Report on rescue excavations and physical anthropological analyses of human skeletal remains inadvertently uncovered in Temba, Hammanskraal

CAS 826/11/2015

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1. Introduction

On the 26/11/2015 Lt M. Motaung (cell:071 224 1232) from the Victim Identification Centre (VIC) of the South African Police Services (SAPS) contacted the Forensic Anthropological Research Centre (FARC) about a case of inadvertently discovered human remains that seemed to be of archaeological age. The remains were accidentally uncovered during pipe-lying activities in Temba, Hammanskraal (GPS S25° 20' 25.6"; E 028° 17' 50.8") on the 25th of November 2015. The Temba SAPS were notified and Communications Officer Modisa (079 694 6956) attended to the case. An inquest (CAS 826/11/2015) was opened. Some of the remains were partially uncovered (Fig. 1). These remains were placed in a Keepsafe bag (PAD 001641837) and placed back into the trench before everything was covered by soil and cordoned off. On 26/11/2015 Ms A Meyer notified Ms I Masiteng from the South African Heritage Resources Agency, Burial Grounds and Graves (SAHRA BGG, contact number: 0731939646) about the discovery. On 26/11/2015 Ms I Masiteng granted written permission to Ms A Meyer to recover the remains by means of rescue excavations with SAPS VIC should an archaeological age for the remains be confirmed. A retrospective rescue permit was lodged with SAHRA BGG on 02/12/2015 (Permit number: 2135).

On 30/11/2015 SAPS VIC and Ms A. Meyer (FARC) conducted a site visit to ascertain whether the remains were of archaeological or forensic nature. The burial position and low visibility archaeological deposit suggested an archaeological age for the remains. The remains were therefore excavated *in situ*, documented and recovered. The remains are currently stored in the Archaeological Humans Remains Collection, Department of Anatomy, University of Pretoria, until deemed necessary for reburial by SAHRA BGG.

2. Legal compliance

A retrospective rescue excavation permit was obtained from the South African Heritage Resources Agency (SAHRA) Burial Ground and Grave Unit as required by Section 36 of Act 29 of 1999 (Permit number: 2135; see Appendix). The permit also allows for physical anthropological analyses and permanent storage of the remains in the Department of Anatomy, University of Pretoria.

3. Location

The grave was located next to a dirt road in an informal residential area in Temba, Hammanskraal on the border between Gauteng and North West (Fig. 1; GPS S25° 20' 25.6"; E 028° 17' 50.8").

Figure 1: Satellite image indicating the location of grave

4. Site description

The grave itself was partially exposed by a trench (approximately 40 cm in width) dug for the laying of fibre optic cables. This trench ran along the eastern edge of a dirt road running parallel to the N1 north (Fig. 2). Ashy soil deposits could be observed in the immediate vicinity of the grave as well as in the profile of the trench (extending approximately 40 cm downwards), suggesting archaeological occupation. No artefacts or larger archaeological features could be observed, but these were most likely completely disturbed during the residential development of the area. The grave itself could not be observed immediately as the Hammanskraal SAPS backfilled the area containing exposed human remains (Fig. 3).

Figure 2: Site where human remains were accidentally discovered (red arrow) during trenching for fibre optic cables. Yellow circle indicates the ashy soil deposits usually associated with archaeological habitation.

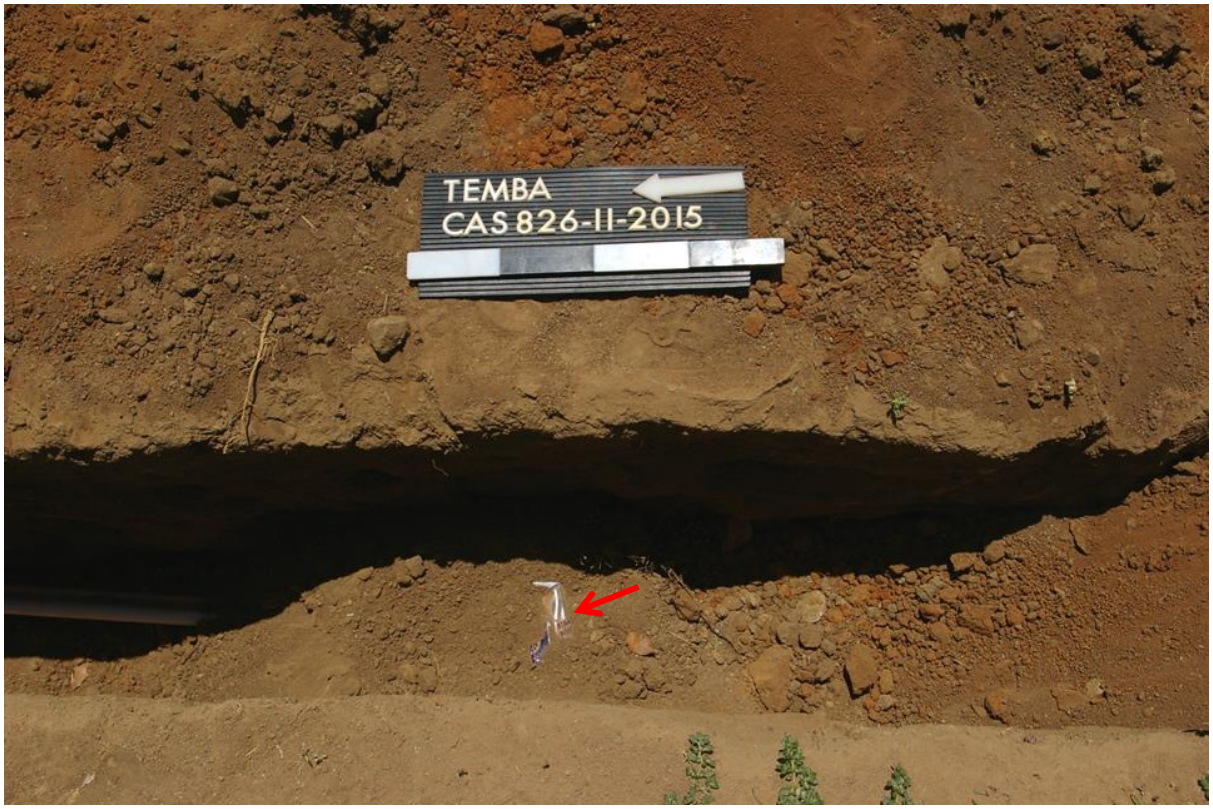

Figure 3: The grave as found prior to rescue excavations. Note the backfilled soil and Keep Safe bag (red arrow) placed there by SAPS after their initial investigation.

5. Recovery methodology

On arrival a foot survey of the immediate area surrounding the grave was conducted in order to identify any exposed archaeological artefacts or features that would indicate the presence of an archaeological site. Standard forensic archaeological techniques (Steyn *et al*., 2000) were employed throughout the excavation to ensure the methodical retrieval and documentation of all disturbed and undisturbed human skeletal remains and associated artefacts. The grave was documented as it was left by the Hammanskraal SAPS after which backfilled soil was removed and sieved for any disturbed skeletal fragments and/or archaeological material. This was done in order to visualise the original grave pit and to expose the undisturbed human remains *in situ*. All visible features pertaining to the grave pit, its dimensions, any associated artefacts, as well as the burial position of the individual was recorded by means of photography and a scale drawing. After the extent of the grave pit was identified this area was systematically excavated in 10 cm layers by means of trowels and brushes. All soil was screened and archaeological material recovered. Human remains were left *in situ*, sketched, photographed and documented before being removed. All human remains and associated archaeological material were

bagged, labelled and transported to the Department of Anatomy, University of Pretoria, for analyses and subsequent storage.

6. Results

6.1. Recovery of human remains

Due to extensive development of the area (residential housing and roads) no clear surface features or artefacts could be observed. The road, especially in the vicinity of the grave, however presented with ashy soil deposits, often associated with archaeological habitation sites. This ashy soil deposit was also visible in the trench originally dug during the pipe-lying activities, extending approximately 40 cm downwards. This seems to be consistent with long term occupation of the area.

The backfilled soil was removed and screened. Several fragments of human skeletal remains were recovered and bagged as *ex situ* remains. After all the backfilled soil was removed a Keepsafe Bag (PAD 001641837), containing the originally exposed human skeletal remains recovered by SAPS and placed back into the trench prior to backfilling, was recovered and skeletal elements inventoried. These skeletal elements included fragments associated with the skull, scapulae, the left proximal humerus and six cervical vertebrae (Fig. 4).

Figure 4: Skeletal remains recovered by SAPS following its accidental discovery.

After all the back-filled soil was removed the edges of the original excavated trench could be observed as well as the signs of the original grave pit (north-south: 59 cm; east-west: 46 cm).

Following the outlines of the grave pit and soil texture differences soil was removed by trowels and brushes and screened for archaeological material and *ex situ* human remains. At approximately 70 cm pottery fragments could be observed *in situ* (Fig. 5). These were left in situ and soil surrounding it was removed by means of trowels and brushes. At 88 cm in depth human skeletal remains could be observed. The positioning of the body suggested an upright sitting foetal burial position (Figs. 5&6). The head, neck and left shoulder was disturbed during the initial discovery, but according to the placement of the *in situ* remains it can be ascertained that the individual was facing south-west when he/she was buried. The back was slightly slumped, and the knees pulled up in a flexed position so as to touch the thorax (Fig. 7). The left and right arms were placed to the sides of the body.

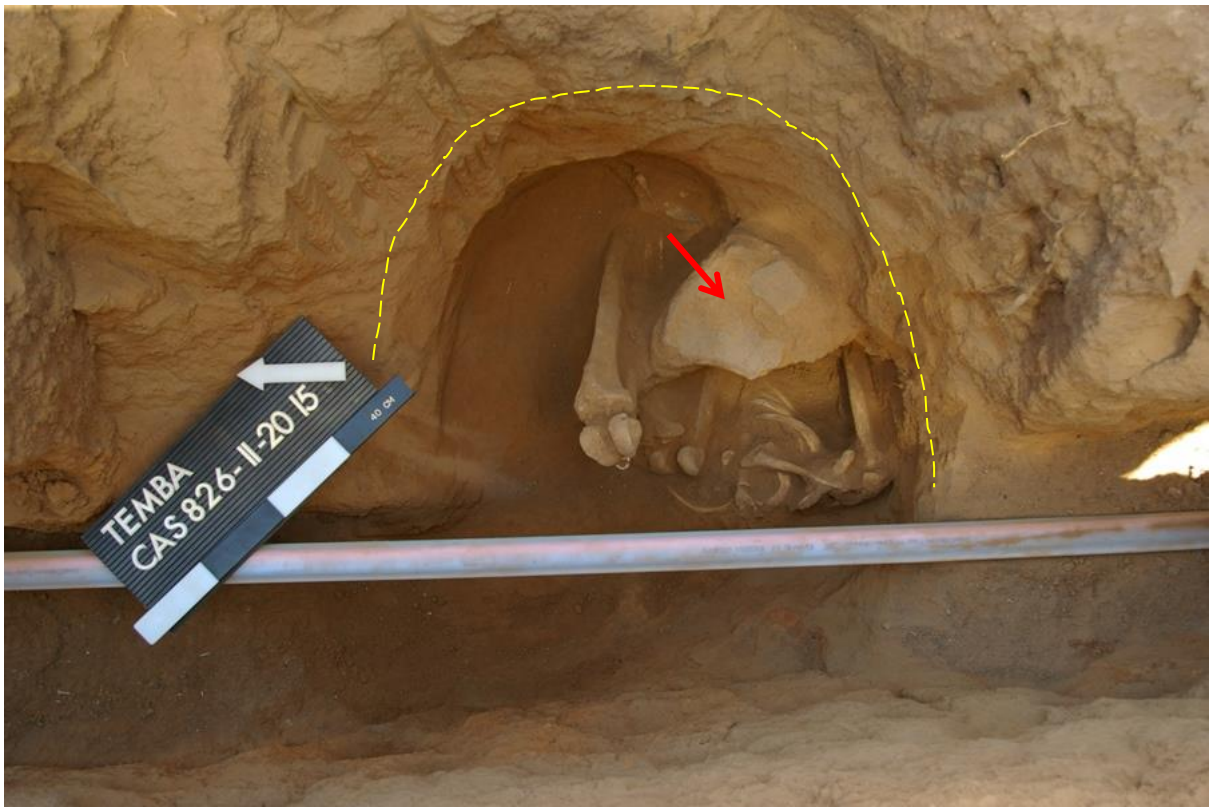

Figure 5: Remains excavated *in situ.* Note the pottery fragments directly on top of the human remains (red arrow), circular grave pit (dashed yellow line) and flexed upright foetal burial position.

Figure 6: Close up of human remains *in situ*. Note the flexed knees indicating a foetal burial position. The head was removed during the initial discovery.

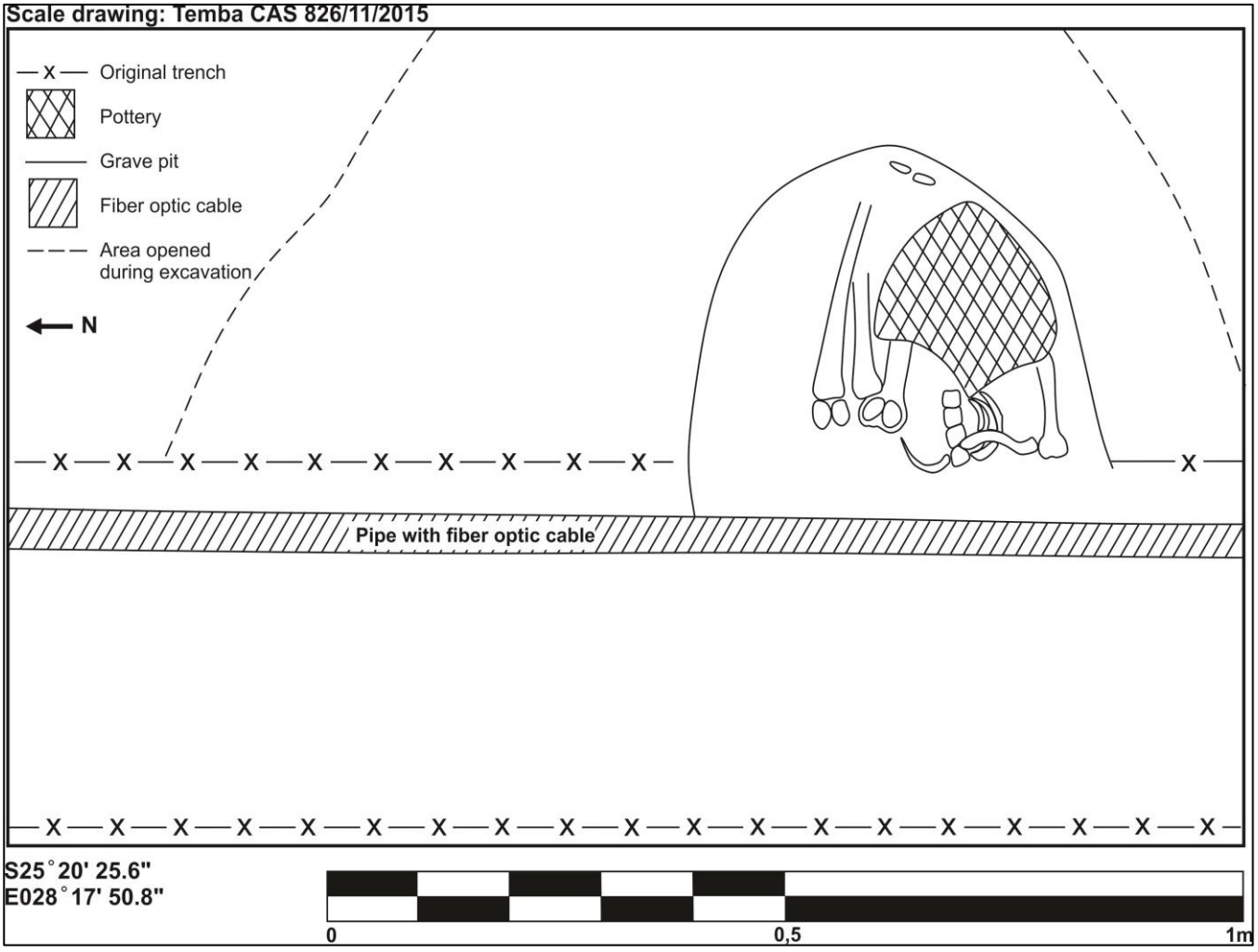

Figure 7: Scale drawing indicating the dimensions of the grave and the positioning of the human skeletal remains *in situ.*

6.2. Standard physical anthropological analysis

6.2.1. Analytical methods

The remains were cleaned and analysed using standard physical anthropological techniques taken from Buikstra and Ubelaker (1994) and İşcan and Steyn (2013) in order to determine the osteobiological profile of the individual.

Age at death was estimated by the degree of epiphyseal closure and tooth development and morphological changes associated with senescence (Krogman & Işcan, 1986; Scheuer & Black, 2000; Schaefer *et al.*, 2009). These usually include the morphological changes in the pubic symphyses (Brooks & Suchey, 1990) and auricular surfaces (Lovejoy *et al.,* 1985) as well as the degree of cranial suture closure (Acsadi & Nemeskéri, 1970; Krogman & Işcan, 1986; Buikstra & Ubelaker, 1994). Additionally transition analysis using the ADBOU 2.1 software program was used to record the macroscopic traits of each of the above mentioned skeletal regions (Boldsen *et al.,* 2002; Milner & Boldsen, 2010). Any observable degenerative changes on the post-crania and dental wear (Loth & Işcan, 2000; Ortner, 2003; İşcan & Steyn, 2013) were noted where present which would suggest an older age.

Sex estimation from the skeletal remains followed morphological and metric assessment of the skull and pelvis. The morphological methods include the Walker, (2008) method (modified by Krüger *et al.* (2014)) for sex estimation from the skull and the Klales *et al*. (2012) method (modified from Phenice (1969)) for sex estimation from the pelvis.

For the determination of ancestry both non-metric and metric techniques were used where possible. This included the non-metric characteristics observable on the skull and mandible (Krogman & İşcan, 1986; İşcan & Steyn, 2013). Both the cranial and postcranial measurements were also analysed using FORDISC 3.2. The archaeological context of the remains, however, already suggests an African ancestry for these individuals.

Stature was determined by regression formulae for single long bone measurements where possible (Lundy & Feldesman, 1987; Steyn & Smith 2007).

Macroscopic assessment of possible pathology and/or trauma was done for each individual. Pathology and/or trauma were described in terms of its location, type, and extent. Several sources were referred to for the pathology observed on the skeleton including Lovell (1997), Aufderheide & Rodriguez-Martin (1998); Hillson (1998); Ortner (2003); and Waldron (2008). The fragmentary and incomplete nature of some of the skeletal elements however hampered the use of some of these techniques.

6.2.2. Results

Preservation and inventory

The remains were completely skeletonized and in a fair state of preservation. Most of the cranial and post-cranial remains were present. For a full skeletal inventory refer to Table 1. Post-mortem fracturing could be observed throughout the upper body which is consistent with the accidental discovery of the remains. Soil and fungal staining was observed throughout the skeleton and is consistent with burial.

Age at death

The third molars of the individual were in full occlusion and the spheno-occipital synchondrosis was completely fused suggesting an age older than 20 years. The medial ends of the clavicles as well as S1 and S2 segments of the sacrum were completely fused suggesting an age older than 30 years. The latter, showed recent fusion however which may suggest a younger adult age. This is consistent with the lack of occlusal wear and degenerative changes normally associated with older individuals.

The pubic symphyses represented phase 3 (Brooks & Suchey, 1990) suggesting an age range of between 21 and 53 years at the time of death. Transition analysis of the pubic symphyses, auricular surfaces and cranial sutures using ADBOU 2.1 provided an age estimate range, with a 95% confidence interval, of between 19 and 32 years. It should however be noted that ADBOU 2.1 currently do not contain South African data sets of individuals of archaeological age, therefore this estimate should be considered a tentative one. Due to the fusion of all visible epiphyses the lower age limit provided by ADBOU 2.1 seems to be a bit too young. For that reason a final age estimate of **25 to 35 years** is suggested for this individual.

Sex

The morphological features observable on the skull were consistent with those associated with females (Walker, 2008) (Fig. 8). Analysis using the population-specific formulae for black South Africans (Krüger *et al.,* 2014) resulted in a 80% probability of male with 88% accuracy when the glabella, mastoid and mental eminence were assessed.

Similarly the moprhological features of the pelvis seemed to correspond with those associated with males. The overall robust size, narrow greater sciatic notches, and lack of any pre-auricular sulcus are suggestive of a male sex. Using the Klales *et al.*, (2012) method the absence of a ventral arc and subpubic concavity, and a broad ischiopubic ramus produced a 92% accuracy and a 99% probability that the individual belongs to the **male sex**.

Figure 8: Frontal and profile views of the skull

Ancestry

The morphological features observable on the skull was consistent with someone of African ancestry as suggested by the wide nasal opening, guttered nasal sills, rectangular orbit, prognathic facial profile and long and low skull. The archaeological context of the remains however already suggests an African ancestry for this individual.

Metric analysis of the cranial measurements was utilized to estimate ancestry (refer to table 2 and 3 for skeletal measurements). Standard cranial measurements were uploaded into FORDISC 3.1 (FD3) in order to compare the unknown cranium to a custom database that is comprised of known 20th century Black (n=162), Coloured (n=85), and White (n=109) South Africans. FD3 is a statistical software program that applies discriminant function analyses to classify an unknown cranium into one of the known comparative reference groups (Jantz & Ousley, 2005). One of the limitations of using FD3 for estimating ancestry is that only three modern socially defined groups are available for comparison in the South African custom database. Therefore, discriminant function analysis will force classify the unknown into one of the three groups, even if the unknown does not belong to any of these groups. However, when the unknown cranium is dissimilar to the sample population, low posterior probabilities and typicality are often the result.

However, since the remains were of archaeological origin the cranial measurements of Grave A were also compared to the “Zulu” (n= 101) and “Bushman” (n=90) reference groups from the Howells population database. Archaeological populations may be difficult to classify using FD3 due to the occurrence of intra-population differences and secular trends that occur over time (Jantz & Ousley, 2005). Analysis of an unknown skull of historic/archaeological age using 20th century reference groups would therefore not be appropriate. The “Zulu” and “Bushman” reference groups are to date the only pre-20th century South African reference samples available for use in FD3. However, the use of these reference samples is also problematic since it is not representative of all historical population groups within South Africa.

A discriminant analysis, using ten Forward Wilks stepwise selected variables, was done in order to compare the cranial measurements to the three modern (black, coloured and white South Africans) and two historical (“Zulu” and “Bushman”) South African ancestral reference groups. Results suggested that the cranial measurements were most similar to The “Zulu” reference sample with a posterior probability of 42.8% (likelihood that the individual belongs to this

particular ancestral group) and significant typicality (how typical the unknown is for the group to which it was classified) with a cross validation of 52% (Table 4).

Low posterior probabilities suggest that this individual cannot be definitively classified into the "Zulu" group as there are also significant similarities with the modern South African Black group (Table 4). Nevertheless, it could be concluded that individual from Temba did not present with characteristics associated with the South African white, Coloured or "Bushman" reference sample banked within FD3. Therefore, the individual was most likely of **African ancestry.**

Stature

The ante-mortem stature was determined by using the physiological length of the left femur. The stature of this individual was calculated as being between **168.3 and 173.9 ± 5.554 cm**. This is regarded as an average stature for someone of this population group and sex (Steyn & Smith, 2007).

Dentition

All the teeth were present except for the upper right canine and lower right second molar. Both these teeth were lost post-mortem. The only dental pathology that could be observed was very slight dental calculus on the buccal and lingual surfaces of the maxillary and mandibular teeth. All dental measurements are represented in table 5.

Trauma and Pathology

No ante-mortem or peri-mortem trauma could be observed.

Periostitis was observed on the medial and distal portions of the left and right tibia (Fig. 9) as well as on the left and right fibula. Periostitis is an indicator of non-specific disease that is usually caused by an inflammation of the periosteum and is most commonly found in the long bones (Ortner, 2003). It is possibly indicative of poor health and population stress (Ortner, 2003). No other signs of pathology could be observed.

Figure 9: Periostitis on the medial surface of the left tibia

7. Conclusion

The remains inadvertently discovered in Temba during pipe-lying activities on 25/11/2015 are confirmed to be of archaeological age as suggested by the ashy deposit, burial position and associated Iron Age pottery. Physical anthropological analysis suggested that the individual was a young adult African male between 25 and 35 years at the time of death.

8. Recommendations

Based on the findings from the follow-up visit, excavation and physical anthropological analysis an archaeological age for the remains can be confirmed.

- It is therefore recommended that the SAPS investigation be closed.
- That retrospective studies be undertaken to determine the archaeological age and significance of the human remains and associated site.
- That all retrospective work be undertaken after the necessary permission has been obtained from the applicable legislative bodies.
- That until an affected family/community can be identified, and arrangements can be made for reburial of the remains, it be permanently stored as part of the Archaeological Human Remains Collection at the Department of Anatomy, university of Pretoria.

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10. Tables

Table 1: Skeletal inventory: CAS 21/06/2015
*** damaged and fragmented**
(n)=The number of the particular skeletal element present (where applicable)

Skeletal element	Present=1 / Absent=0
Cranial Bones:	
Frontal	1
Parietal	1*
Occipital	1*
Temporal	1*
Temporal-mandibular joint	1
Sphenoid	0
Zygomatic	1*
Maxilla	1*
Palatine	1
Mandible	1*
Post-cranial bones:	
Cervical vertebrae	1*(7)
Thoracic vertebrae	1*(12)
Lumbar vertebrae	1(5)
Sacrum	1*
Manubrium	1
Sternum	1
Right clavicle	1*
Left clavicle	1
Right scapula	1*
Left scapula	1
Right ribs	1* (12)
Left ribs	1* (12)
Right humerus	1*
Left humerus	1
Right radius	1
Left radius	1*
Right ulna	1
Left ulna	1
Right os coxae	1*
Left os coxae	1*
Right femur	1
Left femur	1
Right tibia	1
Left tibia	1
Right fibula	1
Left fibula	1
Right patella	1
Left patella	1
Right carpals	1* (7)
Left carpals	1* (7)
Right metacarpals	1 (5)
Left metacarpals	1 (5)
Hand phalanges	1* (23)
Right tarsals	1 (7)
Left tarsals	1 (7)
Right metatarsals	1 (5)
Left metatarsals	1 (5)
Foot phalanges	1* (18)

Table 2: Cranial measurements

All measurements in mm.

- skeletal element was absent or damaged and therefore measurements could not be obtained

*** indicates right side**

Skeletal dimension	Temba CAS 826/11/2015
Max. cranial length	-
Max. cranial breadth	-
Bizygomatic diameter	-
Basion-bregma height	-
Cranial base length	-
Basion-prosthion length	-
Maxillo-alveolar breadth	63
Maxillo-alveolar length	54
Biauricular breadth	-
Upper facial height	70
Min. frontal breadth	101
Upper facial breadth	110
Nasal height	48
Nasal breadth	28
Orbital breadth	33
Orbital height	40
Biorbital breadth	101
Interorbital breadth	29
Frontal chord	110
Parietal chord	-
Occipital chord	92
Foramen magnum length	35
Foramen magnum breadth	31
Mastoid length	25*
Chin height	33
Height of mandibular body	31
Breadth of mandibular body	13
Bigonial width	109
Bicondylar breadth	129
Min. ramus breadth	38
Max. ramus breadth	45
Max. ramus height	-
Mandibular length	-
Biasterionic breadth	-

Table 3: Post-cranial measurements

All measurements in mm.

- skeletal element was absent or damaged and therefore measurements could not be obtained

*** indicates right side**

Skeletal dimension	Temba CAS 826/11/2015
Clavicle max. length	147
Clavicle ant.-post. diameter midshaft	10
Clavicle sup.-inf. diameter midshaft	13
Scapula height	-
Scapula breadth	103
Humerus max. length	323
Humerus epicondylar breadth	61
Humerus vertical diameter head	45
Humerus max. diameter midshaft	22
Humerus min. diameter midshaft	18
Radius max. length	250*
Radius ant.-post. diameter midshaft	12
Radius med.-lat. diameter midshaft	15
Ulna max. length	269*
Ulna ant.-post diameter	14
Ulna med.-lat. diameter	17
Ulna physiological length	237
Ulna min. circumference	34
Sacrum anterior length	-
Sacrum ant.-sup. breadth	94
Sacrum max. transverse diameter base	51
Os coxae height	-
Os coxae iliac breadth	-
Os coxae pubis length	-
Os coxae ischium length	-
Femur max. length	483
Femur bicondylar length	478
Femur epicondylar breadth	75
Femur max. diameter femur head	45
Femur ant.-post. subtrochanteric diameter	26
Femur med.-lat. subtrochanteric diameter	31
Femur ant.-post. midshaft diameter	32
Femur med.-lat. midshaft diameter	26
Femur midshaft circumference	95
Tibia length	413
Tibia physiological length	403
Tibia max. prox. epiphyseal breadth	71
Tibia max. distal epiphyseal breadth	48
Tibia max. diameter nutrient foramen	40
Tibia med.-lat. diameter nutrient foramen	23
Tibia circumference nutrient foramen	101
Fibula max. length	398
Fibula max. diameter midshaft	13
Calcaneus max. length	75
Calcaneus middle breadth	42

Table 4: FORDISC 3.1 Analysis of Current Case Temba CAS 826/11/2015

FORDISC 3.1 Analysis of Current Case
Using Africa.adt
DF results using 10 Forward Wilks selected (min: 1 max: 10, out of 10) measurements:
NLB NLH FRC NPH MDH XFB EKB FOL OBB OCC

From Group	Total Number	Into Group B	BUSHMAN	C	W	ZULU	Percent Correct
B	162	54	23	22	7	56	33.3 %
BUSHMAN	90	12	64	3	0	11	71.1 %
C	85	13	21	27	11	13	31.8 %
W	109	6	1	16	78	8	71.6 %
ZULU	101	23	11	3	1	63	62.4 %

Total Correct: 286 out of 547 (52.3 %) *** CROSSVALIDATED ***

Multigroup Classification of Current Case

Group	Classified into	Distance from	Probabilities Posterior	Typ F	Typ Chi	Typ R
ZULU	**ZULU**	5.0	0.428	0.915	0.894	0.137 (89/102)
B		5.3	0.369	0.889	0.873	0.288 (117/163)
BUSHMAN		7.2	0.143	0.769	0.711	0.088 (84/91)
C		9.1	0.054	0.610	0.522	0.314 (60/86)
W		13.5	0.006	0.268	0.196	0.382 (69/110)

Current Case is closest to ZULUs

Current Case	Chk	Group Means B 162	BUSHMAN 90	C 85	W 109	ZULU 101
NLB	28	27.5	26.5	25.8	23.9	28.3
NLH	48	47.2	43.3	46.7	50.5	48.8
FRC	110	110.0	107.0	104.6	79.9	110.6
NPH	70	+ 59.7	56.8	51.1	60.7	65.5
MDH	25	27.1	23.3	25.4	28.4	27.1
XFB	101	109.3	108.2	102.6	100.6	114.9
EKB	101	+ 98.2	95.3	95.2	96.1	99.5
FOL	35	- 37.1	35.9	37.2	38.6	36.7
OBB	33	- 39.2	38.4	40.2	40.7	39.9
OCC	92	93.9	88.5	89.0	88.0	95.8

+/- measurement deviates higher/lower than all group means; ++/-- deviates one to two STDEVs
+++/--- deviates two to three STDEVs; ++++/---- deviates at least three STDEVs

Natural Log of VCVM Determinant = 39.3034

Table 5: Dental measurements

All measurements were taken in mm.

- dentition was absent or damaged and therefore measurements could not be obtained

*** indicates right side. MD=mesiodistal, BL = buccolingual**

Maxilla	Temba CAS 826/11/2015	Mandible	Temba CAS 826/11/2015
MDI1	9.28	**MD I1**	4.91
BL I1	7.89	**BL I1**	6.18
MD I2	7.22	**MD I2**	5.98
BL I2	7.41	**BL I2**	6.16
MD C	7.85*	**MD C**	8.48
BL C	9.88*	**BL C**	7.68
MD PM1	6.90	**MD PM1**	7.30
BL PM1	9.57	**BL PM1**	8.12
MD PM2	6.72	**MD PM2**	7.12*
BL PM2	10.17	**BL PM2**	9.55*
MD M1	11.09	**MD M1**	11.84
BL M1	11.90	**BL M1**	11.69
MD M2	11.25	**MD M2**	10.86*
BL M2	12.84	**BL M2**	11.80*
MD M3	9.94	**MD M3**	12.35
BL M3	13.50	**BL M3**	11.87

11. Appendix

Temba Rescue Excavation of Inadvertently Discovered Human Remains

Our Ref:

Enquiries: Itumeleng Masiteng
Tel: 012 9414967
Email: imasiteng@sahra.org.za
CaseID: 8824

Date: Thursday December 03, 2015
Page No: 1

PermitID: 2135

PERMIT: Rescue Relocation

In terms of Section 36(3) of the National Heritage Resources Act (Act 25 of 1999)

Permit Holder: Anja Meyer
University of Pretoria - Forensic Anthropology Research Centre
Department of Anatomy
Faculty of Health Sciences
Private Bag x323
Pretoria
0001

Site: Temba Hammanskraal Gauteng (Temba)

Conditions:Skeletonised human remains were inadvertently discovered during pipe-lying work in Temba, Hammanskraal, Gauteng.The discovery was reported to Temba SAPS on the 25th of November 2015 upon which Communications Officer Modisa contacted the SAPS Victim Identification Center. SAPS VIC requested the assistance of the Forensic Anthropological Research Centre (University of Pretoria) in confirming an archaeological age for the remains and to assist with the recovery of said remains. SAHRA BGG was immediately contacted and permission was obtained to do a site visit and rescue recovery should the remains be deemed to be of archaeological age. Immediate mitigation will ensure that the human remains are recovered ethically so that construction can continue.

1. If the permit holder is not to be present on the site at all times then the heritage authority must be provided with the names and qualifications of the authorised representatives.
2. Adequate recording methods as specified in the Regulations and Guidelines pertaining to the National Heritage Resources Act must be employed. Note that the position of all excavations and objects collected must be marked on a plan of site.
3. A standard site record form must be lodged on SAHRIS.
4. Human remains must at all times be handled with respect and graves should not be disturbed except where unavoidable. The consultation procedures as indicated in the Regulations and the National Heritage Resources Act must be observed as appropriate. The recommendations for removal of graves and exhumations and for re-burial stipulated in SAHRA's Policy 'What to do when graves are uncovered', section 3, must be observed as far as possible. A report on the specimens recovered and their origin must be submitted to the heritage authority annually on or before 30 December 2016 for the duration of the permit.
5. All remains recovered, including relics and artefacts, must be kept with the skeletal material and be curated at the national depository or reburied at a local municipal cemetery.
6. Reprints of all published papers or copies of theses and/or reports resulting from this work must be lodged with the relevant provincial heritage authority and SAHRA.
7. If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request.
8. It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and