnaw marks were probably made by these dogs.

The polished freshwater mussel fragment may have been used to smooth clay objects, since both the rim and outer shell surface is smoothed. This has been noted, for example, from Steinaecker's Horse, the northernmost British military outpost in the Kruger National Park during the South African (or Anglo-Boer) War (Badenhorst et. al. 2002).

The bovid skeletal part representation does not suggest any unusual trends. Most of the remains are from bovid size class III animals. It is not known what influence the location of the excavations and size of the sample has, in this particular case, on the skeletal representation.

The age classes provide very little interpretable information. As Pistorius & Plug (2001) note, the age classes are not equal in the time period they represent in the development of the animal and are therefore not directly comparable. However, it seems as if there was an emphasis on older animals, but this can also be related to sample size and preservation.

In terms of herd health, it could be said that unless oral pathology affects economical factors such as weight loss, it was hardly of any significance to their owners. Early farmers were far less likely to appreciate the significance of good oral health. Moreover, oral diseases may have been allowed to proceed to a stage not encountered today (Baker & Brothwell 1980:135).

The modified bone fragments from the sample are similar to those classified by Voigt (1983:109) as "non-formal bone tools." Although the differentiation on the tools itself cannot as yet be readily made, it is generally thought that such bone tools were either used in the hide production process to scrape leather, (and) or extracting marula pits from the fruit. The latter practice have been described by Moifatswane (1990) and noted, for

example, from a Late Iron Age site, Bôitsemagano in the Rustenburg district (North West Province) by Badenhorst & Plug (in prep.).

### Acknowledgements

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### References

Badenhorst, S. & Plug, I. 2001. Appendix: the faunal remains from Mmatshetshela, a Late Iron Age site in the Rustenburg district. In: Pistorius, J. C. C. Late Iron Age sites on Mmatshetshela Mountain in the central Bankeveld of the North West Province, South Africa. *South African Archaeological Bulletin* 56(173&174):55-56

Badenhorst, S., Plug, I., Pelsler, A. J. & Van Vollenhoven, A. C. 2002. Faunal analysis from Steinaecker's Horse, the northernmost British military outpost in the Kruger National Park during the South African War. *Annals of the Transvaal Museum* 39:57-63

Badenhorst, S. & Plug, I. in press. Animal remains from recent excavations at a Late Iron Age site, Simunye, Swaziland. *Natal Museum Journal of Humanities*

Badenhorst, S. & Plug, I. in prep. An archaeofaunal investigation of a Late Iron Age site, Bôitsemagano from the North West Province, South Africa. Pretoria: Transvaal Museum

Baker, J. & Brothwell, D. 1980. *Animal diseases in archaeology*. London: Academic Press

Bruwer, J. 1956. *Die Bantoe van Suid-Afrika*. Johannesburg: Afrikaanse Pers-Boekhandel

Buikstra, J. E. & Swegle, M. 1989. Bone modification due to burning: experimental evidence. In: Bonnicksen, R. & Sorg, M. H. (eds.) *Bone modification*. Peopling of the

Americas Publication. Center for the study of the first Americans, Institute for Quaternary studies. Maine: University of Maine. Pp. 247-258

Cappell, D. F. & Anderson, J. R. (revised by) 1971. *Muir's textbook of pathology*. Ninth edition. London: Edward Arnold

Fuller, C. 1923. Tsetse in the Transvaal and surrounding territories. An historical review. *Entomology Memoirs no. 5*. Department of Agriculture, Union of South Africa. Pretoria: The Government printing and Stationary Office

Grayson, D. K. 1984. *Quantitative zooarchaeology. Topics in the analysis of archaeological faunas*. Studies in archaeological science. London: Academic Press

Klein, R. G. & Cruz-Urbe, K. 1984. *The analysis of animal bones from archaeological sites*. Prehistoric archaeology and Ecology series. Chicago: The University of Chicago Press

Krige, E. J. 1957. *The social system of the Zulus*. Pietermaritzburg: Shuter & Shooter

Marshall, L. G. 1989. Bone modification and "The Laws of Burial". In: Bonnicksen, R. & Sorg, M. H. (eds.) *Bone modification*. Peopling of the Americas Publication. Center for the study of the first Americans, Institute for Quaternary studies. Maine: University of Maine. Pp. 7-24

Meester, J. A. J., Rautenbach, I. L., Dippenaar, N. J. & Baker, C. M. 1986. *Classification of southern African mammals*. Transvaal Museum Monograph no. 5. Pretoria: Transvaal Museum

Miles, A. E. W. & Grigson, C. (revised by) 1990. *Colyer's variations and diseases of the teeth of animals*. Cambridge: Cambridge University Press



Moifatswane, S. 1990. Die gebruik van Marula in Noord-Transvaal deur die Sotho. *Museum Memo* 18(3):31-36

Mönnig, H. O. 1967. *The Pedi*. Pretoria: J. L. van Schaik Limited

Peters, J. 1986. *Bijdrage tot de archeozoölogie van Soedan en Egypte*. Unpublished Ph.D. thesis. Gent: Rijksuniversiteit Gent

Pistorius, J. C. C. & Plug, I. 2001. The faunal remains from Molokwane, capital of the Bakwena ba Modimosana, Northwest Province, South Africa. *South African Journal of Ethnology* 24(1):25-39

Plug, I. 1988. *Hunters and herders: an archaeozoology study of some prehistoric communities in the Kruger National Park*. Unpublished D.Phil. thesis. Pretoria: University of Pretoria

Plug, I. & Badenhorst, S. 2001. *The distribution of macromammals in southern Africa over the past 30 000 years as reflected in animal remains from archaeological sites*. Transvaal Museum Monograph no. 12. Pretoria: Transvaal Museum

Plug, I. & Badenhorst, S. in press. The dwarf cattle and unusually small sheep/goat from Muozi, Zimbabwe. In: Soper, R. *Title undecided*. Zimbabwe University Monograph

Plug, I. & Voigt, E. A. 1985. Archaeozoological studies of Iron Age communities in southern Africa. *Advances in World Archaeology* 4:189-238

Schapera, I. (ed.) 1953. *The Bantu-speaking tribes of South Africa. An ethnographical survey*. London: Routledge & Kegan Paul Ltd

Schapera, I. 1984. *The Tswana*. London: Routledge & Kegan Paul Ltd

Shipman, P. 1989. Altered bones from Olduvai Gorge, Tanzania: techniques, problems, and implications for their recognition. In: Bonnichsen, R. & Sorg, M. H. (eds.) *Bone modification*. Peopling of the Americas Publication. Center for the study of the first Americans, Institute for Quaternary studies. Maine: University of Maine. Pp. 317-334

Smithers, R. H. N. 1983. *The mammals of the southern African subregion*. Pretoria: University of Pretoria

Van Schalkwyk, J. A., Pelsler, A. J. & Teichert, F. 2000. Archaeological investigation of a Late Iron Age Tswana settlement on the farm Hoekfontein 432JQ, ODI 1 district, North West Province. *Research by the National Cultural History Museum* 9:58-64

Voigt, E. A. 1983. *Mapungubwe: an archaeozoological interpretation of an Iron Age community*. Transvaal Museum Monograph no. 1. Pretoria: Transvaal Museum

Von den Driesch, E. 1976. *A guide to the measurement of animal bones from archaeological sites*. Peabody Museum Bulletin no. 1. Peabody Museum of Archaeology and Ethnology. Harvard University

Table 1: Hoekfontein total faunal sample

<b>Bone</b>	<b>Total</b>
Identifiable bone (NISP)	230
Unidentifiable bone:	877
Enamel	3
Skull	55
Vertebrate	34
Rib	144
Miscellaneous	435
Bone flakes	188
Polished	18
<b>Total unidentifiable bone</b>	<b>877</b>
<b>Total sample</b>	<b>1107</b>
Mass identifiable bone (g)	4119,3
Mass unidentifiable bone (g)	2660,5
<b>Total mass (g)</b>	<b>6779,8</b>

Table 2: Hoekfontein species list per NISP, QSP, MNI and mass (g)

Species	NISP	QSP	MNI	Mass (g)
Viverridae mongoose	5	6	1	3,8
Carnivora medium	1	-	1	5,3
<i>Bos Taurus</i> cattle	188	103	7	3966,6
<i>Ovis aries</i> sheep	2	1	2	20,4
<i>Capra hircus</i> goat	1	1	1	3,1
<i>Ovis/Capra</i> sheep/goat	21	19	-	80,7
Bovid I	2	-	1	12,5
Bovid II	1	-	-	2,4
Bovid III	5	-	-	22,0
<i>Lepus saxatilis</i> shrub hare	3	2	1	1,5
<i>Unionidae</i> freshwater mussel	1	-	1	1,0
<b>Total</b>	<b>230</b>	<b>132</b>	<b>15</b>	<b>4119,3</b>

Table 3: Hoekfontien modified bone and shell

Layer	Length (mm)	Description
Layer 1	46	Rib fragment: one end polished convex
Layer 1	131	Rib fragment: one end polished into a point
Layer 2	65	Bone flake: one end polished into a point
Layer 3	49	Bone flake: both ends polished
Layer 3	43	Rib fragment: one end polished
Layer 3	101	Rib fragment: one end polished convex
Layer 4	85	Rib fragment: one end polished convex
Layer 4	103	Rib fragment: one end polished convex
Layer 4	82	Bone flake: both ends polished convex
Layer 4	77	Cattle metacarpal fragment: one end polished convex
Layer 4	125	Cattle femur fragment: one end polished convex
Layer 4	117	Cattle metatarsal fragment: both ends polished convex
Layer 6	80	Bone flake: both ends polished convex
Layer 6	32	Rib fragment: one end polished convex
Layer 6	53	Rib fragment: one end polished
Layer 7	35	Rib fragment: one end polished
Layer 7	33	Bone flake: one end polished convex
Layer 7	155	Rib fragment: both sides polished
Layer 7	23	Freshwater mussel fragment: surface and rim polished
Layer 8	29	Rib fragment: one end polished
Layer 9	38	Bone flake: on end polished convex
Layer 9	158	Rib fragment: both ends, sides and surface polished

Table 4: Hoekfontein age classes for cattle and sheep/goat per NISP (NA = Not Applicable)

Age class	Cattle	Sheep/goat
I	-	-
II	2	-
III	3	2
IV	-	-
V	-	7
VI	1	-
VII	-	NA
VIII	17	NA
IX	3	NA

Table 5: Hoekfontien bovid skeletal part representation

Skeletal part	Bovid I	Bovid II	Bovid III	Total
Horncore	-	-	9	9
Skull & mandibles	-	5	30	35
Teeth	-	9	32	41
Scapula	-	-	3	3
Humerus	-	1	9	10
Radius	1	5	16	22
Ulna	-	1	4	5
Pelvis	-	2	9	11
Femur	1	-	11	12
Tibia	-	-	9	9
Metacarpal	-	-	22	22
Metatarsal	-	-	12	12
Metapodial	-	1	-	1
Os carpi	-	-	6	6
Os tarsi	-	1	8	9
Os malleolare	-	-	1	1
Sesamoid	-	-	2	2
Phalanx 1	-	1	5	6
Phalanx 2	-	-	2	2
<b>Total</b>	<b>2</b>	<b>26</b>	<b>195</b>	<b>223</b>
<b>%</b>	<b>0,9</b>	<b>11,7</b>	<b>87,4</b>	

**ANNEXURE D**



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### REPORT ON RADIOCARBON ANALYSIS

Charcoal from LIA site Hockfontein 432 JQ (25°35.757'S, 27°54.277'E) Makau Ga-Rankuwa.  
 Samples collected and submitted 2002 by U. Küsel, African Heritage Consultants.

Anal. <sup>1</sup> No. Pta-	Sample <sup>2</sup> designation	$\delta^{13}\text{C}$ (‰PDB)	Radiocarbon <sup>3</sup> age, yrs BP	Calibrated <sup>4</sup> date
8784	HKF T.Pit I La 3	-22.8	110 ± 45	Most probable cal date AD 1900
8785	HKF T.Pit I La 9	-24.3	430 ± 50	AD 1443(1469)1516; 1590-1622
8800	HKF T.Pit II La 11	-22.3	460 ± 50	AD 1433(1451)1487
8802	HKF T.Pit II La 6	-25.7	290 ± 40	AD 1640(1652)1664

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### REPORT ON RADIOCARBON ANALYSIS

Collagen from human skeletons from Hoekfontein (25°35.757S, 27°54.277'E) near Brits. Sample collected and submitted 1999 by W. C. Nienaber, University of Pretoria.

Anal. <sup>1</sup> No. Pta-	Sample <sup>2</sup> designation	$\delta^{13}\text{C}$ (‰ PDB)	Radiocarbon <sup>3</sup> age yrs BP	Calibrated date <sup>4</sup>
8852	Hoekfontein HKF 3	-7.4	90 ± 40	Most probable cal date AD 1900
8857	Hoekfontein HKF 4	-7.1	140 ± 50	AD 1681(1712)1738;1806(1883,1923)1948
8856	Hoekfontein HKF 5	-6.8	120 ± 50	most probable cal date AD 1900
8855	Hoekfontein HKF 6	-6.5	90 ± 50	most probable cal date AD 1900
8858	Hoekfontein HKF 7	-6.8	240 ± 50	AD 1652(1667)1681;1738-1806
8864	Hoekfontein HKF 9	-7.1	390 ± 50	AD 1462(1509,1598,1616)1637

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c:/Nienaber. March 03

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### REPORT ON RADIOCARBON ANALYSIS

Collagen from human skeletons from Hoekfontein (25°35.757S, 27°54.277'E) near Brita. Sample collected and submitted 2002 by W. C. Nienaber, University of Pretoria.

Anal. <sup>1</sup> No. Pta-	Sample <sup>2</sup> designation	$\delta^{13}\text{C}$ (‰ PDB)	Radiocarbon <sup>3</sup> age yrs BP	Calibrated date <sup>4</sup>
8870	Hoekfontein HKF 1	-6.8	40 ± 50	most probable cal date AD 1900
8866	Hoekfontein HKF 2	-7.8	40 ± 45	most probable cal date AD 1900
8861	Hoekfontein HKF 8	-6.4	50 ± 70	most probable cal date AD 1900

S WOODBORNE

/pto.....

c:/Nienaber, April 03

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