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LATER STONE AGE BURIALS FROM THE WESTERN CAPE PROVINCE, SOUTH AFRICA. PART 2: LEEUFONTEIN

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ABSTRACT

The human skeleton found eroding out of a river bank on the farm Leeufontein in the Murraysburg District of the Western Cape is the first human burial to be fully described from the central Karoo. The skeleton is that of a man older than 50 years at death. The burial was marked with a large cairn of stones, but other than the presence of a single sheep cervical vertebra, there were no grave goods. The individual was buried on his left side in a tightly flexed position. His teeth were very heavily worn with some periodontal disease and he had osteoarthritis in his vertebral column. Although it is not possible to confirm his identity, a radiocarbon date from the mid-17th century and corroborating historical evidence suggest that he was one of the aboriginal San foragers of the region.

INTRODUCTION

In April 1997, the owners of the farm Leeufontein (23.37E; 31.41S), in the Murraysburg District of the Karoo, notified Mr. David Morris of the McGregor Museum in Kimberley that a human burial was eroding out of a river bank on their farm. The McGregor Museum in turn notified the Department of Human Biology at the University of Cape Town, and the burial was excavated as a science class project in April 1998. This paper is the second in a series describing such isolated burials discovered in the Western Cape Province of South Africa (Morris *et al.* 2005).

The farm Leeufontein (Fig. 1) is within the Nama-Karoo biome (Rutherford & Westfall 1986). In previous years it had been stocked with sheep, but under the current ownership it is a game farm on which controlled shooting is allowed during the appropriate season. The veld is predominantly of a Karoo nature, but Acocks has noted that the original ecology of the area was grassveld or transition to grassveld (Acocks 1988). Acocks further notes that the upper elevations are still essentially of grassveld type but that overgrazing and subsequent erosion has been a serious problem in the region. The area has always been marginal for grazing species and the historical records indicate that vegetation was scarce in dry years and that many of the game animals were highly mobile, being more numerous in wetter seasons and rare in drier ones (Skead 1980).

The burial had been exposed by erosion on the upper reaches of a small spruit about one kilometre south-west of the farm house (Fig. 2). The excavation of the grave was technically difficult because the river bank was 2 metres in depth and the exposure was mid-way down the eroded side of the bank (Fig. 3). From a datum point on the top of the bank, a 3 metre by 2 metre grid was erected using 2 metre long metal rods to keep the grid at the level of the top of the bank. Strings were dropped from the elevated grid, so that a three-dimensional lattice was created enclosing the full site of the burial exposure.

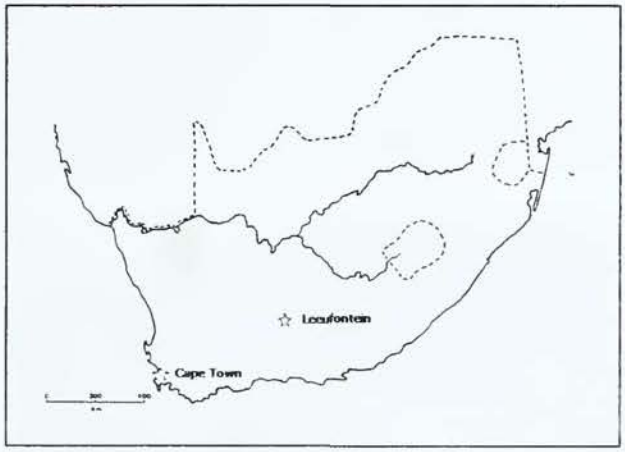

Fig. 1. Map of South Africa showing location of the farm Leeufontein

The burial originally had at least 18 stones on top of it, but the cairn had collapsed into the river bed in the slump that had exposed the skeleton (Fig. 3). The skeleton, on excavation, was lying on its left side in a tightly flexed position with the head to the north. The right side of the skeleton was exposed by the slump, and much of the right arm had been washed away and was not recovered. The grave shaft was round and approximately 50 cm in diameter. The highest bones in the burial were about 75 cm below the top of the river bank, and the deepest part of the grave shaft was at 1.2 metres. It is not

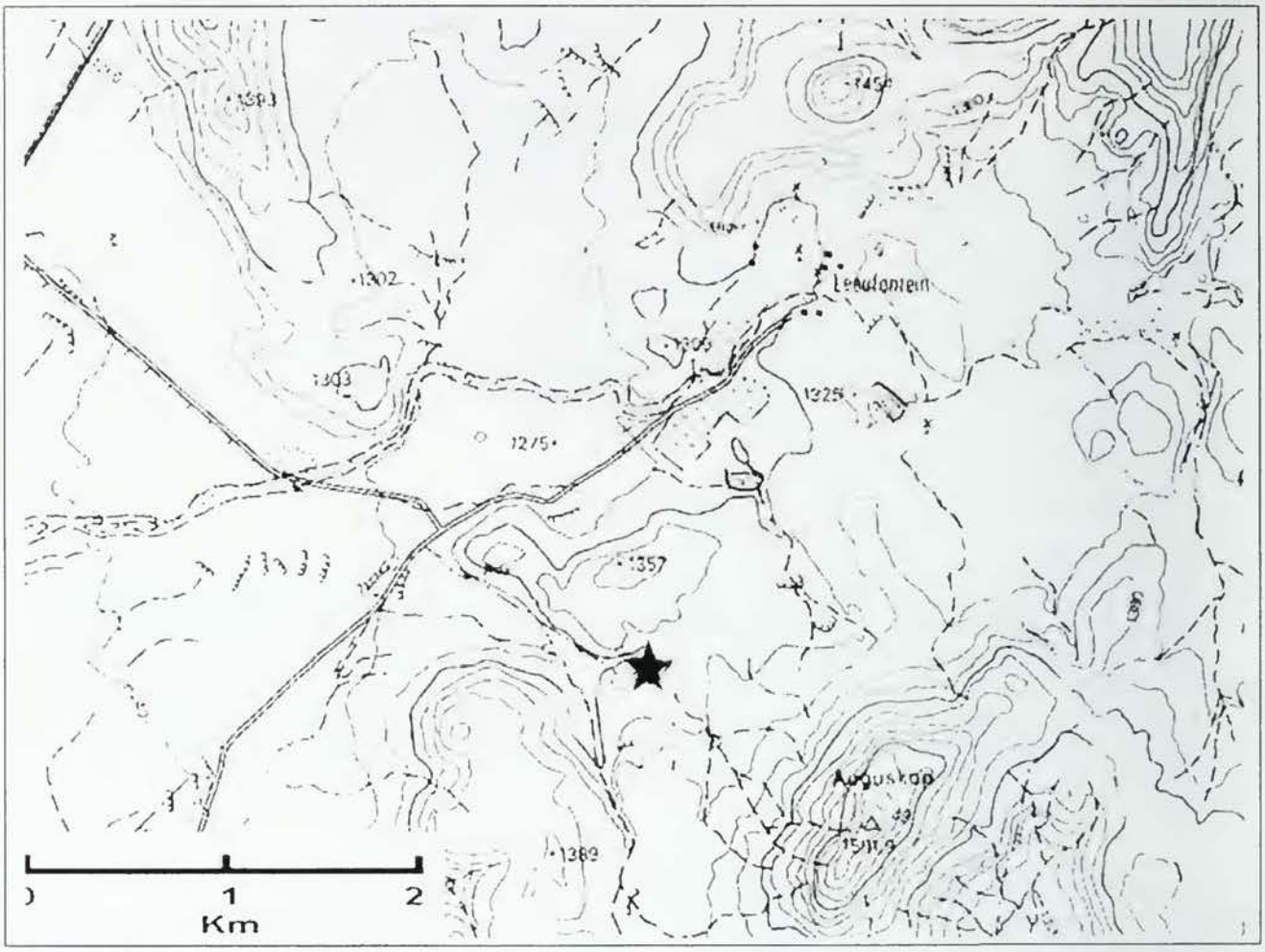

Fig. 2. Map of Leeufontein showing location of burial.

Fig. 3. Photograph of burial in situ in side of riverbank.

possible to identify the original location of the cairn as all of the stones had fallen into the river bed. No grave goods were found with the skeleton, but a sheep atlas (C1) and several small

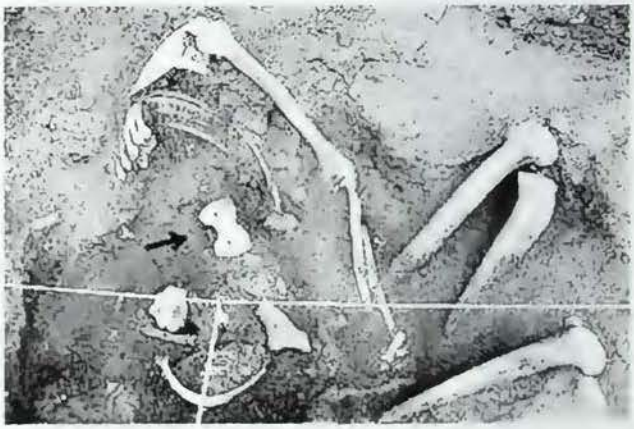

Fig. 4. Position of skeleton after removal of disturbed bones. Sheep atlas marked by arrow.

mammal bones were directly associated with the undisturbed part of the burial (Fig. 4).

A fragment of right radius was submitted to the Quaternary Dating Research Unit (QUADRU) at the CSIR in Pretoria for dating. The results gave a radiocarbon age of 300 ± 60 years BP (Pta-9370). The Pretoria Calibration Curve provides a range of possible dates between AD 1525 and 1667, but with the most probable date being AD 1649. Given the statistical

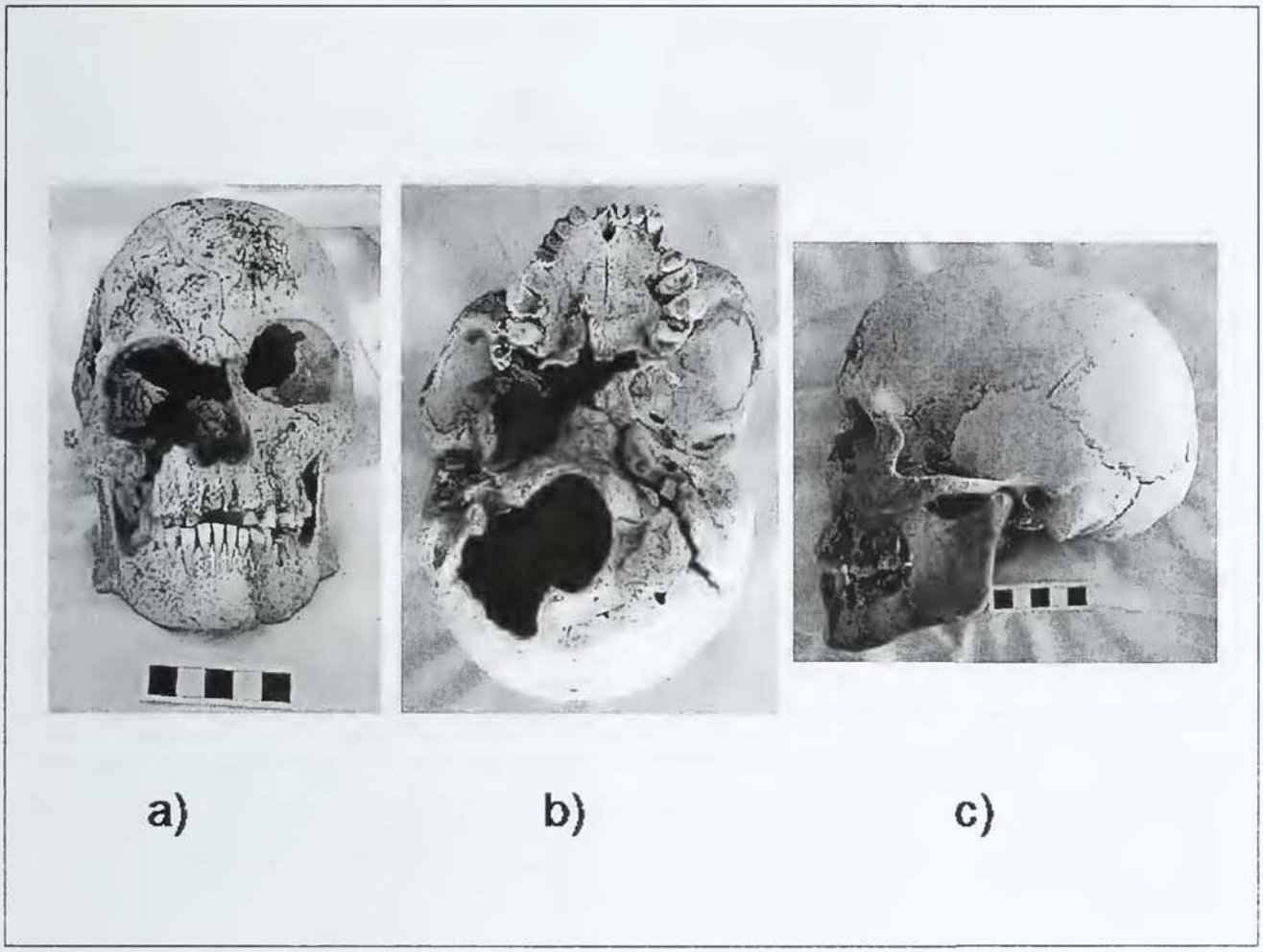

Fig. 5. Cranium: a) facial, b) basal and c) left lateral view.

error around such a relatively recent date, the best dating estimate is that the grave was from the period immediately before the colonial settlement of the region.

DESCRIPTION OF THE SKELETON (UCT 565)

The preservation of the skeleton is only moderate. The exposure of the skull prior to discovery has resulted in the skull being damaged. Most of the vault has been bleached white by the sun and the right side of the skull has been crushed. Subsequent deformation has created a line of distortion from the roof of the medial side of the right orbit posteriorly and medially across the frontal bone (Fig. 5). The right zygomatic bone has been displaced posteriorly. Although the most posterior part of the right maxilla is also displaced, the palate remains undistorted. The right temporal and adjacent parietal bones have been pushed inwards and breadth measurements of the frontal bone and much of the face cannot be accurately measured. The exception is the biorbital breadths that have been estimated by mirror image. The mandible is well preserved and most teeth are present. The two upper central incisors have been lost post-mortem. Cranial, mandibular and post-cranial measurements can be found in Tables 1 to 3.

The post-cranial skeleton is nearly complete despite the exposure by erosion of the right shoulder and the thorax. The right clavicle has been lost, and the right scapula and humerus fragmented. The right hand is complete along with the distal ulna and radius, but the proximal portion of the ulna and radius along with the distal humerus are gone. The ribs of the left side are complete, but the right side ribs are fragmented and some have been lost. The cervical and lumbar vertebrae are well preserved, but most of thoracic elements are fragmentary. The bones of the lower half of the body are more or less complete. The left fibula is broken. The right foot and much of the left foot bones have been lost due to the exposure by the erosion of the river bank.

The sex of this individual is male. Masculine features are well marked on the pelvis, with a narrow sciatic notch, high rounded ilium, and narrow sub-pubic angle. These masculine pelvic features are reflected on the cranium with a strong glabellar and supra-ciliary development, rounded lateral orbital margin, relatively large mastoid and extensive gonial flare on the mandible (Buikstra & Ubelaker 1994, Maat *et al.* 2002).

The skeleton is that of an adult. The medial epiphysis of the clavicle is fused. There is some obliteration of the coronal and sagittal sutures, the rib ends are cupped, and the surfaces of the pubic symphyses, although damaged, are

Table 1: Cranial measurements (measurements in mm).

Maximum Cranial Length	179
Bifrontal Breadth	-
Maximum Cranial Breadth	136
Bizygomatie Breadth	131 (distorted)
Basibregmatic Height	117
Bimaxillary Breadth	-
Bistephanic Breadth	100 (distorted)
Upper Facial Height	64
Biasterionie Breadth	111
Nasion-basion Length	93
Frontal Sagittal Arc	128
Prosthion-basion Length	94
Parietal Sagittal Are	107
Bimaxillary Subtense	-
Oceipital Sagittal Are	117
Naso-frontal Subtense	-
Transverse Are	288
Inner Bi-orbital Breadth	96 (mirror image)
Frontal Sagittal Chord	107
Outer Bi-orbital Breadth	104 (mirror image)
Parietal Sagittal Chord	100
Interorbital Breadth (Dae.)	21
Oceipital Sagittal Chord	91
Orbital Breadth	39
Nasion-Bregma Subtense	-
Orbital Height	35
Nasion Subtense Fraetion	-
Nasal Height	50
Foramen Magnum Length	44
Nasal Breadth	25
Foramen Magnum Breadth	34
Least Nasal Breadth	-
Mastoid Height	26
Maxillo-alveolar Length	49
Least Frontal Breadth	90 (distorted)
Maxillo-alveolar Breadth	63
Palatal Length	44
Palatal Breadth	36
Palatal Height	11

Table 2: Mandibular measurements (measurements in mm).

Bicondylar Breadth	110
Bicoronoidal Breadth	90
Bigonial Breadth	100
Bimental Breadth	43
Proj. Height of Ramus	45
Proj. Height of Coronoid	53
Proj. Length of Corpus	73
Proj. Length of Mandible	99
Length of Condyle	18
Breadth of Condyle	9
Sigmoid Notch Subtense	9
Minimum Width of Ramus	34
Symphyseal Height	31
Corpus Height at M2	23
Mandibular Angle	125°

Table 3: Long bone lengths (measurements in mm).

	L	R
Humerus (max)	288	-
Radius (max)	227	-
Ulna (max)	247	-
Femur (max)	410	411
Femur (physiol)	409	407
Tibia (max)	362	363
Fibula (max)	-	-

flat and featureless. All of these features indicate an age older than 50 years (Buikstra & Ubelaker 1994).

The general appearanee of the eranium is strongly suggestive of a KhoeSan genetie identity. A number of osteological features are present that are common in KhoeSan populations but rare in other Afrieans (Morris 1992a). A strong frontal eminenee and a distinet mons temporosphenoidalis are visible. The strongest visual similarity of this specimen to the KhoeSan range of variation is in the face whieh is low and broad with quadrilateral orbits, flattened nasal bones and a shallow palate. The eranial vault is low and the bossed with a pentagonoid shape in superior view.

The stature based on the SA Negro male formula for physiolological length of femur is 154.0 ± 2.8 em (Lundy & Feldesman 1987). The standard ratio of 3.745 times the maximum femur length (Lundy & Feldesman 1989) produees a similar value of 153.55 cm.

PATHOLOGY AND SKELETAL ANOMALIES

The dentition of the Leeufontein speeimen is both heavily worn and diseased.The oeelusal attrition has reaehed a helieoidal state, and is so severe that the oeelusal wear on the lower M1's has exposed the roots on their buccal sides (Fig. 6). The lower anterior teeth are also heavily worn but there is no ineisor rounding. The upper lateral ineisors are worn down to near the neek of the teeth, and it is assumed that the missing eentral ineisors would have exhibited a similar advaneed wear pattern. The teeth themselves seem to be relatively healthy and only the right maxillary M3 (of 13 teeth present) is carious, but periodontal disease and alveolar resorption on both jaws is extensive. The upper left first premolar has been lost antemortem. The roots of the left maxillary M1 are abseessed, as are the roots of the opposing lower molar (Fig. 7).

Other than the dental disease, the only other visible sign of pathology is vertebral arthritis. Distinct osteophytes are visible at the T10-T11 and L3-L4 body junetions. The synovial joints elsewhere on the vertebral eolumn and at other joints appear normal.

Several skeletal anomalies are present on the Leeufontein skeleton. These have little elinieal interest, but are part of the normal skeletal variation in humans. The eranium has some sutural ossieles on the lambdoid suture ineluding a single interparietal ossiele at lambda.

The lower portion of the sternal corpus demonstrates a sternal aperture in the midline. This is not an uncommon oeeurrence and originates when the sternal segments form from

Fig. 6. Mandible: occlusal view.

Fig. 7. Dentition: left lateral view.

bilateral centres of ossification. Ashley (1956) reported a requency of 4% in his European sample, but 13% in his East African sample. Saunders (1978) found the anomaly at the rate of 2.4% in Eskimo-Aleuts. Data are not available for archaeological populations in southern Africa.

The Leeufontein individual has an abnormal pre-sacral vertebral (PSV) count of 25. The normal count is 7 cervical, 12 thoracic and 5 lumbar (24), and in this case the extra vertebra is an L6. The sacrum is normal. This anomalous PSV pattern is usually more common in males than females. De Beer Kaufman (1974) has documented that this PSV pattern was present in 10.5% of her South African Negro sample and 14.3% of her San sample. Over all, De Beer Kaufman noted that African populations tended to have more variability in PSV number than other world populations. Not only is the pre-sacral vertebral count distinctive at Leeufontein, but the anomalous 6th lumbar vertebra has a spondylolytic defect. Spondylolysis is the separation of the arch from the vertebra body at the pars intcrarticularis of the neural arch. It is often interpreted as being the result of exceptional stresses on the back generated by physical activity, but we are still uncertain about it etiology. Recent research has suggested that it is a response to stress on the back in late adolescence or early adulthood (Mays 2006). The only clinical sign may be chronic low back pain. Spondylolysis occurs most frequently on the 5th lumbar vertebra, so its presence here on the last of the lumbars is consistent with other cases, although in this instance the last vertebra is an L6. The defect has been seen before in southern African populations (Morris 1995), and Eisenstein (1978) has noted an overall frequency of 3% in populations of South African Negro origin.

DISCUSSION

Single isolated burials can provide us with a wealth of information about the individual, but drawing links to the broader community from which that individual was drawn remains a difficult task. The Leeufontein man was certainly older than 50 years at death. This relatively old age is not exceptional for living Kalahari San (Howell 1979) as individuals who have survived the peaks of mortality in childhood and young adulthood have a good chance of making it into the older stages of life. The diseases of old age, especially dental problems and osteoarthritis, are consistent with his advanced years. Despite the alveolar disease, the general pattern of dental health is typical of modern San foragers with a low incidence of caries but extremely marked levels of occlusal attrition (van Reenen 1964; Morris 1992a; Sealy *et. al* 1992).

Descriptions of racial attributes are of particularly limited value because we have no idea where in the total range of variation this single individual is placed. That the Leeufontein individual shows KhoeSan craniological features is of interest, but not unexpected in the region from which the burial was excavated. A much more valuable question would be to identify whether the Leeufontein remains represent an individual from a Khoekhoe herder group or a San forager group. Unfortunately the osteological information sheds little light on this question. The two populations are strongly overlapped in morphology and the only consistent feature separating the two groups is stature and dietary trophic level.

Using modern ethnographic data from the literature, Wilson & Lundy (1994) have noted an average male Khoekhoe stature at 162.4 cm and San male stature at 155.8 cm. The Leeufontein man, with a calculated height of 154 cm, falls close to the San mean and in the lower quadrant of the Khoekhoe male range. Stable carbon isotope data do not help, as the Karoo is a predominantly a C4 area and foragers and pastoralists are likely to have similar dietary isotopic fractions (Sealy 1997). All that remains are cultural clues from the burial style and associated grave goods, but even here the data from Leeufontein are ambiguous. The historical literature records an upright sitting posture with no grave goods for Khoekhoe burials (Inskeep 1986; Morris 1992a), but San burials are much more variable. Rich grave goods are frequent occurrences and may have important cultural significance along the southern coastal belt (Wadley 1997; Hall 2000; Sealy 2006). Grave goods are much rarer in the more northerly regions of South Africa (Inskeep 1986; Wadley 1997) and only about half of the San graves along

the Riet River had any form of burial inclusions (Morris 1992a). Therefore the lack of grave goods at Leeufontein cannot be interpreted in any particular direction. The presence of a sheep bone does not help. This could have been an accidental inclusion with the grave fill, but even if the burial of the bone was intentional, it still does not identify the man as a herder or a hunter.

The surveys of burials by Inskeep (1986) and Wadley (1997) failed to record even a single published burial from the Great Karoo, so in essence the Leeufontein burial is a 'first record' for the region. Burials in the inland Karoo region are much rarer than on the coast. Coastal discoveries are frequent because of holiday development and dune erosion, but also because people were closely clustered at marine resource foci and burials are frequently in food middens. There also appears have been a cultural choice in the use of the rock shelters at the coast or in the coastal mountain range as locations for burials. Such a pattern is not present in the inland areas. Rock shelters are rare, but even when they do occur; they are not used as burial sites (Sampson 1972, 1995).

Graves in the Karoo are much dispersed. Morris (1992b) has catalogued specimens from the district in the various museums in South Africa. Of 11 specimens recovered from the Victoria West/Three Sisters/Hanover/Murraysburg areas, almost all were accidental discoveries and very few have excavation data, or even general information about archeological association. One skeleton from Vigilant's Dam, Victoria West (Wits Anatomy A 671) was on its left side, fully flexed and oriented E-W. A second skeleton from Rooiwal, Richmond (UCT 412), was noted as being in an upright flexed position with hands on chest, but further notes with the accessioned skeleton indicate that the skeleton was in an old aardvark hole and therefore its upright posture may have been related to technical aspects of the burial rather than a ritual aspect of 'sitting the body upright'. The same skeleton was recovered with ostrich egg shell beads and a pendant of fresh water mussel shell (Morris 1992b). SAM 5029 from Travalia at Three Sisters has a date of 330 ± 50 years before present (Pta-2350), and a second skeleton from Kruidfontein near Prince Albert has a date of 310 ± 50 years before present (Pta-1884) (Morris 1992b).

Together, these two dates and the new one from Leeufontein indicate that the graves are probably associated with the time immediately before European settlement and it is possible to use historical data to gain a picture of these people. The Karoo itself was marginal for early historic pastoralists and most of the land away from the river systems was occupied by hunters rather than herders. The European intrusion into the area during the 18th century was contested by San groups in what was essentially a low-level war (Marks 1972). Sampson (1972) has reviewed the 'taming' of the frontier in the Zeekoerivier area of the eastern Karoo. Conflict between the San forager groups and the colonial farmers resulted in a series of Commandos against the San. In 1775 one party of Europeans and their Khoekhoe servants killed 503 San and captured 241, the latter mostly women and children. This process of 'pacification' in the eastern Karoo continued until the 1820's and was common on all of the frontier districts (Eldredge 1994). Szalay (1995) estimates that between 3000 and 4000 were killed by the Commandos from the late 18th century to about 1830, yet at least 9000 or as many as 12000 survived and were acculturated as farm labourers. Although much of the San-Settler interaction was violent, there was also a parallel pattern of acculturation in which those San who survived were drawn into the Colonial society. In particular, the San became stockmen of some excellence and entered into service relationship with the Boers. Those few San who survived as independent foragers or herders joined the ranks of the 'farm Bushmen' by the mid-19th century as the closure of Crown lands, collapse of the wild game populations and overgrazing removed their options (Sampson 1995).

The acculturation of the San, whether voluntary or through 'capture', resulted in a nearly complete loss of San identity and a fusion of San with other incorporated peoples in the colonial society (Szalay 1995). Barrow, travelling in the Graaff-Reinet district in the last years of the 18th century, noted that there were only about 600 to 700 slaves in the whole district, but there were at least 10,000 'Hottentots' (Eldredge 1994). By the early 19th century it would have been impossible to easily differentiate between those who were acculturated Khoekhoe, 'Bastards' or San, as all were now effectively dispossessed of independence and culture (Eldredge 1994; Szalay 1995). The introduction of wire fencing and jackal-proof mesh along with borehole technology at the beginning of the 20th century removed the necessity for traditional shepherds. For those KhoeSan of various origins who did not have gainful employment on farms, there was little other option than to live as squatters on the edges of towns in the region. It is from these economically marginalised people that the ranks of the modern "Karretjiemense" were drawn (De Jongh 2002). Folk lore links these itinerant sheep-shearers travelling between farms in their distinctive donkey carts with the last of the San of the Great Karoo, but ethnographic data cannot confirm this. Recent, but still unpublished research by Himla Soodyall of the Division of Human Genetics, National Health Laboratory Service and the University of the Witwatersrand, has suggested from DNA studies that the folk lore may very well be true and that the "Karretjiemense" remain genetically San. If so, skeletons such as that from Leeufontein provide tangible evidence of their roots.

Ultimately, the identification of the man from Leeufontein must rest on the likelihood that the inhabitants of the region in the 17th century were San foragers. The burial style and information from the bones on life habits are consistent with this identity. Perhaps more importantly, the individual from Leeufontein is the first LSA individual to be fully described from the heart of the Great Karoo.

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