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Human remains from Ntshekane, an Early Iron Age site in central KwaZulu-Natal

[1,2]**Lawrence S. Owens**, [2]**Carolyn Thorp** and [3]**Gavin Whitelaw**

[1]Department of Archaeology, University of Winchester, United Kingdom; Anthropology & Archaeology, University of South Africa, South Africa; lawrence_owens@yahoo.co.uk

[2]KwaZulu-Natal Museum; Anthropology & Archaeology, University of South Africa, South Africa; cthorp1952@gmail.com

[3]KwaZulu-Natal Museum; Geography, Archaeology & Environmental Studies, University of the Witwatersrand, South Africa; gwhitelaw@nmsa.org.za

ABSTRACT

Research at the Early Iron Age site of Ntshekane in central KwaZulu-Natal, South Africa, recovered human skeletal remains representing a pregnant adult, two young adults and two infants. All were exposed by severe erosion. Ceramics and an interpretation of settlement history at Ntshekane suggest an infant buried in a grain pit dates to the Msuluzi phase (630–800), one young adult to either the Ndondondwane (800–950) or Ntshekane (950–1050) phase, the second young adult to the Ntshekane phase, with the pregnant woman and possibly the second infant belonging to the Ntshekane phase. The dentition of the pregnant woman and a modified tooth associated with the remains of one young adult indicate the practice of dental modification. Differences in the interments of the two infants possibly relate to the circumstances of their deaths.

KEY WORDS: Southern Africa, Early Iron Age, human remains, dental modification, death in pregnancy, burial, ancestors, anthropological interpretation.

This article considers the skeletal remains of several human individuals recovered from the Early Iron Age site of Ntshekane in central KwaZulu-Natal. Some background is necessary to put these remains in context.

Archaeologists divide the Iron Age of KwaZulu-Natal into two periods based on material culture and site distributions. The Early Iron Age dates from about 300 to around 1050, with the Late Iron Age following through to about 1840. A substantial body of Early Iron Age research conducted since the early 1970s provides the basis for a sound understanding of agriculturist communities of the period. The research began with Tim Maggs's excavations at Ntshekane and expanded to include other sites in the uThukela and uMngeni basins, as well as in the coastal belt (Maggs 1989, 1994–95).

Based on ceramic style and radiocarbon dates, archaeologists define five phases within the local Early Iron Age. From earliest to most recent these are Silver Leaves, Mzonjani, Msuluzi, Ndondondwane and Ntshekane. These names derive from the sites at which the ceramic styles were first described and also apply to the ceramic facies characteristic of each phase (for first descriptions see Klapwijk 1974; Maggs & Michael 1976; Maggs 1980a, b, 1984a; Klapwijk & Huffman 1996).

The two earliest facies belong to the Urewe Tradition and the subsequent three to the Kalundu Tradition. Both ceramic traditions contain younger facies directly linked to speakers of Eastern Bantu languages of the Nguni, Sotho-Tswana and Shona clusters, as well as Swahili (e.g. Urewe Tradition: Tana, Icon, Blackburn; Kalundu Tradition: K2, Mapungubwe, Great Zimbabwe, Khami; merged facies: Tavhatshena, Letaba). In

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the absence of evidence to the contrary, it is most likely that the older facies were also made by speakers of Eastern Bantu languages (Huffman 2007: 335).

THE NTSHEKANE SITE

Ntshekane is situated near the village of Muden in KwaZulu-Natal, South Africa (Fig. 1). Its name derives from a small river that flows past the site into the iMpofana, a major tributary of the uThukela River. Ntshekane's location is typical of Early Iron Age sites in southern Africa (Maggs 1980c, 1984b): the settlement was built on deep arable soil in a low-lying valley dominated by bushveld containing hard- and softwood trees, as well as year-round sweetveld grazing. Annual rainfall was, and continues to be, adequate for the suite of crops that Early Iron Age agriculturists cultivated. The hills around the site contain seams of iron ore in sedimentary deposits that provided the raw material for the production of iron. Today, archaeological features at the site are exposed by severe erosion that was probably initiated during the 1st-millennium occupation, then accelerated by more recent land uses. The erosion removed many traces of above-ground structures and exposed underground features such as storage pits and graves.

Tim Maggs named and excavated the site in 1973 (Mason et al. 1973; Maggs & Michael 1976). His work at Ntshekane established the essential characteristics of Early Iron Age life in the region. Domestic animals (cattle, sheep and possibly goats) provided most of the meat that the community ate, and dogs were part of daily life. Pits, grindstones and a preference for arable soils indicated grain cultivation and storage, while the pattern of pit fillings suggested ritual practices. Buildings were constructed of poles, thatch and mud plaster. Flaked stone artefacts and ostrich-eggshell disc-beads and fragments hinted at interaction with hunter-gatherers, while a glass cane bead pointed to international exchange networks. Two radiocarbon dates on charcoal from pits V and O assigned the larger proportion of the deposits to the 10th century (Pta-1057, 1100±50 BP; Pta-1058, 1150±45 BP), but ceramic style suggested an earlier occupation. Indeed, Ntshekane displays the pattern of long-term occupation or reoccupation of sites that was common during the Early Iron Age (Maggs & Michael 1976: 737; Maggs & Ward 1984: 136–7). Maggs's research at other sites significantly reinforced and also added to his interpretation of Ntshekane (Maggs 1980a, b, 1984a; Maggs & Ward 1984; Ward & Maggs 1988: 415).

Fieldwork for the current project began in 2015. Ongoing erosion since 1973 had destroyed some of the features that Maggs identified, but exposed new ones, including human burials. The project sought to rescue newly exposed material and to determine whether application of the Central Cattle Pattern could make sense of the distribution of features on the site (Huffman & Whitelaw 2020).

The Central Cattle Pattern is a model of settlement organisation based on anthropological and historical data related to Eastern Bantu speakers in southern Africa and accumulated mainly during the past 200 years (see Kuper 1980, 1982; Huffman 1982, 2001). Research since the mid-1980s shows that spatial and social principles adequately represented by the model most likely applied to Early Iron Age sites. This is true for Kalundu Tradition sites in the uMngeni (KwaGandaganda: Whitelaw 1994, 1994–95) and uThukela valleys (Ndondondwane: Maggs 1984a; Loubser 1993; Greenfield et al.

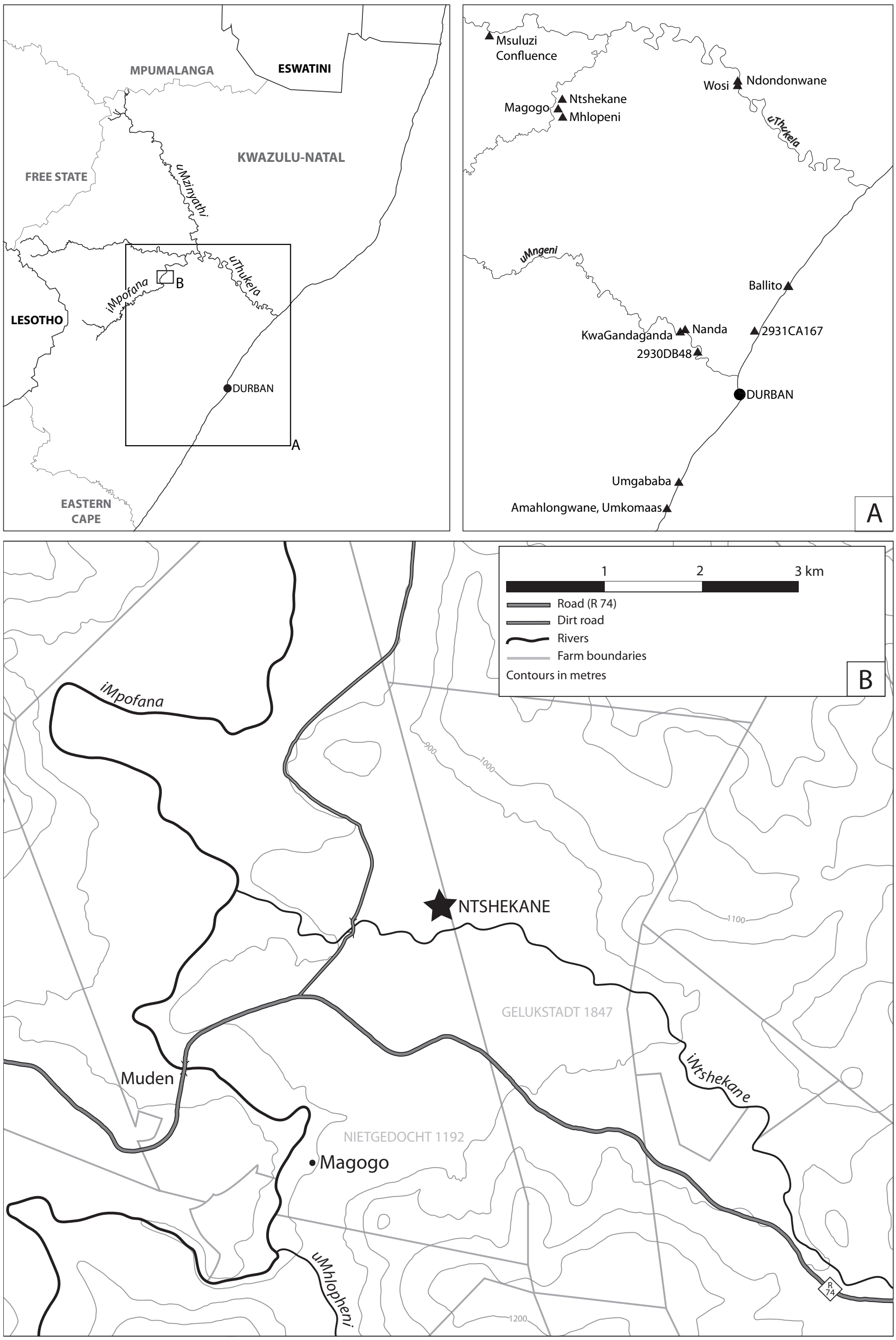

Fig. 1. Ntshekane and other sites with burials in KwaZulu-Natal (Table 1). The site Mhlopeni lies about 3 km upstream of the uMhlopheni-iMpofana confluence (Fig. 1B). Illustration: G. Laue, 2022.

2005; Fowler & Greenfield 2009) and for a Urewe Tradition site in the Magaliesberg (Broederstroom: Huffman 1990, 1993).

In addition, sites of both Early Iron Age traditions with more limited excavations yielded finds and features in relationships that exist within the Central Cattle Pattern. Such sites include the Eiland component at Bambo 2329CD9A (Loubser 1981, 1994: 82–5, 144); Langdraai (Evers 1981: 87); Lydenburg Heads Site (Evers 1982); Happy Rest (Voigt & Plug 1984; Steyn et al. 1994), Ntsitsana (Prins & Granger 1993); Nanda (Whitelaw 1993); Kulubele (Binneman 1996); Riverside (Huffman 1998); Beauley, Millbank and Mototolong (Van Schalkwyk 1998, 2004, 2007); Lebalelo (Huffman & Schoeman 2011); and Rhino (Huffman et al. 2020).

The wide distribution of these sites suggests that Central Cattle Pattern layouts and the associated worldview characterised agriculturist life in southern Africa from at least the 6th century onwards (Zimbabwe Culture societies to some extent excepted, notably in the case of elite social classes). Data for the earliest centuries of the Iron Age are not yet sufficient, but we can reasonably expect that, minimally, the seeds of the Central Cattle Pattern worldview structured agriculturist life in the 200–300 years prior to the 6th century.

At Ntshekane, the field team mapped every feature and labelled each with its survey point (SVP) number, thus SVP1, SVP2, etc. Wherever possible, features were assigned to a phase of occupation based on associated pottery. The features covered three phases of the local Early Iron Age sequence: Msuluzi (630–800), Ndondondwane (800–950) and Ntshekane (950–c. 1060). In addition, a few features yielded Blackburn ceramics (c. 1040–1300), indicating interaction between Ntshekane and Late Iron Age Blackburn communities. The analysis therefore confirmed the long-term occupation (or reoccupation) of Ntshekane that Maggs and Michael had suspected (1976: 737; also Ward & Maggs 1988: 415).

The application of the Central Cattle Pattern, moreover, brought sense to the seemingly chaotic distribution of exposed features at Ntshekane. Huffman and Whitelaw (2020) identified the position of up to ten livestock pens in the Ntshekane-phase horizon, four in the Ndondondwane horizon and at least two in the Msuluzi horizon (Figs 2–4). Their interpretation suggests continuous occupation of the site by a growing population through the three phases. These conclusions, and the broader settlement pattern evidence and ceramic continuities outlined earlier, provide the rationale for the use of ethnographies of Eastern Bantu speakers in interpretation of remains—including human skeletal remains—from Ntshekane and other Early Iron Age sites.

According to these ethnographies, people were typically buried in places they were associated with in life (e.g. Schapera 1937: plate XVIIb, 248; Krige 1962: 161; Boeyens et al. 2009: 230): the homestead head and his kin (commonly but not necessarily only male kin) were buried in or close to the cattle pen, wives were buried in courtyards behind their houses, and children were buried in the intervening spaces between cattle pens and households, or around or under houses, depending on age (Huffman & Murimbika 2003; Boeyens et al. 2009). Variations existed, but most had off-settlement consequences (e.g. Steyn et al. 2019: 43–5). This basic pattern therefore guides our hypotheses about the chronological and spatial context of the burials at Ntshekane.

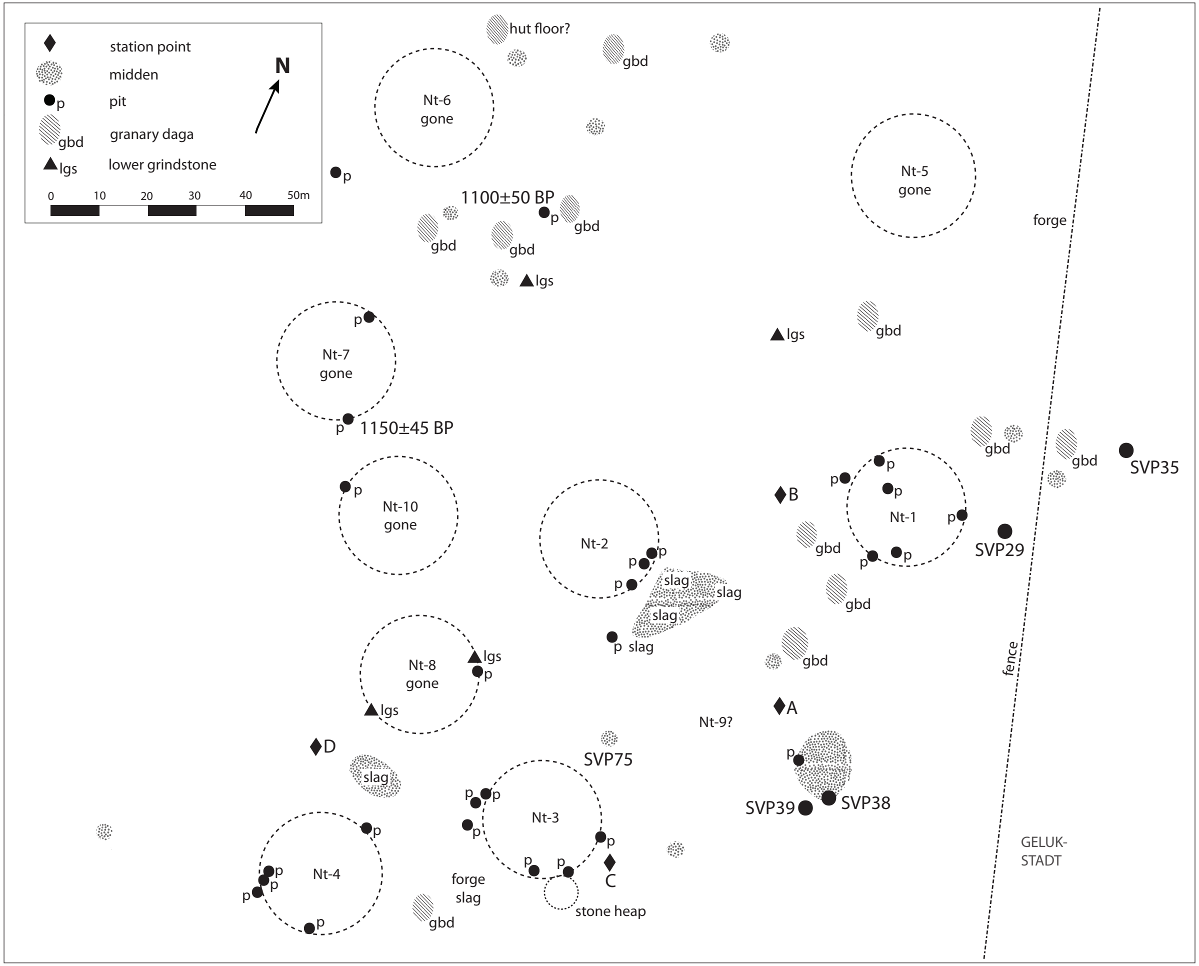

Fig. 2. Ntshekane-phase features at Ntshekane. Fence marks the boundary between the two farms. Illustration: G. Laue, 2022.

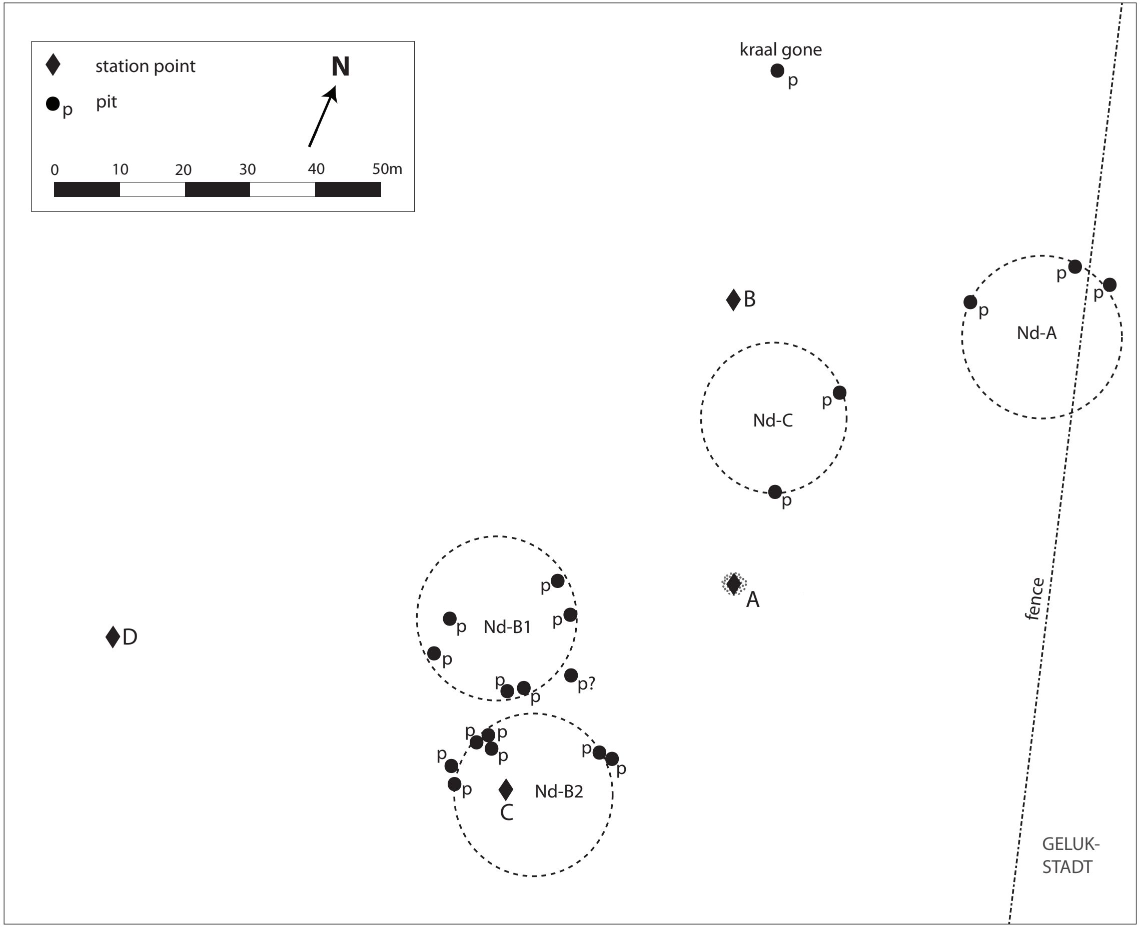

Fig. 3. Ndondondwane-phase features at Ntshekane. Fence marks the boundary between the two farms. Illustration: G. Laue, 2022.

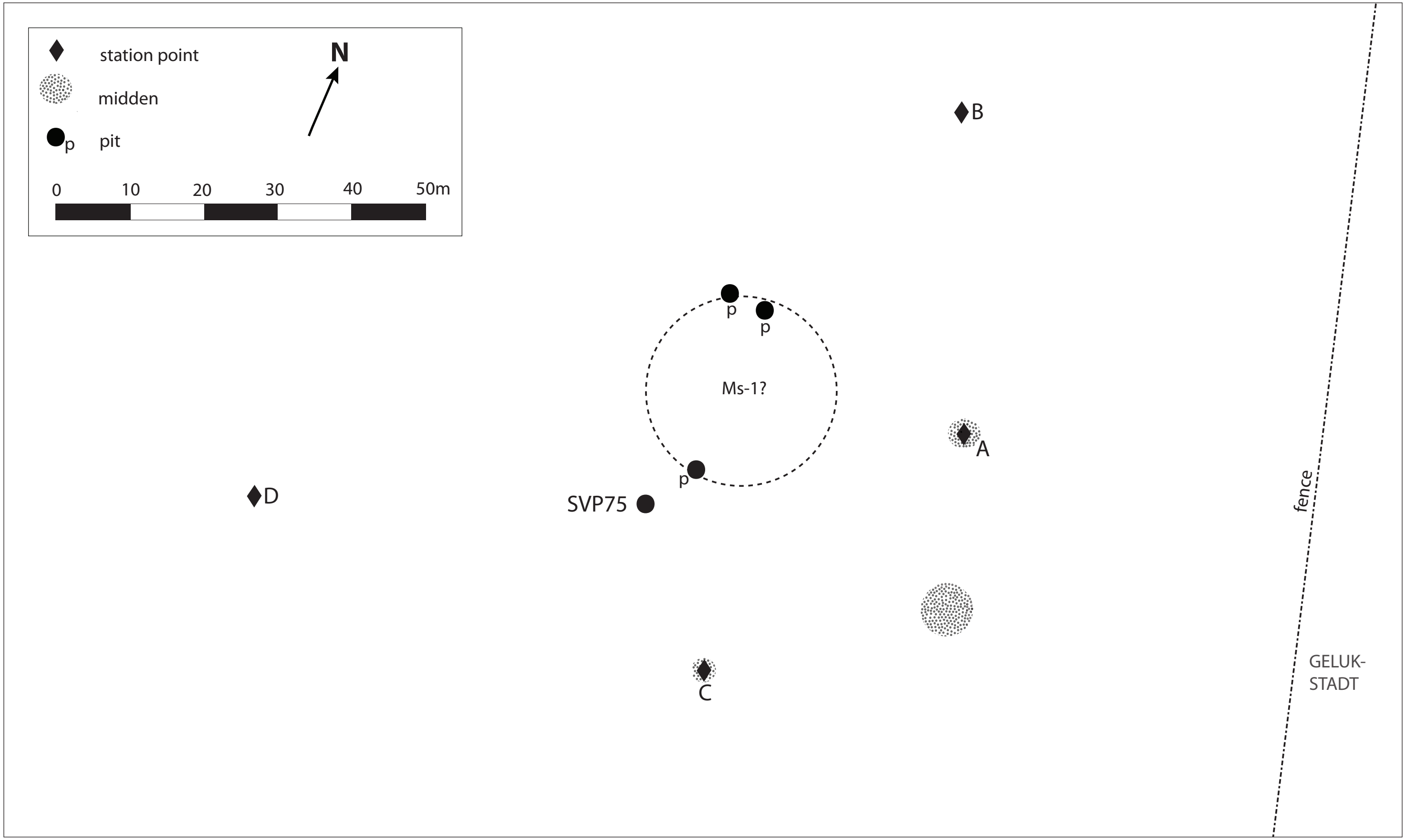

Fig. 4. Msuluzi-phase features at Ntshekane. The second hypothesised Msuluzi homestead centre lay north-east of Ms-1 on the farm Geluk Stadt. Fence marks the boundary between the two farms. Illustration: G. Laue, 2022.

BIOARCHAEOLOGICAL METHODS

The human skeletal remains were excavated by the current authors, student and other volunteers and the KwaZulu-Natal Museum team. The analysis excludes skeletal remains recovered after 2017. The skeletal remains were sexed by scoring pelvic morphology (sciatic notch, preauricular sulcus, subpubic concavity/angle and ventral arc) and characteristics of the skull (supraorbital complex, mandibular morphology, bossing, mastoid process, palate shape and nuchal/temporal crests). Methods are as laid out by Phenice (1969), Krogman and İşcan (1986), Buikstra and Ubelaker (1994) and Bass (2005). Subadult skeletal remains were aged using dental development, bone lengths and epiphyseal fusion (Scheuer et al. 2008). Adults were aged on the basis of pelvic (auricular surface, pubic symphysis) and cranial (dental wear, suture obliteration) markers into young adult (20–35), middle adult (35–50) and older adult (50+) age classes (Brothwell 1981; Lovejoy 1985; Lovejoy et al. 1985; Meindl & Lovejoy 1985; Brooks & Suchey 1990; Buikstra & Ubelaker 1994). Dental traits were scored according to guidelines summarised by Scott and Irish (2017). Dental filing and mutilation was scored with reference to Irish (2017). Dental pathology was scored in accordance with Hillson (2001), while determination of dental enamel hypoplasia followed guidelines set out by Reid and Dean (2000). Stature was assessed following Lundy and Feldesman (1987) and Raxter et al. (2006), with a soft-tissue correction from Brits et al. (2017). In cases where long bones were absent, the metacarpal method (Meadows & Jantz 1992) was used to determine stature. Body mass (weight) was calculated using the guidelines of Auerbach and Ruff (2004). Palaeopathology and joint pathology were scored according to the methods given by Waldron (2008).

THE SKELETONS

The skeletal remains described in this report represent two young children, two young adults and an older pregnant adult. Other than the foetal remains, each individual has a distinct SVP number (see Figs 2–4 for locations). Their remains comprise one-fifth of the published or analysed Early Iron Age human skeletons from KwaZulu-Natal (excluding isolated remains such as those from SVP75). They represent a significant addition to the data set and can therefore contribute to our understanding of the health and welfare of Early Iron Age communities. Table 1 lists the 28 individuals from the province, plus a single Blackburn-phase individual from 2931CA167 at eMdloti (all tables after the references). They provide a backdrop for the analysis and interpretation of the Ntshekane individuals.

SVP29

Archaeology

We recorded the burial at SVP29 in July 2015 on the sloping side of a deep donga, some 1.5 m below the surface (Fig. 5). Various disarticulated human bones occurred together with a worn red stone, a slab of sandstone, a broken dolerite boulder, and a dolerite lower grindstone with a flat grinding surface different from the characteristic grooves of grain grindstones. The red stone is a metamorphosed, iron-rich and pulverulent silty sandstone, probably of the Vryheid Formation. No cuts or fill lines were detected and the skeletal remains seemingly derived from a washed-out grave. No position could be discerned, although the pattern of missing bones and damage suggests the body

Fig. 5. SVP29 exposed near base of donga, indicated with point of staff. Photo: T.N. Huffman, 2015.

may originally have been vertically flexed. The cluster contained several large sherds, including pieces from a bowl and a pot with Msuluzi decoration, plus two small intact 'pinch-pots'—one an open bowl and the other a pot with a profile arguably most similar to an Msuluzi- or Ndondondwane-phase vessel, though it is too crude for certainty. The collection also contains Ntshekane-phase sherds; these are generally smaller than the Msuluzi-phase sherds. Cattle and sheep/goat bones were also recovered.

Huffman and Whitelaw (2020: 141) suggest that the SVP29 individual belonged to an Ntshekane-phase household east of cattle pen Nt-1 (Fig. 2); this possibility fits a female individual best. If the grave was instead of the Ndondondwane phase, the person was buried in cattle pen Nd-A (Fig. 3); this possibility fits male kin of the homestead head best, but the Early Iron Age includes examples of females buried in cattle pens (e.g. Mason 1981: appendix 2; Huffman 1993: 223; Morris 1993: 84; Whitelaw 1993: 74; Steyn & Nienaber 2000: 114–15). The Msuluzi sherds show that this part of the site was used during the Msuluzi phase and they perhaps derive from the second hypothesised Msuluzi homestead (Fig. 4 caption; see Huffman & Whitelaw 2020: 146). The size of the sherds suggests they came from a pit. They possibly came from the grave, or the Msuluzi sherds and the human skeletal remains represent two different features, with the contents mixed after erosion.

Skeletal remains

The skeletal remains represent a single individual, around 60% complete. Pieces of all six lower limb bones, fragments of both forearms, the left ilium, various tarsals, carpals, metacarpals, several vertebrae and some rib fragments were recovered (Table 2). The skull, upper limbs and torso were highly fragmented and incomplete. A single tooth was recovered, but no other parts of the skull. The skeletal remains were highly weathered, with extensive root etching, sun bleaching and some evidence for canid gnawing.

Fig. 6. SVP29: from left, lingual, labial, mesial and distal views of modified right maxillary first incisor. Scale in mm. Photos: J. Wintjes, 2022.

The fragmented pelvis was scored for sex characteristics. Of 10 traits scored, 90% indicated a female (subpubic concavity, sciatic notch, preauricular sulcus, arc compose, obturator foramen, iliac crest, subpubic angle, sacrum and pelvic outlet form), whereas the ventral arc was 'possible male'. Ageing data indicated a late adolescent individual, so sexing data may be inaccurate. Pubic symphysis age was consistent, at Phase 1 (15–24). The iliac crest, distal femur, distal ulna, distal radius, distal fibula, ischial tuberosity and several vertebral plates were either unfused or fusing (Table 3). These suggest an age from 15–22. Overall age is estimated at 15–17. As no fully fused long bones were present, stature was estimated using metacarpal lengths (Meadows & Jantz 1992). These suggested a stature of 156.5±5.1 cm (for the left MC4) and 157.8±5.1 cm (for the left MC5). The mean estimate is 157.2 cm. Body mass was estimated at 62.3 kg. There was no pathology to the shoulder, elbow, wrist, hip, knee or ankle, though both left- and right-sided anterior tali have squatting facets. No pathology was noted on the four lumbar, eight thoracic and single cervical vertebrae, except for a small osteophyte to one side of the superior articular process of L5. The sacrum, however, displayed *spina bifida occulta* between S2 and S5.

There is evidence of dental modification on the single remaining tooth, an upper right first incisor that displayed strong diagonal shaping to the mesial and distal aspects (Fig. 6). The distal was more strongly filed than the mesial, which would have resulted in a caniniform tooth, with the 'apex' lying mesial to the midline. The tooth was unaffected by hypoplasia or pathology.

SVP35

Archaeology

We recorded this burial in July 2015 in the concave wall of a deeply incised donga. The remains were visible some 50 cm below the surface underneath a boulder, originally placed on the body. Bone, cobbles, stones and potsherds lay on the erosion surface below the grave (Fig. 7). Further sherds embedded in the donga wall above the boulder were presumably also part of the grave fill. The grave is situated on the farm Geluk Stadt, which is adjacent to Nietgedocht where most of the exposed archaeological deposits occur (Fig. 1). We did not originally have excavation access to Geluk Stadt,

Fig. 7a. SVP35 burial in donga wall. Photo: T.N. Huffman, 2015. 7b. SVP35 burial on erosion surface below grave. Photo: L.S. Owens, 2017.

and the individual was represented only by skeletal remains collected over several field seasons from the collapsed deposit and donga floor below the exposed grave. All the skeletal elements collected came from the upper half of the body; we recovered more remains in 2021. By then, fragments of the lower limbs, the pelvis, the lumbar vertebrae and the covering stones were visible in the donga section, suggesting that much of the skeleton had already been lost.

The earth above and around the bones was much worked over by ants, with holes, sorted grains, white-flecked material (possibly organic) and chambers, some built against skeletal elements. Directly above the remains, from around 20 cm below the surface, the earth was softer, but around the bones it was much harder. Ant activity may have shifted some remains from their original context and mixed small sherds, slag and burnt bone in with them.

The body was probably buried in a horizontally flexed position, lying on the right side, with the body oriented roughly west (hips) to east (head) and legs flexed with the feet drawn close to the buttocks. The lower limbs included fragments of both femora, tibiae and fibulae. Based on photographs taken in 2015 and subsequent years, the body seems to have been tightly flexed—certainly this was true for the legs. Boulders, cobbles and other stones had been placed over the hips and probably the rest of the body. These included a large, flat, 5-cm thick dolerite slab with a faint grinding surface on one side below an even larger dolerite boulder. We observed at least two other large boulders over the skeleton earlier in the project. Other associated pieces included a broken dolerite lower grindstone. The weight of this covering had flattened the pelvis. The stone cover probably accelerated the loss of the skeleton as each piece was exposed and tipped by its weight out of the donga wall.

Sherds from the erosion surface below the grave refitted with a sherd embedded in the donga wall above the boulder. They come from a pot with a tall decorated neck, a near-vertical plain rim and a fairly weak shoulder (i.e. the diameter at the base of the neck approaches the shoulder diameter) (Fig. 8). This profile is typical of the Ntshekane facies (cf. Maggs & Michael 1976: fig. 7). The grave location is about 35 m north-east of cattle pen Nt-1 (Fig. 2). If female, the SVP35 individual was possibly

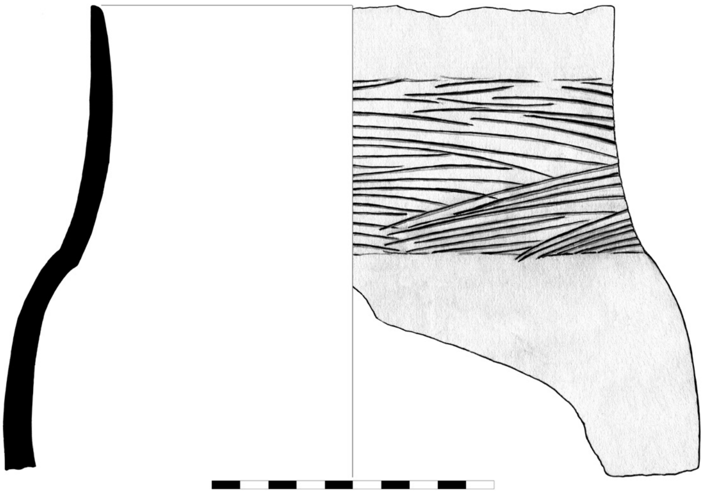

Fig. 8. Pot in SVP35. Scale in cm. Illustration: G. Whitelaw (drawing); J. Wintjes (digital editing), 2023.

buried in the back courtyard of a household in the Nt-1 homestead, but the presence of granary daga (SVP21 and 32) and midden deposits (SVP22 and 31) between SVP35 and Nt-1 means it is perhaps more likely that he/she belonged to an as yet unidentified homestead north-east of Nt-1.

Skeletal remains

The recovered skeletal remains include a fragmented skull (mandibular and cranial vault sections), fragments of the upper limbs, parts of both scapulae/clavicles and various pieces of the ribs and vertebrae. The remains had been subject to considerable weathering following their collapse into the donga, and several bore marks of canid chewing. The extreme fragmentation precluded a full analysis but it was possible to ascertain certain information concerning the individual.

The bones are generally gracile, suggesting a female, but it is not possible to confirm the sex of the individual owing in part to the poor preservation and also the young age of the individual. All the teeth are completely formed except the maxillary and mandibular third molars, for which the root apices were open. This suggests an age between 16 and 20 when a global sample is used, although the third molars are notoriously variable in terms of formation and eruption (Hillson 1996). The dental development data closely matches the almost unworn dentition and confirms an age in the mid- to late teens. The dental wear age range is 16–25, depending upon the method used. The few cranial sutures that could be scored are grade 1 (Meind & Lovejoy 1985), indicating an age range of 20–34 (see Key et al. 1994). No other ageing data is available.

There were traces of periostitis to the cranial vault, although this was much affected by post-mortem weathering and canid gnawing. The deltoid tuberosity of the humeri were unusually large for such an otherwise gracile individual. Extensive dental trait and measurement data was taken, owing to the unworn nature of the teeth (Tables 4, 5). There are no signs of dental caries or pathology on this individual, with the exception of very slight (trace) dental calculus. All dental surfaces are free of linear enamel hypoplasia (LEH), suggesting a good general level of health in infancy through to the age of around 12.

In summary, this individual is tentatively female, aged between 16 and 20, but likely at the younger end of this range. There are no signs of cause of death, skeletal pathology or trauma.

Miscellaneous human remains
A lower left canine came from the eroded surface below the grave. Since the SVP35 material includes a lower left canine, this tooth represents a second individual from this vicinity.

SVP38

Archaeology
This individual was located in 2017 between branches of the erosion gulley about 5.5 m north-east of SVP39. Skeletal elements (including parts of the upper limb) and teeth of a small child were exposed on the eroded surface towards the base of the donga. They were surrounded by numerous ceramic fragments (mainly Ntshekane, with some Msuluzi material) as well as weathered and fragmented bovid bones that probably derive from several eroded pits situated nearby. The SVP38 individual possibly belonged to the same Ntshekane-phase household as SVP39.

Excavation in the 2021 season revealed that the child had been buried in a horizontally flexed position, lying on the right side with the head to the north and face towards the west. The arms were flexed at the elbow, with hands towards the head.

Skeletal remains
The remains recovered in 2017 represent a single, subadult individual. The deciduous crowns are all complete and the roots in the process of formation. The estimated age is 2–3 years, based primarily on the ldm2 (2.5–3) and the udm1 (<3.1). No osteological markers of pathology were noted. Odontometrics and trait scoring are presented in Tables 6–8. There are no signs of trauma, pathology or cause of death.

SVP39

Archaeology
We first identified the SVP39 burial during a site visit in October 2011. Skeletal elements of the lower limbs were exposed among a cluster of stones on the edge of an erosion gulley. The cluster included a large lower grindstone and fragments of broken grindstones. We excavated the feature during the 2015 field season. Erosion since 2011 had altered the feature somewhat on its downslope gulley side, possibly causing the loss of some skeletal elements and stones (Fig. 9).

Excavation proceeded in a 2×2 m trench divided into 1 m^2 quadrants—G5, G6, H5 and H6. Most of the remains lay in H5 and H6, with the only skeletal elements in the G squares being either limb-bone fragments or material that had washed downslope from the H squares. We removed the pelvis and the cranium and mandible en bloc for processing later. Re-examination of the excavated trench in 2017 yielded a proximal adult fibula fragment, plus fragments of tarsal bones, including a navicular. A 6-cm length of a tibial diaphysis found on the surface some 25 m across the gulley from SVP39 possibly belongs to this individual.

The individual had been buried on the left side, with the head to the west. The arms were bent at the elbow with the hands close to the face. The arrangement of the legs is uncertain, but we suspect they were loosely flexed.

A large flat stone was placed over the abdomen and many other broken stones, including broken grindstones, lay over the thorax and head area. Some sherds, chunks of slag and a piece of ore among the stones were either part of the original body cover, or became incorporated as the site eroded. The covering was topped, as far as we can tell from the preserved remains, by a large lower grindstone over the abdomen. The weight of the stone cover evidently forced the thorax to twist in a westerly direction so that it almost appeared from the ribcage that the individual lay prone within the grave (Fig. 10). The shifting weight ultimately damaged the right scapula and adjacent vertebrae. The preservation of the ribcage shows that this settling must have occurred prior to severe decomposition of the soft tissue.

No trace of the grave cut remained. We speculate that the body and its stone cover were placed within a niche excavated into the wall of the grave shaft. Before it filled with earth, the niche would have provided the space necessary for the twisting of the thorax. The niche placement and the discomfort of working within a grave shaft could account for the possible loose arrangement of the legs. The grave shaft itself would then have contributed significantly to the erosion of the feature.

The left-side positioning in the grave suggested that the individual was a woman (cf. Huffman & Murimbika 2003: 241–3), while the lower grindstone suggested a married woman who had given birth at least once. The anatomical data confirms a female sex assessment, as did the foetal bones recovered from her lower abdomen. She was 5–6 months pregnant when she died.

Huffman and Whitelaw (2020: 142–3, 146) suggest that the SVP39 burial lay within the residential area associated with a livestock pen (probably for cattle) in the Ntshekane-phase horizon. The enclosure, Nt-9 (Fig. 2), was one of a cluster of livestock pens that possibly marked the centre of a large long-lived settlement, that of a chief. In this interpretation, the woman would have been buried in the back courtyard of her household (e.g. Huffman & Murimbika 2003: 242).

Skeletal remains

The condition of the bone is generally good with some sun bleaching and exposure damage (Tables 9–11). The pelvis is truncated and bleached, and has suffered canid chewing. The cranium is very gracile and elongated, with marked frontal eminences, smaller eminences to the left and right parietals, a rounded, smooth nuchal area, and a gracile form to the supraorbital region. On the postcrania, however, the individual is rather robust, with well-defined intertrochanteric lines, a well-marked fovea capitatis, strong supinator crests and crested tuberosities in the ulna and radius. All cranial and pelvic sexing indicators that could be scored (nuchal/supramastoid crests, mastoid process, supraorbital complex, temporal lines, frontal bossing, ramus width, palate shape, mental eminence, mandibular angle, ischiopubic ramus, sciatic notch, preauricular sulcus, arc compose, iliac crest robusticity and width of the pubic body) suggested that the individual is female, with the sole exception being a male-like gonial flare. The individual's sex was confirmed by the discovery of foetal bones in the lower abdominal cavity (see SVP39A later).

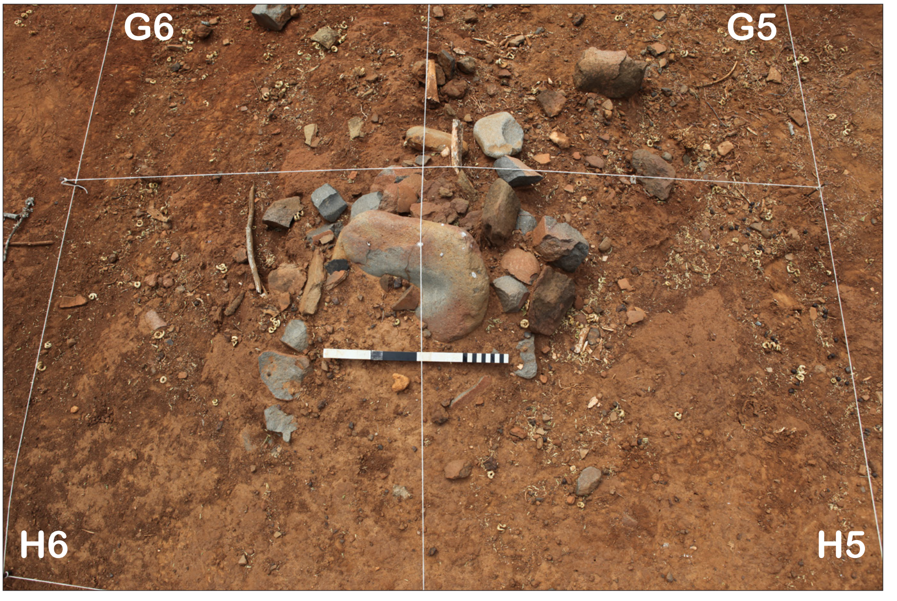

Fig. 9. SVP39, viewed from south-west. Note the lower grindstone over the abdomen. Photo: M. Munzhedzi, 2015.

All the long bones recovered were fully fused, so the individual was adult when she died. Dental wear levels were quite low (17–27) and cranial sutures also provided a youthful estimate (20–34); however, the pubic symphysis and auricular surface (phase 4/4) provided an age in the later 30s to 40s ('middle adult'). This inconsistency

Fig. 10. SVP39 remains with stone cover removed. Photo: M. Munzhedzi, 2015.

may reflect the individual's seemingly active lifestyle. Stature was estimated from the ulna (254 mm) and the radius (234 mm), giving estimates of 162.40±3.63 cm and 162.14±3.39 cm, respectively (cf. Lundy & Feldesman 1987; Brits et al. 2017). Metacarpal-based stature estimates ranged from 155.9 to 166.7 cm (Meadows & Jantz 1992). These results place the SVP39 woman at the upper end of the medium height category (155.5–163.9 cm) for modern South African black women (Steyn & Smith 2007). Her height was also similar to the averaged preferred interpretive estimates for women of Isamu Pati (156.3 cm) and Ingombe Ilede (161.9 cm) (Gibbon et al. 2014: 106), where the soft-tissue correction was probably underestimated. Her body mass was estimated at 57.9 kg, using AP femoral head diameter. Osteological and dental non-metric traits and measurements are presented in Tables 4 and 5.

There was a single very faint hypoplastic line on the lower left canine, indicating some form of systemic stress in childhood. Wear patterns suggest that the individual chewed preferentially on her left side. The individual exhibited ante-mortem tooth loss and pathology indicative of cultural dental modification. The upper first incisors were ablated on both sides and the sockets fully resorbed. The lateral incisors and right canine are absent, but were lost post-mortem as the sockets are extant. The upper left canine was filed both mesially and distally. This resulted in the removal of the enamel, extensive exposure of the dentine, and mesiodistal reduction of the visible crown diameter in buccal view, lending a somewhat 'fang-like' appearance (Fig. 11). The upper left first and second premolars were absent, lost post-mortem. Damage to the mandible precluded ascertaining whether the four lower incisors were similarly affected. No other dental pathology was noted.

The individual showed no signs of skeletal pathology other than a build-up of new bone in the frontal sinus. *Cribra orbitalia* was absent. Minor signs of wear and tear to the articulations were noted, including mild peripheral lipping to the acetabula, the left auricular surface, and the articular facets of L2-3-4. The mandibular condyle was unaffected. A sacralised L5 was also noted. An isolated fragment of the left tibial diaphysis showed considerable reactive bone and periostitis, suggestive of either a systemic/physiological issue, or localised soft-tissue pathology.

In summary, these are the skeletal remains of a young adult (20–35) woman, probably aged in her 20s, who seems to have had a fairly active lifestyle. She was pregnant at the time of her death. There are no indications of skeletal pathology, except for minor

Fig. 11. SVP39: modified left maxillary canine. Photo: L. S. Owens, 2017.

wear and tear to the joints, a small localised infection, and bony proliferation in the sinuses that was likely caused by smoke or particulate inhalation. Her stature is slightly above comparative samples described elsewhere in the region, yet not markedly so. Her dental health was good—other than ablation and modification—with a minor suggestion of systemic issues in her youth.

SVP39A

Context

Processing of the sediment inside and around the SVP39 pelvis revealed a foetal scapula and various cranial and postcranial fragments.

Skeletal remains

This individual comprises around 20% of a foetal skeleton, consisting of parts of the skull, thorax, shoulder and upper limb. The tooth germs were absent and the dm1-2 crypts too poorly preserved and ill-defined to determine developmental stage; the fact they were present at all indicates that the foetus was over 23.5 foetal weeks, the maximum cusp initiation age for dm2 (Lunt & Law 1974). The first incisor crypts were well formed enough to determine that the germs were not more than 50% complete, indicating an estimated age of 5–6 months in utero. Measurements of the vomer, scapula, zygomatic and basilar portion all indicate an age between 24 and 32 foetal weeks, largely in agreement with the dental (crypt) data (Scheuer et al. 2008) (Table 12). Given that much of the literature concerns white North American samples—and that sub-Saharan children tend to mature c. 5% faster than white children—it is possible that this figure overestimates actual age (Harris & McKee 1990). The individual could not be sexed. No pathology or trauma was noted.

SVP75

Archaeology

The burial at SVP75 was identified and photographed in 2014 (Fig. 12). Excavation began in July 2016. We established a 4×3 m grid of 1 m^2 squares over SVP75 and other nearby features. The skull protruded slightly above the ground within a raised area of dark grey ashy soil. The thinness of the exposed skull suggested a small child.

We excavated the burial in six 5-cm spits. The grave shaft, roughly oval in plan, had been dug into a pre-existing pit that had likely been used for storing grain. Apart from the skeletal remains, the grey ashy fill of the grave contained some large stones and was easily distinguishable from the surrounding harder, orange-clayey deposit (Fig. 13). The grave extended some 30 cm beneath the modern surface. The body had been placed facing west in an upright, tightly flexed position and was originally held in place by two large stones. The left and right arm bones lay between 12 and 15 cm deep, level with the top of the rib cage. During burial they had probably been positioned bent at the elbows and raised so that the hands and wrists reached to either side of the neck.

The proximal end of the left tibia lay at nearly the same depth (10 cm) as the top of the rib cage (12 cm), indicating a flexed position with the knees drawn up towards the rib cage. An undecorated sherd lay immediately below the ribs and vertebrae, while the skeleton rested on a large stone above a tuyère fragment.

Fig. 12. SVP75 burial exposed on surface, viewed from north. Photo: M. Munzhedzi, 2014.

The fill of the storage pit below and around the grave included patches of ashy deposit, grey and red soil of varying textures, and areas of hard red termite nest (Fig. 13). The walls of the pit were rough and hardened red clay without any evidence of dung lining. The pit reached a depth of 72 cm. It had a constricted mouth but opened to a maximum width of 96 cm. It contained stones of varying sizes, sherds, slag, and tuyère and furnace wall fragments. The sherds are of the Msuluzi facies.

Huffman and Whitelaw (2020: 145–6) place the pit about 7 m south of cattle pen Ms-1 in the Msuluzi phase horizon (Fig. 4). The pit would have been under cattle pen Nd-B1 during the Ndondondwane phase (and so probably not visible), and about 2 m north of cattle pen Nt-3 during the Ntshekane phase (Figs 2, 3). Based on these interpretations, the child was most likely buried in the Msuluzi phase; burial in the Ndondondwane phase is least likely.

Skeletal remains

The burial was mostly intact but had become partly disarticulated owing to collapse of the body after deposition, and perhaps termite activity. Preservation of the skull and axial skeleton was poor, although the appendicular skeleton had fared better. Small bones such as epiphyses, phalanges, tarsals and carpals were underrepresented.

The individual was aged using both dental and osteological indicators, which provided contrasting results (Table 13). In general terms, the data suggested a slightly older age than SVP38, although in the same range of 2–3 years (UM1 2.5+; dum2 2.5–3). We favoured the dental data over that derived from diaphyseal length (Scheuer et al. 2008), which suggested an age ranging from 0.75–1.0 (tibia/femur) to 2.25 years (basilar portion) (Table 14). This highlights the problem of using universal standards of osteological development to age subadults, as this individual would have been judged to be 'too young' if only diaphyseal lengths were used. Dental traits were also noted and are presented in Tables 6 and 7. There were no signs of pathology and the teeth were clear of caries. A single hypoplastic pit was noted on the lower right deciduous canine. No *cribra orbitalia* was noted.

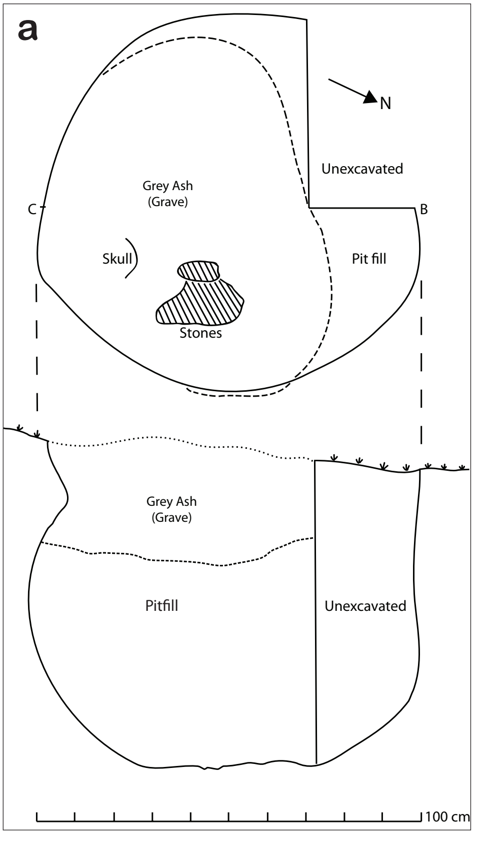

Fig. 13a. Plan of SVP75 grave within pit and cross-section of the pit. Illustration: G. Laue, 2022. 13b. Pit below child's grave, viewed from east. Photo: M. Munzhedzi, 2017.

In summary, these remains represent an infant of around 2.5–3 years. No trauma or pathology was detected, except for the single hypoplastic pit on the lower deciduous canine. Cause of death is unknown.

Miscellaneous human remains

The excavation yielded human remains unrelated to the child's skeleton. These were a left temporal petrous fragment with the mastoid process, probably of an adult woman, from the surface in the vicinity of SVP75; fragments of an adult skull from Spit 1; two carpal fragments from Spit 5, one of which is possibly arthritic; and two worn molars suggesting an age of 40–50+ years, also from Spit 5. These bones probably came from a nearby burial exposed by erosion and entered SVP75 through an animal burrow. A single adult finger phalanx came from the bottom 20 cm of the pitfill, well below the child's grave. It possibly derives from ritual linked to the original use of the pit, or to the filling that ended its life as a storage facility.

SUMMARY OF OSTEOLOGICAL INFORMATION

The six individuals recovered from Ntshekane cannot be representative of the population as a whole, but certain points can be noted.

Demographic data

The sample comprised three adults, two infants and a foetus. All the adults were probably female. Both children were of similar age (2–3 years old). All appear to have been buried within the confines of the settlement and thus proximate to the society's main activity areas. Two individuals, both probably female, were young adults at death. The other female individual was somewhat older and died while pregnant. The finding of solely women and children may be interpreted in terms of social and site structure (e.g. Huffman & Murimbika 2003); the absence of males suggests that men were buried in cattle pens, which are now largely lost to erosion (Huffman & Whitelaw 2020).

Anthropometric data

Long-bone measurements were carried out where possible; forearm bones and metacarpals were used for stature calculations in SVP39 and SVP29. Results using the different methods were consistently 156–163 cm, largely in line with other stature data for black women in southern Africa (Steyn & Smith 2007; Gibbon et al. 2014: 106). Body mass estimation from femoral head diameter were similarly consistent for the female individuals, ranging from 57.9 kg (SVP39) to 62.3 kg (SVP29); these figures are at the higher end of the 48.24–63.21 kg range for Zambian females (Gibbon et al. 2014: 106). Platymeric[1] and platycnemic[2] indices were calculated for the proximal femora and the tibiae, producing cross-sectional shape variants that have been shown to differ between populations (Bass 2005). The femora scored under 84.9 (SVP29 73.333; SVP39 78.125) and are therefore platymeric—broad/flat from front to back. The platycnemic index expresses the mediolateral flatness of the tibial diaphysis, which is both behaviourally and genetically defined. Both tibiae were mesocnemic (SVP29 68.57; SVP39 67.65), an intermediate level of trait expression. It was not possible to use CRANID to map the cranium's morphological characteristics against world populations (Wright 2010), owing to poor preservation—only 8 of the required 29 measurements could be taken on SVP39. Maximum length and breadth permitted assessment of the cranial index, a general measure of skull shape. SVP39's skull was dolichocranic, with an index of 62.24, indicating that the skull was very long relative to breadth. None of the other craniofacial indices could be calculated.

Odontometrics were taken on all adult and deciduous teeth to enable eventual assessment of genetic relationships on an intra- and inter-group level, as well as wider perspectives on environmental and dietary adaptations. Buccolingual and mesiodistal (breadth and length) diameters of all preserved teeth were taken, and crown areas were calculated. The total postcanine area was calculated for SVP35: the area of the maxillary dentition was 533 mm^2, while the area of the mandibular teeth was 484.4 mm^2. This generally agrees with the tendency of sub-Saharan African teeth to be larger than those of Eurasian groups (Pilloud et al. 2014), although there is considerable variability in Central Africa at least (Romero et al. 2018). With a sample of only two adult individuals, it is difficult to say much about odontometric trends in this group. It remains to be seen how these individuals fit into current understanding of dental size in African populations. Dental traits were scored for the same purpose.

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[1] Platymeric index (subtrochanteric AP diameter ×100/subtrochanteric ML diameter).

[2] Platycnemic index (ML diameter at NF ×100/AP diameter at NF).

Pathology

There was no major visible osteological pathology on the skeletal remains. There were minor patches of periostitis and hypoplastic defects, but there was no major infection or systemic impact so far as could be determined and no specific diseases could be identified. No degenerative joint diseases were noted. Further finds may highlight behavioural differences between the sexes and the results of ageing and loading on the skeleton (Klaus et al. 2009). The individuals described here were very young, however, and it is thus unlikely that they would have suffered any joint disease, even in a group that would ordinarily be prone to it.

Dental pathology—caries, chipping and hypoplasia—was uncommon in this group, although the small sample size and the young ages of the individuals should be taken into account. Caries and chipping prevalence are informative in terms of diet, while hypoplasia may identify social conventions concerning perturbations during development.

A total of 311 dental sites of the two adults were scored for caries prevalence, including the occlusal surfaces, approximal ends, sides, and all four root surfaces of each tooth. Overall caries levels were quite low (3.2%; 10/311), although lower levels have been reported elsewhere in South Africa (e.g. 1.4% by L'Abbé et al. 2008). The prevalence of caries in these two individuals was fairly low—SVP35 showed caries at 2 of 195 sites (1%), whereas the older SVP39 was affected at 8 of 116 sites (6.9%)—but this would be expected in fairly young individuals. The majority of lesions were located in the fissures of the crowns (molars and premolars) and some root surfaces when exposed by wear. This pattern differed from that of Iron Age Zambians, where 78% (43/55) of lesions were on the approximal surfaces (Gibbon & Grimoud 2014), implying a different dietary or behavioural profile. It should be noted that the data were not gathered in the same way, and comparisons may be skewed.[3]

It would be premature to discuss the dietary implications of these findings on the basis of such a small sample, although the basic corollary—increased caries with increased sugars and carbohydrates such as cereals; reduced caries in groups with increased levels of dietary protein such as milk or meat—has obvious implications for this agricultural economy (see Hillson 1996, 2001). The higher prevalence of caries in women, owing to behavioural and hormonal differentiation from men (Lukacs & Largaespada 2006), could not be tested as there were no male individuals in this sample.

Dental chipping was uncommon, except in cases of deliberate dental modification. Only one distinct band of hypoplasia was noted (in SVP39), which had been acquired at c. 3.1–3.6 years; this tends to suggest a lack of major systemic issues in childhood. No deciduous dental pathology was noted.

Trauma

No trauma was found, although the fragmentary nature of the specimens should be considered, as should the possibility of injury to soft tissues only. Eastern Bantu groups are not known for having particularly high levels of trauma (e.g. Gibbon et

[3] While not strictly comparable, a study by Manyaapelo (2007) of 19th-century Cape Town residents puts the average prevalence of caries at 13.9%.

al. 2014); however, a larger sample of both sexes would be necessary to assess this at Ntshekane.

Dental modification and cultural behaviour

Dental ablation, shaping, filing and chipping was once common on the African continent. Motivations include ornamentation, punishment, proof of the ability to withstand pain, or as markers of ethnic affiliation, adherence to tradition, or completion of initiation ceremonies (Irish 2017: 35; also see Pinchi et al. 2015; Wandera & Kasumba 2017). The tradition has been practised since the Palaeolithic (Irish 2017: 33–4), throughout the Iron Age, the colonial period (Manyaapelo 2007) and into the present (the so-called 'passion gap', or 'Cape Flats Smile': Morris 1998). While the practice may be widespread, there has been a lack of reporting and thus systematisation for recording dental modifications. Different styles have arisen in different areas of southern Africa, including in indigenous hunter-gatherer populations, although the practice appears to track the spread of Bantu speakers in sub-Saharan Africa (Irish et al. 2014; Irish 2017).

Of the 28 Early Iron Age individuals from KwaZulu-Natal (Table 1, Fig. 1), 12 were identified as either 'adult' or at least 20 years old at death. Six of the 12 displayed dental modification. The late adolescent from Mhlopeni provides a seventh case. Insufficient data exist for the remaining six adults, but there is no example of an adult with adequately preserved dentition that does not have dental modification. These data favour a hypothesis that dental modification was the norm for all adults in Kalundu Tradition communities during the Early Iron Age. Three individuals emphasise this point. A1060 Umgababa and A2120 Ballito Bay are directly dated to the cusp of the Blackburn phase that marks the first settlement of Nguni speakers in the region. The dentition of both is modified. By contrast, the dentition of the Blackburn-phase (based on ceramics) woman from 2931CA167 eMdloti is complete, except for a few post-mortem losses (Steyn & Mosothwane 2012). A1060 and A2120 most probably belonged to Ntshekane-phase communities, while dental modification is apparently absent in subsequent Blackburn Branch communities.

Two skeletons from Nanda in the uMngeni valley provide a clear illustration of Early Iron Age dental modification. All four mandibular incisors were removed, as were the two maxillary first incisors. The maxillary second incisors and maxillary canines were probably all chipped on their labial surfaces to shape them into points (Morris 1993: 87, 90). Both males and females endured this operation, most likely in their teenage years. The anterior dentition of a 12-year-old girl from site 2930DB48, also in the uMngeni valley (cf. Whitelaw & Moon 1996: 57),[4] is complete, while that of the 15–18-year-old young man from Mhlopeni, near Ntshekane, is not (Gibbon 2019a, b). The modification on the Mhlopeni individual seems to follow the Nanda pattern.

The Nanda pattern seems to apply to the remains of an older man (40–60 years) at Happy Rest. He was buried in a cattle pen, vertically flexed and 'seated' on a 'step' within the grave. He wore an ivory bangle, a lion-tooth pendant and a decorated bone bead—all probably signifying status (Voigt & Plug 1984; Steyn et al. 1994; Steyn & Nienaber 2000: 115). Burial 4 at Broederstroom provides another example of the

[4] Whitelaw and Moon (1996) incorrectly identify the individual as an adult.

Nanda pattern; she died in her early 20s and was buried vertically flexed in a cattle pen (Mason 1981: 404–5, appendix 2, 415–16; Huffman 1993: 221, 223). Finds at the site of isolated teeth in cattle pens and maxillary and mandibular fragments in pots also conform, both to the pattern and the teenage timing of the operation. Variation, however, occurs in the form of swallowtail mutilation of a mandibular right first incisor—a tooth that was discarded in the Nanda pattern (Van Reenen 1975, 1977). Naba and Lanlory in Zimbabwe provide further variation, with the removal of upper and lower first incisors only, and upper incisors filed into points (Huffman 1979: 14, 28).

Minor variation also occurs at Ntshekane. The incisor absence and canine chipping on SVP39 is consistent with the Nanda pattern, but the shaped maxillary first incisor from SVP29 is not. Instead, it resembles the equivalent tooth in A1071, an adult male individual from the KwaZulu-Natal coast (Table 1, Fig. 1). Also worth noting at Ntshekane is that the SVP35 individual had not suffered the operation, despite having reached her mid- to late teens at death. At the same age, the tooth sockets of the young man from Mhlopeni had already resorbed. This difference suggests that the timing of the operation was not scheduled according to the age of each youngster, but was rather a somewhat irregular event in which all teenagers in an administrative unit (either neighbourhood, district or chiefdom) were communally processed by an experienced ritual specialist.

Morris (1993: 97) perceptively notes that Early Iron Age dental ablation is represented on three (and probably originally four) of the famous Lydenburg head sculptures, reflecting its sociocultural significance. Inskeep and Maggs (1975: 136) suggest that the heads functioned in an initiation context. Loubser (1993: 147) develops this idea for the heads from Ndondondwane in the uThukela valley, arguing that ceramic heads and associated structures were used in premarital initiation schools. This hypothesis conforms to the suggestive skeletal evidence for the periodicity of dental modification. Hall (2015) adds additional weight to the hypothesis with his innovative interpretation of the seventh Lydenburg head. In contrast to the anthropomorphism of the first six heads, the seventh has animal features (Inskeep & Maggs 1975: 131). Its teeth are set towards the back of its mouth. Hall argues that it is modelled on the aardvark, an animal that loses its anterior teeth as it matures to adulthood. The dental history of Early Iron Age people thus mirrored that of aardvarks, with maturity visibly indicated by the loss of anterior teeth. Significantly, in myths of sub-Saharan Africa, aardvarks are commonly involved in the creation of human culture. Variation in modification practice, especially the retention of shaped anterior teeth, might require an extension or elaboration of Hall's hypothesis. Nevertheless, for each person, enduring dental modification was likely a mandatory step in premarital rites of passage towards achieving fully cultural, adult status.

TREATING DEATH

The social impact of death is configured according to a host of norms and conventions around the social identity of the deceased, the social standing of their kin group, the cause of death and the magicoreligious infrastructure within society. While deaths of elderly individuals may be 'expected', their status may result in greater social impact than the unexpected death of a very young individual who has not managed to achieve a status requiring significant lamentation. Conversely, untimely or unnatural deaths can provoke concern and fear, and healing might require special treatment of the body. The individuals described here all experienced untimely deaths.

SVP39

From the point of view of untimely deaths, the SVP39 case is the greatest tragedy. It was not possible to determine if this pregnant woman was primiparous or multiparous. Her estimated age and the lower grindstone over her abdomen suggest that she was already a mother at the time of her death, meaning that she had an established creative capacity. If, on the other hand, her pregnancy at death was her first, then she had, minimally, provided evidence of her creative potential. Her death terminated this capacity/potential. In a similar situation, one of Berglund's (1976: 80) interlocutors commented: 'The most terrible thing of all is that she could still bear children, there being one already (the deceased was pregnant). But now there will be no more children by her.' Such deaths can invite suspicion of witchcraft directed at the family and we can expect that these concerns would have flared, especially if the SVP38 individual was an earlier child of hers.

Burials with in utero foetal skeletons are rare in archaeological contexts. This rarity is largely artificial, for while childbirth has always been a major cause of death in young women, a combination of hostile sediments and untrained excavators means that many foetal skeletal remains have been destroyed or gone unrecognised. Off-settlement burial traditions for pregnant women are also a possibility, thus reducing the likelihood of archaeological discovery. In Venda practice, women who died when pregnant were buried in a riverbank 'and a little channel of water … [was] directed to run over the grave' (Stayt 1931: 163). This treatment was designed to cool the polluting heat of the death, preventing it from adversely affecting the health and good fortune of associated people and things. Similar strategies surely existed in the past, using both riverbanks (e.g. L'Abbé et al. 2008: 29; Boeyens et al. 2009: 233) and other landscape features assigned the capacity to cool hot deaths (cf. Steyn et al. 2019: 44–5; Meyer et al. 2021: 529). SVP39 nevertheless indicates variation in practice, some of which might relate to the timing of death during pregnancy (Boeyens et al. 2009: 232–3).

It is not possible to identify the cause of death of the SVP39 mother and child. The foetus was too young to have reached the point of birth, although premature labour is not impossible. Typical causes of death in pregnancy include dystocia linked to foetal malpositioning (Malgosa et al. 2004), head/pelvis disproportion, eclampsia and a range of infections. Not enough was preserved to determine if complications in (premature) delivery were to blame for the death of foetus and mother. The absence of the lower limbs and the body below the upper thorax of the foetus may be indicative of breech position resulting in dystocial labour. It is also possible that the mother died of an unrelated condition and that the foetus was partially expelled later during decomposition of the body (Piga et al. 2016).

The legs of the SVP39 woman were apparently loosely flexed. Her pregnancy bump perhaps contributed to this arrangement, although it was unlikely significant at 5–6 months, especially as she probably had good core strength from a physically active life. Junod's (1962, I: 166) account of the Tsonga offers another possibility:

> *If a woman dies during pregnancy*, she must be cut open to see what the sex of her child is. This must be done inside the grave, before the earth is covered in. As [interlocutor] Mboza said: 'The air (moya) must come out.'[5]

An operation within the grave to open the abdomen might easily result in a loosely flexed corpse.

A similar idea is captured in Zulu (Bryant 1967: 716) and Venda ethnographies, which record removal of the foetus and its burial beside the mother (Lugg 1907: 118; Stayt 1931: 163). This treatment of the foetus as a distinct individual that needs escape or separation from the mother's remains seems consistent with another convention: corpses should not be bound or unduly restrained. If used, a cloak or mat or ox-hide is wrapped loosely around the body, or in some cases cut through, while the ties of any apron worn or placed in the grave are separated. Junod (1962, I: 140) notes that it seems 'no knot must enter a grave', 'because it is taboo to tie a corpse' (cf. Ashton 1952: 102, 106; Bryant 1967: 701). This principle probably symbolically reflects real concern about the threat that knotted and tangled umbilical cords pose to foetus health. The deceased should be free to enter the ancestral world and the same was surely true for the foetus, whether through independent burial, separately within the mother's grave, or via an incision in the mother's abdomen.

We suspect that the SVP39 woman was laid in a niche excavated into the side of her grave shaft. Descriptions of niche burials are common in ethnographic accounts, yet they are rarely described in the archaeological literature. This is possibly because they can be difficult to identify. Burials are typically exposed by erosion (or construction) or discovered within an excavation trench and the focus thereafter might be on the skeleton itself. Erosion (or construction) might remove evidence of the larger feature, as we suspect happened with SVP39, or the limits of excavation trenches might exclude a complete picture of the grave. The shafts of niche-style graves must be large enough to accept both the body of the deceased and the person who places and arranges the body and any material culture in the niche. The fill of the shaft can be indistinguishable from its surrounds, depending on the location of the grave. An unplastered, swept-clean back courtyard, for instance, would contribute little to a grave dug below the village horizon. The fill itself is barely excavated before it is restored to the pit, so there is little chance of alteration.

Niche graves in KwaZulu-Natal date from at least the Blackburn phase of the early 2nd millennium (on site 2931CA167, KwaZulu-Natal Museum records). The SVP39 remains indicate that they were possibly also part of Early Iron Age culture. Elsewhere, the 'steps' on which two individuals at Happy Rest rested—an adult female and the male described earlier (Steyn & Nienaber 2000: 114–15)—also suggest niche graves.

In ethnographic accounts, the niche is sealed with stones or earth clods or logs before the grave is filled. The grave at site 2931CA167 contained no stones. Similarly, while some of the stone covering at SVP39 could have fallen from a stonewalled niche seal, the majority appear to have been placed to cover the body. If the intention was 'to confine the deceased's spirit' (Antonites 2016: 23; cf. Huffman & Murimbika 2003:

[5] Mboza was a Ronga man of the Mazwaya family and an elder in a church at Ricatla, north of modern Maputo. He was an authority on the 'rites of the clan' and had trained and become a diviner ('exorciser' in Junod's terminology) (Junod 1962, I: 6).

243–4), the purpose was perhaps to protect other pregnant women in the homestead from the same fate. Alternatively, the stones represent the lifeless body, for 'dead people are stones [or broken pots]' (Berglund 1976: 353, also 385–6). We favour the second interpretation because stones, including broken grindstones, commonly occur in Early Iron Age graves; because interpretation of covering stones as 'confinement' contradicts the 'no ties' principle and probably applies in extreme cases only, such as interments of witches; and because such extreme case disposals were more likely off site (Huffman & Murimbika 2003: 243–4).

Whole grindstones, on the other hand, might have been the deceased's personal equipment, included for her use in the ancestral realm. At SVP39, however, the position of the large lower grindstone over the woman's lower abdomen strongly suggests a symbolic statement as its primary purpose. It clearly references the woman's procreative capacity, her power to generate and support new life by milling seed in its groove and cooking the product for the health and continuity of her family (compare with the analogy drawn between married women and fields; Ngubane 1977: 94–5; Aschwanden 1982: 181).

Graves, houses and wombs are conceptually associated in southern African ethnographies. The association extends to pools, caves, aardvark holes in termite mounds and, in certain contexts, pots (e.g. Berglund 1976: 146, 148; Ngubane 1977: 85; Armstrong et al. 2008: 543; Boeyens et al. 2009; Hattingh & Hall 2009). They are linked in that all can serve as portals to the ancestral world. This symbolic nexus is expressed archaeologically in foetus-like burial positions, the burial of infants beneath houses and in pots and, in KwaZulu-Natal, in corbelled hut-like grave structures dated to 1300–1700. The grave serves as a womb from which the deceased is born into the ancestral world (e.g. Aschwanden 1987: 288–9), where he or she works for the benefit (ideally) of living descendants, most especially to enhance their productive and reproductive capacity. Graves are typically located in places associated with the deceased in life and, indeed, Tsonga of southern Mozambique speak of the grave niche as the deceased's house, and the main shaft as the public assembly space within the homestead (Junod 1962, I: 137). Thus, graves tie ancestors and descendants to places in the landscape. Such ideas surely contributed to the long-term occupation of Early Iron Age sites and are therefore important in archaeological interpretation of detailed settlement histories on those sites.

SVP75 and SVP38

Grain pits, it seems, also belong to the symbolic nexus surrounding graves and wombs. A young man of high status was buried in the 19th century in a grain basket set into the ground beneath a cattle pen on the Kwena-Kgatla site of Mabyanamatshwaana (Pistorius & Steyn 1995). Similarly, Zulu king Shaka kaSenzangakhona was buried in a grain pit, as was the young man at Mhlopeni in the 7th century (Gibbon 2019a; KwaZulu-Natal Museum records). At Happy Rest, a 'cavity' at the feet of the high-status man buried in a cattle pen extended 70 cm deeper than his remains. Like many Early Iron Age pits, the cavity contained deliberately broken pots beneath stones (Steyn et al. 1994: 552). Perhaps this feature was a ritually filled grain pit, reopened and repurposed as a grave through the excavation of a niche in its wall. Finally, excavations at 9th-century

Ndondondwane recovered an infant buried in a pot placed within a dung-lined grain pit (Van Schalkwyk et al. 1997: 71–3); this example doubles up on the metaphor.

In a Zulu context, grain pits in the cattle pen are conceptually like the hearth in a hut and both are strongly associated with the ancestors and procreation (e.g. Berglund 1976: 103–4, 112, 205–6). As Berglund (1976: 104) notes, in 'Zulu interpretations' there 'is no wide difference between sexual organs and intercourse … and the shades …. So if you call it shades or call it sexual intercourse (*ubulili*) it is the same.' Also, Karanga view granaries as metaphors of procreation. On a man's death, a prepubescent girl (i.e. free of pollution) places his weapons in a granary: 'What happens to his things, happens to him too' (Aschwanden 1987: 179, 239). The granary is equivalent to his grave. Not surprisingly, the excavation and use of grain pits are ring-fenced with avoidance practices to protect them and their contents from pollution (Raum 1973: 145).

The SVP75 storage pit was no longer in use when the child was buried, but it was likely still visible as a shallow circular depression in the ground (e.g. Huffman 2012: fig. 5; Loubser 2007: 20). The position of the grave in relation to the walls of the pit indicates that the grave was intentionally dug into the storage pit (Fig. 15). We argue that the burial party placed the body upright in the grave with its head near the mouth of the pit to represent a foetus with its head directed towards the entrance of the womb, ready for birth. It is worth noting that, for many people, the ancestral world is the reverse of the world of the living. What points up on the surface points down in the ancestral world and diviners say 'that they see things upside-down' (Berglund 1976: 371, also 370). Thus framed, the upward direction of the storage/grave-pit-as-womb makes sense.

The grave was filled with ash, a substance with powerful associations. It is, in the first instance, the matter left behind once a fire has died and so the opposite of heat. Consequently, people use it to cool the heat of pollution and to restore healthy states of mind and being (e.g. Hammond-Tooke 1981: 117, 144–5). Ash, moreover, supports invocations of the ancestors through its ingestion or application to people and things (Berglund 1976: 205–6, 324; Armstrong et al. 2008: 526). Ash is therefore useful for treating misfortune that results from either pollution or discontented ancestors—these two sources of ill fortune anyway lie on a spectrum and in diagnoses people favour different parts of the spectrum according to cultural convention and personal choice.

Ash can also serve as a metaphor for semen (in Zulu the two words have the same root, *-lotha*), representing the agnatic life force that ancestors provide (e.g. Berglund 1976: 206, 221, 337; Aschwanden 1982: 215–16). For this reason, Zulu diviners allow the hearth-ash in their huts to accumulate, removing only what is absolutely necessary when absolutely necessary (Berglund 1976: 152, 174). Since the hearth is an important portal to the ancestral world, the ash it contains is evidence of the work that ancestors do to secure a productive and procreative future for their descendants. Although ordinary folk clear ash from their hearths every day, taking it to the ash-heap at the entrance to the homestead, their ash has the same symbolic import. It is this ash, taken directly from the hearth, that might be favoured when invoking the ancestors (Berglund 1976: 205–6). On the other hand, Hammond-Tooke (1981: 145) records that in two Kgaga contexts, treatment for ritual impurity occurs with the patient sitting or standing on the family ash-heap (cf. Junod 1962, I: 53 for its use in another ritual context). Both the hearth and ash-heap might then be appropriate sources of ash used ritually.

In Early Iron Age settlements of the Kalundu Tradition, hearth-ash was arguably added daily to middens adjacent to the cattle pens and men's court in the centre of the settlement (Whitelaw 2013: 213–15, 2020: 163–5). A third-trimester miscarried baby buried in a pot in such a central midden on KwaGandaganda (Morris 1993: 95; Whitelaw 1994: 34) strongly suggests that central midden ash functioned as a cooling treatment for this hot death, which might otherwise have threatened the productive and reproductive future of its household and wider community (Boeyens et al. 2009: 233; see Van Schalkwyk 1994 for other examples of child burials in ashy middens). Similarly, the ash that filled the SVP75 child's grave probably served to cool its death, as well as invoke the ancestral life force that ensured the continuity of descendants. The storage-pit-turned-grave gave this invocation a special emphasis by reactivating the pit's redolent association with ancestors and procreation.

The tuyère fragment placed at the bottom of the child's grave further reinforced this symbolism. As is well known, iron-ore smelting was analogous to procreation throughout the Bantu-speaking world (e.g. Maggs 1992; Collett 1993; Herbert 1993). A smelter's ancestors played a vital role in ensuring the success of his work, just as they did in begetting his children (McCosh 1979: 160). At SVP75, the tuyère fragment explicitly references the work of the paternal ancestors in birthing the child into the ancestral world. Perhaps the tuyère symbol was available to all in the community, but the specialist nature of metallurgy perhaps indicates that SVP75 was a child of a smith. There were, after all, abundant other symbols of procreation available to survivors.

The burial of the SVP75 child clearly involved special treatment. The similarly aged SVP38 child displays no such treatment. Instead, it resembles Burial D6 from Msuluzi Confluence, also a 2-year-old child at the time of death (Maggs 1980b: 120; Maggs & Ward 1984: appendix, 140). According to Bourdillon (1976: 238), the intensity of death pollution depends partly on the status of the deceased individual. Status reflects the circle of significance that surrounds a person: it is typically small for children but widens as people mature and acquire influence through accumulating relationships. Thus, Junod (1962, I: 166) and Krige (1962: 160) record the burial of children with little ceremony, involving only immediate family. A possible explanation for the elaborate treatment of SVP75—directed at ameliorating pollution and enhancing creative capacity—is that the child's death coincided with a stress that threatened the wider community, such as food shortages resulting from drought. The selection of grain pit as grave seems additionally relevant here.

Of interest, then, is Huffman's (2010) identification of three severe, El Niño-driven droughts during the Msuluzi phase. They fell into the periods 635–665 (Group III), 675–700 (Group IV) and 750–800 (Group V). Each drought would have lasted three to five years. Each would have provoked behaviour designed to encourage a return to regular rainfall patterns. The SVP75 burial might have been an event selected for this emphasis. Perhaps, through elaborate burial of their lost child, the parents sought to shape a bounteous future.

CONCLUDING REMARKS

Future analyses, we hope, will include a genetic component and radiocarbon dating. The dating alone will contribute to the current interpretation of settlement history at Ntshekane and either bolster or refute our assignment of remains to particular homesteads. Our approach to the Ntshekane burials drew inspiration from several scholars who have demonstrated the value of ethnographic accounts in the archaeological interpretation of human remains (Hall & Binneman 1987; Hall 2000; Huffman & Murimbika 2003; Boeyens et al. 2009; Hattingh & Hall 2009). The range of variation in the archaeological record is, however, greater than in the ethnographic record, necessitating an understanding of relevant cultural principles for application to phenomena not documented by anthropologists. In this regard, Simon Hall has made several important contributions to interpretations of past burial practices. His approach—and ours as disciples of it—can reveal something of the symbolic richness that gave meaning to the hopes and fears of communities of the archaeological past and, moreover, feed back into ethnographies to perhaps give them some of the granularity lost through colonisation, codification and documentation.

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Error notice [from page iv of Volume 36]

Gavin Whitelaw provided the following correction: The laboratory code for the radiocarbon date on individual A1071 is Pta-6997, not Pta-6998 as recorded in Owens et al. (2023: 235). Morphological and isotopic analyses suggest that individual A1071 was likely of Khoisan descent (Ribot et al. 2010: 108) and thus best excluded from consideration. This change has numerical, but not interpretive, implications for the Owens et al. discussion on p. 222–3.

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TABLE 1

Some details of published/analysed human skeletal remains from KwaZulu-Natal Early Iron Age sites and 2931CA167. See Fig. 1 for site locations. Shading indicates adult individuals.

Site/Individual	Sex	Age at death	Burial position	Grave location	Direct date BP	Lab code	Phase/Facies	Dental modification	Reference
2930DB48 Bridge site Burial 1	probable female	11–12	vertically flexed	unknown			Msuluzi	none	Whitelaw & Moon 1996; Gibbon 2019b
2931CA167 eMdloti	female	20–40	vertically flexed	back courtyard of household			Blackburn	none	Steyn & Mosothwane 2012
A1060 Umgababa	probable female	possibly 18–20	unknown	unknown	1025±35	OxA-6220	Ntshekane/ Blackburn	central maxillary incisors removed (remains consist of cranium only)	Ribot et al. 2010; Morris notes
A1071 Amahlongwane (Umkomaas)	male	30–40	unknown	unknown	1320±50	Pta-6998	Msuluzi	central maxillary incisors chipped	Ribot et al. 2010; Morris notes
A2120 Ballito Bay	female	adult	unknown	unknown	940±20	Pta-6108	Ntshekane/ Blackburn	central maxillary incisors removed	Ribot et al. 2010; Morris notes
KwaGandaganda Burial 1	male	50–72 (c. 60)	horizontally flexed, right side	Central midden?			Msuluzi?	unknown	Morris 1993; Whitelaw 1994
KwaGandaganda Burial 2	unknown	premature baby	buried in pot	Central midden			Msuluzi	none	Morris 1993; Whitelaw 1994
Magogo	unknown	unknown	vertically flexed	unknown			unknown	No mandibular dental modification	Gibbon 2019c
Mhlopeni Burial 1 (lower)	female	45–50	horizontally flexed, left side	Unknown			Msuluzi	unknown	Maggs & Ward 1984
Mhlopeni Burial 1 (upper)	female?	c. 4	horizontally flexed, left side	unknown			Msuluzi	unknown	Maggs & Ward 1984
Mhlopeni Burial 2	probable male	adult	horizontally flexed, left side	unknown				unknown	Maggs & Ward 1984

TABLE 1 *(continued)*

Some details of published/analysed human skeletal remains from KwaZulu-Natal Early Iron Age sites and 2931CA167. See Fig. 1 for site locations. Shading indicates adult individuals.

Site/Individual	**Sex**	**Age at death**	**Burial position**	**Grave location**	**Direct date BP**	**Lab code**	**Phase/Facies**	**Dental modification**	**Reference**
Mhlopeni Burial 3	male	15–18	vertically flexed	grain pit			Msuluzi	Dental modification: central maxillary and all 4 mandibular incisors extracted	Gibbon 2019a
Msuluzi Confluence Burial 30	male	25–35 (wear on 2 molars)	vertically flexed	unknown			Msuluzi	unknown	
Msuluzi Confluence Burial D6	unknown	2	horizontally flexed, left side	back courtyard?			Msuluzi		Maggs 1980b; Maggs & Ward 1984
Nanda Burial 1	male	28–40	probably vertically flexed	termite mound			Msuluzi	Dental modification: 4 mandibular incisors extracted; Central maxillary incisors extracted, lateral max. incisors present at death, were likely chipped, left canine (right lost) chipped on labial edge to form blunt point.	Morris 1993; Whitelaw 1993
Nanda Burial 2	unknown	c. 7–8	vertically flexed	termite mound			Msuluzi	none	Morris 1993; Whitelaw 1993
Nanda SVP5	unknown	3 months	buried in pot	unknown			Msuluzi?		Morris 1993; Whitelaw & Moon 1996
Nanda TS25	unknown	adult	unknown	termite mound			Msuluzi	unknown	Morris 1993; Whitelaw 1993

TABLE 1 *(continued)*

Some details of published/analysed human skeletal remains from KwaZulu-Natal Early Iron Age sites and 2931CA167. See Fig. 1 for site locations. Shading indicates adult individuals.

Site/Individual	Sex	Age at death	Burial position	Grave location	Direct date BP	Lab code	Phase/Facies	Dental modification	Reference
Nanda TS7	female	<40	horizontally flexed, right side	cattle pen			Msuluzi	Dental modification: 4 mandibular incisors extracted; Central maxillary and right incisor extracted, left max. incisor, left and right canine chipped on labial edge to form blunt point.	Morris 1993; Whitelaw 1993
Ndondondwane Midden 1, Pit 3	unknown	3 months	buried in pot	domestic area; back courtyard?			Ndondon-dwane	none	Van Schalkwyk et al. 1997; Greenfield & Van Schalkwyk 2003
Ntshekane SVP29	female	15–17	possibly vertically flexed	household courtyard?			Ndondondwane or Ntshekane	Unknown, but had possibly undergone dental modification, suggested by a loose second right maxillary incisor that displayed strong diagonal shaping to the mesial and distal aspects. The distal was more strongly filed than the mesial.	Owens et al.
Ntshekane SVP35	possibly female	16–20	horizontally flexed, right side	household courtyard?			Ntshekane	none	Owens et al.
Ntshekane SVP38	unknown	2–3	horizontally flexed, right side	household courtyard?			Ntshekane?	none	Owens et al.

TABLE 1 *(continued)*

Some details of published/analysed human skeletal remains from KwaZulu-Natal Early Iron Age sites and 2931CA167. See Fig. 1 for site locations. Shading indicates adult individuals.

Site/Individual	Sex	Age at death	Burial position	Grave location	Direct date BP	Lab code	Phase/Facies	Dental modification	Reference
Ntshekane SVP39	female	26–40	horizontally flexed, left side	household courtyard?			Ntshekane?	First maxillary incisors extracted, while both canines and second incisors unaffected, the right first and second premolars were absent, and the right first premolar was filed both mesially and distally. Mandible damaged, but mandibular incisors absent, possibly also extracted.	Owens et al.
Ntshekane SVP39A	unknown	Foetus, 5–6 months (24–36 foetal weeks)	horizontally flexed, left side	household courtyard?				none	Owens et al.
Ntshekane SVP75	unknown	2–3	vertically flexed	grain pit			Msuluzi?	none	Owens et al.
Wosi Burial 1	female	40+	unknown	unknown				unknown	Van Schalkwyk 1994; Ribot et al. 2010; Morris notes
Wosi Burial 2	unknown	7–8	probably flexed	unknown					Van Schalkwyk 1994; Ribot et al. 2010
Wosi Burial 3	unknown	2–4, but closer to 4							Van Schalkwyk 1994; Ribot et al. 2010

TABLE 2
SVP29 osteometrics. * = longbones that lacked epiphyses.

Measurement	**Side**	**mm**	**Measurement**	**Side**	**mm**
Radial AP midshaft diameter	L	12 e	Tibial ML diameter at NF	R	24
Radial ML midshaft diameter	L	14 e	Patella height	R	38
Radial head diameter	L	21	Patella width	R	44
Ulnar maximum length *	L	266	Patella thickness	R	21
Ulnar physiological length *	L	240	Sacrum height	-	101
Ulnar midshaft AP diameter	L	14	Sacrum width	-	90
Ulnar midshaft ML diameter	L	12	S1 diameter	-	44
Femoral distal breadth	L	72	Calcaneus length	L/R	78/80
Max/AP femoral head diameter	R	43	Calcaneus width	L/R	38/40
Femoral subtrochanteric AP	L	22	Talus length	L/R	56/57
Femoral subtrochanteric ML	L	30	MT1 length	R	63
Femoral AP shaft diameter	L/R	24/24	MC3 length	L	62
Femoral ML shaft diameter	L/R	25/25	MC4 length	L	55
Femoral vertical neck diameter	R	30	MC5 length	L	51
Tibial AP diameter at NF	R	35			

TABLE 3
SVP29 age indicators. [1] = fusion line visible; [2] = Lines separating 1–2, 2–3 and 4–5 visible.

	Unfused	**Fusing**	**Fused**
Distal fibula		X	X
Distal femur	X		
Proximal femur			X[1]
Iliac crest		X	
Ischial tuberosity		X	
Sacral vertebra		X[2]	
Lumbar vertebrae		X	
Thoracic vertebrae		X	X
Distal ulna	X		
Proximal ulna			X
Distal radius	X		
MC heads			X
Sternum (body)	X		

TABLE 4
Odontometrics for SVP35 and SVP39.

	SVP 35			**SVP 39**			**Mean**		
	BL	**MD**	**Area**	**BL**	**MD**	**Area**	**BL**	**MD**	**Area**
Upper I1	-	9.2	-	-	-	-	-	9.2	-
Upper I2	6.8	7.3	49.6	-	-	-	6.8	7.3	49.6
Upper C	9.1	8.3	75.5	-	-	-	9.1	8.3	75.5
Upper P1	10.4	7.7	80.1	-	-	-	10.4	7.7	80.1
Upper P2	9.7	6.7	65.0	-	-	-	9.7	6.7	65.0
Upper M1	12.5	11.2	140	-	11.8e	-	12.5	11.5	143.8
Upper M2	12.4	9.9	122.8	10.7e	11.0	117.7	11.6	10.5	120.3
Upper M3	12.5	9.9	123.8	-	-	-	12.5	9.9	123.8
Lower I1	-	-	-	-	-	-	-	-	-
Lower I2	6.5	5.8	36.0	-	-	-	6.5	5.8	36.0
Lower C	8.1	7.8	63.2	7.2	7.0e	50.4	7.7	7.4	57.0
Lower P1	8	7.4	59.2	7.0	7.3	51.1	7.5	7.4	55.5
Lower P2	8.2	7.3	59.9	8.6	6.1e	52.5	8.4	6.7	56.3
Lower M1	11.1	12.2	135.4	11.0	11.7	128.7	11.1	12.0	133.2
Lower M2	10.3	11.2	115.4	10.0	10.8	108.0	10.2	11.0	112.2
Lower M3	10.9	12.5	136.3	10.2	11.4	116.3	10.6	12.0	127.2

TABLE 5
Dental pathology for SVP35 and SVP39.

	SVP35		**SVP39**	
	Maxilla	Mandible	Maxilla	Mandible
Crown Surfaces	1/7	0/8	0/3	4/9
Pits	0/2	0/2	-	0/4
Approximal Surfaces	1/24	0/20	0/4	0/20
Root Surfaces	0/48	0/40	1/10	3/40
Smooth Surfaces	0/24	0/20	0/6	0/20
Total	**2/105**	**0/90**	**1/23**	**7/93**
%	**1.9%**	**0%**	**4.3%**	**7.5%**
Abscessing	0	0	0	0
Calculus	2/12	0/10	0/3	2/10
Chipping	0	0	Present	-
Ablation	0	0	Present	-
Filing	0	0	Present	-

TABLE 6
Odontometrics for SVP38 and SVP75.

	SVP38			**SVP75**			**Mean**		
	BL	**MD**	**Area**	**BL**	**MD**	**Area**	**BL**	**MD**	**Area**
Upper dm2	10.2	10.4	106.1	11.1	10.3	114.3	10.7	10.4	111.3
Upper dm1	9.4	8.2	77.1	10.3	8.3	85.5	9.9	8.3	82.3
Upper dc	5.6	6.1	34.2	-	-	-	5.6	6.1	34.2
Upper di2	4.8	5.6	26.9	-	-	-	4.8	5.6	26.9
Upper di1	5.1	7.1	36.2	-	-	-	5.1	7.1	36.2
Lower dm2	9.4	11.5	108.1	-	-	-	9.4	11.5	108.1
Lower dm1	6.9	9.4	64.9	7.3	8.5	62.1	7.1	9.0	63.9
Lower dc	-	-	-	-	-	-	-	-	-
Lower di2	4.3	4.9	21.1	4.2	4.8	20.2	4.3	4.9	21.1
Lower di1	3.9	4.2	16.4	4.0	4.3	17.2	4.0	4.3	17.2

TABLE 7
Dental pathology for SVP38 and 75.

	SVP 38		**SVP75**	
	Maxilla	Mandible	Maxilla	Mandible
Crown Surfaces	0/2	0/2	0/2	0/1
Pits	-	-	-	-
Approximal Surfaces	0/10	0/8	0/4	0/6
Root Surfaces	0/20	0/16	0/8	0/12
Smooth Surfaces	0/20	0/16	0/4	0/6
Total	**0/52**	**0/42**	**0/18**	**0/25**
%	**0%**	**0%**	**0%**	**0%**

TABLE 8
SVP38 osteometrics.

Measurement	**Side**	**mm**
Humeral distal width	L	27 e
Humeral midshaft max	L	14
Humeral midshaft min	L	11
Humeral midshaft AP	L	14
Humeral midshaft ML	L	12

TABLE 9
SVP39 post-cranial measurements (in mm). * Platycnemic index = 68.

	Left	**Right**		**Left**	**Right**
Subtrochanteric AP	-	25	Humeral Head	-	43
Subtrochanteric ML	-	32	Humeral Shaft Max	-	23
Femoral Midshaft AP	-	27	Humeral Shaft Min	-	18
Femoral Midshaft ML	-	27	Glenoid Height	31	-
Vertical FemHead	-	39	Radial Length	231 e	234
Transverse FemHead	-	41	Radial Head	-	22 e
Femoral Neck Max	-	30	Radial Midshaft AP	12	11
Tibia AP at NF	34*	-	Radial Midshaft ML	15	16
Tibia ML at NF	23	-	Ulna Max Length	254	-
Tibia AP Midshaft	29	-	Ulna Phys. Length	226	224
Tibia ML Midshaft	21	-	Ulna Midshaft AP	17	17
Calcaneus Length	70	-	Ulna Midshaft ML	15	15
Calcaneus Width	e. 35	-	MC1 Length	-	49
Talus length	50	-	MC2 Length	66 (phys 64)	66
Clavicle Midshaft AP	11	12	MC3 Length	-	-
Clavicle Midshaft SI	11	8	MC4 Length	-	55
Distal Humerus Width	-	57	MC5 Length	-	52

TABLE 10
SVP39 cranial measurements (CRANID definitions).

Measurement	**mm**
Max Length	196 e
Max Breadth	122
Max Frontal Breadth	106
Biasterionic Breadth	101 e
Frontal Chord	111 e
Nasion-Bregma Subtense	27 e
Parietal Chord	120
Bregma-Lambda Subtense	23

TABLE 11
SVP39 mandibular measurements.

Measurement	mm	**Measurement**	mm
Body Height	31	Minimum Ramus Breadth	35
Body Breadth	11	Maximum Ramus Breadth	43
Condyle Width	23	Maximum Ramus Height	53

TABLE 12
SVP39A (foetus) measurements. Zygomatic height measured from inferior margin to the tip of the frontal process (i.e. not oblique). FW=foetal weeks.

SVP39A	**mm**	**Age Range**
Vomer Max Height	21.42	30–32 FW
Scapula Max Height	22.70	26–28 FW
Scapula Max Breadth	18.38	24–26 FW
Zygomatic Height	13.00	24–26 FW
Basilar Portion Max Length	12.09	28–30 FW
Basilar Portion Sagittal Length	9.98	28–30 FW
Basilar Portion Max Breadth	9.93	28–30 FW

TABLE 13
SVP75 age determination based on dentition.

Tooth	**Development**	**Age (yrs)**
dli1	R¾	1.5 – 2
dli2	R½	1.5 – 2
dlc	R½	2.8 – 3.5
dlm1	R½ – R ¾	2 – 2.3
dum2	RI – R ¼	2.5 – 3

TABLE 14
SVP75 cranial and post-cranial measurements.
Where both sides of a given bone were present, L first, R second.

Measurement	**mm**	**Age (yrs)**	**Measurement**	**mm**	**Age (yrs)**
Chin Height	22	-	Distal Humerus Breadth	27/26	-
Mandibular Body Height	16	-	Ulna Length	97	1–1.5
Mandibular Body Breadth	10	-	Radius Length	85	1–1.5
Zygomatic Height	32	<2	Femur Length	c. 130	1
Basilar Portion Max Length	21.80	1.17+	Femoral Midshaft AP	10/10	-
Basilar Portion Sagittal Length	17.40	2.4 +	Femoral Midshaft ML	11/11	-
Basilar Portion Max Width	23.73	2.25+	Tibia Length	116/115	1–1.5
Clavicle Midshaft SI	4/4	-	Tibia Length	116/115	0.75–1
Clavicle Midshaft AP	5/6	-	Tibia Midshaft AP	11/11	-
Scapula Length	52	0.5–2	Tibia Midshaft ML	10/10	-
Scapula Width	42	1–2	Proximal Tibia Breadth	27	-
Humerus Length	104	1–1.5	Fibula Length	112	1–1.5