Abstract

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Research Article

BUSHMAN ROCK SHELTER (LIMPOPO, SOUTH AFRICA): A PERSPECTIVE FROM THE EDGE OF THE HIGHVELD

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ABSTRACT

In this paper, we introduce a recently initiated research project conducted at Bushman Rock Shelter, on the northeastern edge of the Highveld plateau in Limpopo Province, South Africa. Previous excavations carried out at the site during the 1960s and 1970s exposed a deep and well-stratified sequence of c. 7 metres of archaeological deposits associated with Late and Middle Stone Age occupations (LSA and MSA). Owing to the lack of contextual information, Bushman Rock Shelter remains poorly studied despite recording cultural and palaeoenvironmental data that are key for the understanding of the South African Stone Age. Here, we propose a synthesis of the 1967–1976 excavations led by Hannes Eloff and provide general background information that will serve as a reference for future research. Our synthesis is based on previous publications by Ina Plug, as well as on Eloff’s field diaries, which were thought to be lost. We complement these observations with data from our own 2014 field season, and pay tribute to the work previously done at the site. Finally, we discuss some aspects of the LSA/MSA contact at the site and comment on the presence of a bifacial lithic component in the upper MSA layers, which is reminiscent of the later Pietersburg.

Keywords: Middle Stone Age, Pietersburg technocomplex, bifacial technology, Later Stone Age, burial.

INTRODUCTION

South Africa documents the appearance of early innovative practices, both technological and symbolic, some of which occur as early as c. 100 ka (e.g. Deacon & Deacon 1999; McBrearty & Brooks 2000; Wurz 2000; Mitchell 2002; Henshilwood et al. 2002, 2004; Texier et al. 2010; Wadley 2013). This archaeological record fuels and challenges our models of cultural history of hunter-gatherers.

For the past two decades, field-based studies in South Africa have intensified dramatically with clear focus on the Still Bay (SB) and Howiesons Poort (HP). This focus has emphasised the high degree of innovation of these two technocomplexes, but has also reinforced two preconceived ideas (Conard et al. 2012): 1) the pre-SB and post-HP technologies are “conventional”, and 2) the MSA is “homogeneous” throughout South Africa.

Recently, questions have arisen about the cultural sequencing of the MSA, and the definition of its (sub)phases and their succession. Researchers now tend to agree that there is broader temporal and spatial variability than previously thought (Soriano et al. 2007; Villa et al. 2010; Mackay 2011; de la Peña et al. 2013; Porraz et al. 2013a,b; Wurz 2013; Henshilwood et al. 2014),
demonstrating the necessity to build independent cultural sequences throughout South Africa. The challenge is to correctly assess the diversity of the South African record; one possibility is to characterise and compare long regional sequences.

With these perspectives in mind, we recently started a new research project at Bushman Rock Shelter (BRS), in the Limpopo Province. Its geographic position – inland and in the northeast of South Africa – together with the nature of its material record, offer a new dataset to compare to other South African Stone Age sites. Neither HP nor SB technologies have been recognised at BRS, and with the exception of the LSA deposits, the chronocultural sequence of the site remains unclear. We consider the BRS project an opportunity to build a new and empirical scenario for cultural changes and AMH adaptations in the interior of southern Africa. However, before BRS can be included in large-scale comparisons, many questions need to be clarified. The site has long been part of the South African research tradition, but has fallen into obscurity in the past few decades, mainly because of the lack of field data. Besides Plug’s papers (Plug 1981a,b, 1982; Badenhorst & Plug 2012) and a series of field reports (Eloff 1969; Louw 1969; Mason 1969; Vogel 1969), little information has been published on the site and the archaeological material it has yielded.

In this paper, we aim to present general background information about the site together with a review of the excavations conducted by Hannes Eloff during the 1960s and 1970s and of the associated archaeological record. This paper is based on the original Eloff field diaries, the papers written by Ina Plug (1981, 1982; Badenhorst & Plug, 2012), as well as on the field data we collected in 2014. In the discussion, we clarify the nature of the LSA/MSA contact at the site and briefly introduce the techno-typological characteristics of the lithic assemblages from the upper MSA layers, which include bifacial pieces and are reminiscent of the later Pietersburg (Mason 1957, 1962; Sampson 1974).

**BACKGROUND TO BUSHMAN ROCK SHELTER**

BRS is located in the Ohrigstad district, in the southeastern corner of the Limpopo Province, close to the border with Mpumalanga Province (Fig. 1). The site is located on the edge of the Great Escarpment in the Drakensberg mountain chain. The Great Escarpment represents a natural ecological boundary between the high-altitude grasslands to the west, called the Highveld, and the low altitude plains to the east, called the Lowveld (or Bushveld). The shelter is located on the edge of the Highveld plateau, at an altitude of about 1500 m above mean sea level (amsl) within a mountainous area with local altitudes up to c. 2000 m amsl (Badenhorst & Plug 2012).

Much of this part of the Great Escarpment is drained by eastward-flowing tributaries of the Limpopo River, which flows into the Indian Ocean at a distance of c. 350 km from the site. BRS opens towards the south and overlooks the alluvial plains of the Molapong River, a small tributary of the perennial Ohrigstad River, which flows northwards (Fig. 1).

The shelter is carved from the dolomites of the Malmani Subgroup, Transvaal Supergroup, and is made of dark-grey to black well-bedded shales. The geology of the area is characterised by the presence of many faults orientated south to north, and southwest to northeast. The shelter is about 55 m wide, 25 m deep and 13 m high. Its geological formation is the result of tectonic events and the progressive collapse of its bedded lithology. The current drip line of the shelter, which corresponds to the modern cliff line of the hill, and the absence of major rockfall suggest the morphology of the shelter did not change radically over the Pleistocene.

The region falls within the summer rainfall zone, characterised by an annual average of c. 900 mm of rain. It experiences warm summers and mild winters. BRS lies on the ecotone of the grassland and savanna biomes (Mucina & Rutherford 2006) and the local vegetation comprises bushveld (Ohrigstad Mountain Bushveld) and wooded grassland. The degree of grass cover and density of wooded vegetation varies between the steep mountain slopes and flatter alluvial plains, such as along the Molapong River, which in turn contributes to the variety of plant communities in the local vegetation mosaic.

Amongst the taxa present are the fruits marula, *Sclerocarya birrea* subsp. *caffra*, stamvrug, *Englerophytum magalismontanum* and the jacket-plum, *Puppea capensis* (also noted for the superior oil of its seeds); excellent woods for firewood and tools such as the wild olive, *Olea europaea* subsp. *capensis* and several *Acacia* and *Grevia* species; and grasses of differing palatability. The local fauna is diverse and comprises a wide range of ungulates (bovids such as blue wildebeest, eland, bushbuck, roan antelope, and impala; and suids, namely warthogs and bush-pigs), carnivores (small and medium taxa), primates (chacma...
baboons and vervet monkeys), rodents (including large species such as scrub hares, porcupines, African mole-rats, and greater cane rats), birds, reptiles and invertebrates (especially the giant African land snail, *Achatina immaculata*) (Branch 1998; Skinner & Chimimba 2005; Sinclair et al. 2011; Herbert & Kilburn 2004).

Until recent times, the region was populated mainly by Shona-speaking people. Iron Age and historical periods are documented at BRS by a few poorly preserved monochrome paintings (red or black). More striking at BRS is the presence of a few thousand grooves incised on the dolomite walls of the shelter, likely produced during the sharpening of metal blades or spears during Iron Age times (Plug 1981a; Louw 1969).

Regarding the Stone Age record, the region remains poorly explored though Revil Mason predicted “a rich reward from [the caves known in the Transvaal Dolomite in the eastern escarpment]” (Mason 1969: 59). Apart from BRS, the only other site documented and studied nearby is Heuningneskrans (HGS), located about 2 km east of BRS, on the east side of the Ohrigstad River. Excavations undertaken by Peter Beaumont in 1968 (Beaumont 1981) exposed a sequence greater than 6 m deep with Iron Age, LSA and MSA deposits. At a regional scale, the second exception is Cave of Hearths, located about 170 km northwest of BRS (Mason et al. 1988; McNabb & Sinclair 2009).

The archaeological potential of BRS seems to have aroused interest for the first time in the 1960s, after J.J. Malan collected artefacts at the site. At that time, the shelter was used as a tobacco barn and some deposits were removed by the farmer, presumably to obtain stones to build a wall along the outer perimeter of the shelter (Plug 1981a). Some deposits located at the front of the shelter were also used to build the road to Echo Caves, situated about 2 km away from the site. A museum, the ‘Museum of Man’, was erected inside the site a few years later.

A.W. Louw from the University of the Witwatersrand was the first to investigate BRS (Louw 1969). From 20 June to 4 July 1965, he excavated a trial trench at the back of the shelter. A datum line, still visible today on the northeastern wall of the shelter, was established to set up the excavation. The trench was about 4.5 m (15 ft) long and 1.5 m (5 ft) wide (squares A/B7, C7, D7 and E7; see Fig. 2). An additional square (A/B8) was opened to rectify the disturbance caused by the presence of a hole previously dug by the farmer (Fig. 2). Louw reached a depth of about 2.4 m (8 ft) and stopped the excavation in his layer 43. The excavation followed a stratigraphy composed of artificial layers of approximately 7 cm (3 inches) thick (Plug 1981a).

J.F. Eloff, leading a team from the University of Pretoria, started excavating the site in July 1967, in response to a request by B.D. Malan from the Monuments Council. Eloff started by opening a new square (C8) of c. 1.5 m² (5 ft × 5 ft) adjacent to Louw’s excavation and stopped at about the same depth as Louw (“about 10 inches below”, Eloff 1969: 60). He then excavated squares A6, B6 and C6, stepping in from the sides for safety reasons. Once the excavation area had reached the same depth everywhere, he shifted to a metric system (Fig. 2) to ultimately attain a final depth of 7 to 8 m, ending with his level 105. It is unclear whether or not bedrock had been reached (Plug 1981a).

Louw and Eloff used the same numbering system but followed different excavation strategies. Thus, their sequencing of the archaeological deposits do not correlate well (Plug 1978). To date, the best record to evaluate the scientific potential represented by BRS comes from Eloff’s excavation. With invaluable help from the staff of the Department of Archaeology at the University of Pretoria, we were able to locate the Eloff’s field diaries, which were thought to be lost (Badenhorst & Plug 2012). These notebooks offer the first opportunity to glean some contextual information on the old collections.

**ELOFF’S EXCAVATIONS: SUMMARY AND TRIBUTE**

The observations presented here rely on six manuscripts that were compiled by Eloff during his fieldwork, almost on a daily basis, starting from 17 July 1967. These notebooks, translated from Afrikaans to English (by Gerhard Jordaan, an archaeology student at the University of Pretoria), record ten field seasons, running from 1967 to 1976. With the exception of 1967, the excavations took place once a year, in November–December, for one to two weeks’ duration. The notes end in 1976 with layer 59, but the fieldwork continued until layer 105 was reached. Together with the field notes, there are a few photographs and sketches, as well as one unpublished stratigraphic profile of layers 1 to 72 (Fig. 3). From layer 59 to
FIG. 3. Unpublished stratigraphic drawing of the West section from Bushman Rock Shelter (from Eloff’s personal documents). Short sedimentological descriptions on the right are taken from Eloff's field diaries. The descriptions of layers 1 to 28(a) are those from square C6, the descriptions of layers 28(b) to 58 are those from square K1.
layer 105, we have at our disposal only a few sketches, sometimes accompanied by comments.

Eloff’s excavations can be subdivided into three distinct phases:

- **Phase 1** (1967 to 1972). This first phase of the excavations focused on the upper deposits, namely layers 1 to 28. Various squares were excavated at different times, with initial attention paid to square C8 in order to secure correlations with Louw’s excavation.

- **Phase 2** (1972 to 1975). This second phase corresponds to when Eloff switched to a metric system, “to determine distribution of artefacts” (1972: book 3). During these four years, layers 28(b) to 36(ii) were excavated consecutively in squares J-K1 (1972–1973) and squares J-K2 and J3 (1974–1975).

- **Phase 3** (1976 onwards). This last phase of excavation is consistent with the exploration of the lower deposits in Test Pit 1 (called T/1). “Even though it is named T/1 (test pit) it is still a controlled excavation based on stratigraphical layers. [...] The reasons for digging the test pit are: (a) to determine the depth of the unit and (b) to understand the material culture coming out and (c) to identify the stratigraphy of the unit and the different layers that are present, also to create a known point from which to work from” (1976: book 5). Excavation of T/1 focused on 2 m², astride squares J1-K1 and J2-K2.

The excavation followed the natural stratigraphy (i.e. changes in sediment type, colour and content). The layers were numbered from 1 to 105 and when specific features were recognised, some of them were subdivided using letters. The layers, their subdivisions and lateral variations, are carefully described in the field books. Stratigraphic descriptions provided by Eloff are summarised in Fig. 3.

In many ways, the excavation methods comply with ‘modern standards’:

- **Excavation techniques**. The field notes document the use of trowels and shovels during the excavations. Archaeological finds were systematically recorded according to their square and layer of provenance. The excavation team was divided into four groups, each composed of four to five people who were assigned to one of the following tasks: excavating, sieving, sorting and recording (Ina Plug, pers. comm. 2014; Fig. 4). The sediments were dry sieved using 12 and 3 mm screen meshes (Plug 1978), and special attention was paid to organic pockets when they were found: “[layer 25] The material from this pocket [25(b)(i)] is sifted and packed separately. A lot of charcoal and burnt seeds were found. [...] The seeds are brittle and are therefore handled with care and treated.” (1972: book 4).

- **Excavation record**. The installation of metal rods together with the use of sketches, photographs and daily notes highlight the importance Eloff attached to the context of the finds, as well as his search for methodological consistency over the years. Personal interpretations, questions and observations made *a posteriori* were also reported: “[layer 17] It seems that what we have here is a transition phase between Middle Stone Age and Later Stone Age. An unsifted soil sample (P42) as well as sifted charcoal samples (B30) were taken. [...] It is difficult to see where one layer ends and the next one starts. [...] during the previous excavations we did not realise that the lower level should be divided.” (1969: book 3).

- **Stratigraphic observations**. In his notebooks, Eloff provided detailed descriptions of the colour and contents of each of the layers (cave roof debris, ash, charcoal, lithics, etc.). He also paid attention to their thickness and lateral variation and noted the presence of post-depositional effects (i.e. water circulation, animal activities, topographic depression and secondary crystal formation). He often discussed stratigraphic correlations. Small test pits were excavated when the stratigraphy was unclear.

- **Archaeological descriptions**. Eloff systematically described the nature of the archaeological remains (i.e. lithics, ochre, fauna, seeds and charcoal). He estimated relative densities of finds and proposed preliminary spatial analysis and associated behavioural interpretations (e.g. occurrence of hearths). The description of the child burial (cf. infra) constitutes one of the best examples of the high level of precision in Eloff’s field notes. In terms of sampling, Eloff adopted a rigorous protocol, whereby each loose sample (mostly for sedimentological

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**FIG. 4. Bushman Rock Shelter during excavation (courtesy I. Plug, centre left).**
Several questions still need to be addressed thereby justifying the reopening of the site for renewed excavations. Such questions relate to the nature of the small components of the fauna and botanical assemblage (<3 mm) and to the validity of the gradual transformations that can be observed between some specific layers. The latter question is especially relevant for the MSA deposits, which have been more affected by diagenetic processes than the LSA ones, and have received field descriptions less detailed than the recent units.

During a three-week field season that took place in April 2014, the site was cleaned and the deposits were secured with scaffolding. This first season allowed us to refine our understanding of the stratigraphy and of the previous work at the site. Based on the significant number of stratigraphic tags still present on the profiles (Fig. 5), we were able to establish direct correspondence between our field observations and the descriptions provided by Eloff. These preliminary observations confirm the high stratigraphic resolution of the LSA and MSA deposits (Fig. 6), as well as the quality of the excavations led by Eloff.

**THE ARCHAEOLOGICAL SEQUENCE OF BRS**

**GENERAL OBSERVATIONS**

No sterile layers have been recognised at BRS, but radiocarbon dates (Plug 1978) suggest the occurrence of hiatuses in sedimentation. The stratigraphic sequence can be schematically divided into two main parts. The upper part, associated with the LSA layers, corresponds to fine layers composed of ash, charcoal and sand. The lower part, consistent with the MSA units, is well-stratified and includes both anthropogenic and natural inputs, but the layers contain more cave roof debris and appear to be thicker and include laterally discontinuous lenses. These two schematic ‘blocks’ are separated by a rocky unit, which corresponds to layers 18 and 19 (Fig. 6). Based on Butzer’s interpretation (1984), this rocky unit that marks the contact between the LSA and the MSA coincides with the Last Glacial Maximum (Badenhorst & Plug 2012).

Throughout the sequence, differences in artefact densities were noticed by Plug as well as Eloff during his excavation: “[layer 30(ii)] A lot less cultural material was found in this layer compared to 30(i) and 29. Not a lot of charcoal found. […]. The layer contains some bone and a few flakes […]. Marula plugs were also found. Within the ash, small thin red brown soil pockets were found, probably burnt pockets” (1973: book 4).

One striking element in this description is the nature and quality of organic preservation at the site. The deposits have yielded abundant vertebrate and invertebrate remains, charcoal and seeds, from the surface to the base of the sequence. According to the notes, it seems that most of the botanical remains were collected from ‘burnt pockets’. They were sifted separately during the excavations. The preliminary study conducted by Wadley (1986, 1987) on the macrobotanical remains from BRS provides valuable palaeoenvironmental indications. Hence, the alternating presence and absence of fruits of the marula, a Bushveld tree that does not tolerate frost, and of *Hypoxis*, an underground edible corm, suggest the occurrence of major ecological shifts between layer 1 and 28.

All the faunal remains recovered during Eloff’s excavations were studied by Plug (1978, 1981b; see also Brain 1969). Taxonomic descriptions of the LSA fauna are provided in Plug (1981a), while a recent paper (Badenhorst & Plug 2012) presents a synthesis on the MSA fauna from the site, based exclusively on data from Plug’s Masters dissertation (Plug 1978). The use of 12 and 3 mm sieves allowed for fairly good...
recovery of faunal remains, including elements such as microfaunal bones and teeth, which have not yet benefited from detailed taxonomic identifications. Bone and tooth fragments are abundant in all archaeological units. Remains recovered from LSA units are relatively well-preserved while those found in MSA layers present a higher level of fragmentation and a poorer degree of cortical preservation. The anthropogenic origin of the faunal assemblage is indisputable for the LSA, as illustrated by the abundance of cut-marked and burnt bones (Plug 1978, 1981b). Given the depth of the deposits for the MSA sequence, one cannot exclude the possibility that some bone-accumulating animals such as leopards, jackals and porcupines used the shelter during non-anthropogenic occupation phases. However, carnivore and rodent modifications of the bone remains are extremely scant since only 13 specimens exhibit gnawing marks, and carnivore contribution to the faunal assemblage seems limited (Badenhorst & Plug 2012). Besides, burnt bones are also abundant in the MSA units and cut marks have been noted. Consequently, Badenhorst and Plug (2012) argue in favour of a predominantly human origin for the faunal remains in the MSA units.

The LSA faunal assemblage (layers 2 to 18) comprises 41 659 faunal remains (Plug 1978), while the MSA units (19 to 88) have yielded 66 358 remains (Badenhorst & Plug 2012). The diversity of the faunal spectrum, both for the LSA and the MSA (39 taxa identified in the LSA; 50 in the MSA assemblage) (Plug 1978, 1981b; Badenhorst & Plug 2012), suggests the existence of a wide range of acquisition techniques, including active hunting, snaring, trapping and gathering. The fauna is numerically dominated by giant land snails (Achatina sp.) and tortoises (no taxonomic identification available), followed by ungulates and monitor lizards (Varanus sp.). The consumption of tortoises, and especially angulate tortoises (Chersina angulata), is common at several other MSA/LSA sites from the Western Cape, including Blombos Cave, Klipdrift Shelter, Pinnacle Point Cave 13B and Diepkloof Rock Shelter (Thompson 2010; Steele & Klein 2013; Henshilwood et al. 2014; Thompson & Henshilwood 2014). Interestingly, the significant place occupied by giant land snails and lizards in the faunal spectrum at BRS seems to be a feature specific to the site. Ungulates are very common in the diet of MSA and LSA hunter-gatherers, across South Africa (see for instance: Klein 1978; Clark & Plug 2008; Thompson 2010; Steele & Klein 2013); species represented at BRS include mainly large bovids, equids and suids. Trapping at BRS is suggested by the presence, mostly in the LSA assemblage, of small bovids, namely duikers (Sylvicapra grimmia),

together with small mammals such as leporids and other large rodents (e.g. *Thryonomys swinderianus*, the giant cane rat); a similar hypothesis was proposed for the HP at Sibudu Cave (Clark & Plug 2008; Wadley 2010).

Based on the composition of the faunal spectrum, there does not seem to be any significant difference between the LSA and the MSA in the taxa exploited and therefore in terms of subsistence strategies. Detailed taphonomic and zooarchaeological studies of the fauna from the LSA and MSA units will enable us to further test this preliminary hypothesis and provide new data regarding butchery practices at the site, sensu Binford (1981).

One of the most spectacular discoveries at BRS is a child burial in the upper part of the LSA sequence (Fig. 7). An excellent field description is provided by Eloff, who was extremely meticulous in recording the context of the burial: "The origins of the grave were probably discovered for the first time in Layer 6 when a soft pocket was identified. Because of the softness of the soil it is possible that the grave originated even higher up (in Layer 5(a) or in Layer 5). It seems highly unlikely that it originated any higher for instance in Layer 4 […]" (1971, book 3). Layer 5 was dated to 9 500 BP. The unearthing of the child burial should not be confused with the discovery in 1969 of an infant mandible aged between six to eight months (Protsch & De Villiers 1974). This mandible, collected by a tour guide while it was apparently protruding from the excavation profile, was said to have been found somewhere between layers 14 and 18, but doubts have been expressed by researchers concerning its provenance (Protsch & De Villiers 1974). Problems regarding the exact origin of the mandible in the site are aggravated by the discrepancy between the two sets of radiocarbon dates available (those from UCLA and those from Gröningen, Protsch & De Villiers 1974). Another two human remains in the form of cuboid fragments were collected from MSA units (layers 28(a) and 29(1)) (Badenhorst & Plug 2012).

MSA and LSA mineral artefacts recovered at BRS include ochre pieces and stone tools. The MSA ochre component has been previously described by Watts (2002) who identified a majority of red shale and hematite and the presence of pieces bearing grinding facets. New examination reveals the use of various types of iron-bearing rocks – massive hematite, lateritic crusts, shale, mudstone, siltstone, etc. For the production of lithic tools, several rock types were selected but four are especially abundant: quartz, quartzite, hornfels and dolerite. Considering that various degrees of metamorphism have affected hornfels, it is sometimes difficult to distinguish this rock type – at a macroscopic scale – from fine dolerite. Information from the geological map together with foot surveys conducted during the 2014 field season support the hypothesis that all the raw materials were locally available.

A good synthesis of the bone tools and beads is available in Plug (1981a, 1982). Most of them come from LSA layers, but a few were also recovered from MSA units. The occurrence of bone tools in MSA deposits was already noted by Louw (1969), who identified two pointed bone implements in his layers 34 and 41. In his field diaries, Eloff also reported possible bone tools. MSA beads were found in Louw’s layer 35 (layer 19/20 of Eloff) as well as in Eloff’s layers 21–22 and 28 (Plug 1982). Our recent overview of the archaeological collections revealed the presence of six MSA beads recovered from layers 27(i) and 28(a). Five specimens are made of ostrich eggshell and one of *Achatina* sp. shell. Neither field notes nor direct dating are available for these. Beaumont and Bednarick (2013) note the presence of engraved dolomite fragments, sometimes densely marked, collected from layer 36.

On several occasions while he was excavating, Eloff inferred the existence of features such as hearths. He also proposed some preliminary interpretations concerning activities and spatial organisation: "[layer 4] In Square A there is an abundance of grass, burnt seeds and some bone and shell pieces. It would seem that Square C consists of similar material, but with less grass and fewer seeds than found in Square A. Therefore it seems that for centuries fire was made in Square B, and food was eaten around the fire (the seeds that were found are evidence for this) and the grass was used to sleep on." (1968: book 1). The type of sediments composing the upper LSA layers suggests that this part of the sequence is consistent with a dumping area ("an ash midden" according to Eloff), while the
lower layers seem to be associated with knapping and/or butchering events. The specific location of the excavated area, at the back of the shelter, should be noted because it has bearing on our understanding of the activities recorded at the site.

THE CHRONOCULTURAL SEQUENCE

To date, detailed cultural analyses have been undertaken on material recovered only from layers 1 to 18 (Plug 1981a). A preliminary analysis of the MSA lithic sequence was published by T. Volman in his synthesis on the southern African MSA (Volman 1981, 1984). More recently, D. Underhill (2012) published a comparative study of the lithics from layers 95 to 105 at BRS (plug with the lithics from layers 26–28 of Louw’s excavation) and of those from Bed IV at Cave of Hearths.

Layers 1 and 2 at BRS yielded some pottery fragments showing Lydenburg characteristics (Plug 1982). These fragments present deeply incised diagonal, horizontal and vertical lines (Louw 1969). The industry recovered from these layers is Iron Age. However, some intrusive stone artefacts from earlier excavations and material of recent origin (including articles of European manufacture, according to Louw 1969) also occur in these layers.

At present, dating of the BRS sequence is exclusively based on radiocarbon and is reliable only for the LSA deposits (Vogel 1969; Plug 1981a; Potsch & De Villiers 1974). Based on the dates obtained from Eloff’s excavations, the age of the LSA occupations can be bracketed between 9 500 and 12 500 BP (Plug 1981a). The LSA chronology is supported by isotopic analysis conducted on shell fragments of the giant land snails *Achatina* sp. collected in abundance at the site (Abell & Plug 2000). Changes in oxygen isotope ratios have been interpreted as evidence of the Younger (layers 9–13) and Older (layers 14–18) Dryas Events (Fig. 8). The LSA deposits of BRS cover the terminal Pleistocene to early Holocene succession and are therefore contemporaneous with some other well-known sequences such as those from Elands Bay Cave (Parkington 1988), Klipdrift Shelter (Ryan 2014), Boomplaas (Fairhall et al. 1976), Nelson Bay Cave (Fairhall et al. 1976), Rose Cottage Cave (Wadley & Vogel 1991) and Heuningneskrans (Beaumont 1981).

Plug subdivided the LSA into two main phases, which she considered to represent various developmental stages within the same cultural context (Plug 1981a). The upper (layers 2–5) and lower (6–14) phases differ in their relative number of quartz pieces and bone tools. Thus, quartz pieces are found in greater numbers in the upper phase than in the lower one, and are more frequently retouched. Quartz backed pieces seem to be restricted to the upper phase. Bone tools are more abundant in the lower phase than in the upper one. According to Plug (1982: 57), “some of the bone tools bear great resemblance to stone artefacts such as scrapers, burins, drills and scaled pieces” and might have compensated for the small number of formal stone tools (Plug 1981b). Polished points, linkshafts and ornaments are also present in the sample. Different researchers have discussed and labelled the cultural definition of the LSA phases differently. Both Eloff (1969) and Mason (1969) have discussed and labelled the cultural definition of the LSA phases differently. Both Eloff (1969) and Mason (1969) interpreted the assemblages as part of the Transvaal Smithfield; Sampson (1974) places the LSA of BRS as part of the Oakhurst. Plug (1981a: 20–21) pointed out noticeable typological variations and concluded: “BRS has very few of the typological Smithfield A (Oakhurst complex), B or C tools in the assemblage […] The industry belongs to the Late Pleistocene/early Holocene and may be referred to for the present as the Bushman rock phase of the Transvaal Later Stone Age”. More recently, the LSA at BRS has been attributed to the Oakhurst technocomplex by Lombard et al. (2012).

The identification of a microlithic bladelet industry in layers 14–18 led Mitchell to propose the presence of a Robberg Industry at the base of the LSA sequence (Mitchell 1988). We support this hypothesis, but also underline the concomitant occurrence of some components that are reminiscent of a MSA technology (cf. infra).

There are two radiocarbon dates available for the MSA deposits (Louw’s excavation), both beyond the range of the technique (Vogel 1969). The results indicate an age greater than 53 000 BP for layer 38 (i.e. Eloff’s layer 21, in Plug 1978) and an age greater than 47 000 BP for layer 41. Besides these dates, the sole chronological framework we have at our disposal relies on botanical remains (Wadley 1986, 1987) and sedimentological interpretations (Butzer & Vogel 1979). In her study of the distribution of marula fruit remains throughout the archaeological sequence, Wadley (1986, 1987) found that they are abundant during the early Holocene (layers 1–8) and the upper part of the MSA (layers 25–28). Their presence reflects warm climatic conditions that, for layers 25–28, could correspond either to a period within MIS3 or to the last interglacial episode. A similar basis of interpretation is proposed by Badenhorst and Plug (2012) who hypothesise that MSA layers with marula correspond to MIS3 while the following layers (31–37) could correspond to MIS4. Butzer and Vogel’s (1979) interpretations suggest that the reached surface of layer 31 might be consistent with MIS5e, while the lower layers might be consistent with MIS6.

The MSA lithic technology at BRS has been discussed by several authors and compared with industries from Cave of Hearths. Mason (1969), using Louw’s collection (layers 28–43),
assigned the upper MSA industry from BRS to a developed MSA technology. He noted that the lithics collected by Eloff in the layers directly underlying those excavated by Louw shared a style similar to those from Cave of Hearths Bed IV. This is stated by Eloff himself (1969: 60), who described an industry below 1.5 m deep that "seems to represent a south-eastern expression of the Pietersburg industrial complex. […] it is possible to discern a distinct typological resemblance between the Cave of Hearths Bed 4 Earlier Pietersburg artefacts and the material from the lowest part of BRS."

The main chrono-cultural subdivision for BRS is the one proposed by T. Volman (1984). Referring to his own typology, he assigned layers 15–18 to the ‘MSA 3’, levels 19–30 to the ‘MSA 2’ and levels 31–105 to the ‘MSA 1’. According to this classification, BRS would then represent one of the few South African sites with an early MSA and LSA. Togetherness with Elands Bay Cave and Peers Cave, Singer and Wymer (1982: 204) also attempted a comparison, suggesting that BRS "might equate with KRM I or II". More recently, Badenhorst and Plug (2012) suggested BRS possibly records MSA 1 occupations, but also MSA 2 and MSA 3, with deposits that are contemporaneous with the pre-SB, the SB, the HP and the post-HP.

THE LSA/MSA CONTACT

"This period is going to be difficult. We are proposing to excavate the area where the Middle Stone Age moves over to the Later Stone Age, in other words the transition period. (...) This part stretches from the layer above the rock level to underneath the level with the large rocks (but still contains some small rocks). These are Layers 17–23. We are going to excavate these layers with great care and make an even smaller division of each layer than what was done in the past." (Eloff 1972: book 3).

The exact nature of the sedimentary contact between the LSA and the MSA units, as well as the formation processes that have contributed to shape it are still poorly understood. This LSA/MSA contact is very coarse-grained on the eastern profile, where Eloff excavated, but appears to be much better stratified on the southern profile, and notably in the western corner where we observe a decreasing presence of rocks from east to west (Fig. 6).

Eloff suggested the possible existence of a transitional phase between the MSA and the LSA: “there are some indications of a transitional phase between the MSA and LSA horizons, but no definite conclusions can be made at this stage” (Eloff 1969: 60). Plug initially considered layers 14 to 18 to be MSA (Plug 1978, 1981a), as did Volman (1984), but she later questioned the homogeneity of these layers: “Levels 15 to 18 at BRS represent a period about which some confusion exists.” (Plug 1982: 61). She questioned the integrity of these layers, but rejected the hypothesis of mixing: “This is, unlikely however, in that the deposit appears to be undisturbed and level 18, a thick level of tightly packed rock spalls and ash, is probably impene-

trable and would have prevented contact between the levels above and below it.” (Plug 1982: 62; but see Badenhorst & Plug 2012).

From our preliminary techno-typological observations, it appears that all the material including and below layer 19 can be classified as MSA. Layers 15 to 18 include MSA-like components (i.e. blades and toolkits) and Robberg-like (micro) bladelet implements. The existing series of radiocarbon dates for layers 15 to 18 (n = 3) are coherent and indicate an age of between 12 000 and 13 000 BP (Plug, 1978). Radiocarbon dating from the lower layers gives an age greater than 40 000 BP, indicating the existence of a hiatus of at least 30 000 years between the top of layer 18 and layer 21.

At this stage of the analysis, we favour the hypothesis of an artificial and fortuitous technological association between the MSA-like and Robberg-like components. The rocky nature of the layers and the presence of large rocks in square C6 (Fig. 6) could have led to such an association. However, as stated by Plug (1982), although they could explain why some small remains could have migrated down the sequence, they can hardly account for larger elements going up. Two main hypotheses are currently considered: 1) the LSA inhabitants of the shelter dug pits into the MSA layers; or 2) MSA implements were scattered on the floor of the shelter when the people who produced the Robberg Industry occupied the site, implying that the rocky unit is associated with a phase of erosion or non-deposition.

TECHNOLOGICAL OVERVIEW OF THE MSA FROM LAYERS 21–24

Layer 21 at BRS is the first layer below the rocky horizon that follows clearly across the profile (Fig. 6). The lithics recovered from this upper part of the MSA sequence were classified as developed MSA technology by Mason (1969) and MSA 2 by Volman (1984), although neither technological nor typological studies have yet been published. Badenhorst and Plug (2012) suggested these layers may be contemporaneous with what is informally referred as post-HP but no direct data support this hypothesis. Here, we provide a short description of Eloff’s lithic assemblage collected from layers 21 to 24 in squares A6, B6 and C6, B8 and C8. As there are some uncertainties regarding the integrity of the collection, we do not provide any detailed and quantified analysis but, rather, highlight a few technological and typological aspects.

Altogether, the lithic assemblage from these layers comprises 4369 artefacts greater than 20 mm in maximum dimension. The richest horizon is layer 21 with a total of 1848 lithic artefacts while the poorest corresponds to layer 24 with a total of 740 pieces. Two main raw materials comprise the lithic assemblage, namely a hornfels category (including fine dolerite) and quartz. Both rock types are represented in similar proportions within the layers. The other rock types, quartzite and chert especially, represent about 2% of the lithic assemblage.

Reduction sequences were oriented towards the production of flakes and blades of various morphologies, though rarely triangular. Our first classification of the cores indicates the presence of a discoid, a Levallois (centripetal and unidirectional) and a prismatic reduction sequence. Blanks often present faceted platforms and some percussion marks illustrate the use of a soft hammer. Quartz and hornfels appear to have been exploited in a similar way.

One of the main differences between hornfels and quartz concerns the frequency of retouched pieces. Between 10 and 20% of hornfels blanks have been retouched whereas this proportion is always less than 5% for the quartz. Different mechanisms may explain this difference with properties of the rock type being a likely possibility (see Wadley & Kempson 2011).

The main typological components of the formal tool sample (n = 363) are convergent and lateral scrapers. Of particular interest is the way they have been shaped. About half of the formal tools have been transformed on their ventral face (Fig. 9): 11% have been retouched only on their ventral face, 17% have been bifacially retouched and 14% bifacially shaped. We present the difference between the bifacially retouched pieces and the bifacially shaped pieces as a preliminary insight.
and not an argument in favour of any specific functions or designs. The difference is based on the degree of invasion of the removals: bifacially shaped pieces, unlike bifacially retouched pieces, have at least one surface entirely shaped. In the layers considered here (21–24), the bifacial reduction strategy represents a minor component, as reflected by the low proportion of shaping flakes, which compose between 2 and 5% of the lithic assemblage. There is no specific selection in terms of blank morphologies and dimensions; a few of the blanks might even originate from a bifacial reduction sequence (Fig. 9). Finally, it is worth mentioning the presence of so-called “Kostienki” pieces (see Klaric et al. 2015), which are blanks that have been retouched, truncated and exploited on their dorsal surface.

Technologically and typologically, the MSA from layers 21
to 24 is reminiscent of the Pietersburg industry and especially its later phase that is characterised by an “increase in the use of bifacial technique” (Mason 1957: 135; 1962; Sampson 1974). Bifacial pieces in Pietersburg contexts have been notably described in the upper beds (6–9) of Cave of Hearths (Sampson 1974) as well as in the pre-HP layers of Border Cave which was dated using ESR between 82 ka and 200 ka (Beaumont et al. 1978; Grün & Beaumont 2001; Wadley 2007). The technology of the Pietersburg and the definition of its three main phases need to be clarified, but some lithic attributes such as prepared cores, blades and flakes, faceted platforms (for the latter phase, see Mason 1957) and elongated unifacial points (Clark 1982; McBrearty & Brooks 2002) – sometimes ventrally retouched – typify and individualise the Pietersburg within the current understanding of technology within the southern African MSA.

PERSPECTIVES
The aim of this paper was to briefly introduce our new field project at BRS and to clarify previous work conducted at the site. We pay tribute to the professionalism of Eloff, the quality of his fieldwork and his legacy (Meyer 2007). Eloff’s excavation methods conform to modern standards and guarantee, four decades later, the scientific value of the old archaeological collections. Conversely, we are concerned about the subsequent curation of the collections. The diversity and richness of the archaeological record, the quality of the organic preservation at the site together with the resolution of the sedimentary events provide an excellent opportunity to decipher cultural changes and human adaptations over a long period. Chronology, palaeoenvironmental change, subsistence and technology are the four main axes that structure the project. The nature of the Terminal Pleistocene to Holocene succession, the LSA/MSA contact and the characterisation of the MSA layer 28 are the short-term goals that will direct our fieldwork.

Long-term goals are to describe the 5 to 6 m deep deposits with MSA occupations, to document the technological transformations and to establish comparisons with other regional records. The presence of bifacial pieces in the upper MSA layers of BRS, recorded from layers 20 to 26, fuels a discussion about the bifacial technological phenomenon in South Africa, its extension, definition and significance. The increasing number of lithic studies recording bifacial pieces (e.g. Wadley 2007, 2012; Lombard et al. 2010; MacKay et al. 2010; Vogelsang et al. 2010; De la Peña et al. 2013; Porraz et al. 2013a; De la Peña & Wadley 2014) show that bifacial technology is not restricted to a single cultural unit nor a specific temporal phase (Conard & Porraz 2015) and the later Pietersburg of BRS provide another example of this. There is a need for more detailed descriptions of these bifacial technologies as well as of their technological associations, a need to provide new insights on the relationships that unify and distinguish the different variants of the MSA bifacial technologies.

The site at Bushman Rock Shelter opens a window facing north, looking at issues of contacts, influences and relationships between south and east Africa, and between the coast and the Highveld. It also opens a new window that provides for a retrospective into the legacy of previous researchers, and perspectives on the origins of the MSA and some of its regional phases that have disappeared from the literature.

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