Frequency distributions of stone artefacts from Holkrans, North West Province, South Africa

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ABSTRACT

Excavations at Holkrans rock shelter, located in the Vredefort Dome, Southern Africa, revealed archaeological deposits dating back some 2000 years, to both the ceramic and pre-ceramic Later Stone Age. The ceramic phase, placed within the last 500 years by radiocarbon dates, was likely contemporary with the Late Iron Age stone-walled structures in the nearby area. The pre-ceramic phase dates from the early first millennium BC to about 1000 AD. This pilot study examined a sample of lithics from the base of the shelter mouth using a standard typology and frequency distribution as a first step to a more extensive study to be conducted in the near future. Analysis revealed a substantial temporal gap in shelter occupation between the ceramic and pre-ceramic levels, largely in agreement with the observations of Bradfield and Sadr (2011) who noted raw material and possible technological differences between these layers. New radiocarbon dates suggest a series of punctuated occupations during the pre-ceramic levels and more regular occupation during the ceramic phase. How did contact with early farmers influence the archaeology of Holkrans? With few other shelters known in the area, research at Holkrans has the potential to fill a physical gap among known Later Stone Age sites in the southern African interior.

INTRODUCTION

Holkrans rock-shelter (BFK1: 26°51'30.49"S 27°17'8.36"E) is located along a shelf of quartzite in the outer rim of the Vredefort Dome, on the property of Thabela Thabeng, part of the original farm Buffelskloof 511 IQ, Potchefstroom District, Northwest Province (Figs 1.). Excavations at BFK1 revealed two main periods of occupation during the late Holocene: a ceramic one and a pre-ceramic one, both associated with stone tools characteristic of the Later Stone Age (LSA). The ceramic phase, placed within the last 500 years by radiocarbon dates, was likely contemporary with the Late Iron Age stone-walled structures in the nearby area (Fig 2.). The pre-ceramic phase dates from the early first millennium BC to about 1000 AD. Based on their preliminary observations, Bradfield and Sadr (2011) suggested that the flaked stone tools in these layers might be technologically different, indicating a possible temporal and/or cultural gap in shelter occupation. This observation stands in contrast to that of Deacon (1984b) who observed little significant differences between the lithics in the ceramic and pre-ceramic levels of late Holocene rock shelters across southern Africa.

AIMS

The aims of this study were to:

- a) Find evidence to support or refute a cultural and/or temporal gap in shelter occupation
- b) Identify similarities and differences between the lithic artefacts in the ceramic and pre-ceramic layers

OBJECTIVES

This objectives of this study were to:

- a) Analyse lithics from quadrants A1 through A4 of square E8 by using a standard typology and a frequency distribution of different types
- b) Identify and explain trends in lithic frequencies and to say something of their archaeological context and associated activities where possible

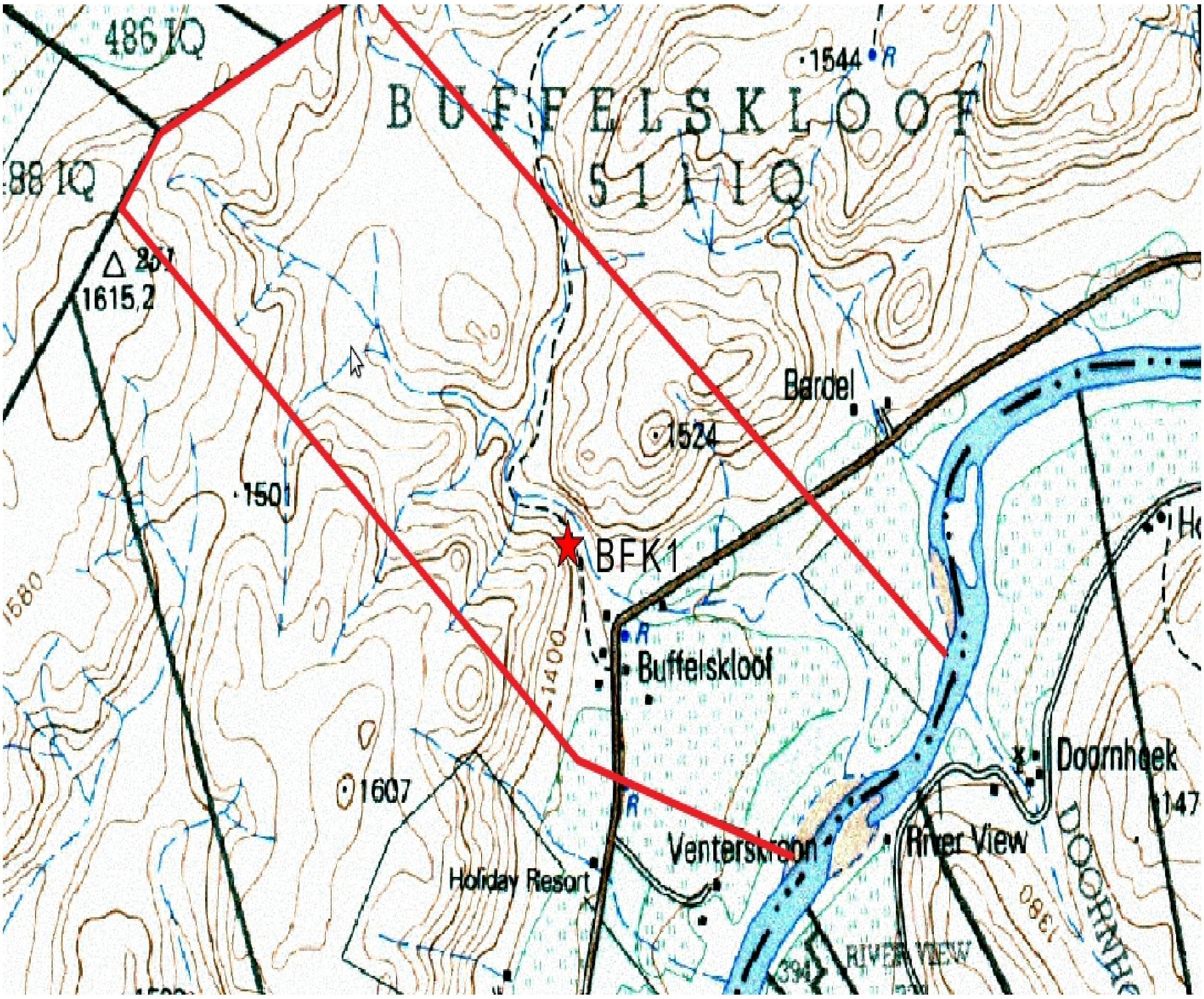


Figure 1: Topographical map showing the location of BFK1. The red border shows the extent of the Thabela Thabeng property.

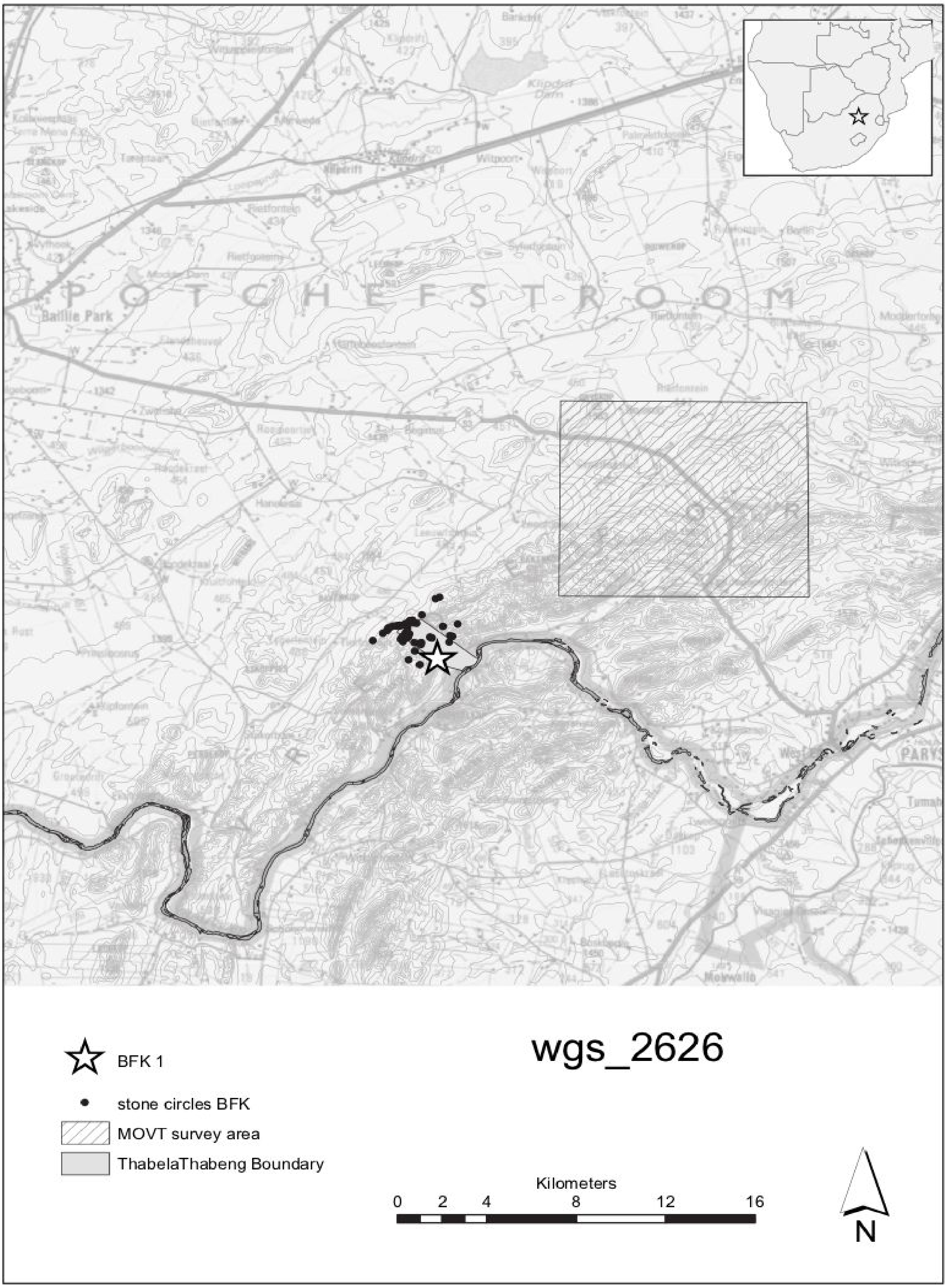


Figure 2: Map showing Iron age stone walled structures, near Holkrans From Bradfield & Sadr (2011: 2)

RATIONALE

Little in the way of LSA research has been conducted in the middle Vaal basin area (Sadr 2009; Reimond & Gibson 2005). Stone tools and the by-products of flaking activity can potentially shed light on the economic and social activities of archaeological cultures. Contextualising lithic material from Holkrans will thus help to fill a research gap and a physical gap between other excavated shelters dating to the late Holocene in the Vaal basin area (Fig. 3). The occupational sequence of Holkrans can potentially answer questions regarding hunter-gatherers in the area from well before contact, through to colonial times (Bradfield & Sadr 2011). Identifying the influence of contact in the archaeological record is of particular interest to this project.

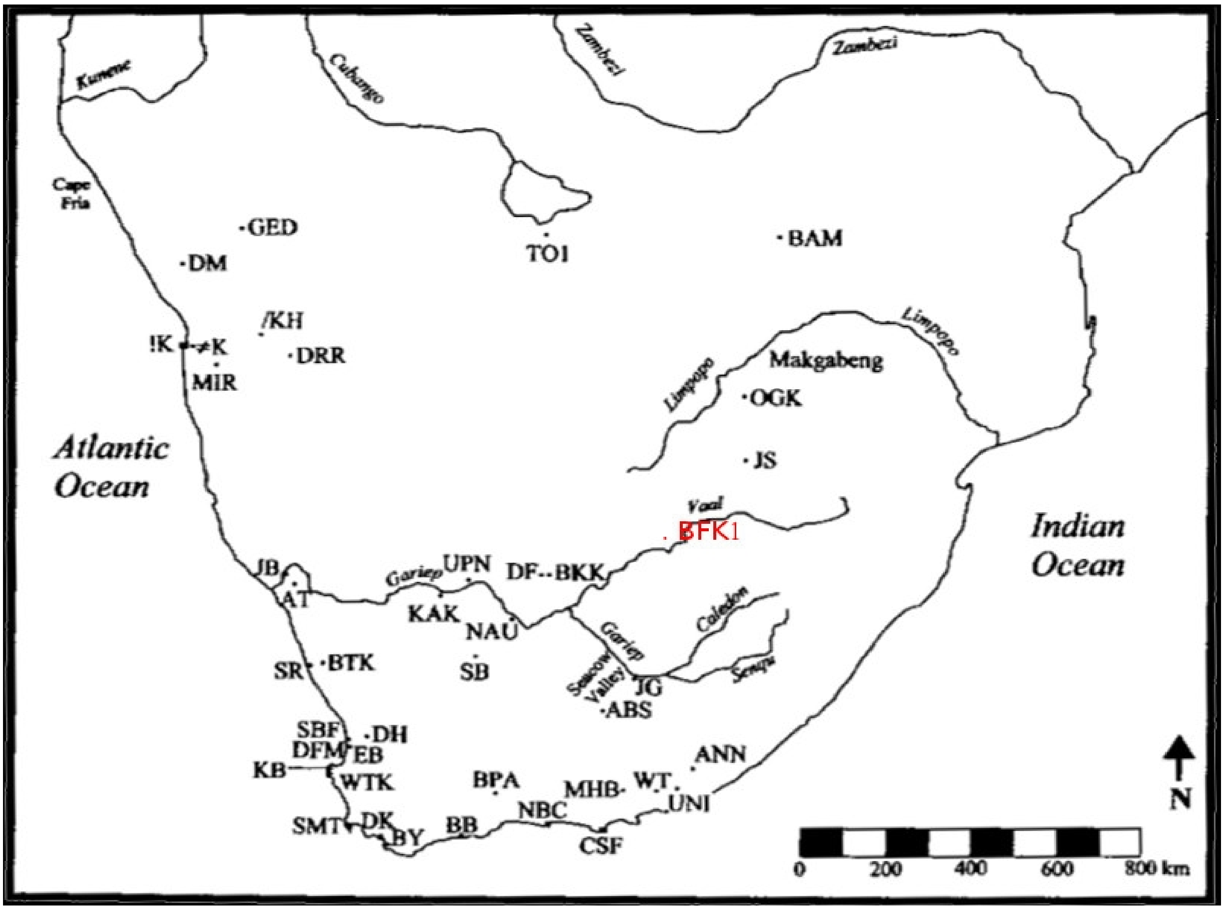


Figure 3: Map showing physical gap between excavated late Holocene rock shelters in the Vaal basin area, location of BFK1 shown in red.

METHOD

Holkrans was excavated using techniques developed by Sampson *et al* (1989). 1m x 1m squares were divided into 25cm x 25cm quadrants, using an alpha numeric system, to provide spatial control of the site (Fig. 4). Excavations were carried out by digging in 25mm spits to provide a reliable temporal resolution of artefacts (Fig. 5).

The sample, of 1 134 lithic artefacts, was drawn from quads A1 through A4 of square E8, located at the base of a quartzite wall just outside of the rock-shelter. These quads were excavated to a depth of 13 spits or 32.5cm. The raw material and physical morphology of artefacts were described using a system of classification based on Deacon's (1984b) typology for LSA lithic assemblages.

The data were converted and represented on a series of graphs which displayed frequency distributions of raw materials and artefact types. Trends in the distribution of artefacts were used to draw comparisons between lithics in the ceramic and pre-ceramic artefact-bearing layers.

As the sample is relatively small, we do not attempt to draw definitive conclusions regarding the occupation of the rock shelter, but rather to explore possibilities and test preliminary observations in preparation for a more extensive study.

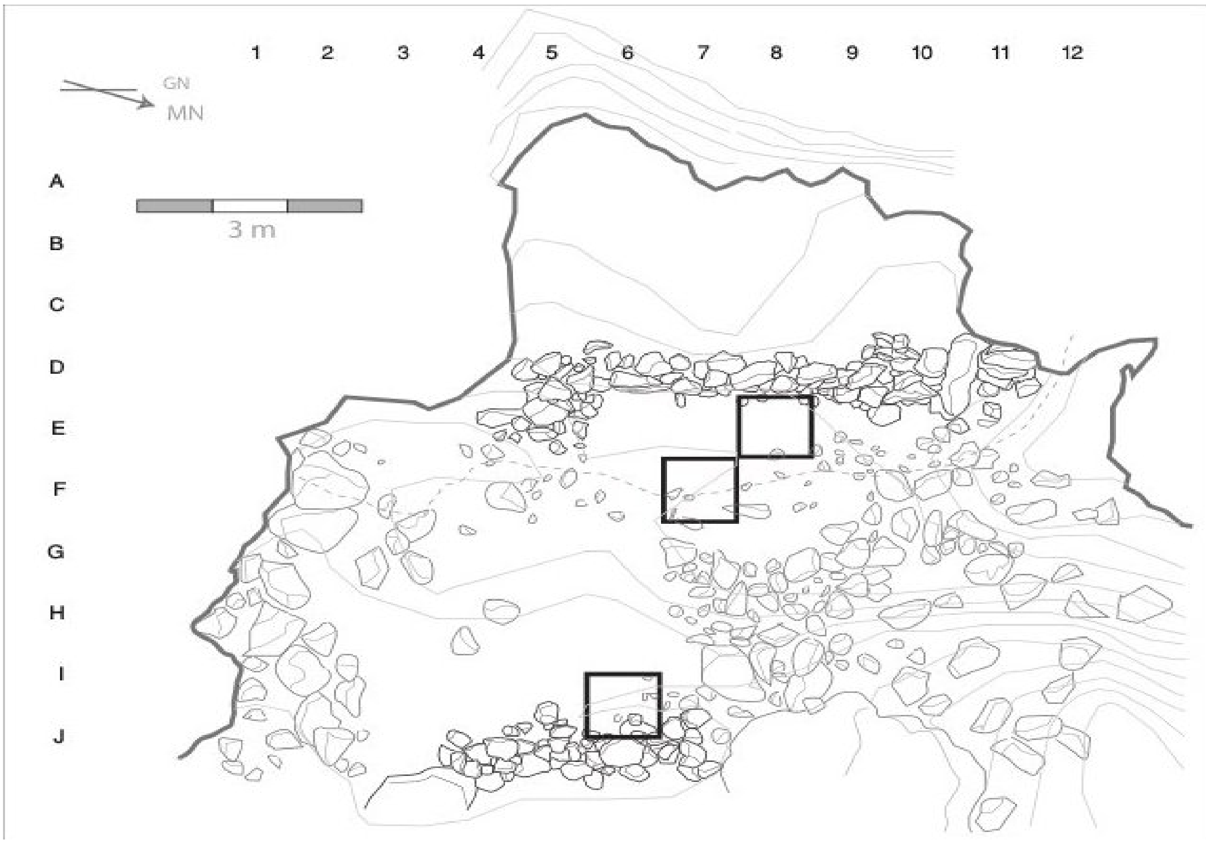


Figure 4: BFK1 Site map (Bradfield & Sadr 2011: 4)

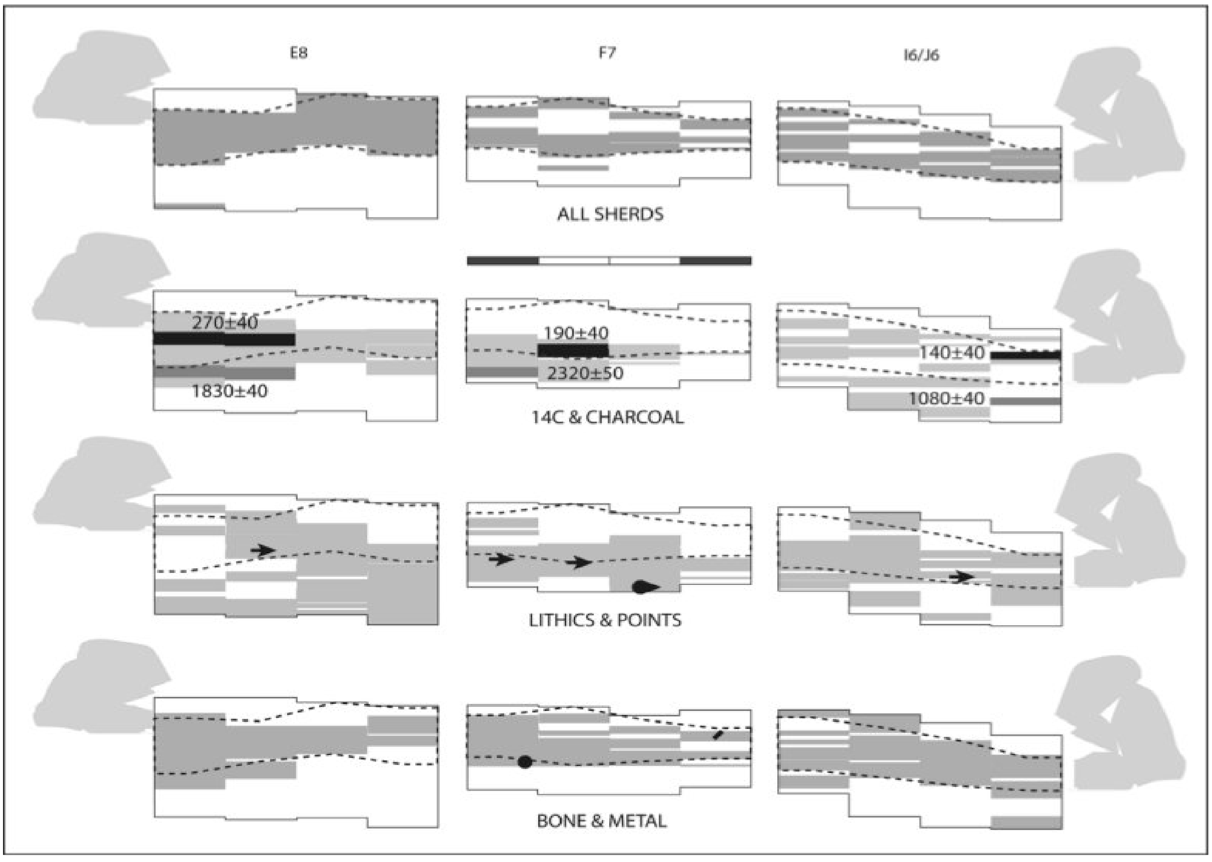


Figure 5: Site Profile of excavated squares and distribution of major finds (Bradfield & Sadr 2011: 5)

SETTING

Holkrans is located along a shelf of quartzite overlooking the Vaal River on the property of Thabela Thabeng, on the North West side of the Vredefort Dome World Heritage Site. The central area of the Dome is flat farmland, while the numerous folds of the outlying quartzite rim give way to the flat planes of Potchefstroom and the Witwatersrand Supergroup to the North (Simpson 1977; Reimond & Gibson 2005).

The vegetation in the hilly area is classified as 'Bankenveld' and is well wooded with *Acacia karoo, A. caffra, Celtis krussian, Rhus lanceolata, Zizyphus mucronat, Protea caffra* (Balkwill 2005). Rainfall is 570-650mm pa, with most of it falling from October to March. Drainage at Thabela Thabeng is largely from Northwest to Southeast, from the watershed to the Vaal River (Sadr 2008, 2009).

The Vredefort Dome was produced by one of the largest and oldest meteorite impacts in the world's history (Reimond & Gibson 2005). The Vredefort dome was declared a World Heritage Site under the World Heritage Convention Act, No 49 of 1999, primarily for its geological importance. While this declaration was issued with respect to the unique geology of the Dome, the ecology and archaeological heritage of the area magnify its importance with respect to future and on-going research. These are protected by the National Environmental Management Act, No 107 of 1998 and the National Heritage Resources act, No 25 of 1999 respectively.

Considerable variability has been observed in the geology of the central and outer rim areas of the Vredefort Dome (Reimond and Gibson 2005), presenting a diversity of raw materials for stone tool production at the regional level. Two local sources of raw material used in stone knapping are identified near Holkrans: the eroding gravels of the Vaal River, and the quartzite ridges of the outer dome formation.

HOLKRANS ROCK SHELTER

Holkrans is situated some 20m up-slope from one of the main roads linking chalets on the Thabela Thabeng property, overlooking the Vaal river. The steep slope leading up to the shelter is scattered with artefacts made of a range of quartzite, fine grained cherts, shale and other raw materials. The soil is both dark and organic, a likely consequence of the nitrogen-rich droppings of the rock rabbits (Hyrax), who make their home in and around the rock shelter. The shelter itself is shallow, with a stone terrace at the mouth (Fig. 6). The outer-most wall, constructed with quartzite boulders and cobbles, maintains the area of relatively flat ground outside the shelter and gives way to a steep slope thereafter, acting as a 'cradle' for the archaeological deposits. Lithics, bone and ceramics can be seen eroding out of the deposit and on the surface. Large pieces of quartzite from periods of rock-fall choke the matrix, sealing off parts of the archaeological deposit. Evidence from past excavations suggest that the stone wall at the mouth of the shelter was constructed above the most recent LSA occupation.

Figure 6: Holkrans rock shelter

LITERATURE REVIEW

PREVIOUS RESEARCH IN THE AREA

To date, several archaeological and geological studies have been conducted in the Vredefort Dome area (Mason 1968; Maggs 1976; Simpson 1977; Taylor 1979; Loubser 1985; Boonzaaier & Lourens 2002; Pelser 2003; Bakker et al 2004; Waanders et al 2005; Nkhasi-Lesaoana 2008; Sadr 2008; Sadr 2009; Reimold & Gibson 2009; Bradfield & Sadr 2011). The archaeological sites from this region are from a variety of time periods (Pelser 2009), some of which provide useful points of comparison for understanding the regional context of the shelter.

The SAHRA cultural heritage survey and management plan for the Vredefort Dome (Bakker et al. 2004) lists all known archaeological sites in the area and grades them according to their apparent significance. Holkrans was given a grade III rating and is considered to be of medium importance, as it may potentially contribute to an improved understanding of the “cultural significance of the larger area” (Section 27 of the National Heritage resources Act, No. 25 of 1999, Paragraph b). For this report archaeological sites which are temporally and/or spatially related to Holkrans are of interest.

STONE AGE SITES IN THE VREDEFORT DOME

As of yet, relatively little in the way of stone age research has been conducted in the Vredefort Dome (Reimond & Gibson 2005). Surface scatters of Middle Stone Age and Later Stone Age artefacts have been found throughout the area, while Early Stone Age material has been discovered eroding out of the gravels surrounding the Vaal River (Bakker et al 2004; Reimond and Gibson 2009), though Holkrans is the only rock shelter to have been excavated in the Vredefort dome. Its associated material culture and radio-carbon dates place the excavated layers during the late Holocene.

STONE ARROW HEADS FROM HOLKRANS

Recently Bradfield and Sadr (2011) published a paper on the stone Arrowheads from the base of the shelter's ceramic LSA layer. The arrowheads' (Fig. 7) mean length and width and associated radio-carbon dates were compared with those of other tanged arrowheads from the South African interior. Identifying observable changes in the lithic artefacts and their distribution in these layers forms part of this project. The ceramic phase may show a temporal association with the occupation of the Buffelskloof and surrounding Vaal River area by Iron Age farmers and herders (Mason 1968; Maggs 1976; Taylor 1979).

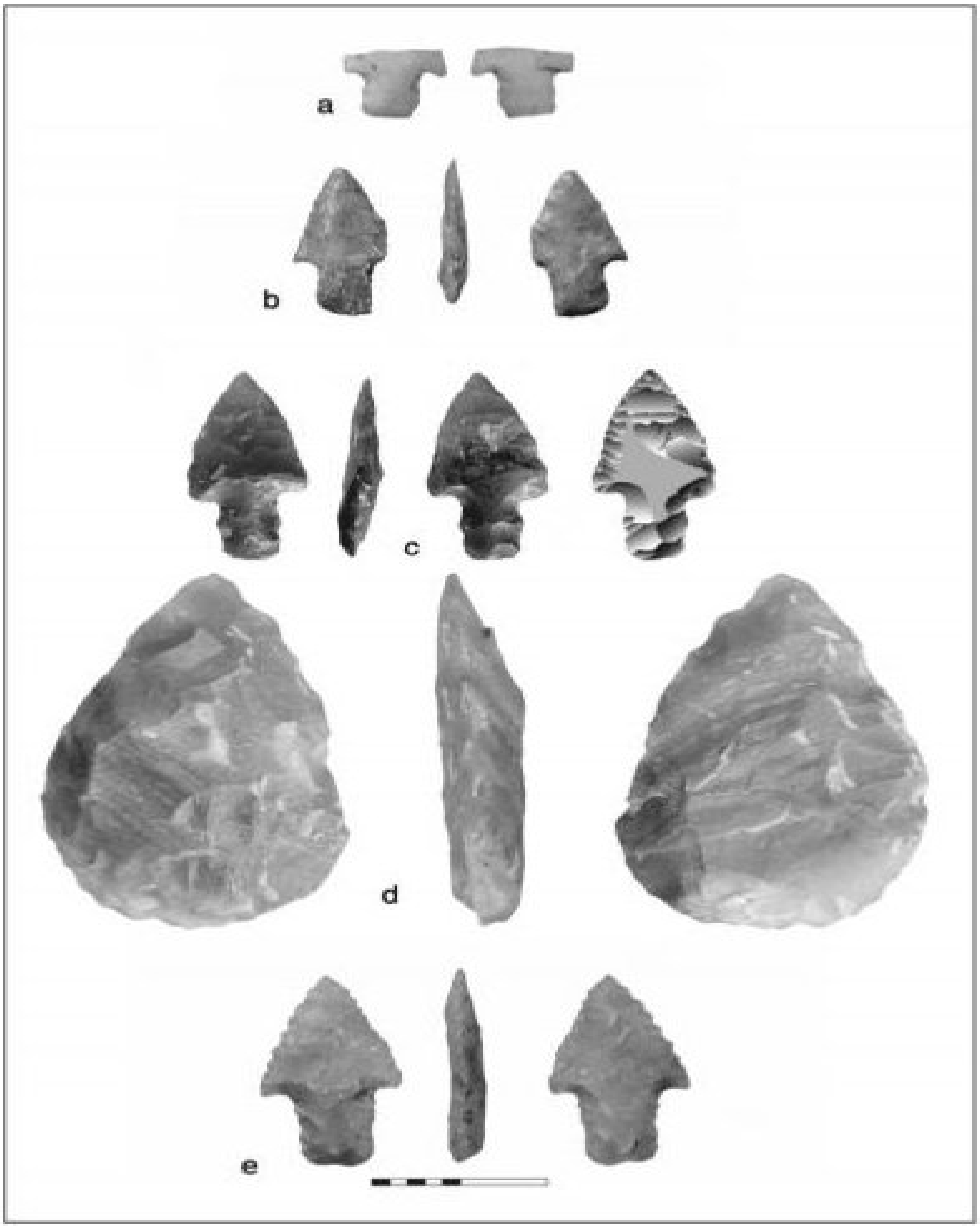


Figure 7: Arrowheads from Holkrans; (a) J6.A1.6; (b) F7.A3.9; (c) F7.A3.9; (d) E8.B2.6. The scale bar is 10 mm (From Bradfield & Sadr 2011: 9)

IRON AGE SITES IN THE VREDEFORT DOME

Compared to Stone Age Archaeology, a great deal more information is available for the Iron Age settlements of the Buffelskloof and surrounding areas. Extensive surveys using aerial photography have revealed numerous Iron Age structures in the region. In 1979 Michael Taylor helped to fill a gap between two previous reconnaissance projects, in the areas to the North of the Vaal River by Mason (1968) and to the South by Maggs (1976). More recently, a study focused on the distribution of these stone-walled structures within the Vredefort dome was conducted by Nkhasi-Lesaoana (2008), adding new information in the spirit of earlier similar work. These projects helped to increase our knowledge of the distribution of these settlements, as well as their associated time-frames and cultures, derived from a scheme of classification based on architectural styles.

IRON AGE ON THE BUFFELSKLOOF

An earlier ethno-archaeological study of an Iron Age structure classified as Group III by Michael Taylor, revealed that it was likely inhabited by a mixture of cultures, either Kwena or Fokeng, who were incorporated by the Rolong in the last 500 years (Loubser 1985). The spacial division of the settlement in terms of gendered activity areas was revealed through excavation, with much of the evidence correlating with settlement organisation models derived from ethnography (Kuper 1980). A bladelett core and worked bone artefacts, recovered along with more characteristic Iron age material culture during the excavation and the mention of rain-making practices, also hint at a mixing of technology, ideology and knowledge derived from indigenous hunter gatherer groups, although this is not specifically represented as such in the research.

IRON AGE AT AASKOPPIES

In 2003 Anton Pelser excavated an aggregation of Iron Age structures at nearby Aaskoppies. The structures were classified as Group II by Taylor and dated to AD 1650 to 1800. This time-frame was largely in accordance with Pelser's findings. The research generated a wealth of information on the activities, domestic economy, settlement layout, cultural identity and time-frame associated with Aaskoppies sites. Although exemplary, questions are raised with regards to the attribution of material evidence in some instances.

Firstly, in the case of one human burial at the site, Pelser (2003) notes that the only associated grave goods were a copper ear ring and a single glass bead. Interestingly, it is further noted that stone tools and worked bone artefacts were also associated with the find, yet these were not seen to be linked to the remains (Pelser 2003: 69). A similar problem in attribution is made with regards to the bone and stone tools recovered during excavation. The stone scrapers are described as having “an Iron Age origin” as they were recovered from both hut and midden excavations (Pelser 2003: 82). This is perhaps not a critical enough evaluation of the stone artefacts and it is not clear whether “Iron Age origin” places the scrapers as a product of a time-frame or an archaeological culture. When considering the possible integration of hunter-gatherers into the polity at Aaskoppies, one may explain the mixture of technologies with added confidence, providing an instance to recognise a mixing of technologically distinct archaeological cultures.

LATE CONTACT SITES

Thorp (1998) hypothesised that in the Orange Free State, south of the Vaal River, existed a frontier between Hunter-gatherers and agriculturalists. Like the Buffelskloof area, populations of hunter-gatherers and Iron Age (IA) farming communities occupied the landscape at more or less the same time (Dreyer 1990). This created a scenario of interaction between archaeologically distinct LSA and IA cultures (Shelona 2000). A similar contact phase was also identified in the southern and eastern Transvaal (Phillip 1979; Wadley 1987). Similarly, late contact rock shelters in the Makabeng, Limpopo province (e.g. Holt 2009) may prove as useful points of comparison for Holkrans, once a larger lithic sample has been attained, as contact between different archaeological cultures may have been a potential shaper of the archaeological record in this area (Forssman 2010). One might imagine that a similar set of circumstances were present in the Buffelskloof area, during a period of pre-colonial contact dating back some 500 years. The influence of contact on the archaeological record is complex, as the nature of contact may take different forms in different historical and geographic contexts, ranging from confrontation and competition for resources, to trade and mutually beneficial exchange. We deal with these concepts in more detail in a later chapter.

While much of southern Africa's pre-colonial stone-walled structures are associated with Iron Age farmers (Huffman 2007), evidence indicates that some structures were built and used by Later Stone Age (LSA) herders and hunter-gatherers (Sampson 2009; Humphreys 2009; Jerardino & Maggs 2007; Webley 1997; Noli & Avery 1987; Humphreys & Thackery 1983). In some instances cultural mixing might explain the appearance of LSA material culture at early farmer sites in the Buffelshoek and surrounding areas

CULTURAL MIXING

Cultural mixing of hunter-gatherers and early farmers is supported by both genetic (Fig 8.) and linguistic evidence, especially visible in the make-up of *Xhosa* speaking populations (Soodyall & Jenkins 2001). Although questions remain as to the identities of S*an* hunter-gatherers and K*hoi* pastoralists in the archaeological record, in some cases the two being lumped together under the category '*Khoisan*'.

TECHNOLOGY, IDENTITY AND ARCHAEOLOGICAL CULTURES

We now turn our attention to establishing the identity(s) of those who occupied Holkrans and what the site was used for. The technological aspects of the LSA will form the focus of this section. It is important to bear in mind that; “No one site can represent the entirety of what people did” (Mitchell 2005: 156). The archaeology at Holkrans thus represents a single facet of human activity.

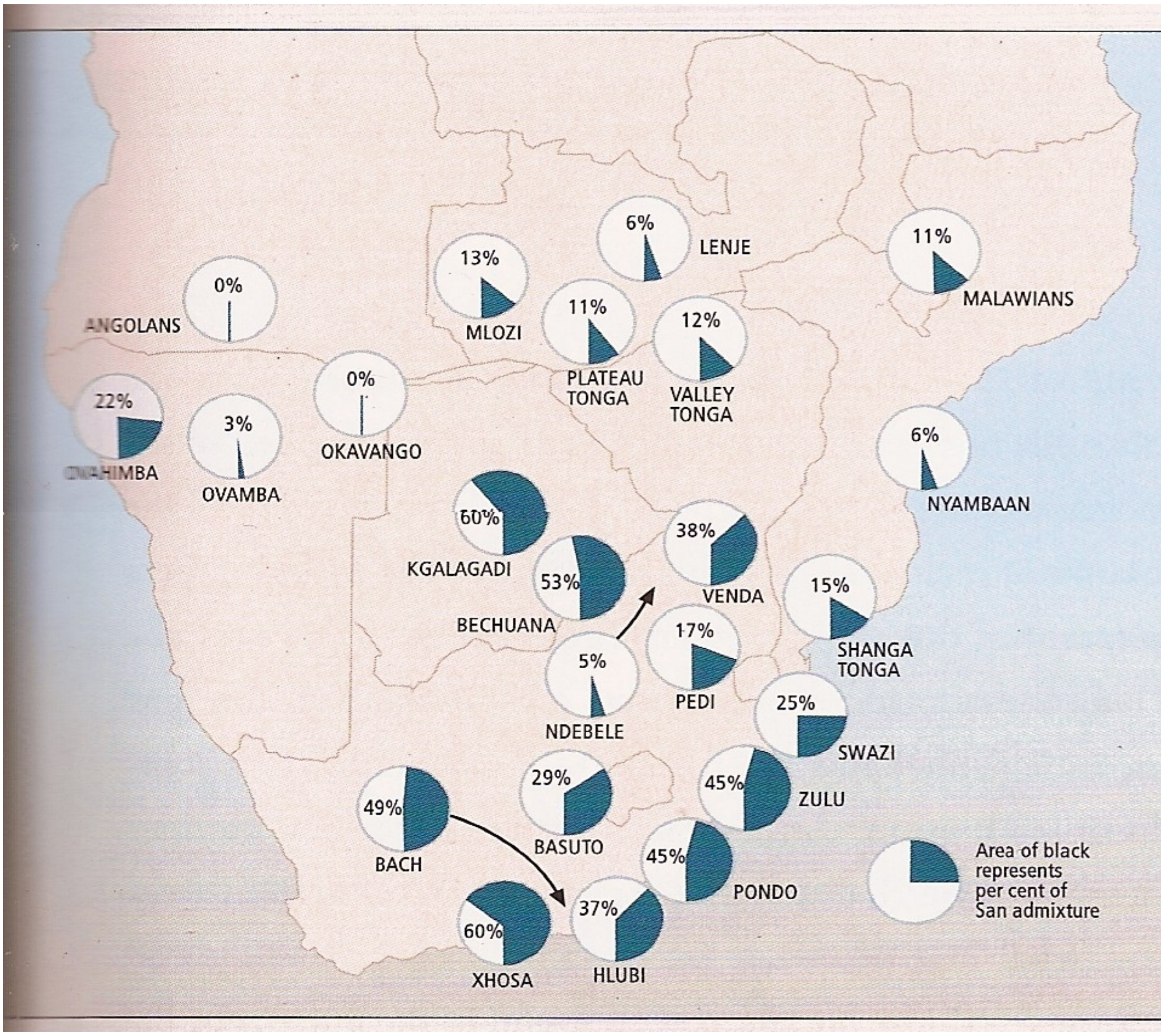


Figure 8: Map of southern Africa showing the estimated percentage of San admixture in Bantu-speaking groups (Soodyall & Jenkins 2001: 81)

MICROLITHIC TECHNOLOGY AND THE LATER STONE AGE

The LSA is characterised by numerous technological innovations including:

> "...bows and arrows, ostrich-eggshell water bottles, bored stones used for digging stick weights, grooved stones for shaping ostrich-eggshell beads or bone points, small stone tools often less than 25 millimetres in length, polished bone tools such as needles, awls, link-shafts... twine made from plant fibre or leather, tortoise shell bowls, fishing equipment such as fish hooks and sinkers, leather clothing, [and] bone tools with

decoration...” (Wadley 2001: 127-130).

Microlithic technology emerged during the LSA as a means to produce multi-component hafted tools, such as spears, arrowheads and knives, while efficiently utilising raw materials and poorer-quality local stone (McCall & Thomas 2009). Utilisation of smaller nodules of fine-grained chert and chalcedony and quartz cobbles would have necessitated the use of bipolar flaking techniques to create a striking platform, to produce microlithic blades and other formal tools.

Technological industries such as the Roburg were particularly related to bladelet production, which formed a major component of LSA technologies into historical times (Deacon 1984b). Although not large enough to inflict mortal wounds without precision aim, these proved to be a highly effective poison delivery mechanism which could fell large prey (Ambrose 1998). Some grindstones found at rock shelters have been interpreted as being used for processing poisons rather than grinding grain (Bousman 1993). Tools such as scrapers, awls and bone needles were apparently used in leather working and hide processing (Deacon 1984b).

HERDERS AND HUNTERS

Khoi pastoralists, San hunter-gatherers and their pre-historical antecedents are frequently defined by their use of lithic technology as LSA cultures. It has been suggested that differences in their lithic components may allow us to differentiate the tools of herders from those of hunter-gatherers (Parsons 2011). In Parsons (2008: 59) earlier work, two broad archaeological signatures were identified in the Northern Cape region. These two archaeologically different signatures seemingly correspond with the activities of herders and hunter-gatherers. The research suggests that these signatures may not be dissimilar to those in the southern African interior. These differences relate to the very different risk management strategies of herders and hunter-gatherers (Bousman 1993).

> “[The] replacement of formal microlithic tool-kits with expedient ones, reflects the opinion that mobile hunter-gatherers are dependent on flexible and lightweight technologies, *e.g.* those based on bladelets, whereas more sedentary populations can afford not to have the best tools for the job at hand” (Parsons 2011: 11).

Parson's deduction is based on the risk factors involved in the hunting practices of hunter-gatherers and with the supplementary hunting practices of herders (Deacon 1984b). While the former invested a great deal of time and effort in producing 'the best tools for the job', to ensure successful hunting practices, the subsistence strategy of the latter used hunting a a supplementary activity that was secondary to herding practices. Thus the tool-kits of herders and hunter-gatherers can be differentiated with a degree of confidence (Smith 1992; Sadr & Gribble 2010). The observations mentioned above largely agree with the research conducted by Andrefsky (2005).

While the the time-constraints placed on this project do not allow for an extensive analysis of the blades and bladelets recovered from Holkrans, insights drawn from Parsons' study, as well as that of Bradfield and Sadr (2011), suggest that Holkrans was primarily associated with hunting activities.

TRANSITION AND CONTINUITY

Explaining transition or cultural change in the archaeological record remains a standard goal in the study of the past. The transition from hunting and gathering to more sedentary practices of farming and herding are of great interest, not just in southern African Archaeology, but the world over (Sadr & Plug 2001). With the transition to herding having occurred relatively late in southern Africa (Smith 1992), Sadr & Plug (2001) emphasise the potential of such studies in examining transitions from hunting to herding. While previous chapters dealt with the theoretically abstract concepts of contact and frontiers, change and transition are both tangible and observable in the archaeological record. Whether or not these observable patterns of change are the result of contact and social interaction, as opposed to other influences such as climate change have yet to be examined.

Archaeological deposits from sites in south-eastern Botswana, reveal the effects of contact between hunters and early farming communities in the area. At two such rock shelters a correlation was found between the presence of ceramics in the contact layers and a notable change in the faunal remains when compared to those of pre-ceramic layers (Sadr & Plug 2001). It was deduced that smaller species of easily trapped animals, which supplemented the hunters diet prior to contact, were replaced by domestic stock, as indicated by changes in the composition of the faunal remains. The remains of larger wild game did not completely disappear, indicating that the communal practice of hunting persisted even after contact. As for the ceramics, it was hypothesised that they contained cereals and other foods cultivated by the agriculturalists which were given to the hunters in exchange for their services as client herders (Sadr & Plug 2001). Whether a similar pattern occurs at Holkrans is as of yet unknown, as the recovered faunal remains have yet to be analysed.

The appearance of lithic artefacts associated at farmer sites may indicate the hunters incorporation into such groups. Evidently the specialised san hunters, rain-makers or shaman incorporated into such groups maintained some elements of their original identity and social memory, in a new social context (e.g. Cipolla 2008). In support, observations such as those of Smith (1990) suggest that the newly integrated hunters may have been regarded to be of a lower class, having joined an already established socio-economic system. Similar observations were made in the case of the Tswana's regard for their client-herders in historical times (Parsons 2008). The integration of these identities under such conditions would initially result in a social stratification based on a difference of cultural traits and ancestry.

THEORETICAL CONSIDERATIONS

As improved understandings of the pre-colonial past developed, the concepts of culture contact, frontiers, changing life-ways and transition became increasingly important among archaeologists in southern Africa. Such understandings are crucial to the theoretical framework of this project. Indeed generating meaningful interpretations of the archaeological remains related to periods of contact would be limited without a contact-based approach.

CHANGING LIFE-WAYS

The arrival of Bantu-speaking herders and farmers some 1 800 years ago, adds a unique layer to the archaeological record in southern Africa, characterised by a distinct cultural package of domestic animals, cereals, ceramics and stone-walled architecture (Huffman 2007). By contrast to stone-tool using cultures in southern Africa, the Khoi herders and San hunter-gatherers, the Iron Age farmers were skilled metallurgists who fashioned many of their tools, jewellery and other forms of material culture from metal and metal alloys (Huffman 2007). Metals were highly valuable in these communities (Miller 2002). In a practical sense this technological difference allowed archaeologists to easily differentiate these technologically distinct cultures in the archaeological record. They can also provide some indication of culture contact at late Holocene sites in southern Africa, as copper beads, jewellery and thick-ware ceramics make their way into rock-shelters used by hunter-gatherers (Deacon 1984b).

A DISCIPLINARY DIVIDE

The division between research conducted in the fields of Stone Age and Iron Age Archaeology results from the arrival of the technologically distinct Nguni Iron Age groups some 2000 years ago in southern Africa (Hall 1984). There are, however, strong counter narratives against the view that the Bantu expansion can be represented by a single cultural package (Boestoen 2007), or 'a massive exodus from one area to another' by 'large coherent groups' Parsons (2009: 49). More realistically, the appearance of the Iron Age in southern Africa was the result of "...slower and progressive mosaics of immigration, diffusion, invention and admixture" (Lwango-Lunyiiso & Vansina 1990: 80-81). Similar views, expressed by archaeologists decades earlier, recognised that there existed a grey area of complexity and interaction sandwiched between the hard analytical division of the Later Stone Age and Iron Age.

Members of the Burg-Wartenstein symposium in terminology, held in 1965 went so far as to consider abolishing the term 'Later Stone Age' providing a more suitable term could replace it (Sampson 1972). As of yet no suitable substitute has been provided for the term, and it continues to be used in much academic literature, both to describe a set of related technological complexes and cultures, and to refer to a time-frame beginning around 28 000 years ago in southern Africa and persisting until as recently as 200 years ago (Mitchell 2002; Wadley 2001).

FRONTIERS

In 1983 the Council of the Southern African Association of Archaeologists conferred in Gaborone, Botswana to discuss archaeology and archaeological issues thematically linked to the concept of 'frontiers'. A year later the proceedings and papers were published in a monograph entitled; *Frontiers: Southern African Archaeology Today*.

In recognising the temporal overlap of the Later Stone Age and Iron Age, an opportunity emerged to examine their interactions within and between archaeologically visible frontiers (Smith 1984). Similarly, Yellen (1984) suggested that the stark division between Iron Age and Later Stone age life-ways may be unjustified. Long-standing perceptions that southern Africa was peopled, in pre-colonial times, by 'distinct, separate communities, rather than a complex pattern of intermingling traits' were politely challenged (Hall 1984: 2).

Wadley (1984) suggested that the arrival of early farmers in the savannah areas of the Transvaal effectively limited the seasonal hunting range of hunter-gatherers, forcing them to adopt different subsistence strategies. Similarly, Deacon (1984b) notes a shift in subsistence strategies between the earlier and later LSA as smaller gregarious grazers, available throughout the year, were hunted more intensely than large, seasonal grazers. One would thus expect a noticeable signature in the archaeological deposits of 'contact' hunter-gatherer sites on the high-veld: a recurrent pattern of seasonal occupation, interrupted by a distinct and noticeable change in the deposits associated with the site's terminal occupation sequence; or a noticeable change in technology and material culture correlating with a shift in subsistence. Due to the high degree of temporal resolution at Holkrans, such changes, if present, might be observable in the archaeological record.

CONTACT

The development of contact theory has largely been cradled by the historical branch of archaeology. A substantial body of literature details the effects of culture-contact and colonialism on indigenous groups (Lightfoot 1995; Orser 1996; Stein 1998; Silliman 2005). The development of the theoretical aspects of contact arise through the supplemental use of archaeological remains and historical documentation to study the past, focusing almost exclusively on European contact with indigenous groups. Although written records provide information on the nature of contact in the historical period, the derived theoretical insights promise to aid in the interpretation of pre-colonial archaeology. Indeed we are urged by authors such as Parsons (2009) to look beyond the 500 year mark for which historical documents exist and apply our insights further back in time.

The theoretical background of culture contact will be useful for interpreting the archaeological deposit at Holkrans, as a limited range of interactions such as; skirmishes, trade, competition for resources, access to territories, cultural integration and transformation, would be factors to consider in the contact of pre-colonial people – although playing out in a different, yet not dissimilar, set of circumstances. It is my goal in this regard to show that theoretical insights derived from historical archaeology may be applied further back in time, to phases of pre-colonial contact.

HISTORICAL CONTACT ALONG THE NAMIB COAST

Using a similar approach rooted in contact studies, Kinahan (2000) produced a wealth of information regarding the little understood impact of contact and trade between European mariners and *Khoi* herders along the Namibian coast. Kinahan's study utilised the archaeological remains of *Khoi* sites to supplement the accounts provided by historical documents and discuss the indigenous response to contact, with particular attention paid to patterns in economic production and the valuation of trade items. While no such records may assist me, the insights drawn from the study may do just as well.

In particular Kinahan (2000: 4) observes that "Initially contact and trade stimulates indigenous production, but because the exchange relationship is uneven, the imports do not have the same labour equivalent of locally manufactured products". In short, the increase in indigenous production precedes economic down-turn, quite possibly resulting in local economic collapse, forcing indigenous groups to adopt new subsistence strategies or reintegrate themselves within a new socio-economic system. The latter response is, indeed, quite realistic as indigenous social structures, such as that of the khoi herders of the Namibian coast, were fluid enough to change and adapt in periods of contact (Wolf 1982; Kinahan 2000).

METHODS

We now define our analytical methods before examining the data. The excavation procedure will be briefly described while the process of constructing a typology will be detailed more extensively.

EXCAVATION

Holkrans rock shelter was excavated using methods developed by Sampson *et al* (1989) for recovering material culture from Later Stone Age (LSA) deposits. This method was chosen based on preliminary observations of the site and its lithics.

A site plan in combination with an alphanumeric grid were used both as a first step to plan excavations and to provide spacial control of the site. The 1m x 1m squares chosen for excavation were set out and then further subdivided into 16 25cm x 25cm quads. To achieve high temporal resolution for recovered artefacts located in 25mm deep spits.

Recovered materials were sieved using a 1mm wire mesh. The volume of excavated deposit was recorded, as were actual spit depths. The latter was recorded using a dumpy level mounted on a tripod, whose height was also recorded. Artefacts were temporarily stored in ziplock bags, along with an identification tag detailing the square, quad and spit level from which the materials came. These were then sorted into bone, lithic, ceramic and charcoal categories and weighed, thereby readying materials for more specific analysis.

The analytical component of this study specifically deals with the lithic materials from quads A1 through 4 of square E8. The lithics in this particular sample were from an area along the quartzite wall just outside of the shelter's mouth. The radio-carbon dates for the sample and other parts of the site provide chronological markers to aid interpretations. A standard typology was used to categorise the lithics prior to interpretation using frequency distributions for raw materials and lithic types. Increases and decreases in frequencies are read from right to left with reference to spit depths. Once a larger lithic sample is acquired more advanced multi-variant statistical techniques such as Principal Component Analysis (e.g. McCall & Thomas 2009) may be used to compare frequency distributions of lithics from Holkrans with other rock shelters occupying a similar time-frame.

TYPOLOGY & CLASSIFICATION

Janette Deacon's (1984) typology for Later Stone Age lithics was used as a guideline to classify materials recovered from BFK1. Lithics were first divided by their raw material following a nominal approach (e.g. Chazan 1997), in this case the categories of Quartz, Quartzite, Shale, fine grained (chalcedony and chert) and 'other' were used. The distribution of these raw material types will be discussed in the results chapter. Pieces were then classified based on their physical forms, in the parent categories of manuports, cores, 'waste' and formal tools. Brief definitions for these major typological categories and their sub-types are as follows:

MANUPORTS

Lithics with an unworked shape which are clearly not from the immediate area and were thus transported to BFK1 from their original context by human agency. Pebbles, specularite, ochre and whole crystals comprise the sub-types of this category. Split pebbles were also recorded in this category. These pebbles had a smooth outer cortex which had been split by natural processes, and subsequently transported to a site. Such pieces possessed a natural striking platform which could be exploited by knappers.

CORES

Lithics with a minimum of 3 visible flake removals with the negative bulb of percussion still intact, indicating their use in creating flakes and blades. The classification of different core types is largely indicative of different flaking techniques (Deacon 1984a). bladelet cores, irregular cores, bipolar cores and discoidal cores are the sub-types of this category. Core types provide indications of how specific raw materials were reduced through knapping.

- Bladelet cores: Cores with one and occasionally more platforms and a minimum of three negative bulbs from which parallel-sided flakes of bladelet dimensions had been struck.

- Irregular cores: Cores with flake removals from multiple striking platforms from multiple directions.

- Bipolar cores: Raw material flaked using a hammer and anvil technique to remove flakes simultaneously from both ends when striking (Mitchell 2002). Visible ripples radiating from either end of each nodule are indicative of bipolar flaking.

- Discoidal cores: Cores of this type have an elliptical shape and show extensive reduction as a result of flaking. This core type indicates intensive flaking activity geared to maximise flake production from a single piece of raw material.

'WASTE'

The waste category refers to lithics produced by knapping which lacked formal retouch or clear utilisation. Flakes, chunks, chips, blades and bladelets constitute the subtypes of this category. The term 'waste' is however a misnomer as pieces placed in this category could have been used. As such some refer to this category as *debitage*, referring to the by products of created by knapping.

- Complete flakes, incomplete flakes and flake fragments: Thin stone fragments with an area larger than $1cm^2$ with a bulb of percussion. Possess a visible striking platform in the case of whole flakes and incomplete flakes, while flake fragments lack a visible bulb of percussion

- Chunk: Thicker, 'chunkier' stone fragments larger than 1cm² which had less then 3 negative bulbs and lacked the characteristics of flakes.

- Chip: Lithics smaller than 1cm² produced by knapping. Chips were collected separately and have yet to be counted or weighed. These data will prove supplementary to this study and shall be incorporated at a later stage.

- Blade: A flake whose length exceeds twice its maximum width and a length greater than 12mm.

- Bladelet: “A narrow parallel-sided flake with a length greater than twice the maximum width and a length less than 12mm” (Deacon 1984a: 375).

FORMAL TOOLS

Formal tools have secondary modification, or retouch, and are commonly defined by their morphological attributes. Scrapers, segments, backed bladelets, awls and flakes with miscellaneous retouch (MRP's) are sub-types of this category. Utilised tools, such as grinding stones were also recorded in this category.

- Scrapers: “Pieces with a flat ventral surface that are un-retouched and a convex working edge that has been deliberately shaped by secondary retouch” (Deacon 1984a: 384). Such tools are associated with the processing of animal hides (Deacon 1984b).

- Backed bladelets: “In plan form backed bladelets have two or more straight margins of which one or more are blunted with abrupt retouch and one is a straight cutting edge” (Deacon 1984a: 390).

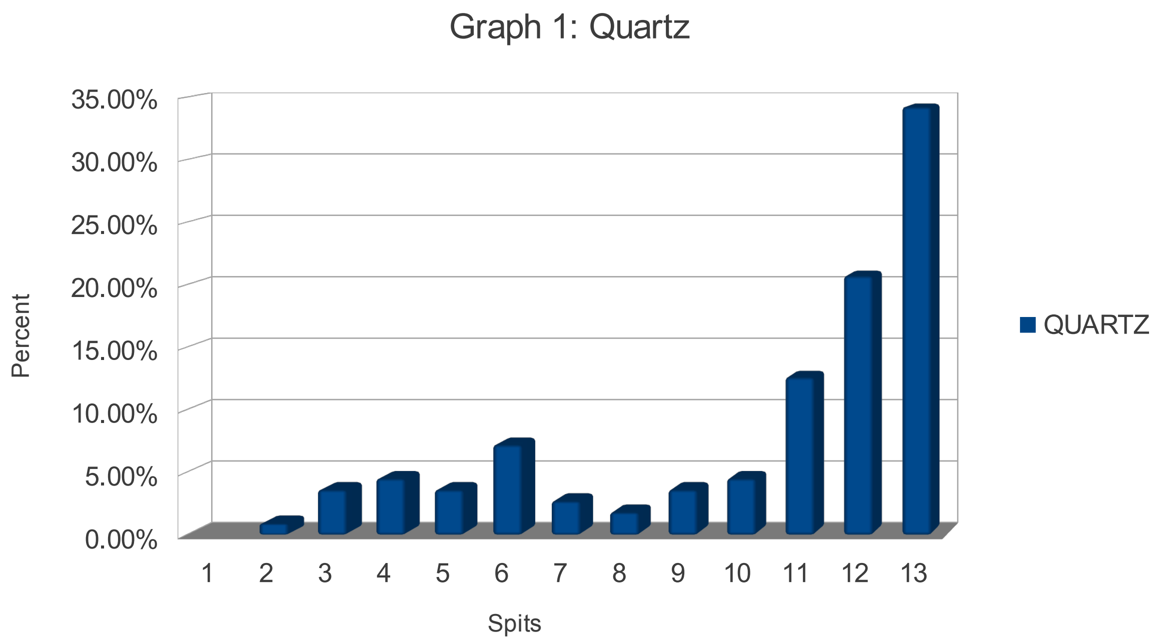
- Awl: “Made on flakes and a portion of the piece has been shaped to an elongated point leaving the rest of the flake un-retouched” Deacon (1984a: 394). Deacon (1984b) suggests that these were associated with leather-working activities.

- Miscellaneous Retouch Piece: Pieces showing sustained formal retouch but, due to their morphological variability, do not fall into any of the commonly established formal tool classes (Deacon 1984a).

RESULTS: RAW MATERIALS

QUARTZ

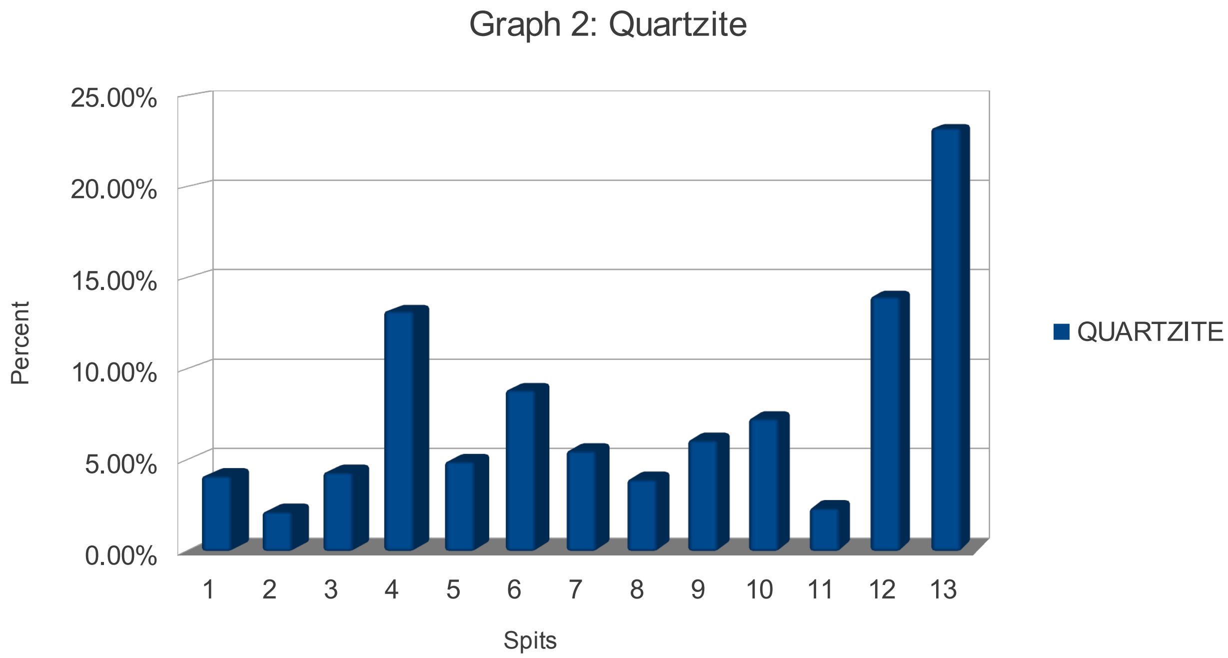
Quartz artefacts totalled 111 pieces or 9.8% of the assemblage. Interestingly, 72.1% of all quartz artefacts were located in spits 11, 12 and 13, totalling 80 pieces. Quartz pieces were present in most of the other spit layers, albeit in significantly smaller quantities. These were likely sourced from veins of milky quartz in the nearby quartzite ridge.



The Majority of quartz lithics were located between layers 13 and 11. A trend in the decrease in this type is also noted between these layers.

QUARTZITE

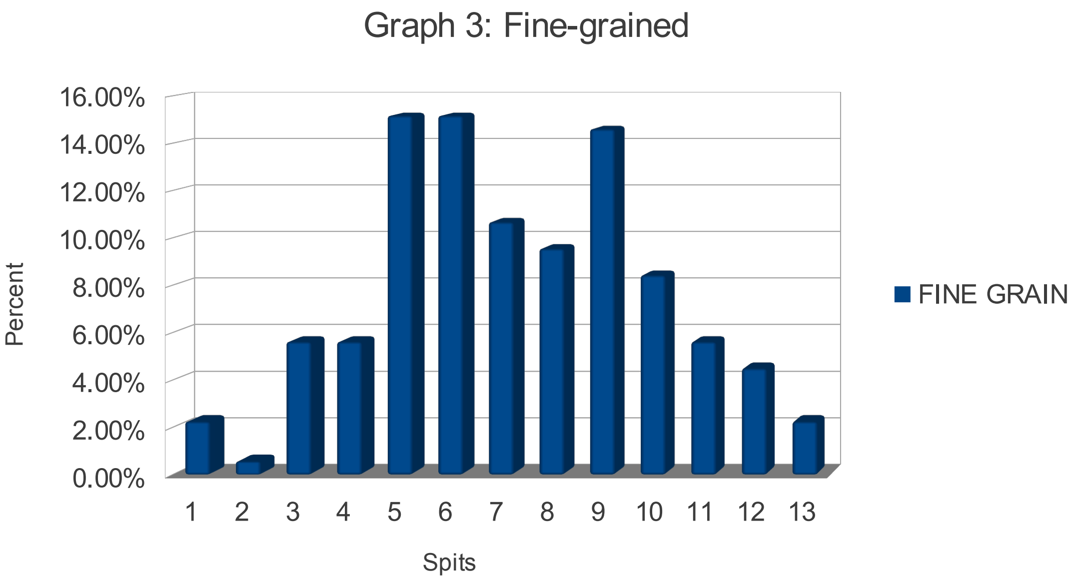
Quartzite was by far the most frequently encountered type of raw material, totalling 508 pieces, or 44.8% of the sample and were present in all spits. The majority of quartzite lithics were associated with spit levels 4, 12 and 13 (13.19%, 13.95% and 23.23% respectively). This type may indicate background 'noise' from natural climate-driven and geological processes. Lithics of this type were sourced from the shelter's immediate vicinity. A significant decrease in this type between spit layers 4 and 3 and 13 to 11 is also observed.



Changes in this type may reflect geological or climate related processes in addition to their use in stone tool production. A sharp decline in this type is noted between spit level 12 and 11.

FINE-GRAINED MATERIALS

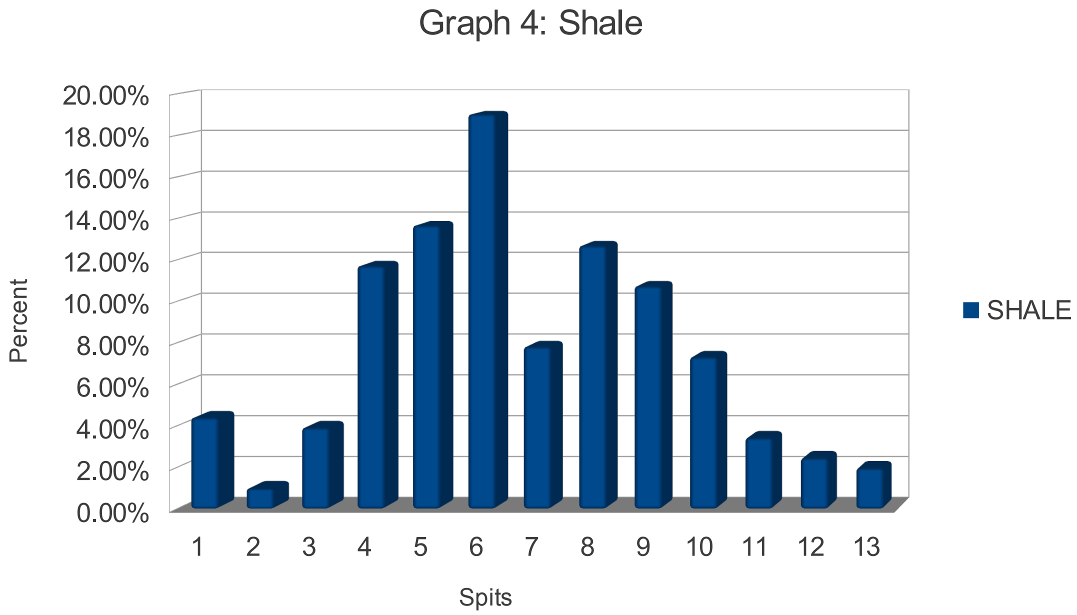
178 pieces of fine-grained raw material were identified in the sample (18.1%) of the total assemblage). A general trend of increased utilisation is observed, with three peaks noted in spit levels 5, 6 and 10. The significant decrease in this raw material in spit 4 is correlated with a noticeable peak in quartzite lithics. Occurring mostly on small pebbles or nodules a bipolar flaking technique was used to flake these.



A steady trend in the increase of fine-grained materials is noted, with several peaks in the ceramic levels. A decrease in this type is noted in the upper four spit levels.

SHALE

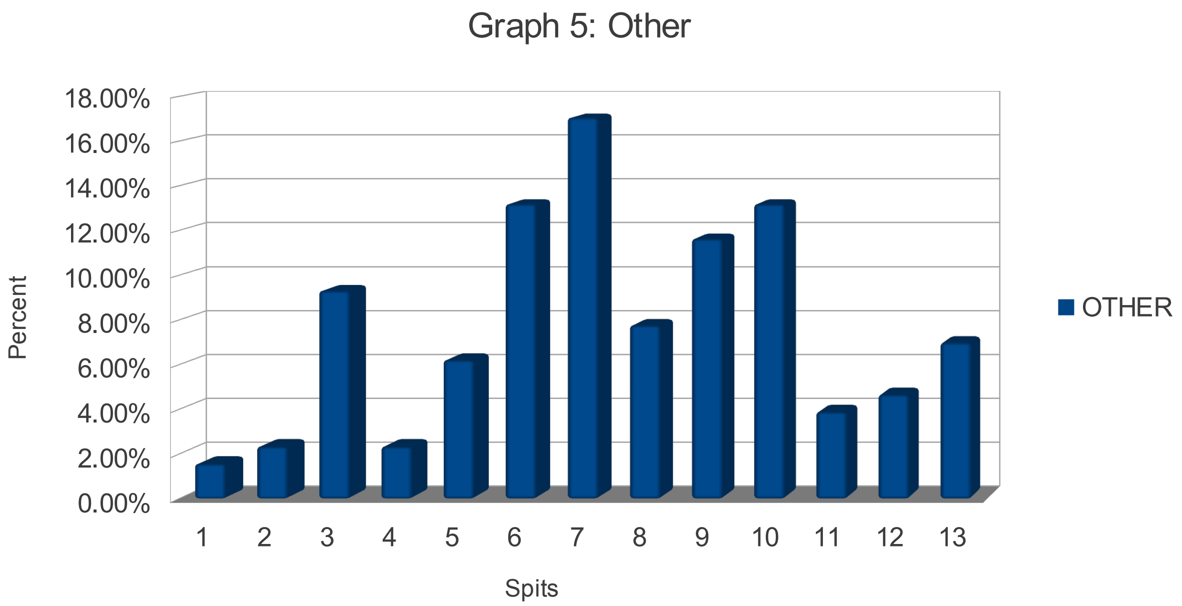
205 lithics were identified as Shale, totalling 18.08% of the assemblage. This was the 2nd largest raw material category, showing extensive utilisation during the late ceramic levels.



Although present in all spits the majority of shale lithics were were found between spit levels 4 and 10. Trends show a steady increase in the use of this raw material with a significant decrease in spit level 3, following a bell-curve distribution.

OTHER

Raw materials classified as 'other' refer to a range of less easily identifiable raw materials. Since this category represent a mixture of different raw materials, it is unlikely that distributions in this type will reflect meaningful patterns. A total of 129 pieces were identified with concentrations located between spits 4 and 11, in the middle ceramic levels. While lithics in this category may require further identification, their distributions indicate a wider range of raw materials were used in knapping during the ceramic levels

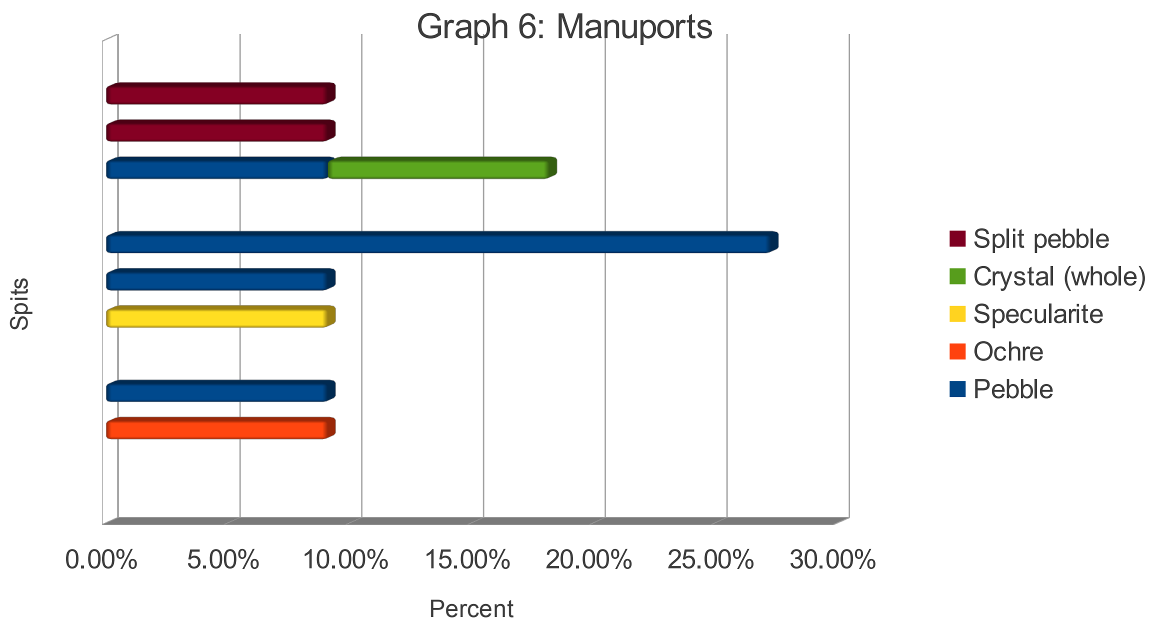


This graph shows increased concentrations of this type between spit levels 10 and 6 indicating a wider range of raw materials were used for tool production during the ceramic levels

RESULTS: TYPES

MANUPORTS

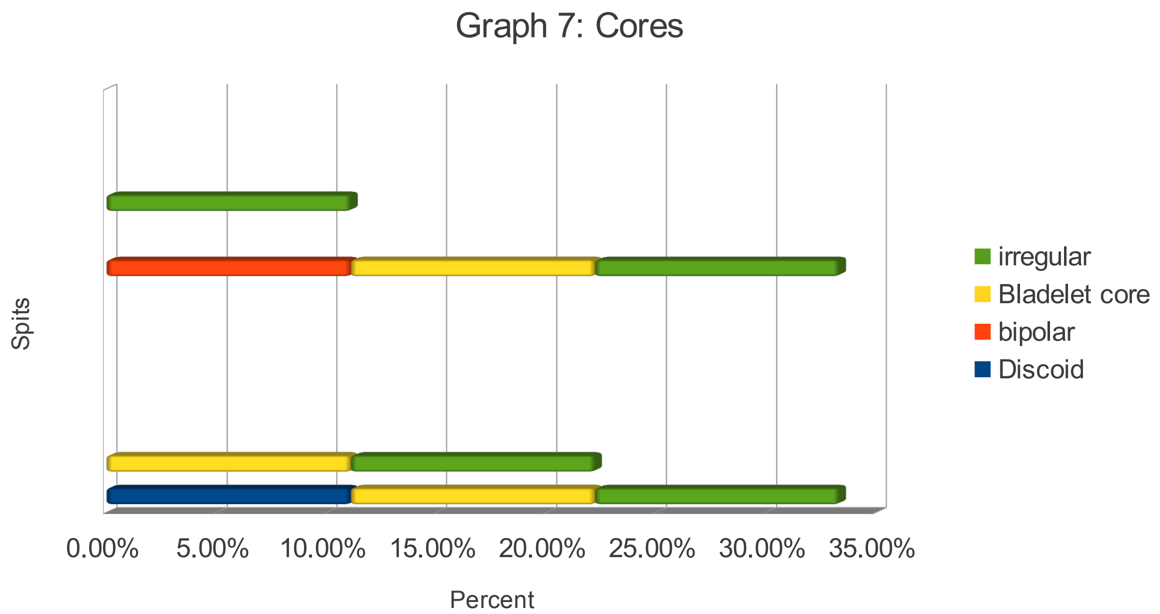
Few lithics with their original manuport form were identified in the sample. Concentrations of fine-grained pebbles of chert were located in the late ceramic layers along with the majority of formal tools, debitage and cores.



Two pieces of clear quartz crystal, one small chunk of red ochre and a small piece of specularite were also present in the sample. Both pieces of quartz (one whole crystal, slightly larger than 1cm² and one small chunk) were found in spit 4. A small chunk of red ochre was found in spit 11 and a small piece of specularite was found in spit 8.

CORES

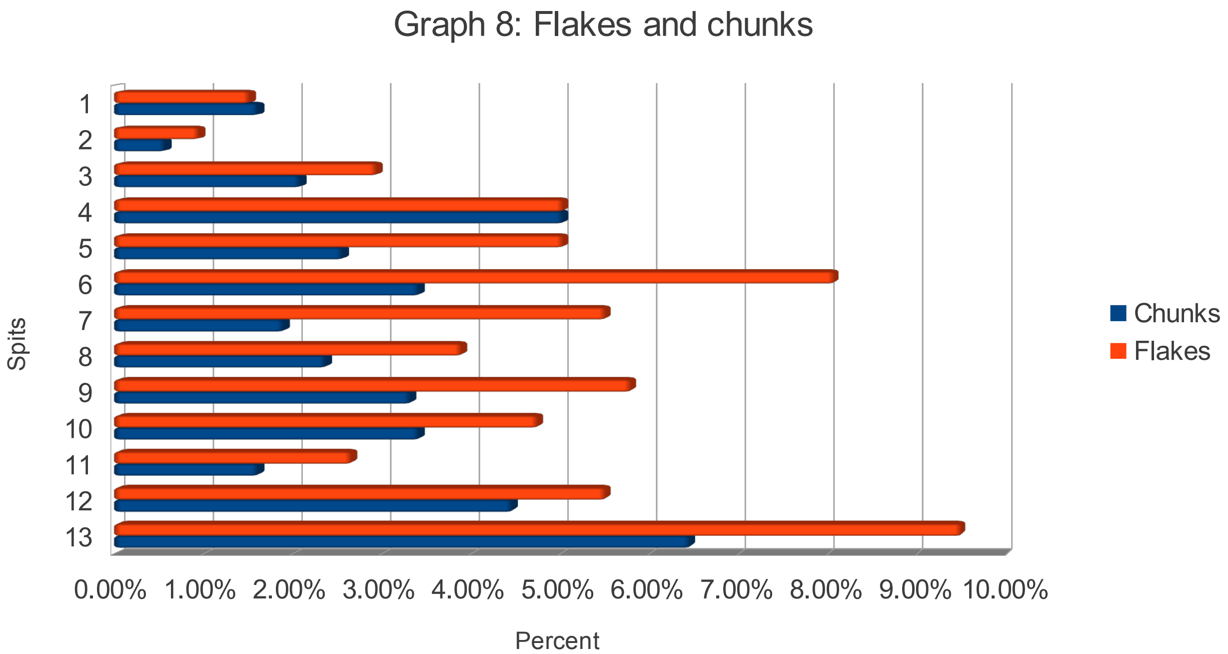
Although few cores were identified in the sample, their different types indicate a range of flaking techniques used on raw material (with the exception of the split pebble category). Different knapping methods appear to be related to the size and shape of raw materials (for example: small nodules of fine grained raw material appear to have been flaked using bipolar methods, while irregular cores were made on shales and quartzite using a range of techniques). Bladelet cores were identified in both the ceramic and pre-ceramic levels. Technological continuity in bladelet production is observed with an apparent temporal punctuation between the pre-ceramic and ceramic layers. The discoidal core in the lowest layer also indicate some technological differences between these layers.



Cores are largely concentrated in spit levels 6, 12 and 13. Bladelet cores are present both in the ceramic and pre-ceramic layers

FLAKES AND CHUNKS

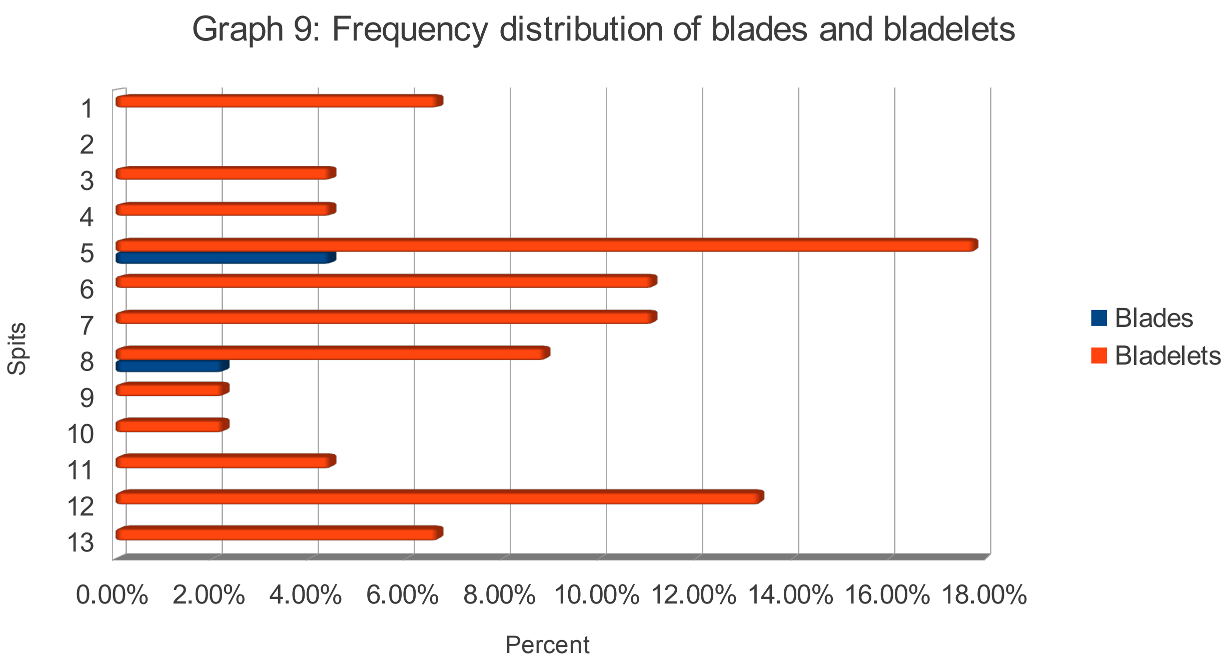
410 Chunks and 664 flakes were identified in the sample and were the most plentiful types in the 'waste' category. Trends in this type revealed that peaks in flake production occurred just prior to a noticeable decline in over-all lithic production. When compared to the raw materials data, at least two phases of increased lithic production are noted in spits 12 and 13, and in spits 6 and 7. A relatively stable phase of production is noted between spit levels 10 and 7. Complete flakes, incomplete flakes and flake fragments were recorded in the flakes category.



This graph shows the frequency distributions of chunks and flakes created by knapping. Decreases in these types are noted between spits 13 and 11.

BLADES AND BLADELETS

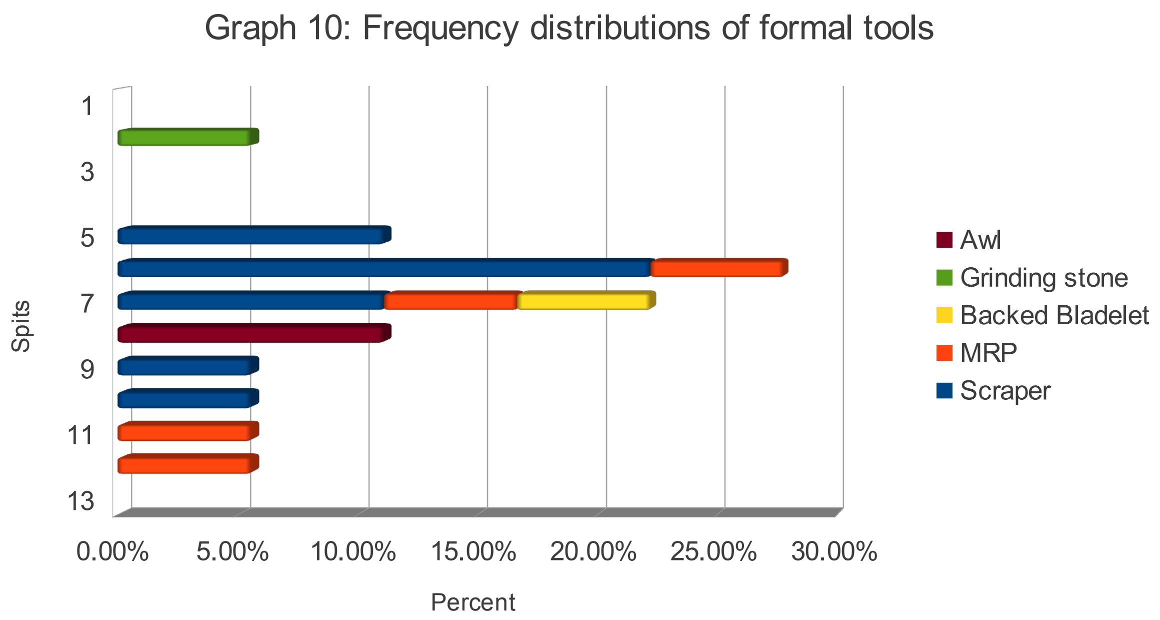
3 blades were identified, two in spit 5 and one in spit 8. A total of 42 bladelets were identified. Bladelets were made on a variety of raw materials. Those in the pre-ceramic layers were, however, predominantly made on quartz and quartzite. The decrease in bladelet production between spit layers 11 and 9, and 4 to 1 show similar to patterns to that of flake production. Although bladelets are present in both the ceramic and pre-ceramic levels, decreases in their production between these layers may indicate a temporal gap in shelter occupation.



The distribution of bladelets peak in spits 12 and 5, displaying a similar pattern to flake distributions.

FORMAL TOOLS

An increase in the distribution of formal tools is identified in the ceramic layers between spit levels 10 and 5 with peaks in the middle to later ceramic levels. Scrapers are identified exclusively with the ceramic layers, appearing in spit 10, along with arrowheads and thin-ware pottery.



Distributions of formal tools reflect general trends in other lithic distributions, pecoming especially prevalent from the mid to late ceramic layers

DISCUSSION

There were both advantages and disadvantages to the analytical approach used. The typological analysis and the analysis of raw material frequencies from this small sample could provide an initial impression of the assemblage within a short space of time without the use of expensive equipment. While trends in artefact frequencies suggest minimal post-depositional disturbances one can not assume that other areas of the site are completely undisturbed by bioturbation. Patterns in the distributions of lithic artefacts, when read in conjunction reference to pre-ceramic and ceramic layers and radio-carbon dates provide an impression occupation. Sampson *et al*'s (1989) excavation method provided a reliable temporal resolution for artefacts which made this approach possible. The obvious disadvantage of my approach relates to the limited sample size and exclusive focus on the lithics. Despite these limitations this approach proved useful for answering my main research questions.

Observations have been summarised in Table 1. Trends in raw material distributions and their associated radiocarbon dates, suggested two phases of occupation coinciding with the with the ceramic and pre-ceramic levels. These were separated by a decrease in the frequencies of flakes, bladelets, cores and retouched tools. An initially gradual shift away from the use of quartz and quartzite toward the use of shale and fine-grained raw materials reappears as a stronger pattern after a hiatus in shelter occupation some 1 500 years ago.

The fairly wide range of radio-carbon dates associated with the pre-ceramic levels compared to the archaeological deposits suggest punctuated shelter occupations, while tightly clustered dates in the ceramic levels suggest more regular or intensive occupation. Despite these differences, bladelets are present in similar proportions in both phases, suggesting a degree of cultural continuity. Based on this evidence a temporal gap in shelter occupation seems likely.

Layers	Radiocarbon dates (clusters)	Raw material	Types	Comments
Recent deposits	60+-40BP	Decrease in raw material types and quantities	Decrease in flakes and formal tools Some bladelets present in upper layers	Terminal shelter occupation
Ceramic	140+-40BP 190+-40BP 270+-40 BP 900+-40BP 960+-40BP 970+-30BP 1080+-40BP	Raw material trends visible in pre-ceramic layers reappear as a much stronger pattern. A wider range of raw materials Quartz hardly used in knapping, Quartzite used expediently	Peaks in bladelet and flake production Followed by a sudden decrease in later pre-ceramic and later ceramic layers Majority of formal tools In mid to late ceramic layers follow an increase in lithic production. Arrowheads in early ceramic layers associated with thin-ware pottery (Bradfield & Sadr 2011)	Tightly clustered dates suggest more regular shelter occupation. Possible subsistence difference between ceramic and pre-ceramic levels Did exchange opportunities with farmers stimulate economic activity at BFK1? Stone tools linked to economic activities by proxy
Pre-ceramic	1430+-40BP 1830+-40BP 2320+-50BP	Dominated by Quartz and Quartzite artefacts. Trend: Quartz frequency steadily decreases while other types increase	Bladelets on both Quartz and Quartzite Decrease in blades, bladelets and flakes at terminal pre-ceramic levels	Radiocarbon dates suggest punctuated occupations of shelter. Quartz & Quartzite predominantly used in flaking. Decrease in bladelet production intermediate with ceramic.

Table 1: Summary of observations

While this study did not use a technological approach, one might expect that the different sizes, shapes and fracturing properties of raw materials in the pre-ceramic and ceramic layers would have necessitated the use of different flaking techniques (e.g. Odell 2002).

Quartzite was present in all spits, with large boulders choking the deposit. These likely result from rockfall caused by geological and climate-driven processes, effectively sealing off parts of the archaeological deposit. Anthropogenically flaked pieces of Quartzite also appeared throughout the spits, indicating the use of this low quality, readily available raw material in tool production.

During the second phase of occupation, scrapers, awls and finely made arrowheads seemingly appear as a cultural package, along with noticeably different raw material preferences. Frequencies of shale, fine-grained and other raw material types roughly show a bell curve distribution with peaks in the mid ceramic layers. These observations do not agree with earlier work, which suggested little significant difference in the lithics associated with ceramic and pre-ceramic layers at late Holocene sites in southern Africa (Deacon 1984b). In this regard, Holkrans appears to be somewhat of an anomaly. Until the other elements of material culture from the site are examined, reasons for this anomaly are limited to speculation. It does, however provoke one to question how cultural contact with early farmers might have shaped the archaeological record at Holkrans. Could a shift in subsistence be responsible for a more regular occupation of the shelter? Did exchange opportunities stimulate economic production at the shelter?

The trends in flake and bladelet production followed a similar pattern to that described by Kinahan (2000). While a different context, this may indicate economic exchange during the contact period, similar to those seen at late rock shelters in southeastern Botswana (Sadr & Plug 2001). By proxy the lithic distributions in the ceramic layers may relate to an increase in economic production, although future analysis of these artefact-bearing layers will be necessary to establish this with certainty.

Parsons (2011) has suggested that bladelets made by herders and hunters in the Western Cape can be differentiated through their measured attributes, and that this difference might also be observed at inland sites. An examination of the measured attributes of blades and bladelets might reveal whether or not the tools in the ceramic and the pre-ceramic layers relate to hunting or herding activities. This contact period is of particular interest, as it may detail the complex nature of pre-colonial interactions in southern Africa.

The results of this study, although limited by sample size, provide a glimpse of a rock shelter with much potential for future research. Examination of the faunal remains and technological aspects of the lithics will be necessary to augment our understanding of the shelter's occupation through time and identify how contact may have played a role in shaping the archaeology of Holkrans.

CONCLUSION

This pilot study has examined the distribution of lithic types and raw materials at Holkrans. Frequency distributions of lithics, when read in relation to available radiocarbon dates, confirmed not one, but several temporal gaps in the occupational sequence of Holkrans. These indicated punctuated, possibly seasonal, occupations between 2 000 and 1 000 years ago with more regular and intensive occupation from the first millennium AD onwards. The evidence suggests that the latter occupational phase was more sedentary while the former was more sporadic. While use of the site as a hunting outpost appeared to persist through time, lithics from the ceramic phase indicate economic activities secondary to hunting such as skinning and leather working took place on site from the early first millennium AD onwards. To say that the differences between these two occupational phases indicate a shift to herding and farming from hunting and gathering, would, however, be an unnecessary leap from one extreme to another. The later ceramic levels are particularly interesting and might indicate that exchange opportunities with farmers played a role in local economic production. Future work will be needed to test these observations and much scope still exists for research at Holkrans. A larger, more comprehensive study, would prove most fruitful in light of the interpretations generated from the relatively small sample used in this study.

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