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Zuurberg (Eastern Cape, South Africa) revisited: human remains, dating and archaeological findings

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ABSTRACT

The Later Stone Age (LSA) site of Zuurberg in the Cape Fold Mountains of South Africa was excavated in the 1920s by F.W. FitzSimons. As with his other excavations, not much is known about the exact provenance and detailed archaeological context of the remains. This paper reports the re-analysis and dating of the human skeletal remains from Zuurberg. The remains were commingled but here sorted according to previously published sources. The remains of eight individuals are present, of which only one (Zg3) is fairly complete. The assemblage includes four older adults, two younger or middle-aged adults, an adolescent and a child. Two of the three individuals who could be assessed showed signs of enamel hypoplasia, which probably attests to some hardship. One of the individuals was dated to 4795 ± 42 BP (Ua-61976), which places this site into the Wilton period of the South African LSA. However, the different levels of burials, as well as the presence of potsherds, may suggest an extended use of the site. Isotopic analysis suggests a mixed diet, which was not depleted of protein. The reassessment, sorting and dating of these remains add value to the collection, especially as they come from an open-air, non-coastal forager site. This assemblage can now be included in future studies of southern African Stone Age foragers.

RÉSUMÉ

Le site de l'âge de pierre récent (LSA) de Zuurberg, dans les montagnes du Cap Fold en Afrique du Sud, a été fouillé dans les années 1920 par F.W. FitzSimons. Comme dans les cas de ses autres fouilles, on sait peu de choses sur la provenance exacte et le contexte archéologique détaillé des vestiges. Cet article fait le rapport de la réanalyse et datation des restes squelettiques humains de Zuurberg. Les restes avaient été mélangés mais ils furent triés au cours de cette étude sur la base de sources précédemment publiées. Les restes de huit individus sont présents, dont un seul (Zg3) est assez complet. L'assemblage comprend quatre personnes âgées, deux adultes plus jeunes ou

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d'âge moyen, un adolescent et un enfant. Deux des trois individus qui ont pu être évalués présentaient des signes d'hypoplasie de l'émail, témoignant probablement de certaines épreuves. L'un des individus a été daté à 4795 ± 42 BP (Ua-61976), ce qui place ce site dans la période Wilton du LSA d'Afrique du Sud. Cependant, les différents niveaux des inhumations, ainsi que la présence de tessons de poterie, peuvent suggérer une utilisation prolongée du site. L'analyse isotopique indique une alimentation mixte qui ne manquait pas de protéines. La réévaluation, le tri et la datation de ces restes ajoutent de la valeur à cette collection, d'autant plus qu'ils proviennent d'un site de chasseurs-cueilleurs à ciel ouvert et non côtier. Cet assemblage peut désormais être inclus dans les futures études sur les chasseurs-cueilleurs de l'âge de pierre en Afrique australe.

Introduction

The result of many excavations conducted in the first half of the twentieth century is that several museums and universities across South Africa hold fairly large, but poorly described and provenanced collections of skeletons (Rightmire 1978; Morris 1992a). This is also the case at the University of the Witwatersrand in Johannesburg, where physical anthropologists such as L.H. Wells and later R.A. Dart excavated and received (from various donors and institutions) many archaeological skeletons. These early researchers published a series of papers with detailed descriptions of skeletons (e.g. Laing 1924; Gear 1926; Wells 1929; Wells and Gear 1931), which are unfortunately of little value today in terms of their conclusions, but helpful for tracing and reassembling commingled skeletons.

During much of the previous century, museum collections mostly came about through the collection of interesting objects (Dunnell 1971), rather than focusing on context and scientific information. The collection of skeletons, and in particular skulls, was no exception, with large numbers of crania excavated to advance various aspects of 'race' science (Morris 2022). In their analyses of human remains from an archaeological context, most early physical anthropologists did not emphasise aspects that are of use in modern bioarchaeology, such as lifestyle, health and demographic characteristics, and their detailed anatomical descriptions have little application today. Much of the information about these skeletons and their context has been lost, yet they remain invaluable sources of information about the past. With modern radiocarbon dating, ancient DNA (aDNA) extraction and other methods of analysis, the value of these irreplaceable collections is increasingly realised and warrants further analysis (e.g. Pfeiffer *et al.* 2019; Steyn *et al.* 2019; Meyer *et al.* 2022).

Mr FW FitzSimons, the then director of the Port Elizabeth Museum (now Gqeberha), conducted a series of excavations in the Eastern Cape Province of South Africa during the 1920s. Sadly, these excavations were often very haphazard and poorly documented (Morris 2022). Their focus was simply on the retrieval of as many skeletons as possible, with little interest in the context of the findings. As part of the typological thinking of the time, excavations of human remains primarily focused on skulls, to be able to investigate the human 'types' that inhabited various regions of southern Africa. The archaeological endeavours of FitzSimons are discussed in more detail in Schauder (1963), Turner

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noted, but abscesses are present at the roots of the right first molar and left second premolar. Heavy tooth wear is present, with exposed pulpal spaces in many of the teeth. This most probably caused the abscessing. The right first molar shows very oblique wear, which may suggest the use of the teeth as tools. The anterior teeth are heavily worn so that they appear rounded.

Zg2

The remains marked as Zg2 comprise cranial (calvaria) fragments only. However, the mandible currently marked (in pencil, probably as a later addition) as Zg7 fits Wells' (1929: 815–816) description of this individual's mandible exactly (complete except for left condyle, osteoarthritis of right condyle, root abscess at the first molar) and was thus reunited with them. The skull seems to have been more complete/intact before but is now broken so that it only comprises fragments of the frontal, occipital, parietal and temporal bones. The mandible is fairly well preserved and its measurements are given in Table 2. Ochre staining of the cranial vault is evident.

The remains are those of an adult. Heavy to extreme dental wear is present and the observable cranial sutures are all obliterated. Wells (1929) mentioned the presence of osteoarthritic changes on both ends of the (now lost) clavicle. These characteristics suggest that this individual survived well into adulthood and even old age. The fairly large mastoids and relatively robust mandible tentatively suggest that he was male.

As also mentioned by Wells, degenerative changes in the right condyle of the mandible are evident. No maxillary teeth are preserved, and of the mandibular teeth the right-sided first and second molars, second premolar and central incisor, as well as the left-sided central incisor and second and third molars are all present. The right-sided third molar and left-sided first molar were lost before death, while all the other teeth were absent post-mortem. No carious lesions were noted, but abscesses are present at the roots of the right-sided first and third molars and canine. The teeth are heavily worn, with a rounded appearance of the anterior teeth, and could not be reliably scored for caries or enamel hypoplasia.

Zg3

This is the most complete of all the remains and is the skeleton described by FitzSimons (1923) in some detail as having been associated with three grinding stones, an object of hard blue slate, 13 ivory implements and various other stone implements. A fragment of an oyster or mussel shell as well as two canid vertebrae were also found near or with this individual. Only one canid cervical vertebra is currently present, specifically the C1/atlas (Figure 4). This was tentatively identified by one of us (Anja Meyer) to be most similar in its morphology and size to those of the domestic dog (*Canis lupus familiaris*) (Figure 5).

The remains of this individual are fairly complete and include a reconstructed skull (with complete face) (Figure 6), near complete mandible, both claviculae, partial scapulae, long bones of both upper limbs, partial os coxae, a sacrum, both femora, both tibiae and fragments of both fibulae. Of the ribs, only the first ribs are preserved, as is a partial vertebral column. A few hand and foot bones are also preserved. The bones are mineralised.

Although some commingling occurred during transport from the Port Elizabeth Museum and the subsequent storage, there is no evidence to suggest that the remains were commingled *in situ*.

Through the detailed descriptions of Wells (1929), who also identified eight individuals, we were able to reassemble the remains where possible and they will be curated with the numbers indicated above in future, under the collection number A1110. Of the eight excavated individuals, four were older adults (Zg1, Zg2, Zg7, Zg8), one was a child (Zg6), one an adolescent (Zg5) and two younger or middle-aged adults (Zg3, Zg4). Unfortunately, the incompleteness of the remains prevented more detailed analyses and closer estimates of age. The four older adults were reportedly buried in the stone circle, whereas the adult individual Zg3 was buried on the same level (or somewhat deeper) but some distance apart. Individuals Zg4, Zg5 and Zg6 were buried at a deeper level(s) according to Wells (1929). From this, it seems that the individuals were interred at probably at least three levels, suggesting different dates/ages and thus a longer use of the site. Wells (1929) mentions the presence of potsherds in the superficial layers, which would also suggest a more recent use of the site than the nearly 5000 BP date of Zg1 in the superficial layer. The possibility that this site was used over an extended period should thus be considered, even though this is unusual for an open-air site in southern Africa. Both Hall (2000) and Lazarides (2015) mention that high-density, concentrated burials are usually found in caves/rock shelters, whereas open-air LSA burials are usually single. This is not the case here and raises some interesting questions. Although the datable material from Zuurberg is limited due to poor preservation, the dating of the other individuals (as well as of the canid vertebra) should be considered to gain a clearer picture of the time depth of this site.

Further investigation into the canid vertebra is important given the early radiocarbon date obtained for Zg1, and therefore the site. *Canis lupus familiaris* is not indigenous to Africa, having been introduced into North Africa from the Middle East (Van Sittert and Swart 2003; Mitchell 2014, 2015). The spread of domestic dogs into southern Africa likely occurred at a staggered rate and appears to have broadly coincided with the spread of farming populations in the first millennium AD (Mitchell 2014). However, archaeological evidence remains scarce and is often inconclusive when identification is based solely on osteological metrics and morphology, given the similarities between domestic dog breeds and other canids such as the black-backed jackal (*Lupulella mesomelas*) and African wild dogs (*Lycaon pictus*) and the general lack of comparative studies (Mitchell 2014). The oldest confirmed presence of domestic dog remains in South Africa comes from the Diamant site in Limpopo Province and dates to the sixth century AD (Plug and Robertson 1989), while remains from Kasteelberg B, a likely pastoralist site in the Western Cape, date to between the mid-seventh and late thirteenth centuries AD (Mitchell 2014). Given the general scarcity of evidence of domestic dogs at LSA sites in South Africa, further investigation of the possible domestic dog vertebra found with Zg3 is warranted and may shed light on the introduction of domesticated dogs to southern Africa and their potential use by early San ancestral populations. Recalling that Wells (1929: 809) thought that the vertebrae found might be those of an African wild dog, such analyses should include absolute dating and potential DNA sequencing or ZooMS analysis to confirm identification to species.

Of the four individuals reportedly buried in the stone circle, two were male and two female. Overall, of the individuals that could tentatively be sexed, four were male (Zg2, 3, 4 and 8), while two (Zg1 and 7) were assessed to be female This small assemblage thus includes the remains of adults of both sexes as well as children. In some other LSA sites (e.g. Dewar 2010; Parkington and Dlamini 2015; Pfeiffer *et al.* 2020) group burials are associated with possible episodes of violence. However, this seems not the case here as we saw no evidence of trauma on the remains and the fact that the burials occurred at different levels (with the possible exception of the four individuals reportedly buried in a stone circle) suggests that they most probably date from different periods and were not communal or buried at the same time. Lazarides (2015) also mentions that communal burials do not usually include the remains of male individuals, thus also arguing against the four burials (Zg1, 2, 7 and 8) being a communal grave as two of the individuals in it were probably male.

FitzSimons reported the presence of many associated artefacts at the Zuurberg site, which is unusual (Lazarides 2015). Their association with the graves, as well as the presence of a stone circle with burials facing the centre (as described by FitzSimons 1923), can unfortunately not be verified. Two of the skulls did show signs of ochre staining, possibly attesting to some ritualistic behaviour, and many other LSA burials have been associated with ochre (Lazarides 2015). The Zuurberg remains were in a horizontally flexed position, like the majority of LSA burials (Inskeep 1986; Hall 2000; Lazarides 2013; Loftus and Pfeiffer 2023), including the much more recent Kouga mummy, which was bundled up and tied with a rope to keep it in a tightly flexed position (Steyn *et al.* 2007). Graves from the more superficial layers, presumed to be more recent, seem to have had more objects associated with them than those from the deeper layers, although it cannot be determined what their exact relationship with the remains was.

Assessment for disease and pathology is difficult due to the small sample size and poor preservation. However, two of the three individuals that could be assessed had enamel hypoplasia. These lesions are caused by hardship during the years in which the teeth develop (Goodman and Rose 1990), possibly suggesting some stress during early life. None of the individuals had cribra orbitalia, which is associated with non-specific anaemia. These skeletons come from a period before the intensification of populations in this general region, which is thought to have given rise to heightened stress, particularly in relation to the availability of resources (Hall 2000; Sealy and Pfeiffer 2000; Pfeiffer and Sealy 2006; Pfeiffer and Harrington 2011).

Of the five individuals with scorable permanent teeth, none had caries. However, three out of the seven adults had dental abscesses, and three also had ante-mortem tooth losses. Due to the small sample size, it is difficult to compare this pattern statistically to other populations. The abscesses and ante-mortem tooth losses all occurred in older adults. This suggests a diet, as expected, that was low in refined carbohydrates, but very abrasive. The coarse food gave rise to rapid dental wear, leading to pulpal exposure, abscessing and subsequent tooth loss. In this, the Zuurberg sample seems similar to the people from Whitchers' Cave, also in the Eastern Cape Province, (Steyn *et al.* submitted), although the relatively high incidence of enamel hypoplasia may suggest higher stress levels than was the case there.

One unusual finding is the many individuals with absent third molars. Of the seven individuals with permanent teeth, three (Zg1, Zg4, Zg7) had no third molars, presumably

due to agenesis. This is an unusual and interesting finding, which may possibly be related to the gracility of individuals with limited space for third molars. It could also suggest close genetic relationships with a limited genetic pool, as has been suggested for the Whitcher's Cave group (Steyn *et al.* submitted). However, currently, nothing is known about the genetic relationships between these individuals, although future analysis may provide pertinent information.

The date of 4795 ± 42 BP obtained from individual Zg1 is a new addition to our knowledge of the Zuurberg site, with other individuals probably interred there before that. In a recent study, Loftus *et al.* (in press) reported just over 80 dated individuals in total from the Wilton period in South Africa, making this a valuable contribution to this relatively small pool. Interestingly, Wells (1929) estimated that the site had been occupied after 6000 BP, but before 1800 BP, based on what was known about the climate at this time. Another Zuurberg skeleton (ALB 206), dated to 4610 ± 50 BP (Pta-8713), has been reported (Morris 1992a; Ginter 2011), but, although this date is very similar to that of Zg1, this was a rock-shelter burial and thus most probably comes from a different site in the region. Other skeletal material from this area (Silberbauer 1979; Morris 1992a) include that from the Vygeboom farm (Middelkop Kloof Cave and Mookrantz Cave) which has dates similar to that of Zg1, while Melkhoutboom (H. Deacon 1976) is more recent. All these burials, however, come from rock-shelter sites and there is relatively little information available from non-coastal, open-air sites during this period.

Hilary Deacon's (1976) study of Melkhoutboom (which is also in the Cape Fold Mountains) and other sites led him to propose that, although these groups were probably ancestral to modern populations, they lived in environments and conditions for which there is no modern analogue. They therefore showed important differences in their adaptations. The Cape Fold Mountains of the Eastern Cape do not support many large animals so only smaller game was available for hunting, predominantly including steenbok (*Raphicerus campestris*), grysbok (*Raphicerus melanotis*), bushbuck (*Tragelaphus scriptus*) and — at the larger end of the spectrum — kudu (*Tragelaphus strepsiceros*). The protein base was thus limited and the reliance on gathering edible plants from the local *fynbos* flora correspondingly high. This can be confirmed to some extent by the stable isotopic results obtained for Zg1, which suggest a mixed terrestrial diet with a slightly higher reliance on C_3/C_4 plants compared to animal-derived protein. This is in contrast to typical coastal forager diets, which have higher nitrogen delta values (Lee-Thorp *et al.* 1993; Lewis and Sealy 2018), suggesting that Zg1 most probably relied mainly on a terrestrial diet obtained from hunting and foraging. Similar isotopic values were observed in the other Zuurberg individual (ALB 206) mentioned above, as well as in a further individual from Whitcher's Cave (Sealy and Pfeiffer, 2000). ALB 206 has a $\delta^{13}C$ value of 12.0‰ and a $\delta^{15}N$ value of 11.9‰ (laboratory number 113; Judith Sealy, pers. comm.), whereas the individual from Whitcher's Cave (A118 VIII) has a $\delta^{13}C$ value of -14.9‰ and a $\delta^{15}N$ value of 10.5‰ (laboratory number: Pta-6973). It has been mentioned that the interaction between populations is relatively unknown for the earlier Holocene, but isotopic and archaeological data seem to suggest a shift in population movements and dietary habits just after 4500 BP (Pfeiffer and Sealy 2006). There are many debates in the literature as to the use and availability of marine resources by LSA people, with the possibility also mentioned that there was a degree

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