

**45 000 YEARS OF HUNTER-GATHERER HISTORY  
AS SEEN FROM UMHLATUZANA ROCK SHELTER.**

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For my father

## ABSTRACT

Umhlatuzana Rock Shelter in Natal was excavated in 1985. A long and detailed sequence of stone artefacts was recovered. These artefacts covered the time range from the Middle Stone Age (MSA) to the Later Stone Age (LSA). The excavations generated important information on the MSA, MSA/LSA transition, the Late Pleistocene early microlithic bladelet assemblages, and the relationship between hunter-gatherers and farmers between AD 400-AD 800. The primary aim of this thesis is to describe the excavation and the results, showing how Umhlatuzana Rock Shelter contributes to a broader understanding of the southern African MSA and LSA technological evolution. The stone artefact sequence, animal and plant remains, worked bone tools, beads, pottery and ochre finds are described. Evidence is presented which shows that the change from the MSA to the beginning of the LSA took place between 35 000 BP and 20 000 BP, while a true LSA industry occurred closer to 20 000 BP. No technological boundary exists between the MSA and the LSA; rather change was a gradual process beginning in the MSA. The bladelet-rich assemblages recovered from Umhlatuzana Rock Shelter are the first of their kind to be positively identified in Natal. Pre-dating 18 000 BP and post-dating 12 000 BP, they show that assemblages of this nature were systematically produced earlier and later in Natal, than elsewhere in southern Africa. The metrical results for bladelet cores and bladelets show that there is a progressive decrease in the mean length sizes of these

artefacts from the MSA to the LSA, as well as within the LSA sequence. Statistics show that the model for gradual change is corroborated. These results have significant implications for our understanding of the culture-history sequence in southern Africa. The results also raise questions regarding the nature of MSA and MSA/LSA assemblages, and the origins of the early microlithic assemblages of the southern African LSA.

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The findings and conclusions reached in this thesis are my own responsibility.

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CHAPTER ONE  
INTRODUCTION

Aims and themes

Umhlatuzana Rock Shelter (Fig. 1:1) was excavated between 5 May and 4 July 1985 with two principle objectives:

1. to rescue material at the site that might be endangered by the building of the new national toll road between Durban and Pietermaritzburg;
2. to investigate the relationship between hunter-gatherers and farmers in the region.

The Umhlatuzana Rock Shelter excavation exposed an unexpectedly rich sequence of cultural deposits which reached a depth of 2,6m (Fig. 1:2). Cultural assemblages from the Holocene and Upper and Late Pleistocene were recovered. The cultural stratigraphy includes assemblages from the broad archaeological periods of the Middle Stone Age (MSA) and Later Stone Age (LSA) (Goodwin & Van Riet Lowe 1929). This long sequence considerably extended the scope and nature of the project.

The more recent past (i.e. hunter-gatherer/farmer interaction) is potentially more accessible archaeologically than the earlier MSA and LSA history. The emphasis of this research project was therefore enlarged, from a study of hunter-gatherer/farmer interaction to include an investigation of the MSA and LSA at Umhlatuzana Rock Shelter.

Fig. 1:1 Umhlatuzana Rock Shelter: the rock shelter.



This thesis will focus on the final 45 000 years of hunter-gatherer settlement at Umhlatuzana Rock Shelter and will address the following issues:

1. The MSA/LSA transition.
2. The origins of the Late Pleistocene early microlithic assemblages.
3. Interaction between LSA hunter-gatherers and iron-producing farmers.

A detailed analysis of the stone artefact assemblages has resulted in the identification of three series of occupations. These include the following:

1. A series of Upper Pleistocene (ca. 70 000-40 000 BP) occupations: the material recovered from the lowermost 700mm of the excavation is typologically and technologically MSA, with assemblages characterised by flakes with faceted platforms (Goodwin & Van Riet Lowe 1929). Bladelet production is a significant feature of these deposits. The formally retouched artefacts include unifacial and bifacial points, some rare bifacial and unifacial denticulate points, and numerous backed items including segments, trapezoids, truncated and miscellaneous backed artefacts (Kaplan 1989a, b). These backed forms are typical of the Howiesonspoor group of assemblages (Stapleton & Hewitt 1927, 1928; Volman 1981, 1984; Kaplan 1989b). Numerous small (< 20 mm) quartz segments were found in these deposits suggesting that the hafting of microlithic artefacts took place perhaps as early as 70 000

years ago (Kaplan 1989b). Many pieces of ground ochre were also recovered from these deposits (Kaplan 1989b). However, these assemblages, except for the uppermost units (Layers 21 and 20), have not been analysed in detail and will not be included in this thesis.

2. A series of Late Pleistocene (40 000-12 000 BP) occupations: these deposits are characterised by numerous unmodified bladelets and bladelet cores. An assemblage apparently transitional between the end of the MSA and the beginning of the LSA has also been identified. The bladelet-rich assemblages are comparable to similar assemblages found in the southern Cape, Lesotho and Swaziland, where they have been collectively referred to as the Robberg or early microlithic LSA (Carter & Vogel 1974; Klein 1974; Carter 1978; Deacon, J. 1978, 1984a, b; Carter et al. 1988; Mitchell 1988a; Barham 1989). In the southern Cape and Lesotho these bladelet-rich assemblages date to between 18 000-12 000 BP. The Robberg assemblages from Umhlatuzana Rock Shelter are the first of their kind to be positively identified in Natal. Pre-dating 18 000 BP and post-dating 12 000 BP, they show that bladelet-rich assemblages were systematically produced earlier and later in Natal than known elsewhere thus far in southern Africa. These observations have implications for our understanding of the cultural-stratigraphic sequence of the southern African LSA. Besides stone artefacts, the Later Pleistocene deposits also produced seeds, beads, shell, ground bone and stone, and faunal remains.

Fig. 1:2 Umhlatuzana Rock Shelter: end of the excavation.

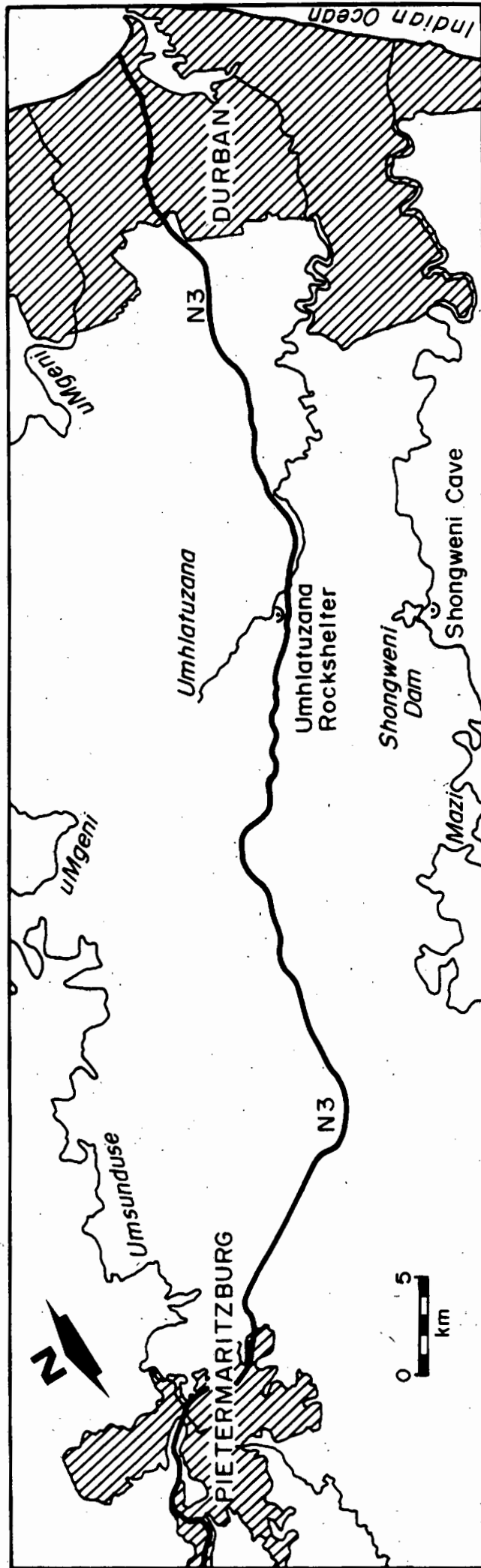


3. A series of early and later Holocene occupations: these deposits contained pottery, stone tools, seeds, beads, shell, bone, ground stone and worked bone objects. The most recent deposits in these series of occupations provide evidence of hunter-gatherer/farmer interaction as it is in these deposits that traditional items of Iron Age farmer material culture have been preserved. These include pottery and beads made from the shell of freshwater snail. The early Holocene occupation, like that of the Upper Pleistocene, is characterised by the production of unmodified bladelets from single platform and bipolar cores; as well as a range of formal tools including natural backed knives (NBK's) and scrapers.

#### Site and setting

Umhlatuzana Rock Shelter (29.48.28S 30.45.22E) is about 35 km west of Durban, on the farm Kerkmans 915 (Fig. 1:3). The site takes its name from the Umhlatuzana River which runs through a steep gorge some 100 metres below the site. The rock shelter was located by Dr R. Maud in 1982 during a geological survey of the area, prior to the building of the new national toll road. The rock shelter is situated immediately below the new road. An exploratory trench was dug by Maud to ascertain the nature of the geology of the area (Maud pers. comm.). Stone flakes, decorated pottery and bone were recovered. Because of the interest generated by the geological sounding, my own research project was initiated in 1985.

Fig. 1:3 Location of Umhlatuzana Rock Shelter.



At an altitude of 531m, Umhlatuzana Rock Shelter is located geologically in the ortho-quartzite horizon of the Natal Group (formerly known as the Table Mountain Sandstone Series). The rock shelter has formed by differential erosion of the softer basal zone sandstones and shales of the Natal Group below the hard and resistant ortho-quartzite horizon (Maud pers. comm.).

The vegetation of the surrounding area is broadly classified as coastal forest and thornveld, with an annual summer rainfall between 600 and 1 200mm (Acocks 1975). Umhlatuzana Rock Shelter itself lies within a microenvironment of secondary Aristidia junciformis Grassland, where the rainfall is below 800mm per annum (Moll 1976). The vegetation in the deep valley where the rock shelter is situated is indigenous forest (or Kloof Forest). These forest patches are outliers of coastal forest (Moll 1976). In this valley, much of the soils are shallow, rocky and slightly to moderately leached, belonging mainly to the Glen Rosa Series Moll (1976:18). Today much of the indigenous vegetation surrounding the site has been cleared and planted with sugarcane. The resultant secondary vegetation therefore tends to obscure the primary vegetation types.

Facing north, the site is well screened by vegetation. The rock shelter is 43m long, reaches a depth of 6.5m and the maximum roof height is 17m.

The Umhlatuzana Rock Shelter excavation generated over 1,25 million stone artefacts (Kaplan 1989b). More than 600 000 artefacts from the deposits dating to the last 45 000 years BP have been sorted, studied and classified. This probably ranks the rock shelter as the richest stone artefact site yet excavated in southern Africa.

The rest of this chapter presents some background discussion on the archaeological interpretation of the periods that are dealt with in this thesis. Chapter 2 will describe the excavation and stratigraphic sequences, and present the radiocarbon dates. Chapter 3 is a detailed description of the stone artefacts and the results of metrical analysis. Chapter 4 will describe the non-lithic artefacts and ochre finds, and Chapter 5 the animal and plant remains. The significance of the observed patterns is discussed in Chapter 6. Chapter 7 will summarise the major conclusions reached in this project. The Appendix presents detailed information on stone artefact frequencies, raw material compositions of the waste assemblages, and the mean and standard deviation statistics of the metrical analysis.

#### Orientation

Other than the information generated by the Shongweni South Cave excavations (Davies 1975), very little is known about the early history of the area between Pietermaritzburg and Durban. Surveys by amateur archaeologists have located a few shelters in the Kloof area with some pottery on the surface (Moon pers. comm.).

The cultural and subsistence assemblages which were recovered from Umhlatuzana Rock Shelter and Shongweni South Cave (Davies 1975) are markedly different. This suggests that the two sites were used differently (except possibly during the final occupation) despite the fact that they are located in the same vegetation region. Interpreting the evidence from Shongweni South Cave, Davies (1975) saw material culture change not as internal to the system, but as a result of ideas which were introduced into the region by people from the north. This argument was influenced by the migration hypothesis, which explained the replacement of one culture and the appearance of new forms of material culture, as ideas introduced by a new population group (Childe 1929).

The models pursued in this thesis argue for more gradualist change; impetus for change is seen as taking place within the system, not outside it.

The terms MSA and Robberg LSA are used to describe the stone artefacts typologically. These terms might imply cultural boundaries, but they have been employed mainly to enable comparisons with similar assemblages recovered elsewhere. They therefore represent artificial boundaries or phases of a continuous sequence of stone artefact manufacture.

## The MSA/LSA transition

Three sites, Border Cave (Beaumont 1978) in KwaZulu, Sehonghong (Carter 1978; Carter et al. 1988) in eastern Lesotho and Boomplaas Cave (Deacon, H.J. 1979) in the southern Cape, contain long occupation sequences which straddle the transitional period between the MSA and the LSA.

Material from Border Cave (Beaumont 1978) attributed to the 'Early LSA' is derived from two units: 1BS.LR and 1WA. Two dates, 33 000 ± 2000 BP (LJ-2892) and 38 600 ± 1500 BP (Pta-704), come from the 1BS.LR unit. Four dates, 35 700 ± 1100 BP (Pta-424), 36 100 ± 900 BP (Pta-433), 36 800 ± 1000 BP (Pta-422) and 45 000 +2750 -2200 BP (Pta-1190), came from the 1WA unit. Beaumont and Vogel (1972:156) claimed that "the 'Early LSA/Final MSA' transition took place at an even earlier date, or that an already developed 'Early LSA' intruded into South Africa shortly before 35 000 BP". Beaumont et al. (1978:414) later argued that this transition took place at an even earlier date, between 60 000-40 000 BP.

The lithic assemblages in the Border Cave 1BS.LR and 1WA units contain numerous cryptocrystalline silicates (CCS) and quartz scaled pieces (outils écaillés), and flakes with plain platforms (Beaumont et al. 1978:411). However, at least 10.0% of the flakes in the 1BS.LR and 1WA units have faceted platforms and a few radial cores are also present (Beaumont 1978:102). Formally retouched tools are rare and include mainly scrapers, while backed pieces and blade points are absent (Beaumont 1978:170). Bipolar cores comprise more than

94.0% of the quartz cores and 82.0% of the CCS cores. Bladelet production is present in these units but in very low frequencies.

Beaumont (1978) lists six criteria which he considers should characterise the Early LSA. These are:

"(a) Ground bone and stone objects, with particular importance being attached to the presence of bone points and shell beads

(b) A variety of scraper types, mainly straight- and convex- edged, which dominate the formal stone tool complement.

(c) Infrequent backed items, which may include true geometric microliths (van Noten 1977; Deacon, n.d.)

(d) An abundance of scaled pieces (usually termed outils écaillés/pièces esquillées).

(e) The presence, where suitable raw materials were available, of very refined microbladelets and related cores, but apparently only in levels predating 12 Kyr. (Klein 1974:258).

(f) The exclusive occurrence of flakes with plain platforms, bar occasional and probably fortuitous dihedrals" (Beaumont 1978:101).

It will be shown in Chapter 6 that some of the above elements occur in secure MSA contexts elsewhere and therefore do not make a good set of criteria when defining the Early LSA. In addition, all of the above characteristics can also be shown to occur in levels below 1BS.LR and 1WA at Border Cave (Beaumont 1978).

Boomplaas Cave (Deacon, H.J. 1979; Deacon, H.J. & Brooker 1976) in the southern Cape contains a relatively continuous series of occupations from the Upper Pleistocene to the Holocene in the time range between 45 000 and 15 000 BP. The basal units are estimated to be of the order of 80 000 years old (Deacon, H.J. 1979:243). Material attributed to the Early LSA comes from three 'members'; LP, LPC and YOL (Mitchell 1988a:68). Three radiocarbon dates have been obtained from LPC; these are: 21 070 ± 180 BP (Pta-2298), 21 110 ± 420 BP (UW-300) and 21 220 ± 195 BP (Pta-1810).

Mitchell (1988a:64-65) reports that quartz is overwhelmingly the dominant raw material in the Early LSA at Boomplaas Cave. The industry contains few cores and among these the single platform variety dominate. Quartz bladelets are present in the LP, LPC and YOL members at Boomplaas Cave, but their frequency is very low. Formally retouched artefacts are virtually absent in these assemblages (Deacon, J. 1984b).

Immediately below YOL at Boomplaas Cave, is a sequence of assemblages characteristic of the MSA. The uppermost MSA member BP 1, is dated to 32 000 BP. Mitchell (1988a:67-68) has pointed out that although the material from BP 1 differs markedly from the material in the overlying LP, LPC and YOL members, some similarities between the three Early LSA assemblages and the underlying MSA assemblage can be demonstrated. All are characterised by a near absence of formally retouched artefacts, and outils écaillés/bipolar cores are common to both groups of assemblages. However, there is a marked change between raw material usage and flake size

between the Early LSA and final MSA assemblages. Flake blades are also restricted to BP 1 and do not occur in LP, LPC and YOL.

Sehonghong was excavated in 1971 (Carter 1978) and contains a fairly continuous series of deposits which spans the transition between the MSA and LSA within the time range between 40 000 and 18 000 BP (Carter et al. 1988:237). Carter and Vogel (1974) also reported the occurrence of a bladelet-rich Robberg assemblage at the site. The Sehonghong sequence has been described as follows: a basal MSA 3 possibly contemporary with Howiesonspoot artefacts; MSA 5, MSA 9, a bladelet industry; and a late Holocene LSA (Carter et al. 1988:194).

Three radiocarbon dates relevant to the MSA/LSA transition are available from the MSA 9 levels at Sehonghong. These are: 19 860 ± 220 BP (Pta-918), 20 240 ± 230 BP (Pta-919) and 20 900 ± 270 BP (Pta-789). From only just below the units containing the bladelet-poor assemblages, the MSA 9 according to Mitchell (1988a:256), may "genuinely date the end of the MSA occupation". Carter et al. (1988) place the MSA/LSA boundary at c. 20 000 BP and consider the bladelet-poor industry as the first expression of the LSA.

The bladelet industry is the most distinctive assemblage in the Sehonghong sequence (Carter et al. 1988:168). The Holocene LSA assemblage is differentiated from the bladelet industry by less pronounced bladelet production, while the MSA assemblages are characterised by even more reduced emphasis on bladelet

production and a shift toward blade production. Metrical results also show a consistent trend towards a reduction in mean blade length and breadth, i.e. towards increasing bladelet production relative to the manufacture of blades, from the MSA 5 to the bladelet-rich industry (Carter et al. 1988:172). Formally retouched artefacts are rare throughout the MSA occurrences as well as in the bladelet industry, and scrapers are the most common tools present. The late Holocene assemblage contains the largest number of formally retouched artefacts and also shows an increase in the numbers of adzes relative to scrapers (Carter et al. 1988:189).

In making extensive use of the concept of 'time-stressed environment' developed by Torrence (1983), Mitchell (1988a, b) proposes a model for the MSA/LSA transition. He points out that the upper Pleniglacial (the period 25-16 000 BP) "was a period of markedly reduced ecological diversity" which severely reduced the availability of subsistence resources. Consequently,

"the efficient use of time will be favoured by such behavior as the scheduling of resource exploitation and by increasing the speed and efficiency of critical activities such as capturing and pursuing prey" (Mitchell 1988a:262-67).

Mitchell (1988a, b) argues that by exploiting a wider range of raw materials, more time could be devoted to hunting. The development of a microlithic technology would cut down on manufacture and maintenance costs of larger retouched stone points. A microlithic technology would therefore allow for the

manufacture of mass-produced composite tools and increase the time that could be devoted to hunting. MSA stone-tipped spears, Mitchell (1988a) argues, were replaced by multi-barbed 'death spears' with systematically and mass-produced bladelets as the source of these barbs.

There is a contradiction between Carter's et al. (1988) and Mitchell's (1988a) interpretation of the Sehonghong sequence. Mitchell (1988a) claims that transitional MSA/LSA industries in southern Africa pre-date 25 000 BP. He argues that bladelet-poor assemblages occur between 25 000 and 19 000 BP and that bladelet-rich assemblages occur between 19 000 and 12 000 BP. Carter et al. (1988), on the other hand, deny the existence of a pre-25 000 bladelet-poor assemblage at Sehonghong, and instead claim that bladelet-rich assemblages occur only between 19 000 and 12 000 BP.

The MSA/LSA models presented by Beaumont (1978), Mitchell (1988a, b) and Carter et al. (1988) are contradictory, but the evidence from Umhlatuzana Rock Shelter, suggests a different MSA/LSA interpretation. This is presented in Chapter 6.

The Robberg or early microlithic assemblages

The term Robberg Industry was first used by Richard Klein (1974) after his excavations at Nelson Bay Cave on the Robberg Peninsula of the southern Cape coast. The industry has been formally defined by J. Deacon (1984a:227).

Two models have been developed to explain the 20-8000 BP change in the South African LSA record. J. Deacon (1978,

1984a, b) proposes that this period can be divided into two sequential but culturally specific toolmaking traditions. The Robberg and Albany industries thus represented relatively stable periods of homeostatic plateaux, periods of stability separated by relatively shorter periods of much more rapid change (Deacon, H. J. 1976). These changes in the stone artefact technologies have been linked to adjustments in changing climatic and ecological conditions (Deacon, H.J. 1972, 1976; Deacon, J. 1978, 1984b).

The Albany Industry, dated to between 12 000 and 8000 BP, is associated with the hunting of large and medium sized bovids (Klein 1983, 1984), and a non-microlithic assemblage dominated by large scrapers (Deacon, J. 1978). The Robberg Industry, dated to between 20 000 and 12 000 BP, is characterised by systematic bladelet production, by the occurrence in some quantity of outils écaillés, and by a very low frequency of formal tools. Quartz, at least in the southern Cape, was the preferred raw material. Mitchell (1988a) has noted similar dated occurrences throughout southern, central and east Africa, and refers to them as 'early microlithic assemblages'.

Robberg groups were associated with the hunting of large mobile grazers (Klein 1976) and characterised by "large group organization, low population density, large territorial range and the absence of fixed territorial boundaries" (Deacon, H.J. 1976:163). Implicit in this model, later refined by J. Deacon (1984b), was

"the assumption that there is a correlation between environmental change and changes in stone artefact manufacturing during the Later Stone Age in southernmost Africa" (Deacon, J. 1984b:3).

In classifying stone artefact assemblages according to a culture- stratigraphic sequence, J. Deacon (1978) states that

"In grouping together assemblages of similar artefacts we are "recognising" patterning which we again assume to have some meaning in isolating the artefacts made by groups of people who were close enough to each other in time or geographically to have had similar ideas about the size and shape, or the style, of artefacts, and whose life-style dictated the range of artefacts needed to perform the tasks necessary to maintain this life-style. The expectation here is that there will be a greater similarity in the artefacts of people who had some level of conscious identity than there will be between artefacts made by groups who had little or no contact with each other. The aim in the reconstruction of the culture history of a region or continent is to find the limits in time and space of such identity-conscious groups of people" (Deacon, J. 1978:101-102).

Thus the variables chosen to represent this reality are stone artefacts. J. Deacon (1978) recognises that inevitably, in drawing boundaries within a continuum, there will be intermediate stages which are difficult to classify. She thus acknowledges that:

"(a) the successive stone artefact assemblages in a sequence are all segments of a continuum,

(b) the rate of change within this continuum is not even and that periods of stability are interspersed with periods of rapid change,

(c) the choice of cutoff point between two clusters of similar assemblages is to some extent arbitrary (my emphasis) when seen in a short time perspective, but that

(d) the marking of the turning point in a trajectory of continuous but relatively rapid change from one tradition to another is a heuristic device for separating such clusters" (Deacon, J. 1978:105).

A second model has been developed to try to understand the 20 000-8000 BP change. Parkington (1980, 1984, 1986) has argued, that stone artefact change should rather be seen as continuous, and variability as "reflections of activity differences from place to place" (Parkington 1980:73). Thus, the southern Cape Robberg should be seen as marginal to and contemporary with a focus of settlement centered in the interior of the country, known as the Lockshoek Industry (Sampson 1974). Parkington (1984) argued that the use of quartz in the southern and southwestern Cape was a response to the unavailability of hornfels as a suitable raw material. This is a fundamental criticism of the culture-stratigraphic model which views the Robberg and Lockshoek industries as two separate phenomena. Parkington (1980, 1984) argues that stone artefact change was not the result of environmental factors, but more a response to people's needs such as raw materials and food, as well as a range of social factors.

#### Hunter-gatherers and farmers

Interaction between two or more groups of different economic, cultural and social status has been viewed in the context of frontier studies (Thompson & Lamar 1981; Alexander 1984; Hall

1984). Mazel (1986a:443) considers Alexander's (1984) definition of 'open' and 'closed' frontiers to be inadequate as it did not take into account the changes that characterised farming communities during the period AD 500 to AD 1500, when significant numbers of farmers moved in the Thukela Basin, and undoubtedly came into contact with hunter-gatherers. He argues that Alexander's (1984) view of the relationship between two groups in economic and ecological terms only, is incomplete, as it ignored the social and symbolic dimensions of those communities.

Thompson and Lamar (1981) recognised the importance of social and political dimensions when investigating inter-group interactions, but their frontier definitions were formulated to investigate post-European colonial interactions in America and South Africa, and not interaction between indigenous groups. Mazel (1986a) argues that the colonial situation is different from a pre-colonial one, and that their model is therefore not applicable to the study of pre-colonial hunter-gatherer/farmer interaction.

Adopting a social and historical approach to hunter-gatherer/farming community interaction, Mazel (1986a, 1988a) first examined the nature of hunter-gatherer/farmer social relations, before considering economic factors such as resource distribution and material culture. Considering social strategies, subsistence, and the material cultural patterning from excavated LSA and farming community sites in the central Thukela Basin between AD 450 and AD 850, Mazel (1986a:448)

concluded that hunter-gatherer/farmer relations seemed close and harmonious.

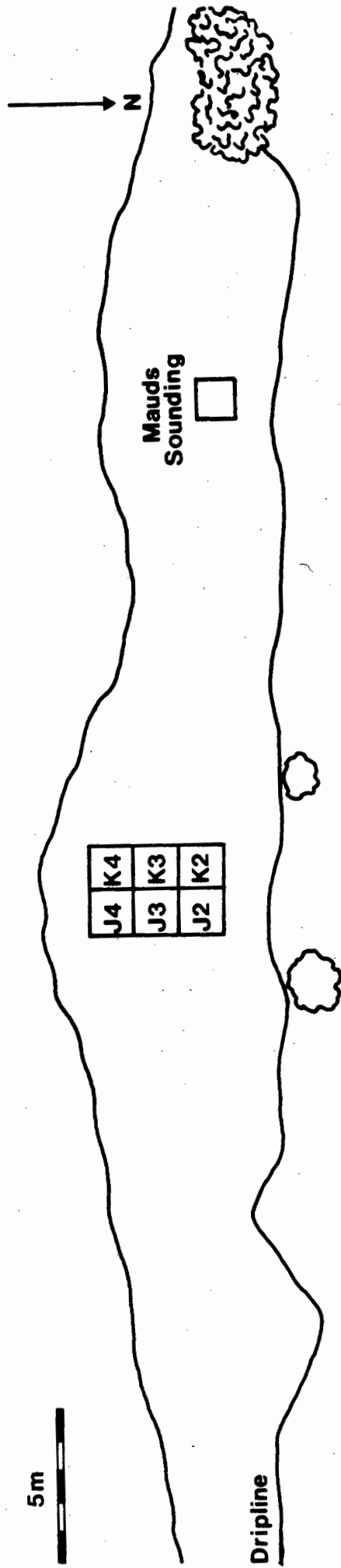
The relationship between hunter-gatherers and farmers at Umhlatuzana Rock Shelter will be discussed in Chapter 6.

CHAPTER TWO  
THE EXCAVATION

Six one-metre squares were excavated in the rock shelter (Fig. 2:1), four of which (J2, K2, J3, & K3) were taken down to bedrock at over 2,5m below the surface, reaching a maximum depth of 2,65m in J2. Squares J4 and K4 were excavated to one metre below the surface. The deposits from the upper units were of a soft, sandy nature and displayed visible natural stratigraphy, including hearths. Where the natural stratigraphic units exceeded 50mm in thickness they were removed in 50-100mm horizontal spits.

The deposits below one metre varied from soft and dry to compact and clay-like, while the deposits in J4 and K4 were slightly moist. These Late Pleistocene deposits varied in colour, from a red brown sand (RBS) in J2-K4, to a purple brown sand (PBS) in J3-K4, and to a dark brown, almost black sand (DBS) in J4 and K4. As there was no visible stratigraphy within each of the RBS, PBS and DBS series, these lower deposits were excavated in 50-100mm horizontal spits. Slow deposition and acidic groundwater percolation have led to the removal of fine sediments and the leaching of organic material from these deposits, reducing them to lag deposits, characterised by very high artefact densities. This is a common feature of MSA cave deposits (Volman 1984).

Fig. 2:1 Umhlatuzana Rock Shelter: site plan.



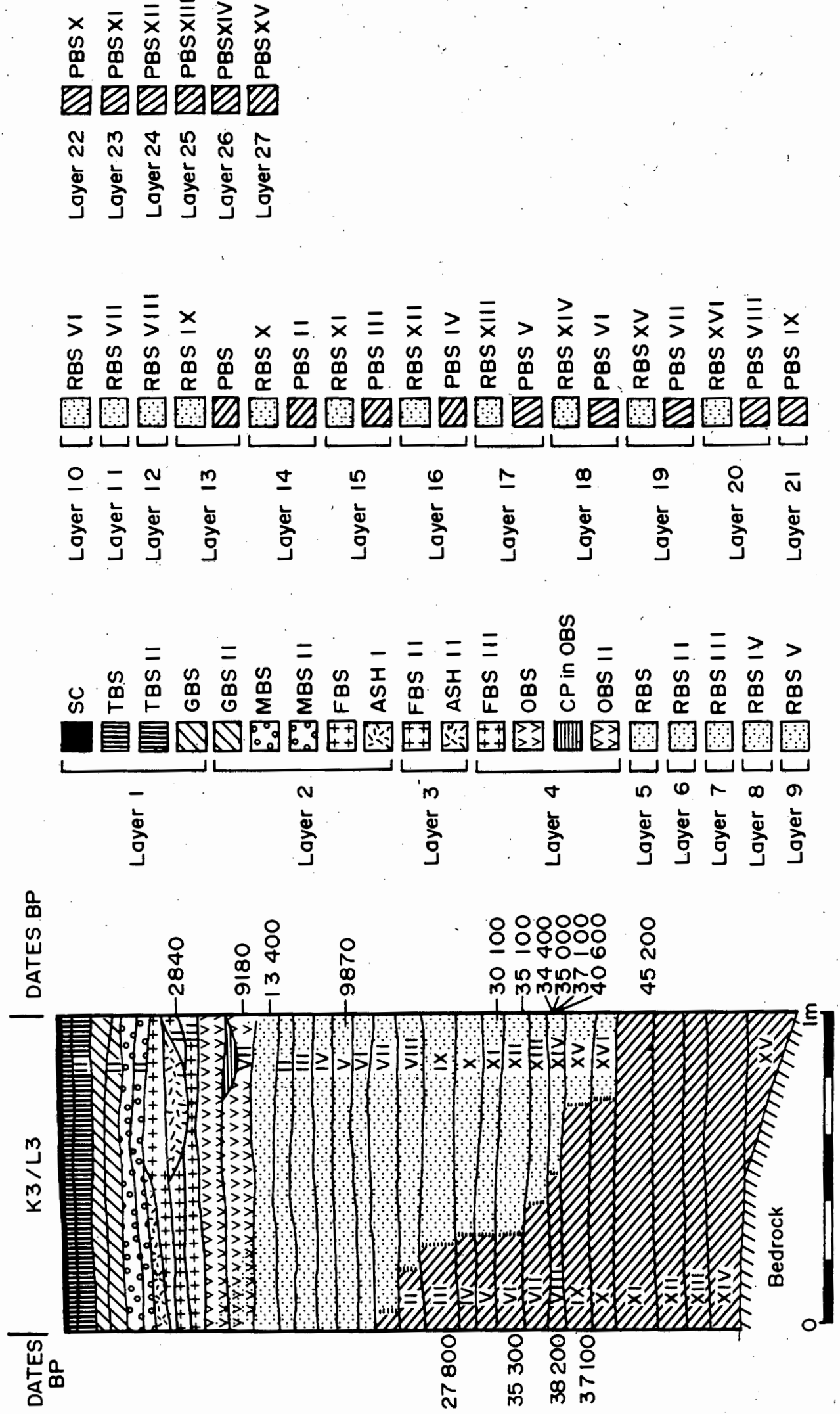
The deposits: stable or displaced?

During the course of the excavation, a marked facies shift of the deposit was identified. This shift was characterised by the PBS/RBS stratigraphic disjunction (Fig. 2:2). The stone tools which came from the PBS deposits appeared to be different from those which came from the RBS deposits on the same level. Because in some squares the RBS/PBS boundary was not clearly defined, some mixing of the artefacts may have occurred. This has taken place on a small scale and has not affected the understanding of the artefact sequence.

A detailed analysis of the stone artefacts was undertaken with the aim of locating any evidence that would resolve the stratigraphic problem of the Umhlatuzana Rock Shelter cultural sequence. This meant drawing up separate tables for stone artefact frequencies and raw material composition of the waste materials for the RBS, PBS and DBS units (Appendix, Tables 1-24). These tables were then compared to each other in an attempt to understand the sequence of deposition.

The results of this exercise were rewarding. It transpired that a 100-150mm slipping of the RBS deposits had occurred. The key to understanding the slipping was the vertical distribution of unifacial and bifacial hollow-based points. These points occur in six units: PBS 1V-V1 and RBS X1-X1V. Once these slipped RBS units which contained the hollow-based points were shifted adjacent to the PBS units which

Fig. 2:2 Umhlatuzana Rock Shelter: RBS/PBS section with radiocarbon dates and stratigraphic disjunction.

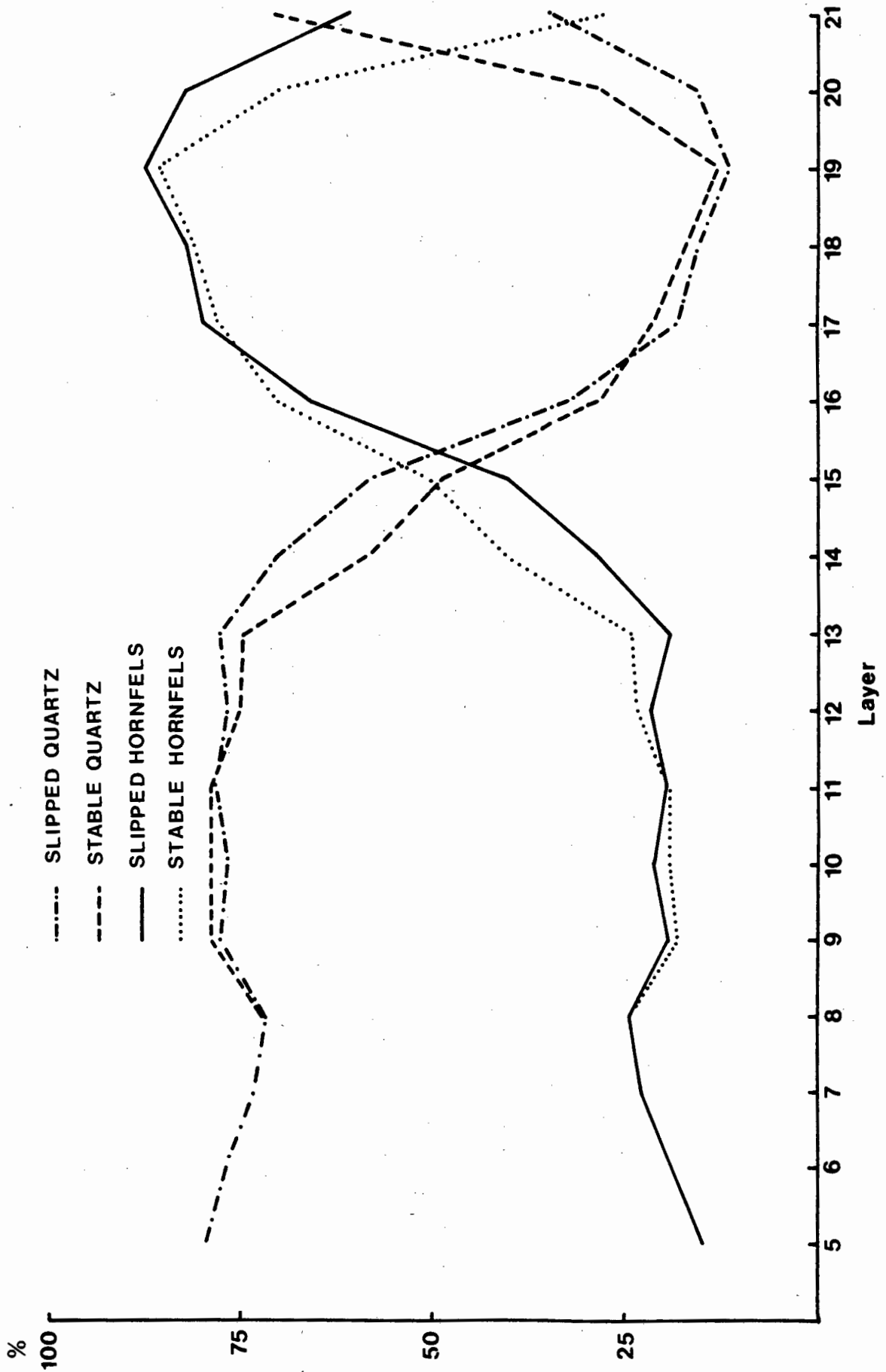


also contained these points, the lithostratigraphy of the site began to make sense (i.e. the lithic differentiation between deposits on the same level disappeared).

Further evidence that the sequence had not been badly affected by the dislocation, was the raw material composition of the waste assemblages from Layers 18-14. Figure 2:3 illustrates the raw material composition of the waste artefacts in the slipped and stable deposits, and it is clear that there is a remarkable internal consistency between the layers showing that the sequence has only been minimally affected by rotational slipping. The radiocarbon dates between PBS 111 and PBS X1, and RBS XIV and RBS XVI, provided further independent confirmation that a dislocation of the RBS deposits may have taken place.

Rotational slipping is uncommon in cave deposits, but has been recognised at Klasies River Mouth (Deacon, H.J. & Geleijnse 1988). According to Dr Tom Mayson (pers. comm.), dislocations of deposits are common in areas of high rainfall and are often recorded in the Durban and Pietermaritzburg region. Moreover, Umhlatuzana Rock Shelter has a steep talus slope and sloping bedrock which corresponds with the PBS/RBS stratigraphic disjunction in J3 and K3 (Fig. 2:2). During a very wet phase rotational slipping probably occurred on the talus slope immediately in front of the rock shelter and this caused a 100-150mm dislocation of the deposits within the rock shelter. The increased water content of the deposits and the combination

Fig. 2:3 Umhlatuzana Rock Shelter: raw material composition of the waste materials in the slipped and stable deposits.



of the variables described above created the conditions for slipping (Mayson pers. comm.).

Dislocations of natural deposits are more commonly referred to as slumping or rotational slipping. (Hutchinson 1968; Blythe & de Freitas 1974). Rotational slips

"occur principally in slopes largely formed of, or underlain by, a fairly thick and relatively homogenous deposit of clay or shale. Failure takes place, usually fairly rapidly, by shearing on a well defined, somewhat curved, slip surface. This, being concave upward, imparts a degree of backward rotation to the slipping mass which produces sinking at the rear, heaving at the toe and back tilting of the slipped strata" (Hutchinson 1968:692).

Furthermore, rotational slipping occurs when the strength of the slope is somewhere exceeded by the stresses within it. Movements which originate at depth indicate the presence of adverse stresses at depth. Rotational slips are a response to the gravity-produced shearing stresses which exist in every slope. They are encountered either underground, or at the surface (Blythe & de Freitas 1974).

The dislocation at Umhlatuzana Rock Shelter was probably the result of a single rotational slip. Single rotational slips are characterised by the presence of a single concave slip surface upon which the slipping mass moves as a virtually coherent mass (Hutchinson 1968:692). Had multiple or successive rotational slips occurred, the stone tool assemblages (and the radiocarbon dates) would have been

completely mixed up and re-creation of the original deposition of the artefacts would not have been possible.

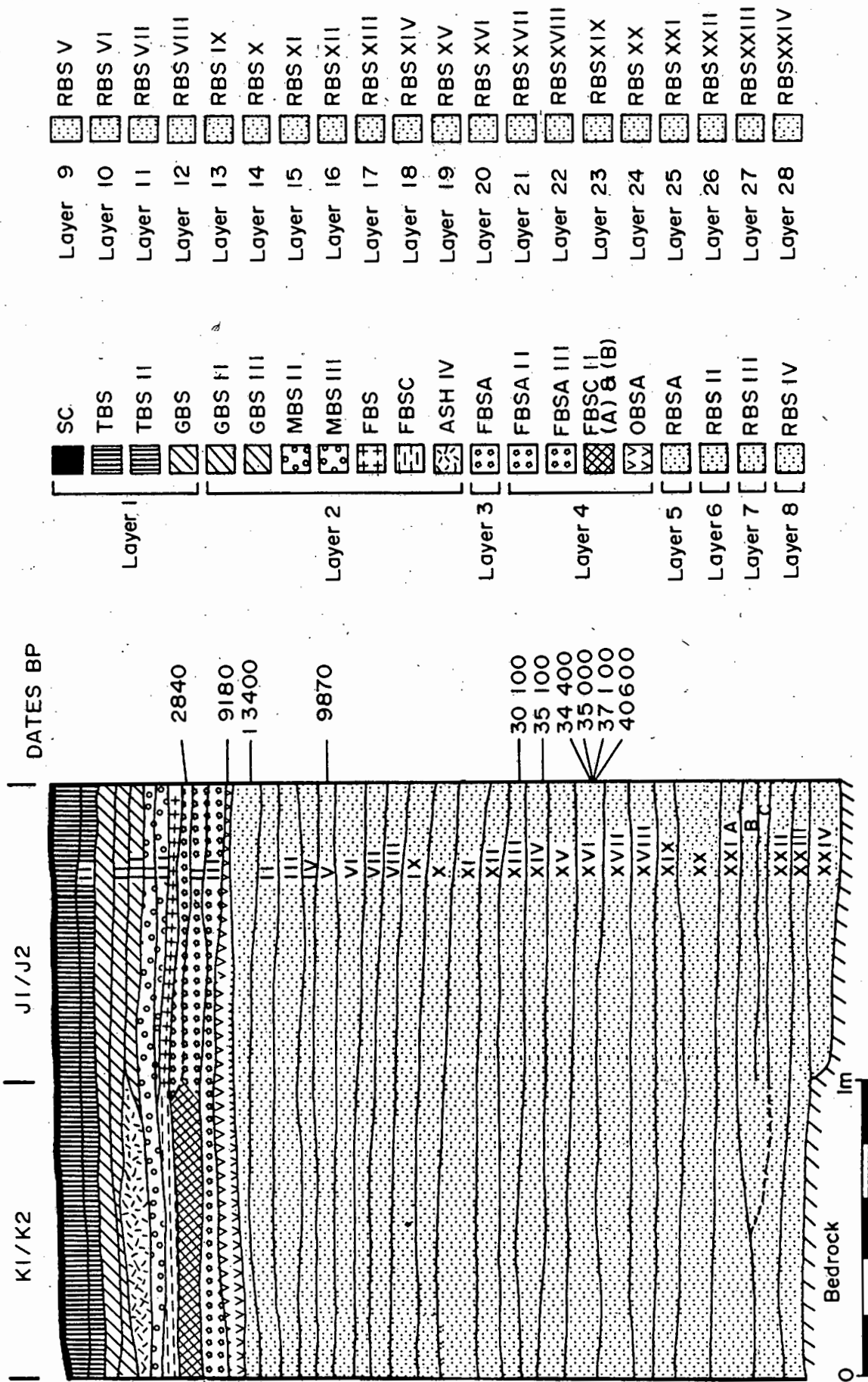
The colour of the sediment is controlled by the oxidation state of the iron minerals (Mayson pers. comm.), and it was noted that the (DBS & PBS) sediments at the back of the rock shelter were slightly moist. The increased moisture content of the excavated DBS and PBS deposits made it darker than the dry RBS deposits. Thus, although the three series of RBS, PBS and DBS deposits are essentially similar, the RBS deposits on the same level as the PBS and DBS deposits were laid down after them.

It is significant that below Layer 6, there are no 'typically LSA non-stone artefacts'. J. Deacon (1984a:222) has pointed out that it is only in the last 10 000 years that ethnographically known items of material culture are common at most LSA sites. The presence of non-stone elements of material culture only in levels post-dating 13 000 BP, is further evidence that the Upper and Late Pleistocene assemblages at Umhlatuzana Rock Shelter are undisturbed.

#### Description of the deposits

Seventy-eight excavated units at Umhlatuzana Rock Shelter have been condensed into 28 layers (Fig. 2:4). Units 1-31 (Layers 1-4) are from the Holocene deposits and units 32-78 (Layers 5-28) are from the Late and Upper Pleistocene deposits.

Fig. 2:4 Umhlatuzana Rock Shelter: J2-K2 section with radiocarbon dates.



## The Holocene deposits

Layer 1 comprised four excavation units: Surface Scrape (SS), Top Brown Sand (TBS), Top Brown Sand II (TBS II) and Grey Brown Sand (GBS). SS covered the entire excavation area and consisted mainly of a combination of twigs, sticks, thorns, and a light-brown sand which was rich in dassie excreta. The stone assemblages from SS comprised only three chips. TBS was a loose, light-coloured, fine soft brown sand, not unlike SS. Leaves, twigs, bits of bark and dassie excreta were mixed in with the deposit. TBS II was slightly more compact than TBS, and of the same colour, with fewer twigs, leaves and excreta. GBS was a lighter, grey-brown deposit that was more compact than TBS II. Flecks of ash and charcoal were scattered throughout the GBS deposits. Some 1.36 cubic metres of deposit was excavated from this layer.

Layer 2 comprised 13 excavation units: Grey Brown Sand II (GBS II), Mottled Brown Sand (MBS), Grey Brown Sand III (GBS III), Brown Sand (BS), Mottled Brown Sand II (MBS II), Mottled Brown Sand III (MBS III), Brown Sand 11 (BS II), Fine Brown Sand (FBS), Fine Brown Sand with Charcoal (FBSC), Ash I, Ash IV, Ash V and Ash Patch (AP). GBS II was a soft, fine, grey deposit with flecks of ash and charcoal. A hearth (Ash IV), was located in GBS II. GBS III occurred in only J2 and was a soft and fine grey-brown ash deposit, slightly mottled in places. MBS was a very soft, reddish brown and orange deposit, with ash flecks and patches of charcoal-rich

soil. In J4 and K4 the BS deposit was light brown and slightly mixed with flecks of ash and charcoal, becoming a darker brown. MBS II was a brown and orange deposit, with flecks of ash and charcoal-rich soil. Ash V consisted mainly of consolidated lumps of hard ash. FBS was a very fine, brown deposit and occurred throughout the squares. In J3, K3 and K4, a hearth (Ash I) of fine white ash with light orange patches was removed. FBSC, which occurred only in K2, was a soft, fine brown deposit with a substantial amount of charcoal in it. BS II, in J4 and K4, was a lighter brown sand, possibly due to slight mixing with ash. Some 1.30 cubic metres of deposit was excavated from this layer.

Layer 3 comprised four excavation units: Fine Brown Sand II (FBS II), Fine Brown Sand with Ash (FBSA), Ash II and Ash III. FBS II was similar to FBS. Ash II, which was located within FBS II, consisted of fairly large chunks of white ash with substantial amounts of charcoal. Charcoal was noticeably more abundant in Layer 3 than in Layer 2. Ash III occurred in FBS II. FBSA, adjacent to FBS II, was a very soft, ash-rich and fine brown deposit, with numerous pieces of charcoal. A charcoal sample from FBSA produced a date of  $2840 \pm 60$  BP (Pta-4215). Some 0.35 cubic metres of deposit was excavated from this layer.

Layer 4 comprised nine excavation units: Fine Brown Sand III (FBS III), Fine Brown Sand with Ash II (FBSA II), Fine Brown Ash with charcoal II A and B (FBSC II A and B), Fine Brown

Sand with Ash III (FBSA III), Orange Brown Sand (OBS), Orange Brown Sand with lumps (OBSL), Charcoal Patch in OBS (CP in OBS), Orange Brown Sand II (OBS II) and Orange Brown Sand with Ash (OBSA). FBS III, FBSA II J2 and FBSC II A and B K2 were adjacent to each other. FBSA II was a very fine and soft deposit and contained a substantial amount of charcoal. FBSC 11 K2 was subdivided into A and B because of the scattered distribution of charcoal in a single square. FBSC II B, K2, had little ash, but contained large amounts of charcoal. FBSC II A K2, on the other hand, produced less charcoal. FBS III was a fine, brown deposit and slightly darker than FBS II. FBSA III, J2 and K2, was a body of soft and fine, light brown-grey deposit, mixed with ash. Three large stones in a circle in the centre of FBSA J2 were surrounded by dense pockets of charcoal, probably representing the remains of a hearth. FBSA III K2 also contained a large concentration of charcoal. OBS was on the same level as FBSA III, and was a fine, orange-brown deposit. In OBS K3, numerous ash lumps were removed as a separate unit (OBSL). OBSA J2 and K2, was a soft, fine, orange-brown deposit, mixed with ash. A few rock spalls were present in this deposit. A charcoal sample from OBSA J2 produced a date of  $9180 \pm 90$  BP (Pta-4307). OBS II, adjacent to OBSA, was similar, except that there was no ash, and there was more spall present in OBS II. Some 0.88 cubic metres of deposit was excavated from this layer.

### The Late Pleistocene deposits

The RBS deposits displayed no visible natural stratigraphy and were excavated in 50-100mm horizontal spits. This resulted in 24 stratigraphic units being designated in 2,02m of deposits (Kaplan 1989a, b). The PBS deposits displayed no visible natural stratigraphy and were removed in 50-100mm horizontal spits. This resulted in the separation of 1,08m of deposits into 17 stratigraphic units. Each unit was treated as a separate layer, partly because of the large stone artefact assemblage, as well as to understand fine scale changes.

The DBS deposits displayed no visible natural stratigraphy and were removed in 50-100mm horizontal spits. This resulted in five stratigraphic units being designated in 250mm of deposits. DBS is confined to J4 and K4, toward the back wall of the rock shelter and was a dark, almost black, slightly moist deposit. Rock spalls were present in DBS V. It was not certain where DBS was located stratigraphically in relation to the RBS and PBS deposits. Consequently the description of the DBS deposits has been omitted from the ensuing discussion. The stone artefacts from the DBS deposits made up only a small percentage (5.4%) of the total excavated assemblage. The hornfels artefacts are highly patinated and include some large chunky MSA artefacts. These DBS units were also characterised by systematic bladelet production (Kaplan 1989a, b).

Layer 5 comprised two excavation units: Red Brown Sand with Ash (RBSA) and Red Brown Sand (RBS). RBSA J2 and K2 was adjacent to RBS. RBSA was a soft deposit mixed with ash and similar to RBS. A few rock spalls and many small pieces of non-artefactual stone, probably broken roof spall, were present. RBS was a soft, fine, red-brown deposit. A charcoal sample from RBSA J2 gave a radiocarbon date of  $13\ 400 \pm 120$  BP (Pta-4226). Some 0.43 cubic metres of deposit was excavated from this layer.

Layer 6 comprised one excavation unit: Red Brown Sand II (RBS II). RBS was a soft, fine deposit slightly tinged with ash in J2. Whole and broken spall were present in all the squares. The deposits in J4 and K4 were more compact as a result of the presence of roots. Some 0.35 cubic metres of deposit was excavated from this layer.

Layer 7 comprised one excavation unit: Red Brown Sand III (RBS III). The deposit was soft, fine and red-brown. There was less charcoal and more whole spalls were present in this layer than in Layer 6. Some 0.35 cubic metres of deposit was excavated from this layer.

Layer 8 comprised one excavation unit: Red Brown Sand IV (RBS IV). RBS IV was a soft, fine red-brown deposit which contained more whole and broken spalls here than in Layer 7. Some 0.49 cubic metres of deposit was excavated from this layer.

Layer 9 comprised one excavation unit: Red Brown Sand V (RBS V). The deposit was soft, dry and a red-brown colour. A charcoal sample from RBS V J3 gave a radiocarbon date of  $9870 \pm 90$  BP (Pta-4631). Some 0.41 cubic metres of deposit was excavated from this layer.

Layer 10 comprised one excavation unit: Red Brown Sand VI (RBS VI). RBS VI was slightly more compact than RBS V. It was a red-brown deposit and contained whole and broken roof spalls, especially in J2 and K2. Some 0.40 cubic metres of deposit was excavated from this layer.

Layer 11 comprised two excavation units: Red Brown Sand VII (RBS VII) and Purple Brown Sand A (PBSA). RBS VII was a slightly darker than RBS VI. There was more roof spall and non-artefactual stone in RBS VII than in RBS VI. PBSA was confined to J4 and K4, and was a dark, purple-brown deposit. It was compact and contained whole and broken spalls. Some 0.28 cubic metres of deposit was excavated from this layer.

Layer 12 comprised two excavation units: Red Brown Sand VIII (RBS VIII) and Purple Brown Sand B (PBSB). The RBS VIII deposits were more compact than the overlying RBS VII deposits, but were still fairly loose and fine when excavated. RBS VIII J2 and K2 contained many whole and broken spalls. PBSB, which occurred in J4 and K4, was a soft, fine, purple-brown deposit. A few whole spalls were present. Some 0.49 cubic metres of deposit was excavated from this layer.

Layer 13 comprised two excavation units: Red Brown Sand IX (RBS IX) and Purple Brown Sand (PBS). RBS IX J2 and K2 contained numerous whole and broken spalls. In RBS IX J3 and K3, the deposit was less compact and there was less spall than J2 and K2. PBS J3 and K3 was a purple-brown deposit which was fairly soft and contained fewer whole spalls than J2 and K2. Some 0.38 cubic metres of deposit was excavated from this layer.

Layer 14 comprised two excavation units: Red Brown Sand X (RBS X) and Purple Brown Sand II (PBS II). RBS X was more compact than RBS IX. Whole spalls were numerous and this probably led to increased compaction of the deposits. There were many more small pieces of broken spalls in these deposits than in RBS IX. PBS II was a fine and soft purple-brown deposit occurring in J3 and K3. Whole and broken spalls were present in this deposit. Some 0.49 cubic metres of deposit was excavated from this layer.

Layer 15 comprised two excavation units: Red Brown Sand XI (RBS XI) and Purple Brown Sand III (PBS III). RBS XI was a fine red-brown deposit. The RBS XI deposit was very compact in K2 and termite casts were present. Many whole roof spalls and small pieces of broken spall were present and probably added to the compaction of the deposits. There were less whole and broken spalls in J3 and K3 than in J2 and K2 and the deposit was softer. The PBS III deposit was soft and fine and a few whole and broken spalls were present. A

charcoal sample from PBS III K3 produced a radiocarbon date of  $27\ 800 \pm 780$  BP (Pta-4389). Some 0.37 cubic metres of deposit was excavated from this layer.

Layer 16 comprised two excavation units: Red Brown Sand XII (RBS XII) and Purple Brown Sand IV (PBS IV). RBS XII was more compact than RBS XI and was slightly darker red-brown than the overlying RBS deposits. The RBS XII K2 deposit was very compact and there were numerous whole roof spalls in it. Termite casts were also present in this deposit. PBS IV was more compact than PBS III and also contained more whole and broken spalls than PBS III. Some 0.24 cubic metres of deposit was excavated from this layer.

Layer 17 comprised two excavation units: Red Brown Sand XIII (RBS XIII) and Purple Brown Sand V (PBS V). RBS XIII was more compact and a darker red-brown deposit than RBS XII. Whole and broken spalls were present. Termite casts were present in J2 and K2. PBS V had less spall than RBS XII and the deposit was softer and finer. A charcoal sample from RBS XIII K3 produced a radiocarbon date of  $30\ 100 \pm 1800$  BP (Pta-4228). Some 0.22 cubic metres of deposit was excavated from this layer.

Layer 18 comprised two excavation units: Red Brown Sand XIV (RBS XIV) and Purple Brown Sand VI (PBS VI). The RBS XIV deposit was fairly soft and fine. There were fewer whole and broken spalls in J2 than in K2. The RBS XIV K2 deposit was compact and clay-like, a darker red-brown colour than in J2,

and contained whole and broken spalls. RBS XIV J3 and K3 was less compact than J2 and K2 and contained fewer whole and broken spalls. PBS VI was a soft purple-brown deposit. Whole spalls were more numerous in PBS VI K3 and the deposit was slightly more compact than in J3. A charcoal sample from RBS XIV K3 produced two radiocarbon dates of  $35\ 100 \pm 830$  BP (Pta-4331) and  $35\ 300 \pm 930$  BP (Pta-4663). Some 0.26 cubic metres of deposit was excavated from this layer.

Layer 19 comprised two excavation units: Red Brown Sand XV (RBS XV) and Purple Brown Sand VII (PBS VII). RBS XV J2 was soft and fine and contained a few whole spalls and many broken spalls. The RBS XV K2 deposit was compact, darker than in J2, and contained many whole spalls. The PBS VII deposit was soft and fine and contained many small pieces of broken spalls. A few large whole spalls were also present. Some 0.29 cubic metres of deposit was excavated from this layer.

Layer 20 comprised two excavation units: Red Brown Sand XVI (RBS XVI) and Purple Brown Sand VIII (PBS VIII). The RBS deposit was softer in J2 and contained fewer whole spalls than in K2. RBS XVI K2 was very compact and a darker red-brown than RBS XV and contained more whole and broken spalls. PBS VIII was a softer deposit than RBS XVI and contained less whole spalls, but many small pieces of broken spalls. Five charcoal samples, four from RBS XVI, and one from PBS VIII, produced radiocarbon dates of  $34\ 400 \pm 1000$

BP (Pta-4288), 35 000 ± 1000 BP (Pta-4235), 37 100 ± 1100 BP (Pta-4366), and 40 600 ± 1500 BP (Pta-4333) respectively. PBS VIII produced a date of 38 200 ± 1100 BP (Pta-4665). Some 0.33 cubic metres of deposit was excavated from this layer.

Layer 21 comprised two excavation units: Red Brown Sand XVII (RBS XVII) and Purple Brown Sand IX (PBS IX). RBS XVII was compact and clay-like, especially in K2 and contained many pieces of broken spalls and a few whole spalls. There were fewer whole spalls in RBS XVII than in RBS XVI, but many broken spalls. PBS IX was a darker deposit and was fairly soft and easy to excavate. The PBS IX deposits were slightly moist. A charcoal sample from PBS IX produced a radiocarbon date of 37 100 ± 860 (Pta-4666), which is a reversed date because PBS VIII (Pta-4665) was dated 38 200 BP. Both dates are, however, close to the limits of radiocarbon dating and are also almost within each other's standard deviation. Therefore, the result is not untoward. Some 0.30 cubic metres of deposit was excavated from this layer.

Layer 22 comprised two excavation units: Red Brown Sand XVIII (RBS XVIII) and Purple Brown Sand X (PBS X). RBS XVIII was darker than RBS XVII and more compact, especially in K2. The RBS XVIII deposit was also clay-like and contained many broken spalls. PBS X was slightly compact, but relatively soft and moist, containing a few whole and many broken

spalls. Some 0.29 cubic metres of deposit was excavated from this layer.

Layer 23 comprised two excavation units: Red Brown Sand XIX (RBS XIX) and Purple Brown Sand XI (PBS XI). RBS XIX was darker than RBS XVIII, compact and clay-like. There were fewer whole spalls present than in the overlying layers, but RBS XIX still contained many broken spalls. PBS XI was more compact than PBS X and contained many broken spalls. The PBS XI deposit was also slightly moist. A charcoal sample from PBS XI K3 produced a date of 45 200 + 3 200 - 5 400 BP (Pta-4234). Some 0.32 cubic meters of deposit was excavated from this layer.

Layer 24 comprised two excavation units: Red Brown Sand XX (RBS XX) and Purple Brown Sand XII (PBS XII). RBS XX J2 and K2 was a rich red-brown colour, compact and clay-like, containing many broken spalls and a few whole spalls. PBS XII was soft and moist, intruding slightly into J2 and K2. A few whole spalls and many broken spalls were present in the the PBS XII deposit. Some 0.35 cubic metres of deposit was excavated from this layer.

Layer 25 comprised two excavation units: Red Brown Sand XXI (RBS XXI) and Purple Brown Sand XIII (PBS XIII). RBS XXI J2, was softer and looser than K2, containing many pieces of broken roof spalls. RBS XXI K2 was fairly compact. RBS XXI J2 was excavated in A, B and C units of 50mm horizontal spits each, in order to correspond with the 150mm excavated

in RBS XXI K2 unit. A detailed analysis of the MSA stone tools in these deposits found that there were no compositional differences between the two adjacent squares (Kaplan 1989b). PBS XIII was soft, loose and slightly moist, containing many pieces of broken roof spalls. Some 0.42 cubic metres of deposit was excavated from this layer.

Layer 26 comprised two excavation units: Red Brown Sand XXII (RBS XXII) and Purple Brown Sand XIV (PBS XIV). RBS XXII was a dark red-brown deposit, clay-like and very compact, containing many pieces of broken roof spalls and a few larger whole spalls. At the J3/K3 interface, RBS XXII was soft and not unlike PBS XIV. PBS XIV was soft and slightly moist, containing many stone artefacts and broken pieces of roof spalls. Bedrock was slightly exposed at the K4/K3 interface at the base of PBS XIV. Some 0.34 cubic metres of deposit was excavated from this layer.

Layer 27 comprised two excavation units: Red Brown Sand XXIII (RBS XXIII) and Purple Brown Sand XV (PBS XV). RBS XXIII was looser and softer than RBS XXII, but still compact and clay-like, especially in K2 where a large number of broken spalls were present. Bedrock was partially exposed in J2 and K2 at the base of RBS XVIII. PBS XV was a softer deposit than PBS XIV and slightly moist, containing many stone artefacts and broken spalls. Bedrock in K3 was exposed at the base of PBS XV. Some 0.27 cubic metres of deposit was excavated from this layer.

Layer 28 comprised one excavation unit: Red Brown Sand XXIV (RBS XXIV). RBS XXIV J2 and K2 was a dark red-brown deposit, compact, clay-like and overlying bedrock. A large number of broken pieces of roof spalls were present in RBS XXIV. Bedrock in J3 and K3 sloped and dropped fairly abruptly into J2 and K2. Some 0.04 cubic metres of deposit was excavated from this layer.

#### Radiocarbon dates

Fifteen radiocarbon dates have been obtained from charcoal (Table 1). A further seven samples, which came from between Layers 17 and 5, were submitted to Dr Vogel at the C.S.I.R. dating laboratory in Pretoria. After pre-treatment with acid and alkali, there was insufficient carbon to run these samples. The radiocarbon dates which were obtained for the Upper and Late Pleistocene series of occupations are all finite dates (Vogel pers. comm.).

Layer 2 (FBSA) produced a date of 2840 BP and was associated with a single undecorated pottery sherd. This date is inconsistent with the established dated sequence for early pottery in Natal (Maggs 1984a, b), and the sherd from FBSA is, therefore, probably intrusive.

Layer 4 (OBSA), dated to 9180 BP, contained numerous unmodified bladelets and bladelet cores. The presence of a systematic bladelet technology in the early Holocene shows that this flaking technology persisted longer in Natal than

Table 2:1 Umhlatuzana Rock Shelter: radiocarbon dates.

Layer				Date BP			Stratigraphic Unit	
2	2	840	±	60	Pta	-	4215	FBSA
4	9	180	±	90	Pta	-	4307	OBSA
5	13	400	±	120	Pta	-	4226	RBSA
9	9	870	±	90	Pta	-	4631	RBS V
15	27	800	±	780	Pta	-	4389	PBS III
17	30	100	±	1 800	Pta	-	4228	RBS XIII
18	35	100	±	830	Pta	-	4331	RBS XIV
18	35	300	±	930	Pta	-	4663	PBS VI
20	34	400	±	1 000	Pta	-	4288	RBS XVI
20	35	000	±	1 600	Pta	-	4235	RBS XVI
20	37	100	±	1 100	Pta	-	4366	RBS XVI
20	40	600	±	1 500	Pta	-	4333	RBS XVI
20	38	200	±	1 100	Pta	-	4665	PBS VIII
21	37	100	±	860	Pta	-	4666	PBS IX
23	45	200	+	3 200	Pta	-	4234	PBS XI
			-	5 400				

it did in the southern Cape and Lesotho, where it phased out at around 12 000 BP (Deacon, J. 1978, 1984a, b, in press; Mitchell 1988a). In Swaziland, however, systematic bladelet production post-dates 12 000 BP (Barham 1989).

It is significant that an occupation hiatus of around 6000 years exists between Layers 3 and 4, from 2840 BP to 9180 BP. Mazel (1988a) has argued that the Thukela Basin was occupied during the LSA around or after 10 000 BP, and that early to mid-Holocene sites do not occur in the lower altitude of southern Natal. The radiocarbon dates from Umhlatuzana Rock Shelter support this interpretation.

Layer 5 (RBSA), dated to 13 400 BP, contained numerous bladelets and bladelet cores with few formal tools, and are similar to assemblages dated to this time in the southern Cape, Lesotho and Swaziland (Deacon, J. 1978, 1984a, b; Carter et al. 1988; Mitchell 1988a; Barham 1989).

Layer 9 (RBS V) produced a date of 9870 BP. This date is problematic as Layer 9 underlies Layer 5 by some 220mm. Furthermore, the consistent trends in the RBS stone artefact sequence would suggest that the Layer 9 date is incorrect. The Late Pleistocene deposits are relatively undisturbed, and the only plausible explanation is that the 4,6g of charcoal from Layer 9 was an amount too small to give a correct reading.

Layer 15 (PBS III) was dated to 27 800 BP. Bladelet production was a significant feature of this layer, while the formally retouched tools included scrapers, segments, and MSA retouched blade points.

Layer 17 (RBS XIII), dated to 30 100 BP, contained numerous bladelets and bladelet cores. Formal tools included scrapers, segments, MSA unifacial, bifacial, and hollow-based points.

Layer 18 (RBS XIV and PBS VI) produced two radiocarbon dates. RBS XIV was dated to 35 100 BP and PBS VI was dated to 35 300 BP. Hollow-based unifacial and bifacial points were distributed between Layers 18-16 and probably date to between 35 000 and 28 000 BP. Layer 18 also contained segments and backed artefacts, and bladelet production was evident.

Layer 20 (RBS XVI and PBS VIII) has a suite of five radiocarbon dates. Four dates from RBS XVI read: 34 400 BP, 35 000 BP, 37 100 BP and 40 600 BP. PBS VIII was dated to 38 200 BP. Segments, MSA unifacial and bifacial points, and bladelets and bladelet cores were present in this layer.

Layer 21 (PBS IX) was dated to 37 100 BP. The stone artefacts in Layer 21 include segments, scrapers, unifacial and bifacial points. Bladelet production is evident in this layer.

Layer 23 (PBS XI) was dated to 45 200 BP. The artefacts are characterised by scrapers, segments, trapezoids and other backed forms, as well as unifacial and bifacial points. Layer 23 is also characterised by systematic bladelet production.

It is significant that Layers 21-18, which cover some 300mm of deposits, produced a suite of eight radiocarbon dates, all of which, excluding one dated to 34 400 BP (Layer 20 RBS XVI), are between 40 000 and 35 000 BP. It is interesting that Layer 18 produced two remarkably consistent dates of 35 100 and 35 300 BP, from the slipped RBS XIV deposits and stable PBS VI deposits. Underlying that, Layer 20 produced five radiocarbon dates which are between 41 000 and 37 000 BP, and two dates of 35 000 and 34 000 BP, respectively. According to Vogel (pers. comm.), the older dates within a single layer are more likely to be correct. Thus it would seem that Layers 21 and 20 dates to between 37 100 and 41 000 BP. Layer 23 is dated to 45 000 BP.

Some inconsistencies are evident in the Umhlatuzana Rock Shelter dated sequence, but these are relatively minor. In general terms, the site produced a consistent sequence of dates between 45 000 and 28 000 BP. The deposits between Layers 5 (13 400 BP) and 15 (27 800 BP) are undated, except for the presumed erroneous Layer 9 (9870 BP) date.

## CHAPTER THREE

### THE LITHIC ARTEFACTS

This chapter is a description of the counts and measurements made on the stone artefacts excavated from Layers 21-1. The stone artefact sequence will be described from the bottom up, i.e. from the Late Pleistocene MSA to the Holocene LSA.

Chapter 3 is divided into three parts.

Part 1 presents the stone artefact and raw material frequencies from the Late Pleistocene deposits. Here, I examine the lithic assemblages from the late MSA, the MSA/LSA transition and the Robberg LSA.

Part 2 presents the stone artefact and raw material frequencies from the Holocene deposits.

Part 3 presents the results of measurements on quartz single platform and bipolar bladelet cores, quartz, hornfels and CCS bladelets, and quartz and hornfels segments.

#### THE LATE PLEISTOCENE ASSEMBLAGES

The Late Pleistocene deposits at Umhlatuzana Rock Shelter comprise Layers 21-4. The inventory of lithic artefacts from these layers is presented in Table 3:1. These deposits comprise stone artefacts which are defined as late MSA, MSA/LSA transition and Robberg LSA. The Late Pleistocene deposits at Umhlatuzana Rock Shelter have been reduced to lag deposits which are characterised by very high artefact

Table 3:1 Umhlatuzana Rock Shelter: frequencies from Layers 21-5.

	Layer 5			Layer 6			Layer 7			Layer 8			Layer 9			Layer 10			Layer 11			Layer 12			Layer 13		
	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total
<b>Waste</b>																											
Chips chunks and flakes	16 388	97,78	96,31	17 812	96,48	98,21	21 133	98,21	98,39	21 515	98,39	97,71	17 680	97,64	97,64	18 552	97,64	98,01	21 950	98,01	98,01	30 226	98,53	30 226	98,53	30 226	98,53
Irregular cores	65	0,39	0,47	48	0,26	0,16	35	0,16	0,09	20	0,09	0,12	22	0,08	0,08	16	0,08	0,09	20	0,09	0,09	35	0,11	35	0,11	35	0,11
Single platform cores	127	0,78	1,17	216	1,17	0,64	137	0,64	0,71	155	0,71	0,86	155	0,86	0,86	167	0,86	0,73	164	0,73	0,73	206	0,67	206	0,67	206	0,67
Bipolar cores	18	0,11	0,17	354	1,92	0,81	175	0,81	0,63	22	0,09	0,05	9	0,05	0,16	30	0,16	0,15	33	0,15	0,15	34	0,11	34	0,11	34	0,11
Bladelets	156	0,93	2,03	9	0,05	0,12	26	0,12	0,09	19	0,09	1,17	212	1,12	1,12	212	1,12	0,93	209	0,93	0,93	153	0,50	153	0,50	153	0,50
Blades	2	0,01	0,03	1	0,01	0,01	3	0,01	0,005	1	0,005	0,09	17	0,09	0,12	22	0,12	0,08	19	0,08	0,08	21	0,07	21	0,07	21	0,07
Grindstone fragments	4	0,02	0,02													2	0,01					1	0,003	1	0,003	1	0,003
TOTAL	16 760		99,77	18 462		99,61	21 518		99,62	21 866		99,72	18 096		99,75	19 001		99,72	22 395		99,89	30 676		30 676		30 676	
<b>Utilised</b>																											
Outils écaillés	21	33,33	17,24	27	49,09	59,62	31	59,62	74,47	35	74,47	62,16	23	62,16	57,45	27	57,45	57,89	11	57,89	57,89	18	54,55	18	54,55	18	54,55
Utilised flakes	41	65,08	75,86	28	50,91	40,38	21	40,38	23,40	11	23,40	37,84	14	37,84	42,55	20	42,55	42,11	8	42,11	42,11	15	45,45	15	45,45	15	45,45
Hammerstones	1	1,59	6,90						2,13	1	2,13																
Grindstones	1	1,59	6,90																								
TOTAL	63		0,16	55		0,30	52		0,24	47		0,21	37		0,20	47		0,25	19		0,08	33		33		33	
<b>Formel</b>																											
Scrapers	1	12,50	18,18	4	23,53	10,34	3	10,34				25,00	2	25,00	16,67			16,67	1	16,67	16,67	2	16,6	2	16,6	2	16,6
Backed points																											
Backed blades																											
Miscellaneous backed																											
Segments																											
Adzes	1	12,50	9,09	1	5,88	3,45	1	3,45																			
Miscellaneous retouched pieces	4	50,00	63,64	9	53,94	41,34	12	41,34	35,71	5	35,71	12,50	4	12,50	14,29	1	14,29	16,67	2	16,67	16,67	1	8,3	1	8,3	1	8,3
Unifacial points																											
Bifacial points																											
Hollow-based points																											
Natural backed knives	2	25,00	9,09	1	9,09	10,34	3	10,34																			
Awls																											
TOTAL	8		2,06	17		0,09	29		0,13	14		0,06	8		0,04	7		0,03	6		0,03	12		12		12	
LAYER TOTAL	16 831			18 534			21 599			21 927			18 140			19 055			22 420			30 721		30 721		30 721	

one artefact fre-

Layer Total	Layer 14			Layer 15			Layer 16			Layer 17			Layer 18			Layer 19			Layer 20			Layer 21		
	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total
9,86	51 784	98,77	99,94	53 351	99,20	99,88	42 463	99,51	99,61	66 653	99,69	99,72	70 065	99,78	99,73	38 762	99,88	99,77	16 911	99,79	99,57			
	51	0,10		57	0,11		24	0,06	0,04	46	0,07		24	0,03		5	0,01		16	0,09				
	238	0,45		151	0,28		72	0,17	0,09	59	0,09		34	0,05		9	0,02		3	0,02				
	39	0,07		17	0,03		7	0,02	0,003	8	0,01		9	0,01		3	0,01		1	0,01				
	263	0,50		153	0,28		84	0,20	0,17	69	0,10		58	0,08		21	0,05		11	0,06				
	55	0,10		52	0,10		19	0,04	0,08	22	0,03		25	0,04		8	0,02		3	0,02				
	1	0,002		2	0,004		1	0,002	0,02	6	0,01		5	0,01		-	-		2	0,01				
	52 431		99,94	53 783		99,88	42 670		99,63	66 863		99,72	70 220		99,73	38 808		99,77	16 947		99,57			
	7	43,75		5	16,13		2	6,06	4,11	1	1,11		1	1,18		-	-		-	100,00				
	9	56,25		25	80,65		31	93,94	95,89	89	98,89		84	98,92		29	100,00		21	100,00				
	-	-		-	-		-	-	-	-	-		-	-		-	-		-	-				
	16	-	0,03	31	3,22	0,06	33	-	-	90	-	0,13	85	-	0,12	29	-	0,07	21	-	0,12			
	3	17,65		5	15,63		7	11,86	8,22	5	5,05		7	6,90		2	3,23		8	15,38				
	1	5,88		2	6,25		1	1,69	2,74	1	1,01		1	0,97		-	-		-	-				
	3	17,65		1	3,12		7	11,86	5,48	7	7,07		3	2,91		4	6,45		-	-				
	4	23,53		13	40,62		8	13,56	2,74	6	6,06		6	5,83		4	6,45		6	11,53				
	5	17,65		8	25,00		17	28,81	1,37	2	2,02		-	-		-	-		-	-				
	2	11,76		2	6,25		9	15,25	39,73	30	30,30		34	33,00		20	32,23		16	30,77				
	1	5,88		1	3,12		5	8,47	23,29	29	29,29		41	39,80		25	40,32		19	36,54				
	-	-		-	-		5	8,47	8,22	16	16,16		11	10,58		7	11,29		2	3,85				
	-	-		-	-		5	8,47	8,22	3	3,03		-	-		-	-		-	-				
	-	-		-	-		-	-	-	-	-		-	-		-	-		-	-				
	17		0,03	32		0,06	59		0,18	99		0,15	103		0,15	62		0,15	52		0,31			
	52 464			53 846			42 762			67 052			70 408			38 899			17 020					

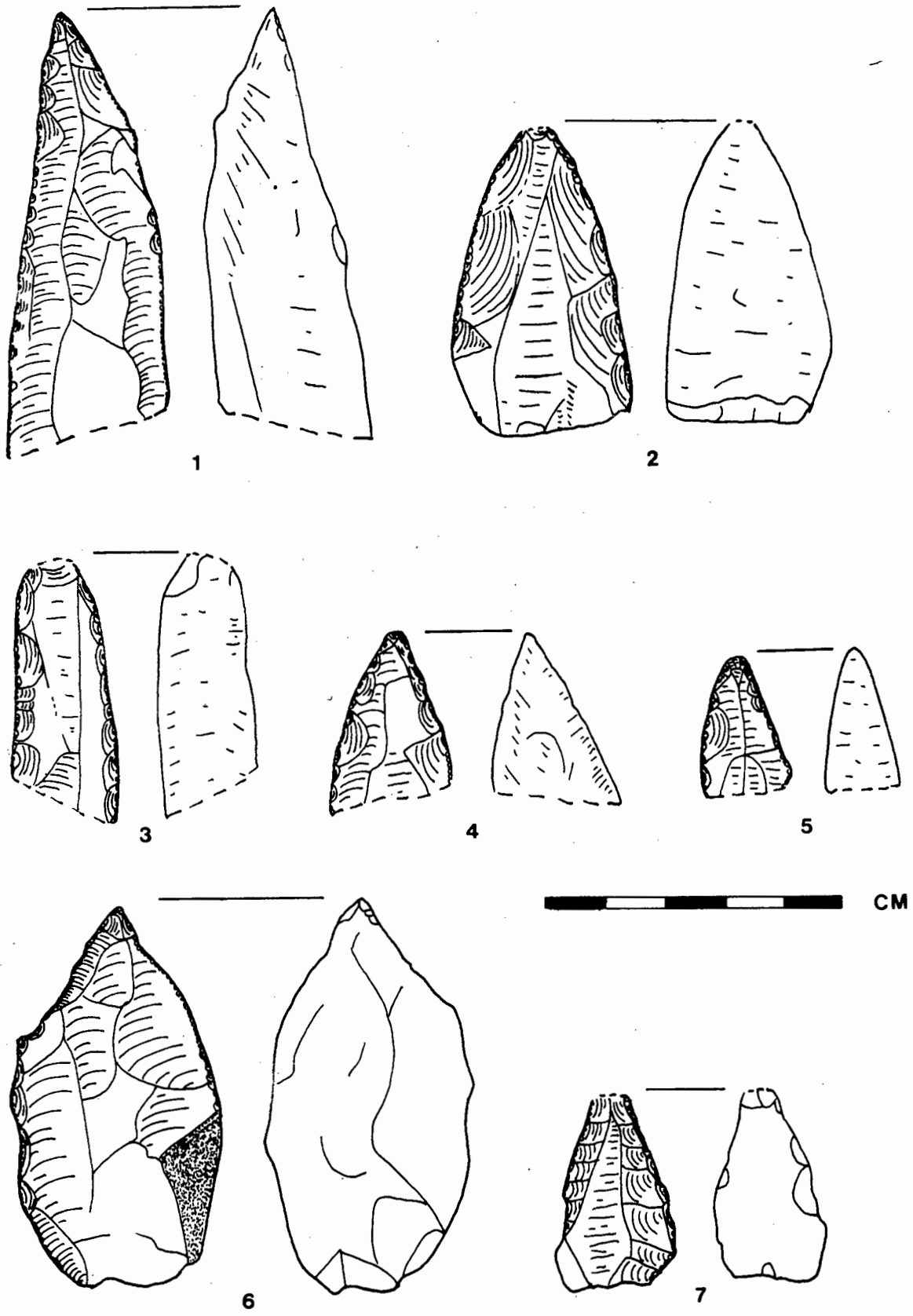
densities. In these compressed sequences, distinct occupation units can no longer be recognised.

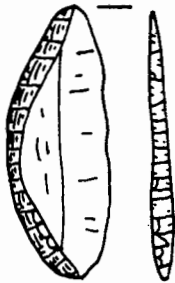
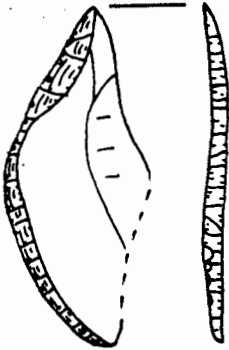
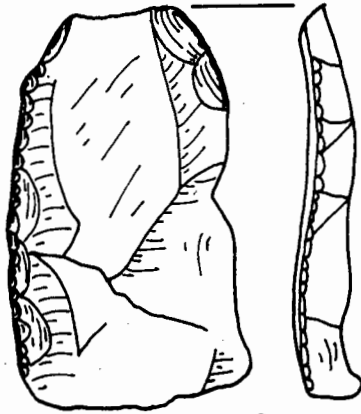
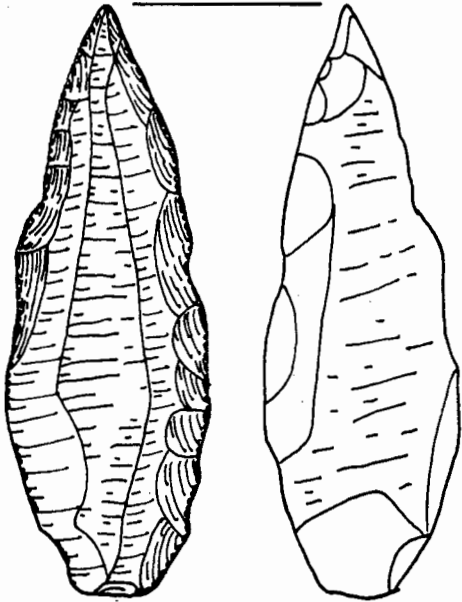
#### The late MSA artefacts

The late MSA deposits at Umhlatuzana Rock Shelter are from Layers 21-19 (Table 3:1). More than 99.0% of the stone artefacts in these layers are waste pieces, and of these more than 99.0% are chips, chunks and flakes. The percentage frequency of irregular cores decreases from 0.09% of the waste category in Layer 21, to 0.01% in Layer 20, and increases slightly in Layer 19 to 0.03%. Single platform cores are 0.02% in Layers 21 and 20 and increase slightly in Layer 19 to 0.05%. Bladelets reflect a trend similar to that displayed by single platform cores, where the percentage frequency declines slightly from 0.06% of the waste category in Layer 21 to 0.05% in Layer 20 and increases to 0.08% in Layer 19. The percentage frequency of blades declines from Layer 21 and increases slightly in Layer 19. Grindstone fragments were also recovered from these late MSA deposits: two from Layer 21 and five from Layer 19.

Utilised artefacts account for less than 0.05% of the total assemblage from any layer. There are fewer utilised artefacts in the late MSA layers than there are formal tools. Outils à caillès are absent in Layers 21 and 20, and in Layer 19, they comprise 1.0% of the utilised category. The percentage frequency of utilised flakes is 100.0% in Layers 21 and 20, and 98.0% in Layer 19.

Fig. 3:1 Umhlatuzana Rock Shelter: selection of artefacts from late MSA layers. Unifacial points. Layer 20: 1-6; Layer 19: 23-25; Layer 21: 39-43. Bifacial points. Layer 20: 7 & 8; Layer 19: 21 & 22; Layer 21: 44. Scrapers. Layer 20: 9; Layer 19: 26-28; Layer 21: 29-33. Segments. Layer 20: 10-12, 14, 37 & 38; Layer 19: 15,17 & 20; Layer 21: 35 & 36. Trapezoids. Layer 20: 13; Layer 19: 16 & 18. MBP's. Layer 19: 19. Adzes. Layer 21: 34. Nos 1-5, 7-11, 16-20, 23-35, 39, 41-44 are hornfels. Nos 6 & 40 are quartzite. Nos 12-15, 21-22, 36-38 are quartz.





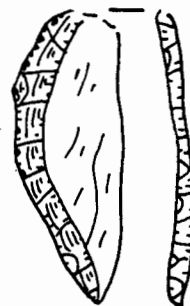
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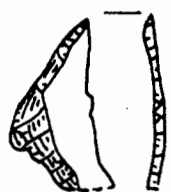
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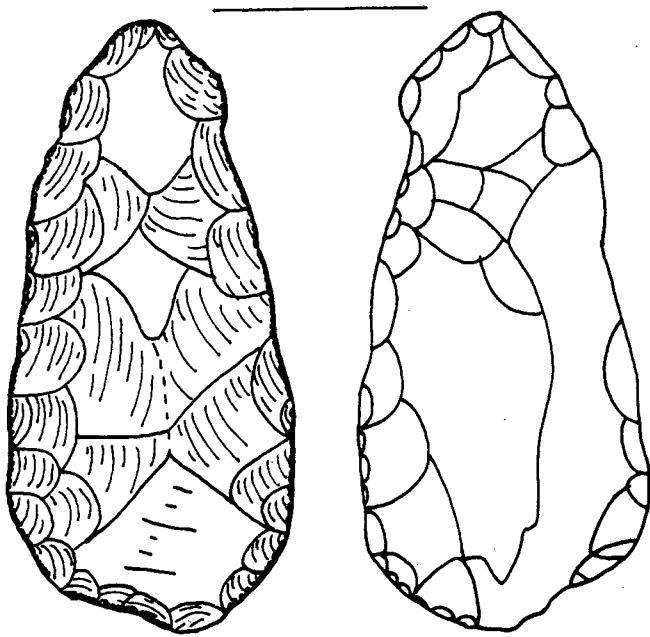
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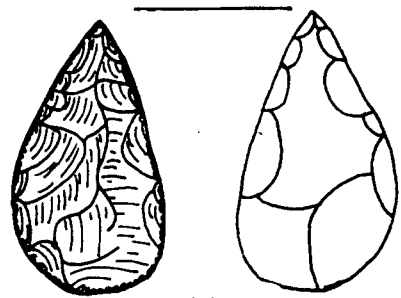
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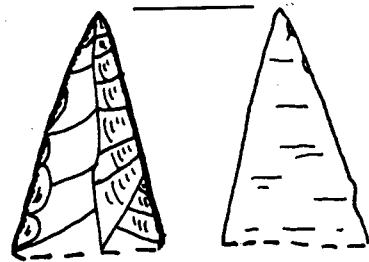




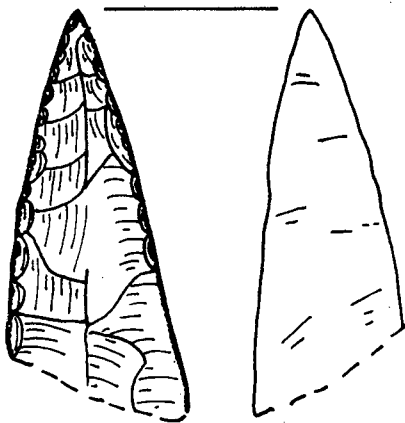
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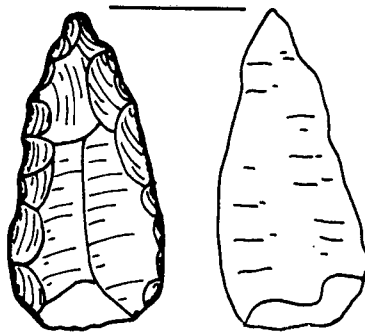
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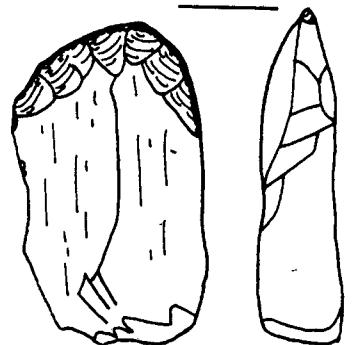
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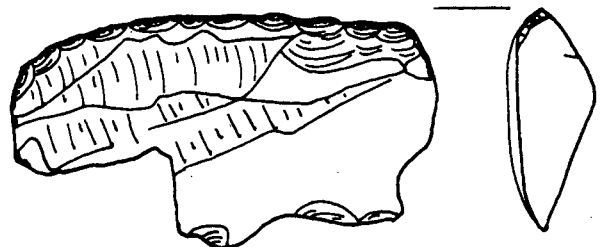
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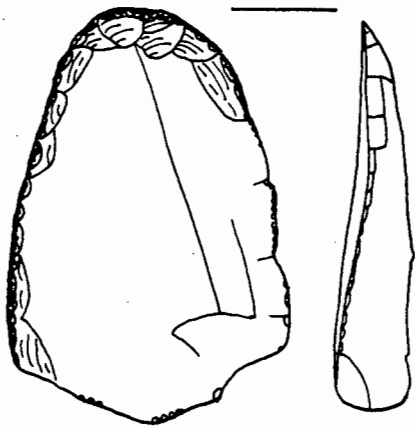
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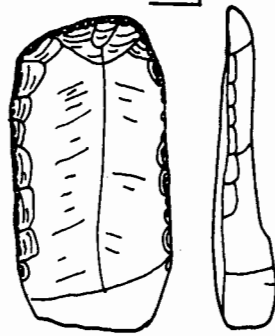
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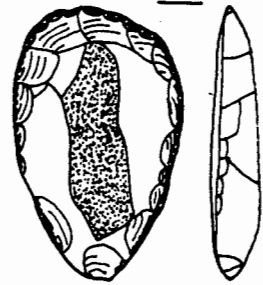
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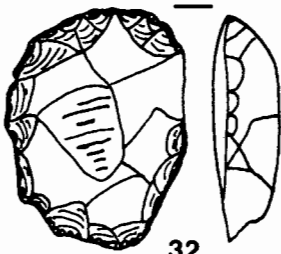
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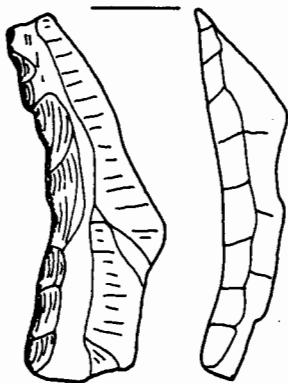
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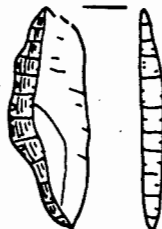
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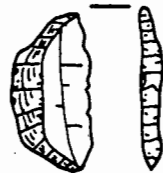
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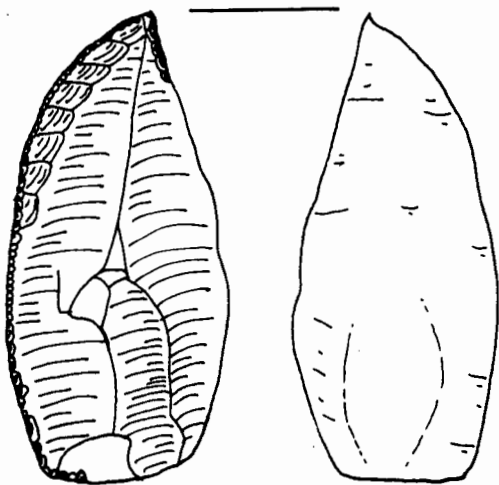
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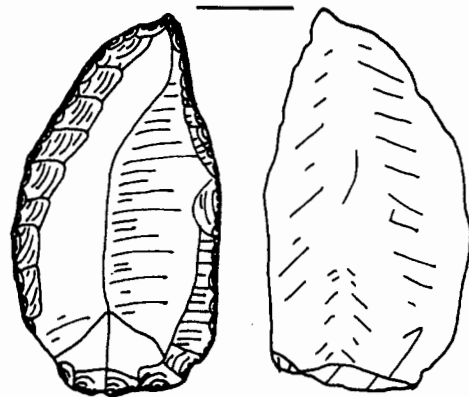
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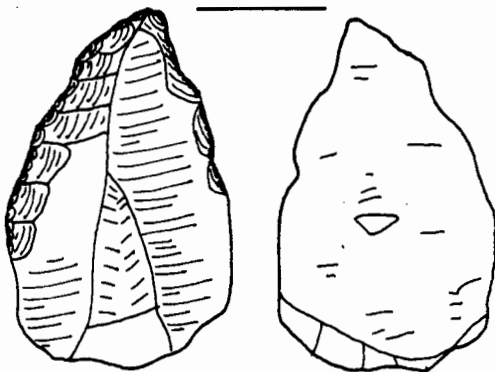
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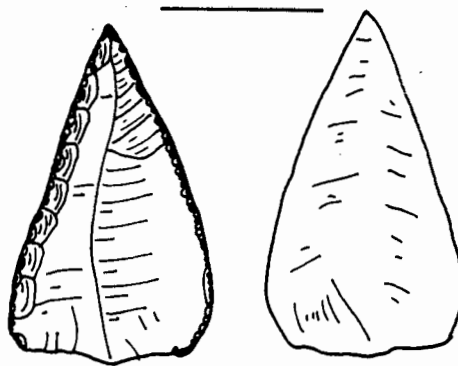
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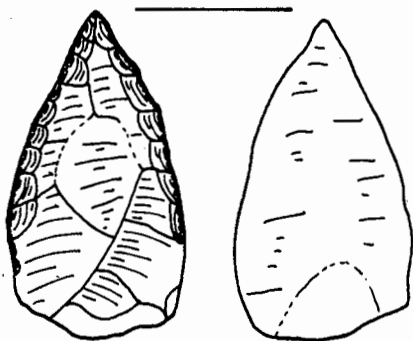
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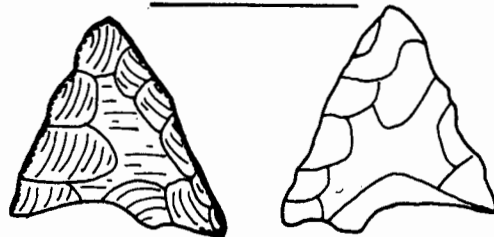
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43



44



of the total artefacts in Layer 21, 16.0% in Layer 20 and 11.0% in Layer 19. Quartzite and CCS are present, albeit in low and fluctuating percentages.

The marked shifts in the percentage frequencies of the raw material categories of the waste artefacts in the late MSA at Umhlatuzana Rock Shelter reflect the change that heralds the transition to the LSA.

Hornfels overwhelmingly dominates the utilised flakes in Layers 21-19, comprising 81.0% in Layer 21 and 89.0% in Layer 19 (Table 3:3). Quartz comprises 5.0% of the utilised flakes in Layers 21 and 19. The quartzite component declines from 14.0% in Layer 21, to 6.0% in Layer 19.

Hornfels comprises 75.0%, quartz 11.0% and quartzite 13.0% of the formal tools in Layers 21-20. Hornfels increases dramatically in Layer 19, to 93.0%, and quartz and quartzite decline markedly to 5.0% and 2.0% respectively (Table 3:2). Trends in the use of raw materials in the manufacture of formal tools are evident in the late MSA layers. The raw material composition of scrapers, unifacial points, bifacial points, and MRP's is presented in Table 3:4.

Eighty-two percent of the scrapers in the late MSA layers are made from hornfels, 12.0% are made from quartz and 6.0% are made from quartzite. Unifacial points are almost exclusively made from hornfels. Some 92.0% of the unifacial points are made from hornfels, 6.0% from quartzite and 2.0% from quartz. Some 70.0% of the bifacial points are made from hornfels, 20.0% from quartzite and 10.0% from quartz. The percentage

Table 3:3 Umhlatuzana Rock Shelter: raw material composition of the utilised flakes in Layers 21-1.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
1	4	23.53	6	35.29	4	23.53	3	17.65	17
2	11	25.00	18	40.91	13	29.55	2	4.55	44
3	-	-	10	83.33	-	-	2	16.67	12
4	6	8.96	35	52.24	14	20.90	12	17.91	67
5	6	14.63	23	56.10	4	9.76	8	19.51	41
6	-	-	16	72.73	3	13.64	3	13.64	22
7	1	3.57	19	68.86	8	28.57	-	-	28
8	2	9.52	18	85.71	1	4.76	-	-	21
9	-	-	6	54.55	4	36.36	1	9.09	11
10	2	14.29	11	78.57	1	7.14	-	-	14
11	3	15.00	14	70.00	3	15.00	-	-	20
12	4	50.00	4	50.00	-	-	-	-	8
13	5	33.33	9	60.00	1	6.67	-	-	15
14	3	33.33	6	66.67	-	-	-	-	9
15	7	28.00	13	52.00	3	12.00	2	8.00	25
16	11	35.48	20	64.52	-	-	-	-	31
17	5	7.14	63	90.00	2	2.86	-	-	70
18	7	7.87	72	80.90	10	11.24	-	-	89
19	4	4.76	75	89.29	5	5.95	-	-	84
20	-	-	26	89.66	3	10.34	-	-	29
21	1	4.76	17	80.95	3	14.29	-	-	21

Table 3:4 Umhlatuzana Rock Shelter: raw material composition of the scraper, unifacial point, bifacial point and miscellaneous retouched piece (MRP) formal, tool classes in Layers 21-19.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
Scrapers									
19	-	-	6	85,71	1	14,29	-	-	7
20	1	50,00	1	50,00	-	-	-	-	2
21	1	12,50	7	87,50	-	-	-	-	8
Unifacial Points									
19	-	-	40	97,56	1	2,44	-	-	41
20	2	8,00	23	92,00	-	-	-	-	25
21	-	-	15	78,95	4	21,05	-	-	19
Bifacial Points									
19	2	18,18	9	81,82	-	-	-	-	11
20	-	-	4	57,14	3	42,86	-	-	7
21	-	-	1	50,00	1	50,00	-	-	2
MRP's									
19	1	2,94	33	97,06	-	-	-	-	34
20	1	5,00	16	80,00	3	15,00	-	-	20
21	1	6,25	14	87,50	1	6,25	-	-	16

frequency of hornfels bifacial points increases from 57.0% to 82.0% between Layers 20 and 21. Some 90.0% of the MRP's are made from hornfels, 4.0% from quartz, and 6.0% from quartzite. One hornfels adze came from Layer 21.

Four (67.0%) segments are made from quartz and two (33.0%) are made from hornfels in Layer 21. Three (75.0%) segments are made from quartz and one (25.0%) is made from hornfels in Layer 20. In Layer 19 there are five (83.0%) segments made from hornfels and one (25.0%) made from quartz. Two MBP's are made from quartz and two from hornfels in Layer 20, and in Layer 19, one is made from quartz and two from hornfels. One backed point in Layer 19 is made from hornfels.

#### The MSA/LSA transition artefacts

A transitional phase from the late MSA to the onset of the LSA has been identified between Layers 18-14. It is clear from Table 3:1 that elements of both the LSA and the MSA appear in these layers. These include scrapers, bladelet cores and bladelets, and MSA blade points, including hollow-based points. Large and small segments are found as well. I have thus defined Layers 18-14 as being the MSA/LSA transition.

There is the possibility that these assemblages may be mixed, in view of the fact that rotational slipping has occurred. However, except perhaps on a limited scale, the possibility of mixing has been discounted (see Chapter 2). I also refer to Keller's (1973) excavations at Montagu Cave where a seemingly mixed assemblage was excavated. Keller (1973) claimed that

"if this assemblage had been collected from the surface of an open site, it would have been interpreted as a mixture and separated into a "Middle Stone Age" and "Later Stone Age" industry, but the association of all those elements... is incontrovertible in a context where mixing is impossible" (Keller 1973:38).

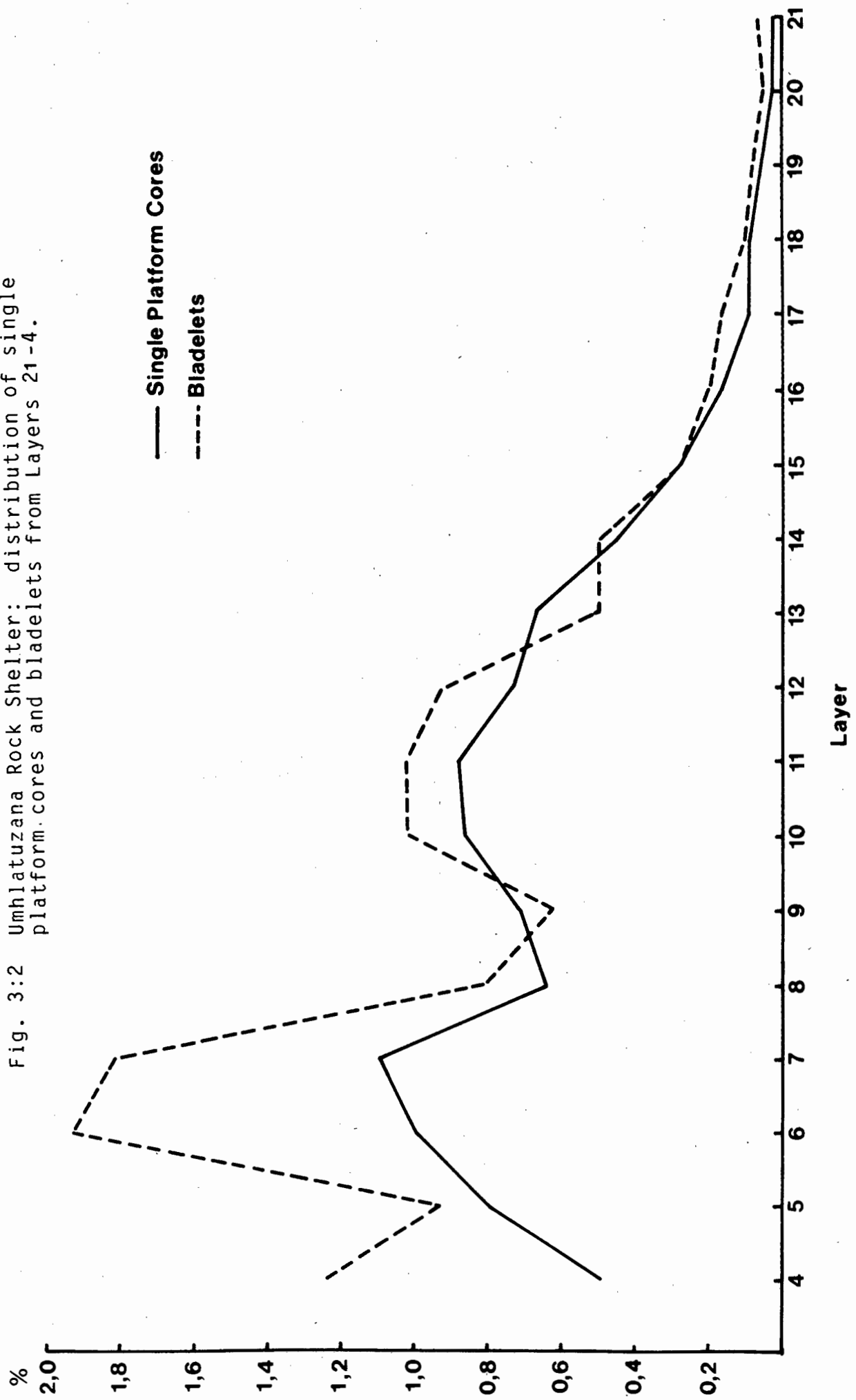
More than 99.0% of the artefacts of each assemblage in the transitional MSA/LSA layers are waste artefacts. Utilised and retouched artefacts account for less than 0.4% of the total assemblage from any layer.

Chips, chunks and flakes comprise 99.5% of the waste artefacts in Layers 18-14. The percentage frequency of single platform cores increases steadily in Layers 18-14 from 0.1% to 0.5% of the waste category. The percentage frequency of bipolar cores increases from 0.01% in Layer 18 to 0.1% in Layer 14 and the percentage frequency of irregular cores in Layers 18-14 is 0.1%.

The increase in the percentage frequency of bladelet cores (i.e. single platform and bipolar cores) corresponds with an increase in the percentage frequency of bladelets. The percentage frequency of bladelets increases from 0.1% of the waste category in Layer 18 to 0.5% in Layer 14. Figure 3:2 illustrates the temporal distribution of single platform cores and bladelets from Layers 21-4. It is noteworthy, that where the transitional MSA/LSA layers begin, there is a substantial increase in the percentage frequency of bladelet cores and bladelets.

Sixteen grindstone fragments were recovered from the MSA/LSA transitional layers. Twelve came from Layers 18 and 17 (six in

Fig. 3:2 Umhlatuzana Rock Shelter: distribution of single platform cores and bladelets from Layers 21-4.



each layer), one was found in Layer 16 and two came from Layer 15.

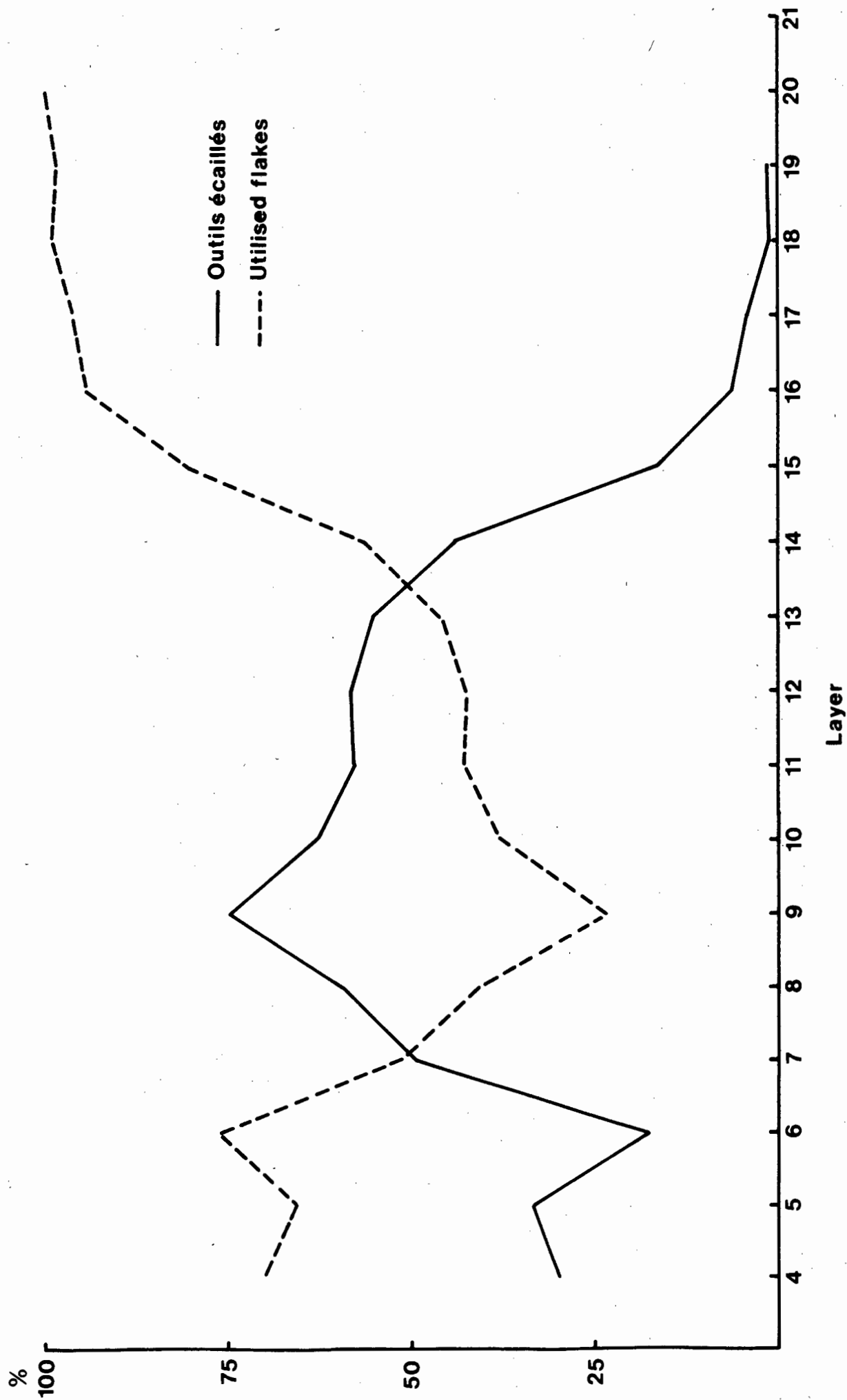
Utilised artefacts comprise less than 0.25% of the total assemblage in the transitional MSA/LSA layers. Of significance is the increase in the percentage frequency of outils écaillés. This increase corresponds with an increase in the percentage frequency of single platform and bipolar cores, and bladelets, in the waste category. Outils écaillés increase steadily from 1.0% of the utilised pieces in Layer 18, to 44.0% in Layer 14 (Table 3:1). The increase in the percentage frequency of outils écaillés in the transitional MSA/LSA layers coincides with a decline in the percentage frequency of utilised flakes. Utilised flakes decline from a high of 99.0% of the utilised pieces in Layer 18, to 52.0% in Layer 14 (Table 3:1). Figure 3:3 illustrates the distribution of outils écaillés and utilised flakes in Layers 21-4.

Utilised flakes with faceted platforms are found in the MSA/LSA transitional layers. All the flakes, save for one made from quartzite in Layer 18 and one made from quartz in Layer 17, are made from hornfels.

Formal tools comprise less than 0.25% of the total assemblage. The percentage frequency of scrapers increases steadily in Layers 18-14 from 5.0%-18.0%. Three adzes were found, two in Layer 18 and one in Layer 17 (Table 3:1).

There is a greater range of backed pieces in the MSA/LSA transitional layers compared to the late MSA layers. Backed points occur consistently in the transitional MSA/LSA layers.

Fig. 3:3 Umhlatuzana Rock Shelter: distribution of outils écaillés and utilised flakes from Layers 21-4.



One was found in each of Layers 18, 16 and 14, and two in each of Layers 15 and 17 (Table 3:1). The fluctuating percentage frequencies of backed points are difficult to explain, but are probably the result of small sample sizes.

The percentage frequency of segments decreases from Layers 18-17, from 6.0%-3.0%. They increase to 13.0% in Layer 16, and 41.0% in Layer 15. Segments then decline to 23.0% in Layer 14. MBP's occur consistently in these layers, albeit in fluctuating percentage frequencies (Table 3:1). The inconsistent percentage frequencies may be a function of not "getting it right" the first time, as a number of the MBP's appear to be incomplete segments or broken pieces of segments.

The percentage frequency of MRP's decreases steadily in the MSA/LSA transitional layers from 40.0% of the formal tools in Layer 17 to 18.0% in Layer 14 (Table 3:1). A few of the MRP's are made on MSA flakes. Two came from Layer 16, one came from Layer 17 and three were found in Layer 14. Two MRP's in Layers 17 and 16 are retouched on the ventral surface. Four MRP's in Layer 17 may be incomplete unifacial points and two MRP's may be incomplete hollow-based points. Two MRP's in Layer 16 may be incomplete hollow-based points.

Unifacial points occur in large numbers in Layers 18-16, while fewer examples occur in Layers 15-14 (Table 3:1). The percentage frequency of unifacial points decreases from 29.0% of the formal tools in Layer 18 to 6.0% in Layer 15. This increases to 12.0% in Layer 14 and is very likely due to the small (n=17) formal tool component. The percentage frequency

of bifacial points decreases from 16.0% of the formal tools in Layer 18, to 8.0% in Layers 17 and 16, and 3.0% in Layer 15. This increases to 6.0% in Layer 14 and is also likely to be the result of the small formal tool component in this layer. Hollow-based unifacial and bifacial points are found only in Layers 18-16, being 3.0% of the formal tools in Layer 18 and 8.0% in Layers 17 and 16 (Table 3:1).

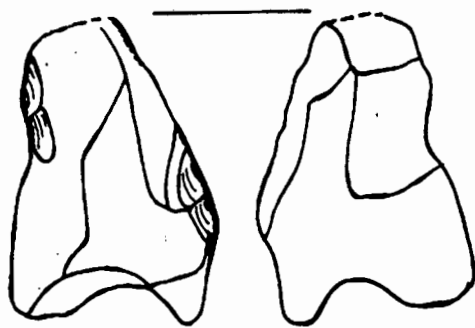
A selection of stone artefacts from the transitional MSA/LSA layers at Umhlatuzana Rock Shelter is illustrated in Fig. 3:4.

#### The MSA/LSA transition: raw materials

The raw material composition of the different artefact categories in the MSA/LSA transitional layers is presented in Table 3:5. There is a marked increase in the percentage frequency of quartz in the waste category, accompanied by a marked decline of hornfels. The implications of these changes are significant. Figure 3:5 illustrates the raw material changes in the MSA/LSA transitional layers waste category, and clearly shows a transition in process.

Hornfels is still overwhelmingly the most common raw material in Layer 18, comprising 83.0% of the waste material category. Thereafter, hornfels steadily declines to 30.0% in Layer 14. Quartz, however, increases from 16.0% in Layer 18 to 70.0% in Layer 14. Quartzite declines from 1.5% of the waste category in Layer 18 to 1.0% in Layer 14, and CCS increases from 0.01% in Layer 18 to 0.1% in Layer 14 (Table 3:5).

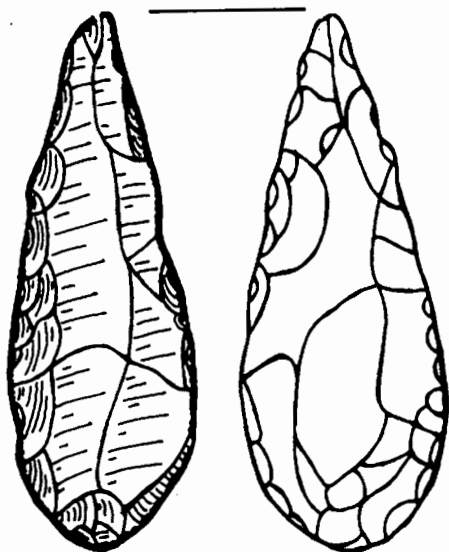
Fig. 3:4 Umhlatuzana Rock Shelter: selection of artefacts from MSA/LSA transitional layers. Hollow-based points. Layer 18: 45 & 46; Layer 17: 58 & 59; Layer 16: 66-68. Bifacial points. Layer 18: 47 & 48; Layer 16: 69. Segments. Layer 18: 49, 50, 52, 53 & 62; Layer 17: 61; Layer 16: 63, 64, 70 & 72; Layer 15: 71, 73, 76-78; Layer 14: 81. Trapezoids. Layer 18: 51. Layer 15: 74 & 75; Layer 14: 83. Scrapers. Layer 18: 54 & 55; Layer 17: 56; Layer 15: 84. Adzes. Layer 18: 57. MBP's. Layer 17: 60 & 65. Layer 15: 79 & 80. Backed points. Layer 14: 82. Nos 45-50, 54-59, 66-74, 80-84 are hornfels. Nos 51-53, 60-65, 75-79 are quartz.



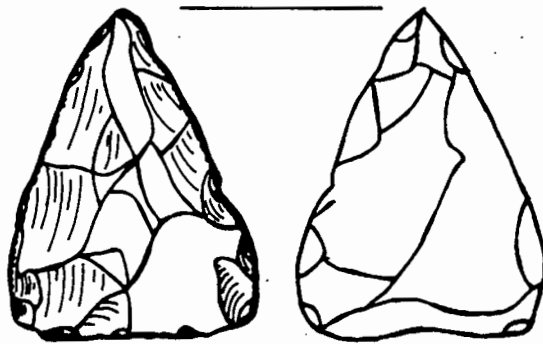
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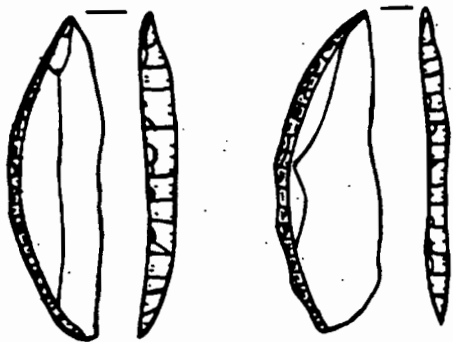
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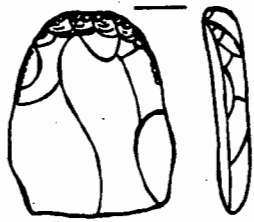
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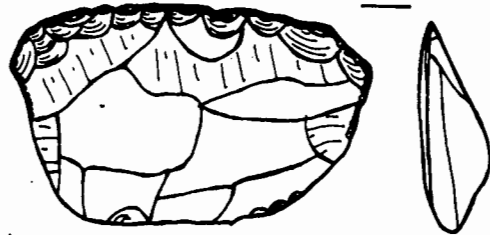
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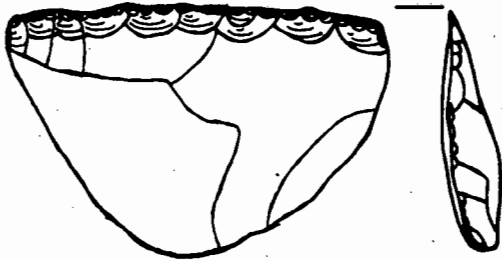
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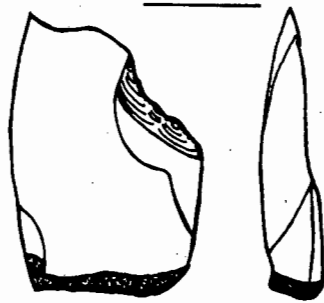
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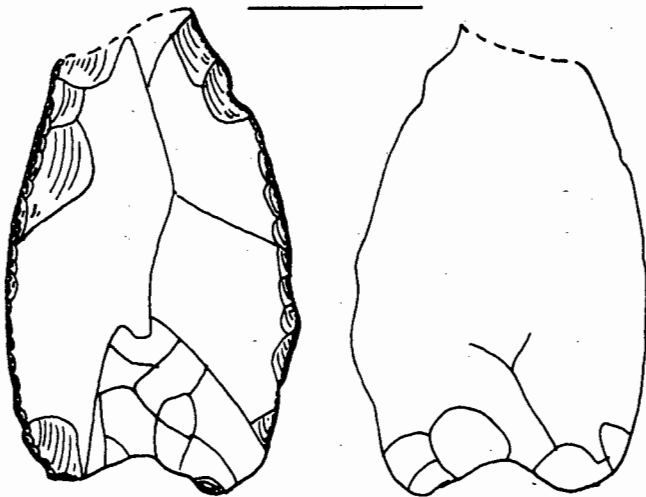
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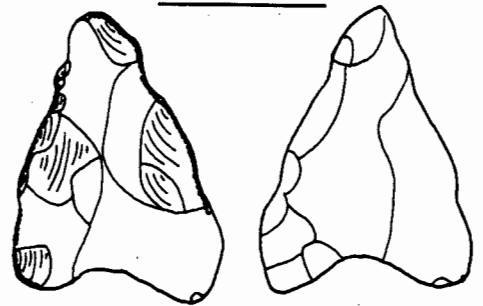
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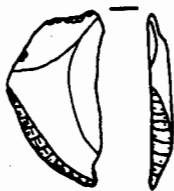
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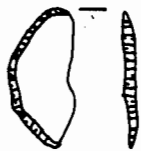
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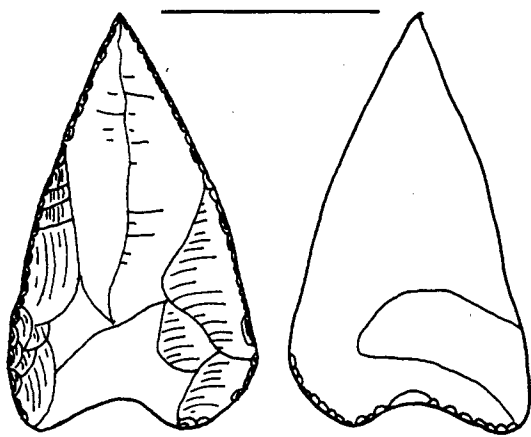
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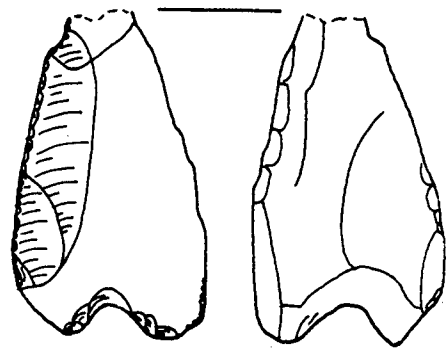
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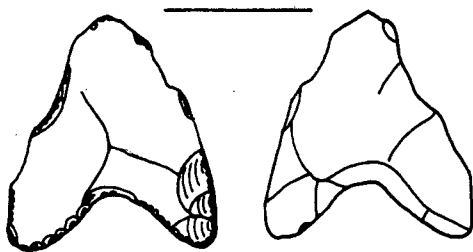
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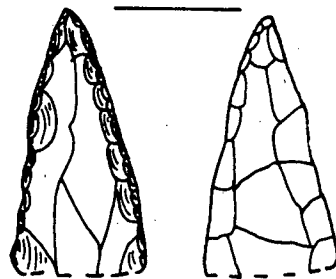
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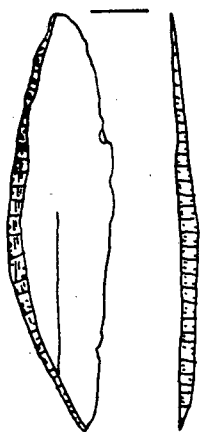
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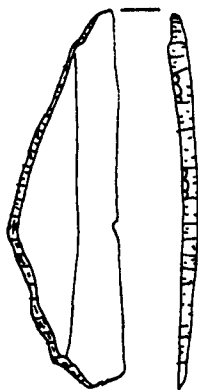
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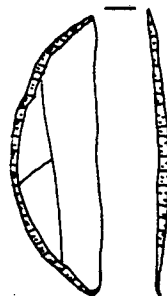
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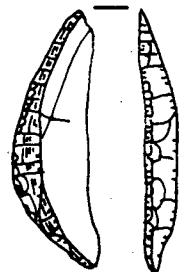
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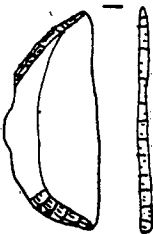
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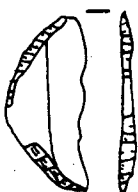
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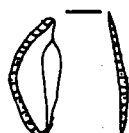
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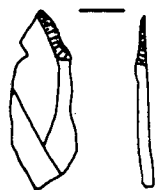
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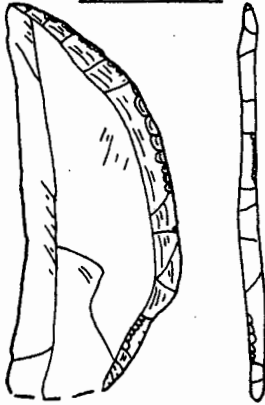
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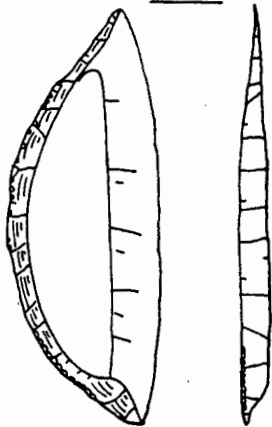
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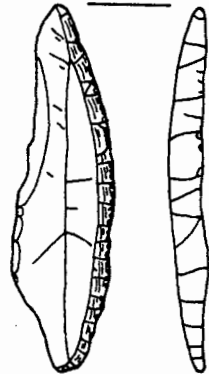
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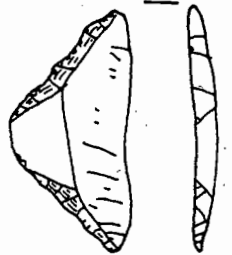
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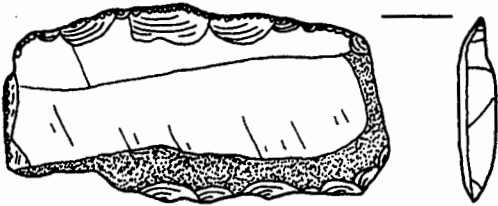
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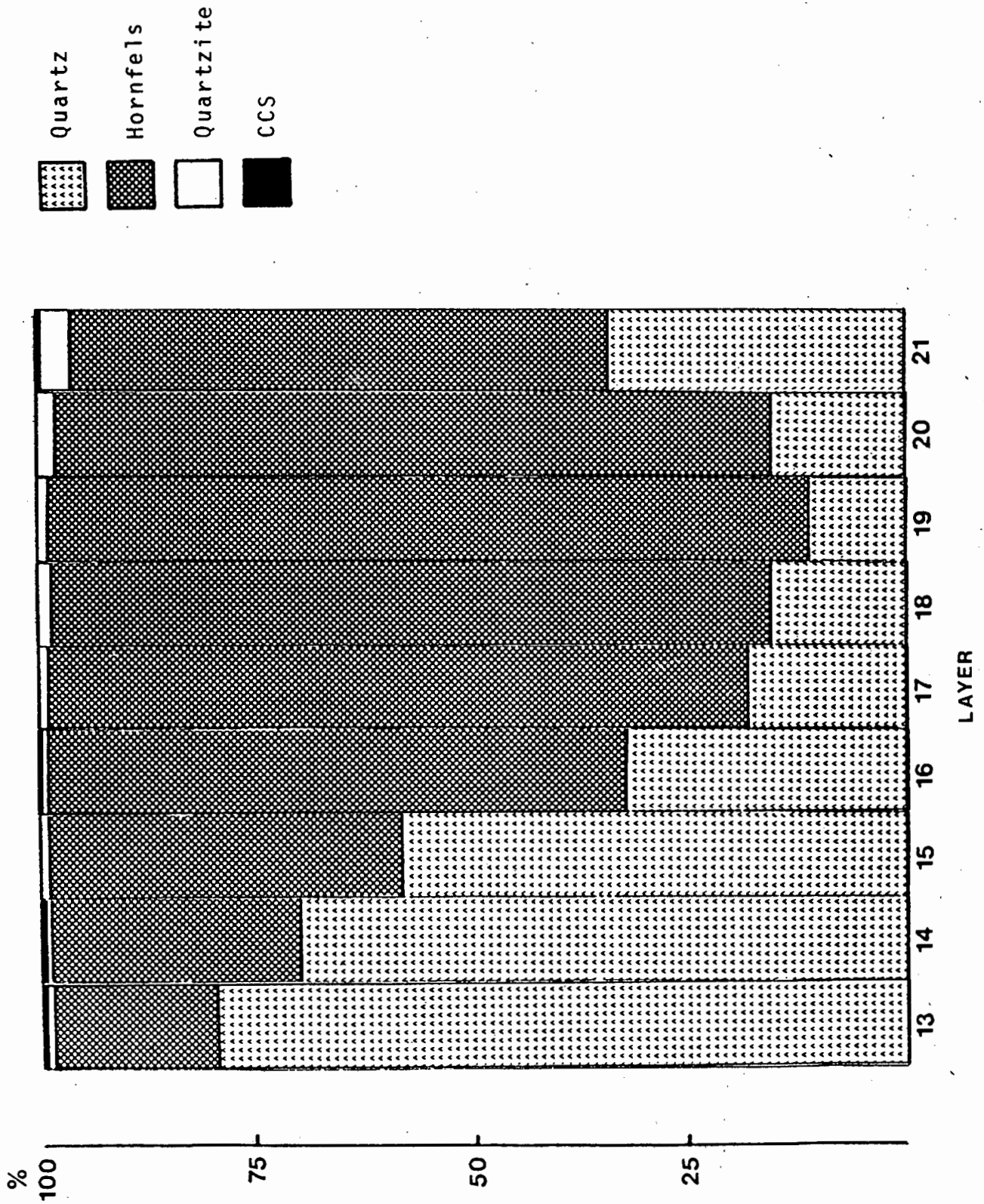


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Fig. 3:5 Umhlatuzana Rock Shelter: raw material distribution of waste materials in the MSA/LSA transitional layers.





The raw material composition of utilised flakes in Layers 18-14 is presented in Table 3:3. Hornfels comprises 80.0% of the utilised category in Layers 18-17, quartz 9.0% and quartzite 11.0%. Quartz increases to 39.0% in Layer 16 while hornfels declines to 61.0%. Quartz makes up 32.0% and hornfels 48.0% in Layer 15; Quartzite, absent in Layer 16, increases to 13.0% and CCS, absent in Layers 18-16, makes up 6.0%. Quartz dominates the utilised category in Layer 14 where it makes up 56.0% while hornfels makes up 44.0%.

Hornfels comprises 81.0% and 90.0% of the utilised flakes in Layers 18 and 17, quartzite 11.0% and 3.0% and quartz 8.0% and 7.0% respectively. Hornfels comprises 65.0%, 52.0% and 67.0% respectively in Layers 16-14, while quartz makes up 35.0%, 28.0% and 33.0% respectively (Table 3:3). Outils à caillès are poorly represented in Layers 18-14 (Table 3:1).

Hornfels comprises 80.0%, quartz 16.0%, quartzite 10.0% and CCS 0.4% of the Layers 18-14 formal tools. On the other hand, quartz increases dramatically from Layers 18-15, from 13.0%-41.0%, but declines to 6.0% in Layer 14. Hornfels, on the other hand, declines from 83.0%-50.0% in Layers 18-15, but increases to 94.0% in Layer 14. Quartzite increases slightly from 4.0%-6.0% in Layers 18-15 (Table 3:5).

The raw material composition of the scrapers, segments, MBP's and MRP's in the transitional MSA/LSA layers are presented in Table 3:6. Some 78.0% of the scrapers are made from hornfels, 18.0% from quartz, and 4.0% from quartzite. Two sizes of segments have been recovered from the Umhlatuzana Rock Shelter

Table 3:6 Umhlatuzana Rock Shelter: raw material composition of the scraper, segment, miscellaneous backed piece (MBP) and miscellaneous retouched piece (MRP) formal tool classes in Layers 18-14.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
Scrapers									
14	1	33,33	2	66,66	-	-	-	-	3
15	2	40,00	3	60,00	-	-	-	-	5
16	1	12,50	7	87,50	-	-	-	-	8
17	1	16,66	5	83,33	-	-	-	-	6
18	-	-	4	80,00	1	20,00	-	-	5
Segments									
14	-	-	4	100,00	-	-	-	-	4
15	7	53,85	5	38,46	-	-	1	7,69	13
16	4	50,00	4	50,00	-	-	-	-	8
17	2	100,00	-	-	-	-	-	-	2
18	4	66,66	2	33,33	-	-	-	-	6
MBP's									
14	-	-	3	100,00	-	-	-	-	3
15	1	100,00	-	-	-	-	-	-	1
16	2	28,57	5	71,43	-	-	-	-	7
17	1	25,00	2	50,00	1	25,00	-	-	4
18	4	57,14	3	42,86	-	-	-	-	7
MRP's									
14	-	-	3	100,00	-	-	-	-	3
15	1	12,50	6	75,00	1	12,50	-	-	8
16	2	11,76	15	88,24	-	-	-	-	17
17	2	6,90	26	89,66	1	3,45	-	-	29
18	4	13,33	25	83,33	1	3,33	-	-	30

MSA/LSA transitional layers and both reflect preferences for a particular raw material. Large (> 20 mm) segments are almost exclusively made from hornfels, while small (< 20 mm) segments are mainly made from quartz. Some 52.0% of the segments are made from quartz and 45.0% from hornfels, while 3.0% are from CCS.

Some 59.0% of MBP's are made from hornfels and 36.0% are made from quartz, while 5.0% are made from quartzite. Seven backed points were recovered, and all, except for one in Layer 14, are made on quartz. Some 86.0% of the MRP's are made from hornfels, 10.0% from quartz and 4.0% from quartzite. A few of the MRP's are made on MSA flakes. All are made from hornfels. Three adzes, two in Layer 18 and one in Layer 17, are made from hornfels.

The raw material composition of unifacial, bifacial and hollow-based points in the MSA/LSA transitional layers is presented in Table 3:7. Raw material preferences are clear. Hornfels is used almost exclusively in the production of these points. Some 93.0% of the unifacial points are made from hornfels and 7.0% are made from quartzite. Bifacial points and unifacial and bifacial hollow-based points are all made from hornfels.

#### The Robberg artefacts

The Late Pleistocene microlithic assemblages of the Robberg industry are characterised by

"the systematic production of small bladelets from standardised single platform bladelet cores and by the

Table 3:7 Umhlatuzana Rock Shelter: raw material composition of the unifacial point, bifacial point and hollow-based point formal tool classes in Layers 18-14.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
Unifacial Points									
14	-	-	2	100,00	-	-	-	-	2
15	-	-	2	100,00	-	-	-	-	2
16	-	-	9	100,00	-	-	-	-	9
17	-	-	15	88,24	2	11,76	-	-	17
18	-	-	27	93,10	2	6,90	-	-	29
Bifacial Points									
14	-	-	1	100,00	-	-	-	-	1
15	-	-	1	100,00	-	-	-	-	1
16	-	-	5	100,00	-	-	-	-	5
17	-	-	6	100,00	-	-	-	-	6
18	-	-	16	100,00	-	-	-	-	16
Hollow-based Points									
14	-	-	-	-	-	-	-	-	0
15	-	-	-	-	-	-	-	-	0
16	-	-	5	100,00	-	-	-	-	5
17	-	-	6	100,00	-	-	-	-	6
18	-	-	3	100,00	-	-	-	-	3

occurrence in some quantity of bipolar cores that have sometimes been so reduced by flaking that they are classed as pièces esquillées, outils écaillés or scaled pieces" (Deacon, J. 1984a:227).

Formal tools are rare in all Robberg assemblages (Deacon, J. 1984a, b). The assemblages from Layers 13-4 at Umhlatuzana Rock Shelter have been defined as belonging to the Robberg. They are characterised by systematic bladelet production and contain few formal tools. The most numerous artefacts in the Robberg layers are the waste, comprising more than 99.0% of each assemblage (Table 3:1). The majority of cores are of the single platform variety. There are 1845 single platform cores which account for 72.0% of the total core assemblage. Irregular cores, of which there are 446, account for 17.0%, and bipolar cores (273) account for 11.0% of the total core assemblage. The increase in the percentage frequency of bladelet cores between Layers 13-4 corresponds with an increase in the percentage frequency of bladelets and outils écaillés in these layers (Table 3:1). Figure 3:2 illustrates the increase in the percentage frequency of single platform cores and bladelets between Layers 13-4.

Utilised artefacts comprise less than 1.0%, and formal tools less than 0.05% of the total Robberg assemblage. The majority of southern Cape Robberg formal tools are scrapers (Deacon, J. 1984a, b), and at Umhlatuzana Rock Shelter, although a wide range of formal tools exists, scrapers are also in the majority.

Despite a consistency in most aspects of the Robberg stone artefact sequence at Umhlatuzana Rock Shelter, closer

examination of the stone artefact sequence reveals differences between what I have termed the early and late Robberg. In the following discussion of the early and late Robberg, I shall first present the waste, utilised and formal tool data for both phases and, thereafter, the raw material data. A selection of stone artefacts from the early and late Robberg is illustrated in Figs. 3:6 and 3:7 respectively.

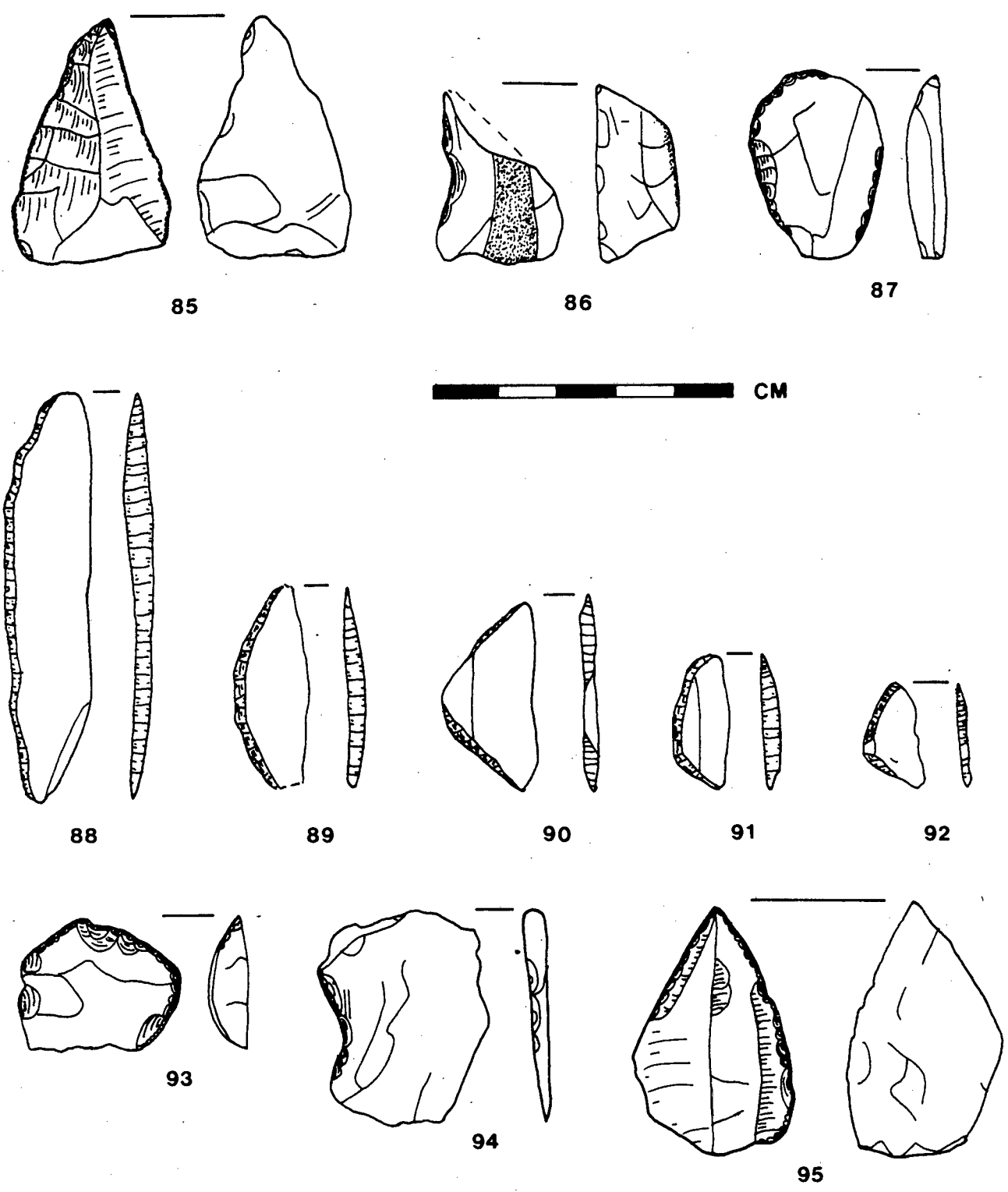
#### The early Robberg artefacts

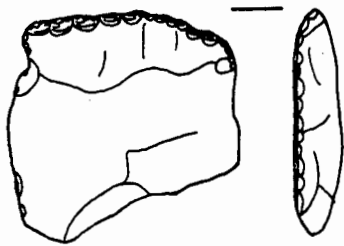
The early Robberg includes Layers 13-9 (Table 3:1). These assemblages are characterised by systematic bladelet production and by the occurrence of numerous outils écaillés.

Five scrapers and five adzes occur in these layers which is 25.0% and 42.0% respectively of the total number of these tools found in the Robberg layers. Eighteen MRP's occur in Layers 13-9, comprising 32.0% of the total number of MRP's found in these layers. A few MRP's in the early Robberg are made on MSA flakes. One each came from Layers 12, 11 and 9 and two were found in Layer 10. Eleven unifacial points came from Layers 13-9. One each came from Layers 13-10 and seven were found in Layer 9 which is 50.0% of the total number of formal tools in this layer. Two segments were recovered from Layer 13 and one from Layer 12. One backed point came from Layer 9. One backed blade and three MBP's were recovered from Layer 13.

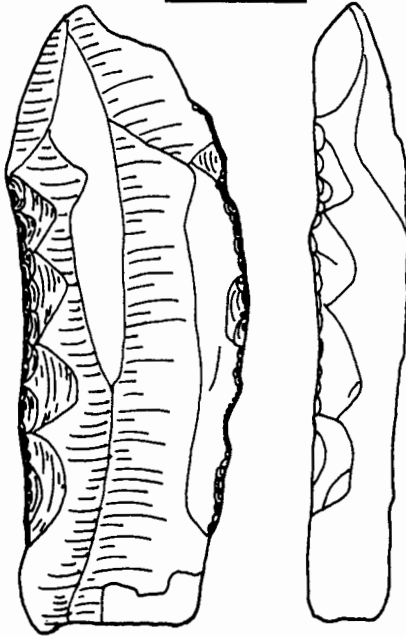
Sixty-eight utilised flakes came from Layers 13-9, making up 28.0% of the total number of utilised flakes in the Robberg deposits. The percentage frequency of utilised flakes declines steadily in Layers 13-9, from 45.0% to 24.0%. An observation

Fig. 3:6 Umhlatuzana Rock Shelter: selection of artefacts from 'early' Robberg layers. Unifacial points. Layer 13: 85; Layer 11: 95; Layer 9: 100 & 102. Adzes. Layer 13: 86; Layer 12: 94; Layer 11: 97; Layer 9: 101. Scrapers. Layer 13: 87; Layer 12: 93; Layer 10: 96 & 99. Backed blades. Layer 13: 88. Segments. Layer 13: 89, 91 & 92. Trapezoids. Layer 13: 90. MRP's. Layer 11: 98. Nos 85-92, 94, 96-102 are hornfels. Nos 93 & 103 are quartz. No. 95 is quartzite.

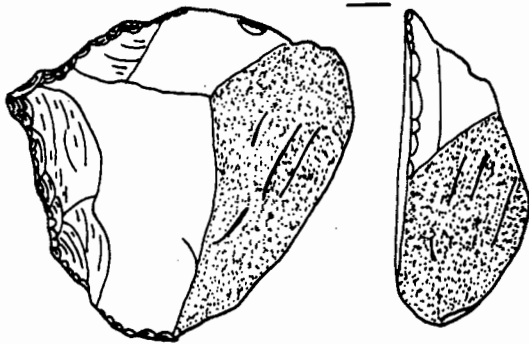




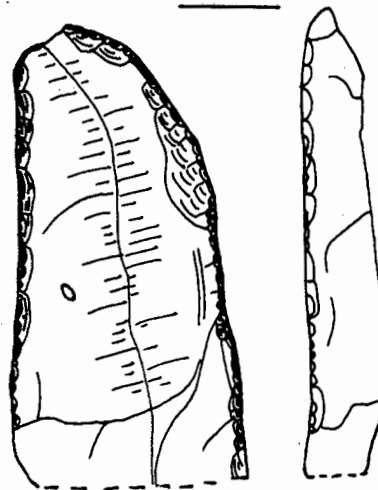
96



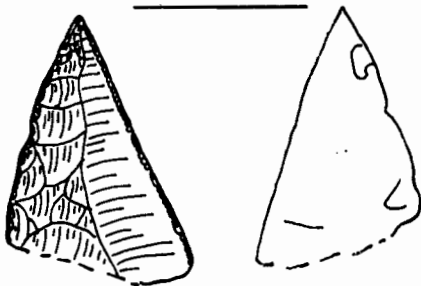
97



98



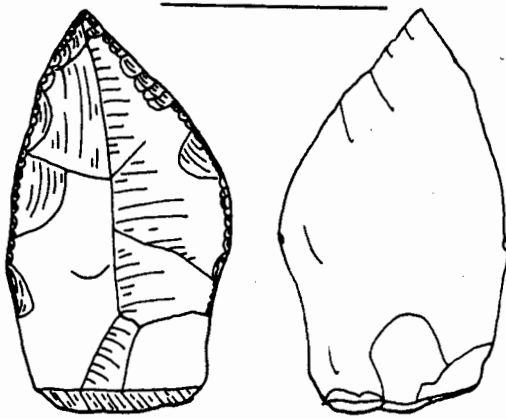
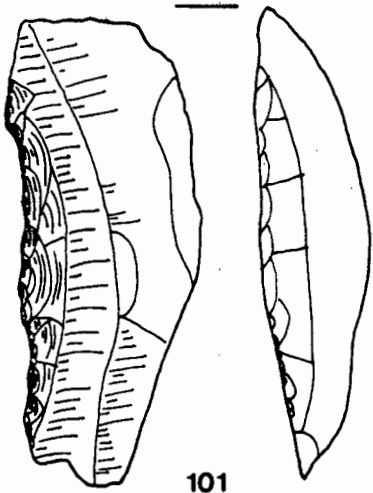
99



100



CM



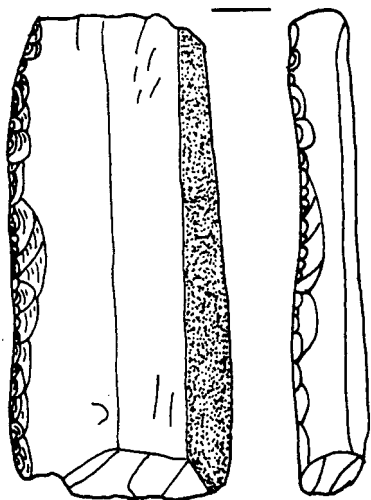
here is the re-use of MSA flakes in the utilised flake class in both the early and late Robberg. Of interest is that in the MSA/LSA transitional layers, there were less utilised flakes made on MSA flakes, than there were in the early and late Robberg. The percentage frequency of outils écaillés increases markedly, from 55.0% in Layer 13, to 74.0% in Layer 9 (Table 3:1).

#### The late Robberg artefacts

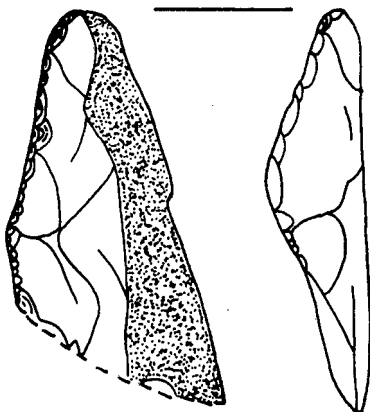
The late Robberg includes Layers 8-4 (Table 3:1). The late Robberg, like the early Robberg, is characterised by systematic bladelet production. Natural backed knives (NBK's) occur only in these layers. There are three in Layer 8, one in Layer 7, one in Layer 6, two in Layer 5 and three in Layer 4. Fifteen scrapers and seven adzes occur in Layers 8-4, which is 75.0% and 58.0% respectively of the total number of these tools found in the Robberg deposits. Some 68.0% of the overall Robberg MRP's appear in Layers 8-4. Nine unifacial points were found; seven in Layer 8 and one each in Layers 7 and 4. Two segments were found, one in Layer 7 and one in Layer 4. One backed point and one MBP came from Layer 8 and one backed bladelet came from Layer 7. A single grindstone came from Layer 4 and one awl was found in Layer 8.

Significant differences may therefore be identified between the early Robberg and the late Robberg at Umhlatuzana Rock Shelter. NBK's are found exclusively in the late Robberg, while some 75.0% of the scrapers and more than 67.0% of the MRP's are found here as well. Some 72.0% of the utilised

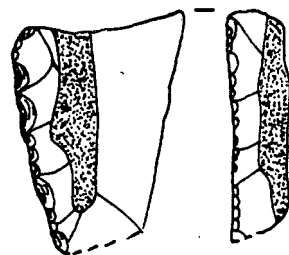
Fig. 3:7 Umhlatuzana Rock Shelter: selection of artefacts from 'late' Robberg layers. NBK's. Layer 8: 104-106; Layer 7: 112; Layer 6: 116; Layer 5: 119 & 120; Layer 4: 122 & 123. Scrapers. Layer 8: 107 & 108; Layer 7: 113 & 114; Layer 6: 117 & 118. Layer 4: 127-131. Adzes. Layer 8: 109; Layer 5: 121; Layer 4: 124-126. Unifacial points. Layer 8: 110. Segments. Layer 8: 111; Layer 7: 115; Layer 4: 131. Nos 104-107, 109, 110, 112-114, 116, 117, 119, 120, 122-127 are hornfels. Nos 108 is quartzite. Nos 11, 115, 128 & 131 are quartz. 118, 121, 129 & 130 are CCS.



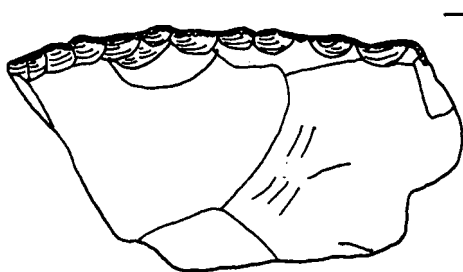
104



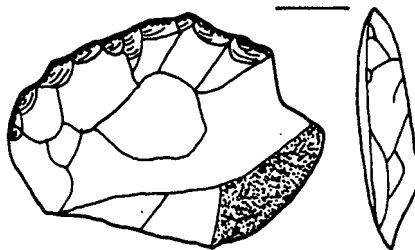
105



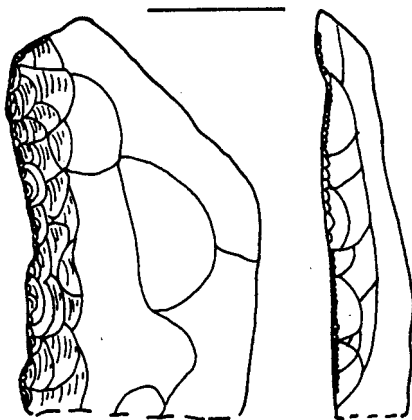
106



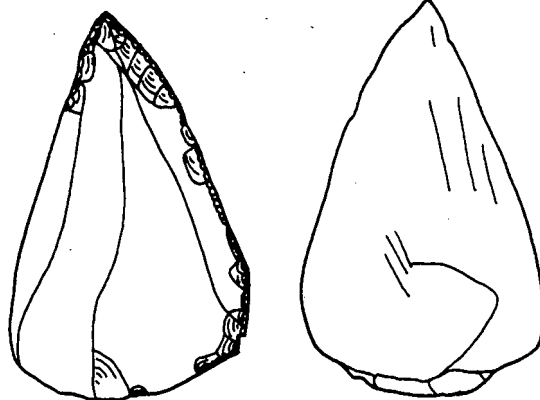
107



108



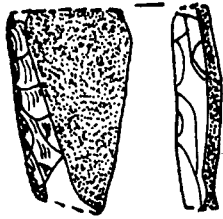
109



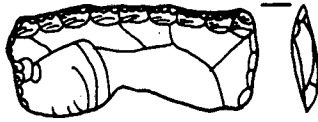
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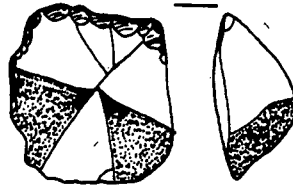
111



112



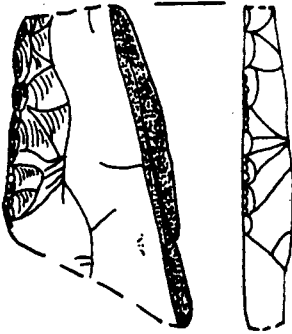
113



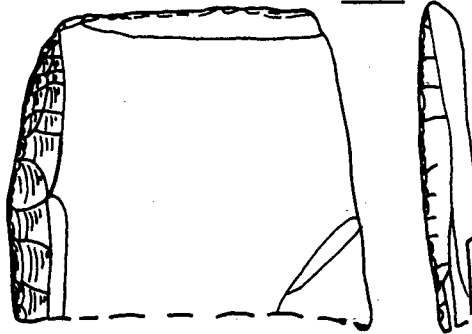
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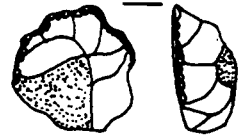
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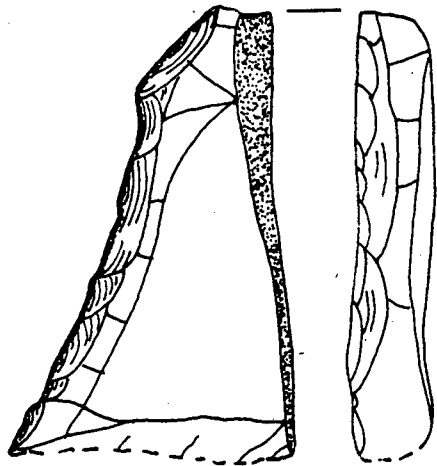
116



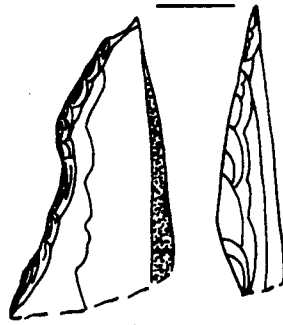
117



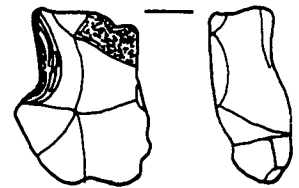
118



119

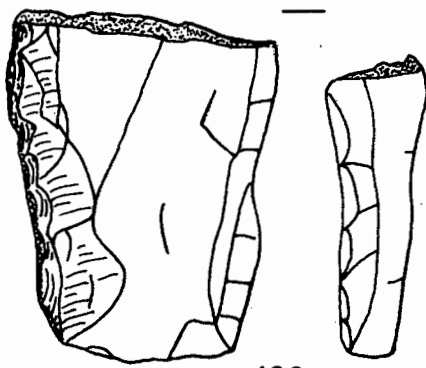


120

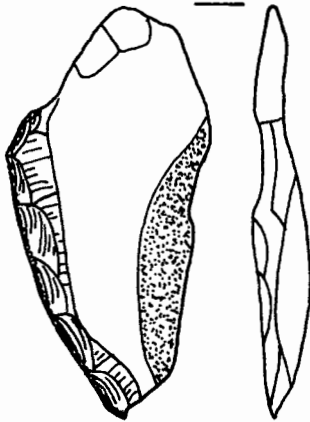


121

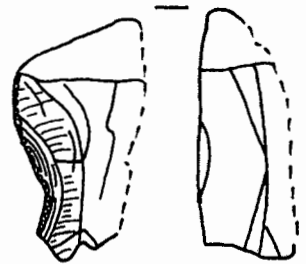




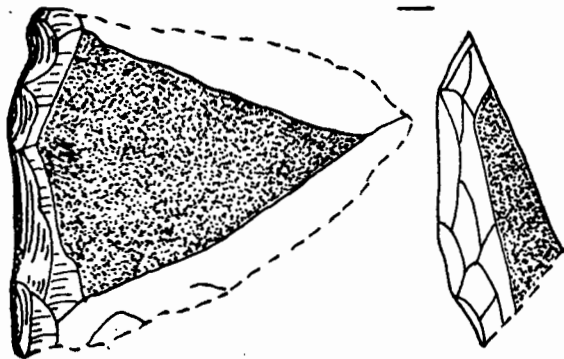
122



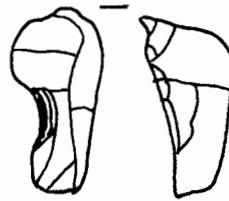
123



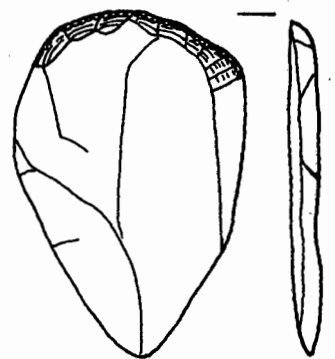
124



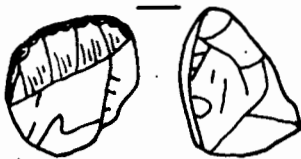
125



126



127



128



129



130



131

flakes came from the late Robberg. It is clear from Fig. 3:2 that there is an increase in bladelet production in the late Robberg compared to that in the early Robberg, and this corresponds with an increase in the percentage frequency of outils écaillés (Fig. 3:3 & Table 3:1).

#### The early Robberg: raw materials

The raw material composition of the different artefact categories in the early Robberg (Layers 13-9) is presented in Table 3:8.

Quartz is overwhelmingly the most common raw material in the waste categories and comprises 78.0% of the overall artefact total, while hornfels comprises 20.0%, quartzite 2.0% and CCS 0.3%. There is little temporal variation in the raw material composition of the Layers 13-9 waste category. Quartz is dominant throughout, varying between 77.0% and 80%, while hornfels varies between 19.0% and 22.0%. Among the utilised pieces in the early Robberg, quartz is the most common raw material, comprising 61.0% of this category, while hornfels comprises 34.0%, quartzite 5.0% and CCS 1.0%.

In the utilised flake class 65.0% of the artefacts are made from hornfels, 21.0% are made from quartz, 13.0% are made from quartzite and 1.0% are made from CCS (Table 3:3). Between Layers 12-8 there is a significant decrease in the use of quartz for utilised flakes, from 50.0% in Layer 12, to 10.0% in Layer 8, while none were found in Layer 9. This decline corresponds with an increase in the preference for hornfels

Table 3:8 Umhlatuzana Rock Shelter: raw material composition of the different artefact categories in Layers 13-9.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
	Waste								
9	16 978	77,65	4 231	19,35	538	2,46	119	0,54	21 866
10	13 852	76,55	3 820	21,11	370	2,04	53	0,29	18 095
11	14 839	78,10	3 678	19,36	427	2,25	57	0,30	19 001
12	17 185	76,74	4 845	21,63	322	1,44	43	0,19	22 395
13	24 471	79,77	5 831	19,01	346	1,13	28	0,09	30 676
	Utilised								
9	30	65,22	11	23,91	4	8,70	1	2,17	46
10	18	48,65	18	48,65	1	2,70	-	-	37
11	27	57,45	17	36,17	3	6,38	-	-	47
12	14	73,68	5	26,32	-	-	-	-	19
13	22	66,67	10	30,30	1	3,03	-	-	33
	Formal								
9	2	18,18	11	78,57	1	7,14	-	-	14
10	-	-	7	87,50	1	12,50	-	-	8
11	1	14,28	5	71,43	1	14,28	-	-	7
12	1	20,00	4	80,00	-	-	-	-	5
13	1	8,33	10	83,33	-	-	1	8,33	12
	Total Layer								
9	17 010	77,58	4 253	19,34	543	2,48	120	0,55	21 926
10	13 870	76,46	3 845	21,20	372	2,05	53	0,29	18 140
11	14 867	78,02	3 700	19,42	431	2,26	57	0,30	19 055
12	17 200	76,72	4 854	21,65	322	1,44	43	0,19	22 419
13	24 494	79,73	5 851	19,05	347	1,13	29	0,09	30 721
	Overall Totals								
	87 441	77,89	22 503	20,05	2 015	1,79	302	0,27	112 261

utilised flakes, from 60.0% in Layer 13 to 79.0% in Layer 10 (Table 3:3).

A significantly greater number of utilised flakes are made of quartz in the early Robberg compared to the late Robberg, 21.0% compared to 8.0%. In both periods, however, hornfels is dominant throughout and varies between 50.0% and 79.0%. Quartzite comprises 13.0% of the utilised flakes in the early Robberg and 17.0% in the late Robberg.

A discernible trend is also evident in the use of CCS for utilised flakes. There is only one CCS utilised flake between Layers 13-9, while between Layers 8-4, the number increases to 23, with 12 occurring in Layer 4 (Table 3:3).

Some 85.0% of outils écaillés in the early Robberg are made of quartz and 15.0% are made of hornfels. There is, however, a significant decrease in the use of quartz in Layers 13-10, from 94.0% to 70.0%. This is followed by an increase in hornfels outils écaillés from 6.0% to 30.0% (Table 3:9).

Four grindstone fragments were found in the early Robberg layers. One came from Layer 13 and is made from hornfels; two were found in Layer 11, one made from quartzite and one made from hornfels, and one came from Layer 9 made from quartzite.

Twenty-six utilised flakes were made on MSA flakes in the early Robberg. Three came from Layer 13, two made from hornfels and one from quartzite. Three came from Layer 12 and are made from hornfels. Seven came from Layer 11, six were

Table 3:9 Umhlatuzana Rock Shelter: raw material composition of outils écaillés in Layers 19-1.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
1	1	50.00	1	50.00	-	-	-	-	2
2	6	85.71	-	-	-	-	1	14.29	7
3	1	100.00	-	-	-	-	-	-	1
4	26	92.86	-	-	-	-	2	7.14	28
5	21	100.00	-	-	-	-	-	-	21
6	4	80.00	1	20.00	-	-	-	-	5
7	24	88.89	3	11.11	-	-	-	-	27
8	29	93.55	2	6.45	-	-	-	-	31
9	30	85.71	5	16.13	-	-	-	-	35
10	16	69.57	7	30.43	-	-	-	-	23
11	24	88.89	3	11.11	-	-	-	-	27
12	10	90.91	1	9.09	-	-	-	-	11
13	17	94.44	1	5.56	-	-	-	-	18
14	5	71.43	2	28.57	-	-	-	-	7
15	3	60.00	2	40.00	-	-	-	-	5
16	2	100.00	-	-	-	-	-	-	2
17	1	33.33	2	66.67	-	-	-	-	3
18	1	100.00	-	-	-	-	-	-	1
19	1	100.00	-	-	-	-	-	-	1

made from hornfels and one from quartzite. Five were found in Layer 10, four made from hornfels and one from quartzite.

Hornfels comprises 80.0%, quartz 11.0%, quartzite 7.0% and CCS 2.0% of the formal tools in the early Robberg (Table 3:8). There is an increase in the percentage frequency of formal tools made from quartz in the early Robberg from 8.0% in Layer 13, to 18.0% in Layer 9. Quartzite formal tools decrease from 14.0% in Layer 11 to 7.0% in Layer 9. One CCS formal tool was found in the early Robberg, an MBP in Layer 9.

The raw material composition of scrapers, adzes, unifacial points and MRP's is presented in Table 3:10. Some 40.0% of the scrapers are made from quartz, 40.0% from hornfels and 20.0% from quartzite. All the adzes are made from hornfels, while in the unifacial point class, 91.0% are made from hornfels and 9.0% from quartzite. Some 83.0% of MRP's are made from hornfels, 11.0% from quartz and 6.0% from quartzite. All the MRP's made on MSA flakes in the early Robberg are made from hornfels.

#### The late Robberg: raw materials

The raw material composition of the different artefact categories in the late Robberg (Layers 8-4) is presented in Table 3:11.

Quartz is overwhelmingly the most common raw material in these layers comprising 75.0% of all the artefacts; hornfels makes up 21.0%, quartzite 3.0% and CCS 1.0%. There is little temporal variation between Layers 8-4 with quartz remaining

Table 3:10 Umhlatuzana Rock Shelter: raw material composition of the scraper, adze, unifacial point and miscellaneous retouched piece (MRP) formal tool classes in Layers 13-9.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
Scrapers									
9	-	-	-	-	-	-	-	-	-
10	-	-	1	50,00	1	50,00	-	-	2
11	-	-	-	-	-	-	-	-	-
12	1	100,00	-	-	-	-	-	-	1
13	1	50,00	1	50,00	-	-	-	-	2
Adzes									
9	-	-	1	100,00	-	-	-	-	1
10	-	-	1	100,00	-	-	-	-	1
11	-	-	1	100,00	-	-	-	-	1
12	-	-	1	100,00	-	-	-	-	1
13	-	-	1	100,00	-	-	-	-	1
Unifacial Points									
9	-	-	7	100,00	-	-	-	-	7
10	-	-	1	100,00	-	-	-	-	1
11	-	-	-	-	1	100,00	-	-	1
12	-	-	1	100,00	-	-	-	-	1
13	-	-	1	100,00	-	-	-	-	1
MRP's									
9	1	20,00	3	60,00	1	20,00	-	-	5
10	-	-	4	100,00	-	-	-	-	4
11	1	20,00	4	80,00	-	-	-	-	5
12	-	-	2	100,00	-	-	-	-	2
13	-	-	2	100,00	-	-	-	-	2

Table 3:11 Umhlatuzana Rock Shelter: raw material composition of the different artefact categories in Layers 8-4.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
				<b>WASTE</b>					
4	16 609	75,19	4 626	20,94	334	1,51	519	2,35	22 088
5	13 390	79,89	2 506	14,95	504	3,01	360	2,15	16 760
6	13 532	76,67	3 312	18,77	412	2,33	393	2,23	17 649
7	13 493	73,09	4 234	22,93	547	2,96	188	1,02	18 462
8	15 395	71,54	5 268	24,48	665	3,09	190	0,88	21 518
				<b>Utilised</b>					
4	31	32,29	35	36,46	16	16,67	14	14,58	96
5	27	43,55	23	37,10	4	6,45	8	12,90	62
6	4	14,81	17	62,96	3	11,11	3	11,11	27
7	25	45,45	22	40,00	8	7,27	-	-	55
8	31	59,62	20	38,46	1	1,92	-	-	52
				<b>Formal</b>					
4	3	13,64	16	72,72	-	-	3	13,64	22
5	-	-	5	71,43	-	-	2	28,57	7
6	1	9,09	9	81,82	-	-	1	9,09	11
7	3	17,65	13	76,47	1	5,88	-	-	17
8	1	3,45	27	93,10	1	3,45	-	-	29
				<b>Total Layer</b>					
4	16 643	74,95	4 677	21,06	350	1,58	536	2,41	22 206
5	13 417	79,73	2 534	15,06	508	3,02	370	2,20	16 829
6	13 537	76,53	3 338	18,87	415	2,35	397	2,24	17 687
7	13 251	72,55	4 269	23,37	556	3,04	188	1,03	18 264
8	15 427	71,42	5 315	24,61	667	3,09	190	0,88	21 599
				<b>Overall Totals</b>					
	72 275	74,83	20 133	20,84	2 496	2,58	1 681	1,74	96 585

dominant throughout, varying between 72.0%-80.0%, and hornfels between 15.0%-24.0%. There is an increase in the percentage frequency of CCS waste in Layers 8-4, from 0.9%-2.4%, with a similar trend being noticeable in the early Robberg.

Among the utilised artefacts in Layers 8-4, quartz and hornfels each comprise 40.0%, quartzite comprises 11.0% and CCS 9.0%. Close examination of Table 3:11 shows that quartz utilised pieces decline from 60.0%-15.0% in Layers 8-6, and increases to 44.0% and 32.0% in Layers 5 and 4 respectively. Hornfels utilised pieces increase from 38.0% to 63.0% in Layers 8-6 and decline to 37.0% and 36.0% in Layers 5 and 4 respectively. This trend in the frequency of quartz utilised artefacts is probably related to the temporal patterning of outils àcaillès which was described earlier.

Some 93.0% of the outils àcaillès are made from quartz and 5.0% are made from hornfels (Table 3:9), while 62.0% of the utilised flakes are made from hornfels, 17.0% from quartzite, 13.0% from CCS and 8.0% from quartz (Table 3:3). Closer examination of Table 3:3 reveals that the percentage frequency of hornfels utilised flakes decreases from 86.0% in Layer 8 to 52.0% in Layer 4.

In the overall formal tool category between Layers 8-4, hornfels comprises 81.0%, quartz 9.0%, CCS 7.0% and quartzite 2% (Table 3:11). Quartz varies between 3.0% and 18.0%, while hornfels varies between 72.0% and 93.0%. Quartzite is absent in Layers 6 and 4, but is 3.0% and 6.0% in Layers 8 and 3

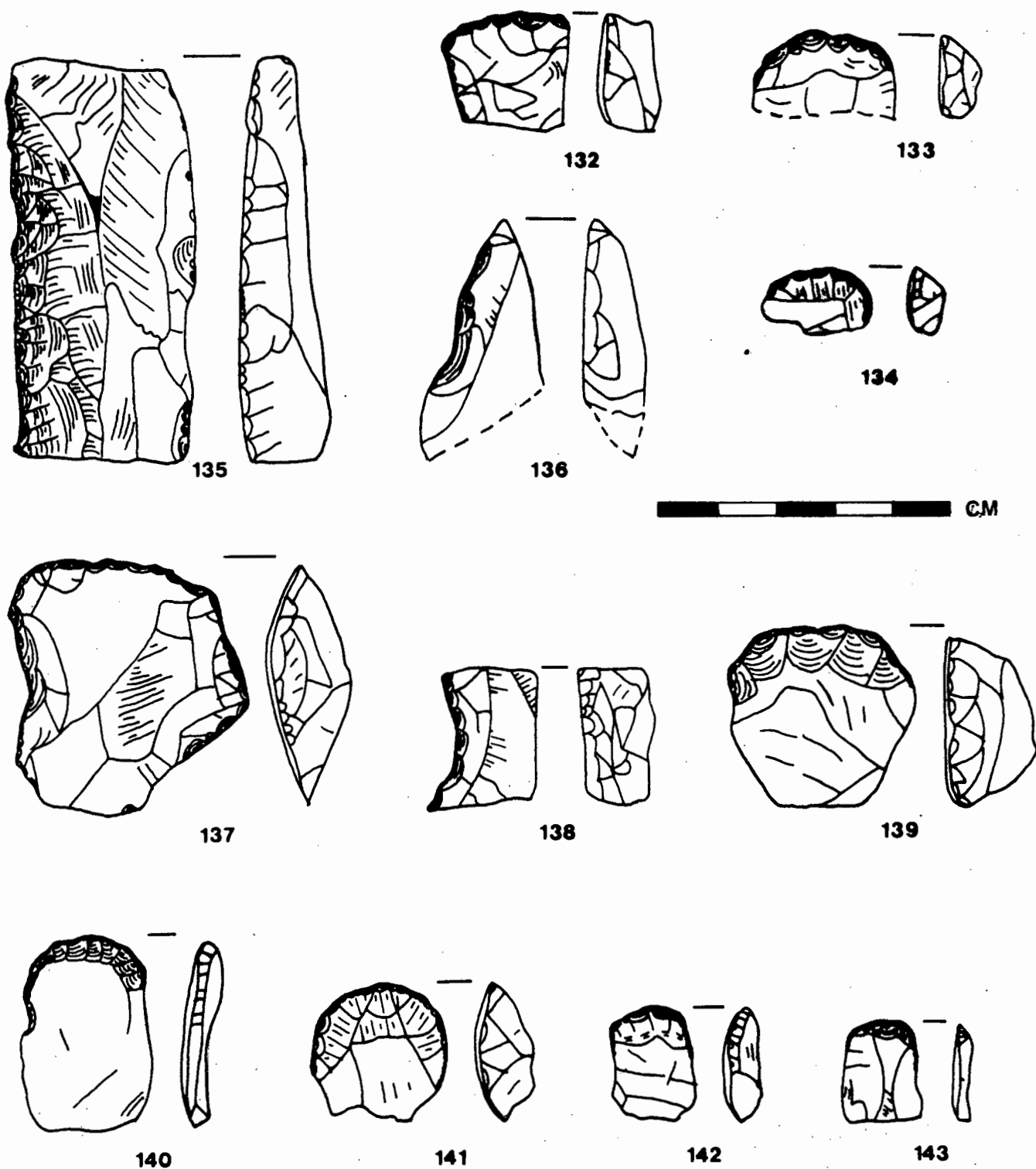
respectively. CCS formal tools occur only in Layers 6-4 varying between 9.0% and 29.0%.

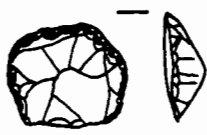
The raw material composition of the scrapers, adzes, NBK's and MRP's is presented in Table 3:12. Some 86.0% of the Layers 8-7 scrapers are made from hornfels and 14.0% from quartzite. In Layers 6-4, however, 63.0% of the scrapers are made from CCS, 25.0% from quartz and 12.0% from hornfels. All the adzes are made from hornfels, while some 92.0% of the MRP's are made from hornfels, 5.0% from quartz and 3.0% from quartzite. All the NBK's are made from hornfels. The unifacial points found in Layers 8-7 are all made from hornfels, the backed point and awl in Layer 8 are made from hornfels, and the MBP is made from quartz. The backed bladelet in Layer 7 is made from quartz, the segments in Layers 7 and 4 are made from quartz and the grindstone in Layer 4 is made from hornfels.

#### THE HOLOCENE ASSEMBLAGES

The Holocene LSA deposits at Umhlatuzana Rock Shelter comprise Layers 4-1. Layer 4 produced an early Holocene date of 9180 BP, but it has been included in the Late Pleistocene series because the lithic assemblage, (having several NBK's), is compatible with the Robberg bladelet assemblages. The following discussion on the Holocene LSA will therefore include only Layers 3-1. A selection of stone artefacts from the Holocene LSA is illustrated in Fig. 3:8.

Fig. 3:8 Umhlatuzana Rock Shelter: selection of stone artefacts from Holocene layers. Scrapers. Layer 3: 132-134; Layer 2: 137, 139-150; Layer 1: 153 & 154. Adzes. Layer 3: 135 & 136; Layer 2: 138. Segments. Layer 2: 151 & 152. Nos 132, 135-138, 140, 143, 144, 148 & 153 are hornfels. Nos 133, 134, 139, 141, 142, 146, 147, 149, 151, 152 & 154 are quartz. Nos 145 & 150 are CCS.





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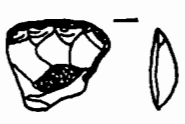
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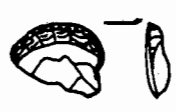
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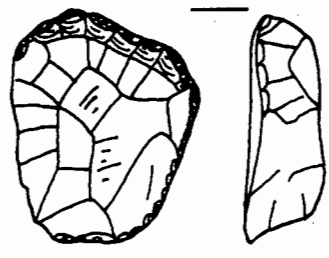
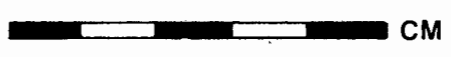
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Table 3:12 Umhlatuzana Rock Shelter: raw material composition of the scraper, adze, natural backed knives and miscellaneous retouched pieces (MRP) formal tool classes in Layers 8-4.

Layer	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
Scrapers									
4	1	20,00	1	20,00	-	-	3	60,00	5
5	-	-	-	-	-	-	1	100,00	1
6	1	50,00	-	-	-	-	1	50,00	2
7	-	-	4	100,00	-	-	-	-	4
8	-	-	2	66,67	1	33,33	-	-	3
Adzes									
4	-	-	4	100,00	-	-	-	-	4
5	-	-	1	100,00	-	-	-	-	1
6	-	-	1	100,00	-	-	-	-	1
7	-	-	-	-	-	-	-	-	0
8	-	-	1	100,00	-	-	-	-	1
Natural Backed Knives									
4	-	-	3	100,00	-	-	-	-	3
5	-	-	2	100,00	-	-	-	-	2
6	-	-	1	100,00	-	-	-	-	1
7	-	-	1	100,00	-	-	-	-	1
8	-	-	3	100,00	-	-	-	-	3
MRP's									
4	1	14,29	6	85,71	-	-	-	-	7
5	-	-	3	100,00	-	-	-	-	3
6	-	-	7	100,00	-	-	-	-	7
7	1	11,11	7	77,78	1	11,11	-	-	9
8	-	-	12	100,00	-	-	-	-	12

## The Holocene artefacts

The inventory of lithic artefacts from Layers 3-1 is presented in Table 3:13. Waste artefacts account for more than 99.0% of each assemblage, while utilised and retouched artefacts together account for less than 1.0% of the total assemblage. Some 98.0% of the waste assemblages comprises chips, chunks and flakes. There are fewer bladelet cores in the Holocene levels than in the Late Pleistocene levels. The percentage frequency of bladelet cores decreases from 1.0% of the waste category in Layer 4 to 0.2% in Layers 3-1. This is accompanied by a significant decline in the percentage frequency of bladelets in these layers, from 1.1% of the waste category in Layer 4 to 0.04% in Layers 3-1. Blades are present in Layer 3 but absent in Layers 1 and 2. Two grindstone fragments were recovered from Layer 2.

Utilised artefacts comprise less than 1.0% of the total Holocene assemblage, but are more common than the formally retouched artefacts. Utilised flakes form 85.0% of the utilised artefact category, outils écaillés 12.0% and grindstones 3.0%. Scrapers are by far the most numerous of the formal retouched artefacts, comprising 62.0% of the total Layers 3-1 formal tools, followed by MRP's (17.0%), adzes (15.0%), segments (4.0%) and (one) groundstone (2.0%).

## The Holocene: raw materials

The raw material composition of the different artefact categories in Layers 3-1 is presented in Table 3:14. Quartz is overwhelmingly the most common raw material comprising 73.0%

Table 3:13 Umhlatuzana Rock Shelter: stone artefact frequencies in Layers 4-1.

	LAYER 1			LAYER 2			LAYER 3			LAYER 4		
	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total	n	% Category	% Layer Total
<b>Waste</b>												
Chips chunks and Flakes	2 590	99,35		11 467	98,85		4 493	97,63		21 580	97,70	
Irregular cores	10	0,38		52	0,45		7	0,15		51	0,23	
Single platform cores	5	0,19		48	0,41		38	0,83		109	0,49	
Bipolar cores	1	0,04		14	0,12		5	0,11		30	0,14	
Bladelets	1	0,04		17	0,15		51	1,11		295	1,34	
Blades	-	-		-	-		8	0,17		17	0,08	
Grindstone fragments	-	-		2	0,01		-	-		6	0,03	
<b>TOTAL</b>	2 607		99,16	11 600		99,44	4 602		99,52	22 088		99,47
<b>Utilised</b>												
Outils écaillés	2	10,53		7	12,96		1	7,69		28	29,17	
Utilised Flakes	17	89,47		44	81,48		12	92,31		67	69,90	
Grindstones	-	-		3	5,56		-	-		1	1,04	
<b>TOTAL</b>	19		0,72	54		0,46	13		0,28	96		0,43
<b>Formal</b>												
Scrapers	2	66,67		26	63,41		5	55,55		5	22,70	
Segments	-	-		2	4,88		-	-		1	4,55	
Atzes	-	-		5	12,20		3	33,33		4	18,18	
Miscellaneous retouched pieces	1	33,33		7	17,07		1	11,11		7	31,82	
Groundstones	-	-		1	2,44		-	-		1	4,55	
Natural backed knives	-	-		-	-		-	-		3	13,64	
Unifacial points	-	-		-	-		-	-		1	4,55	
<b>TOTAL</b>	3		0,11	41		0,35	9		0,19	22		0,10
<b>LAYER TOTAL</b>	2 629			11 665			4 624			22 206		

of the Holocene artefacts, followed by hornfels (24.0%), quartzite (2.0%) and CCS (1.0%). The percentage frequency of quartz increases from 70.0% to 79.0% in Layers 3-1 and the percentage frequency of hornfels decreases from 26.0% to 18.0%. The percentage frequency of CCS declines from 2.3% to 0.8% in Layers 3-1.

Among the utilised artefacts in Layers 3-1, hornfels comprises 41.0%, quartz 27.0%, quartzite 23.0% and CCS 9.0% (Table 3:14). Some 47.0% of the utilised flakes are made from hornfels, 23.0% from quartzite, 21.0% from quartz and 10.0% from CCS (Table 3:3). The percentage frequency of utilised flakes made from hornfels declines from 83.0% in Layer 3 to 35.0% in Layer 1. Quartz and quartzite utilised flakes are absent in Layer 3. Some 80.0% of the outils à caillès in Layers 3-1 are made from quartz, 10.0% from hornfels and 10.0% from CCS (Table 3:9). Three hornfels grindstones were recovered from Layer 2.

Quartz comprises 62.0% of the formal tools in Layers 3-1, hornfels 28.0%, CCS 6.0% and quartzite 4.0% (Table 3:14). In Layer 2, where there are 41 formal tools, quartz comprises 66.0%, hornfels 24.0% and quartzite and CCS 5.0% each. The formal tool component in Layers 3 and 1 is very small (Table 3:13).

Some 63.0% of the scrapers are made from quartz, 24.0% from hornfels, 10.0% from CCS and 3.0% from quartzite. Seven (88.0%) of the eight adzes are made from hornfels and one (12.0%) in Layer 2 is made from CCS. Two quartz segments came



from Layer 2. Seven (77.3%) of the Layers 3-1 MRP's are made from hornfels and two (22.2%) (one each from Layers 2 & 1), are made from quartz.

#### METRICAL RESULTS

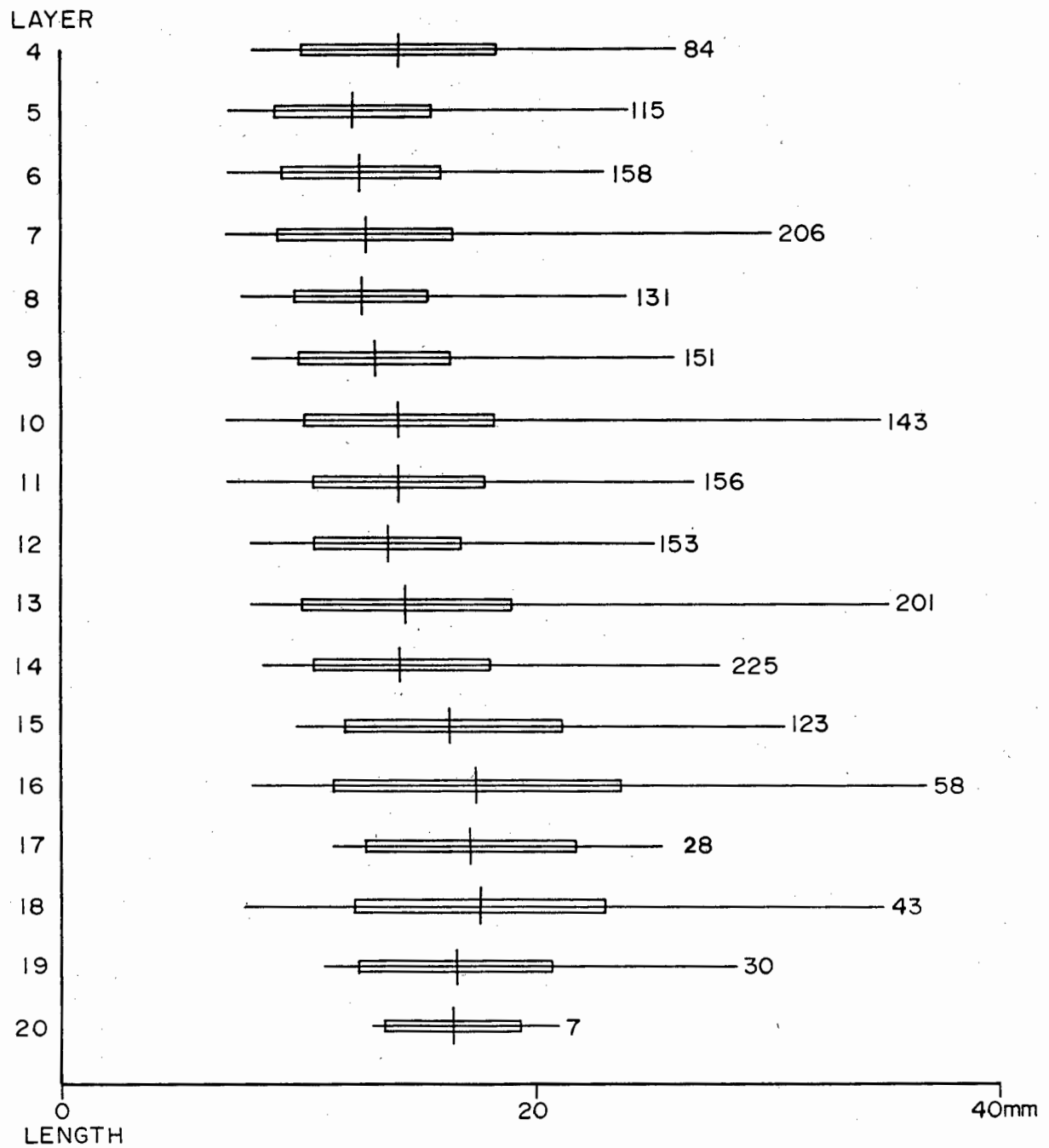
The lengths of single platform cores and bipolar cores, and the lengths and widths of quartz, hornfels and CCS bladelets have been measured in order to investigate trends and/or abrupt changes in artefact sizes through time. Quartz and hornfels segment lengths have also been measured, although the overall sample sizes were small. Scrapers were not measured as the sample size was considered too small.

Only quartz bladelet cores were measured. The sample sizes of hornfels bladelet cores and CCS bladelet cores were considered too small and, even when combined, comprised less than 1.0% of the total (bladelet) core assemblage. The length measurements for quartz single platform and bipolar cores are illustrated in Figs. 3:9 & 3:10 respectively. Tables 25 and 26 in the Appendix present the mean and standard deviation statistics of length measurements for quartz single platform and bipolar cores. With respect to the Dice-Leraas diagrams, the horizontal line indicates the range of measurements, vertical line the mean, bar the standard deviation, and number the sample size.

#### Single platform cores

Between Layers 21-19 (the late MSA), the mean length of single platform cores decreases from 19.8mm in Layer 21 to 16.7mm in Layer 19. Between Layers 18-14, which has been described as

Fig. 3:9 Umhlatuzana Rock Shelter: Dice-Leraas diagram of single platform cores length dimensions.



the transitional phase between the MSA and the LSA, the mean length range varies between 17.6mm and 17.4mm in Layers 18-16, and is 14.5mm in Layer 14 (Fig. 3:9).

Between Layers 13-9 (the early Robberg), the mean length of single platform bladelet cores varies between 14.6mm in Layer 13 and 13.3mm in Layer 9. Between Layers 8-5 (the late Robberg), the quartz single platform cores mean lengths are consistent, varying between 12.8mm to 12.3mm. In Layer 4, the mean length increases to 14.3mm (Fig. 3:9).

It is thus clear that from the MSA to the LSA, the mean size of single platform cores become progressively smaller, but in the terminal Robberg (Layer 4) the mean size increases.

#### Bipolar cores

Fewer bipolar cores than single platform cores were recovered from Umhlatuzana Rock Shelter. Bipolar cores are generally smaller than single platform cores. Sometimes they have been "so reduced by flaking" that they are classed as outils écaillés (Deacon, J. 1984a:227). Experimental work by Barham (1987) has shown that outils écaillés are the product of bipolar flaking.

Between Layers 21-16, the sample size of bipolar cores is less than 10 per layer and is therefore not a very reliable indicator of change through time. However, the mean length measurement results tentatively suggest a decrease in their lengths through time. Between Layers 18-14 (the MSA/LSA transitional layers) the mean length of bipolar cores

decreases, from 18.5mm in Layer 18 to 13.4mm in Layer 14. Between Layers 13-9 (the early Robberg), the mean length varies between 11.9mm and 13mm, with Layer 11 slightly anomalous at 14.4mm. Between Layers 8-5 (the late Robberg) bipolar cores mean length measurements are consistently smaller than the underlying early Robberg layers, the mean length varying between 12.6mm in Layer 8 and 11mm in Layer 5. In Layer 4 (the terminal Robberg) the mean length increases to 13.6mm and this corresponds with a similar increase among single platform cores in this layer (Fig. 3:10).

#### Bladelets

The results of the length and width measurements on quartz, hornfels and CCS bladelets are illustrated in Figs. 3:11-3:13. Tables 27-29 in the Appendix present the mean and standard deviation statistics on length measurements for quartz, hornfels and CCS bladelets. Only six quartzite bladelets were recovered and their measurements have not been included.

We shall first consider the length measurements for raw material categories of bladelets and then the width measurements.

#### Quartz bladelets: length

The mean length of quartz bladelets in Layer 20 is 15.9mm and 14.1mm in Layer 19, but the sample size is small. Between Layers 18-14 (the MSA/LSA transitional layers), the mean length of quartz bladelets varies between 16.7mm and 13.3mm.

Between Layers 13-9, (the early Robberg) the mean length of quartz bladelets varies between 14.2mm and 12.1mm. Between Layers 8-4 (the late Robberg) the mean length of bladelets varies between 12.8mm and 11mm. Thus, there is a clear size distinction between the mean length of quartz bladelets in the late and early Robberg. In Layer 4 (the terminal Robberg), the mean length of quartz bladelets increases to 12.8mm (Fig. 3:11).

#### Hornfels bladelets: length

A general decrease in the mean length of hornfels bladelets is evident (Fig. 3:12). The measurement contrasts are not as clear as those evidenced in quartz bladelets, and it is possible that the small sample size may have contributed to the inconsistency. Between Layers 21-14 (the late MSA and transitional MSA/LSA), the mean length of hornfels bladelets varies between 17.8mm and 15.2mm respectively.

The mean lengths of hornfels bladelets are generally smaller between Layers 13-5 than between Layers 21-14, varying between 12.2mm and 16.9mm. In the late Robberg (Layers 8-4), hornfels bladelets become smaller and vary between 12.6mm and 14.5mm (Fig. 3:12).

Overall, the mean length of hornfels bladelets between Layers 21-4 is greater than that for quartz bladelets in the same layers. This difference may be a reflection of the size of the hornfels cores and the consequent striking of longer flakes, as well as of the superior flaking quality of this raw material. What is clear is that the mean lengths of quartz and

Fig. 3:12 Umhlatuzana Rock Shelter: Dice-Leraas diagram of hornfels bladelet length dimensions.

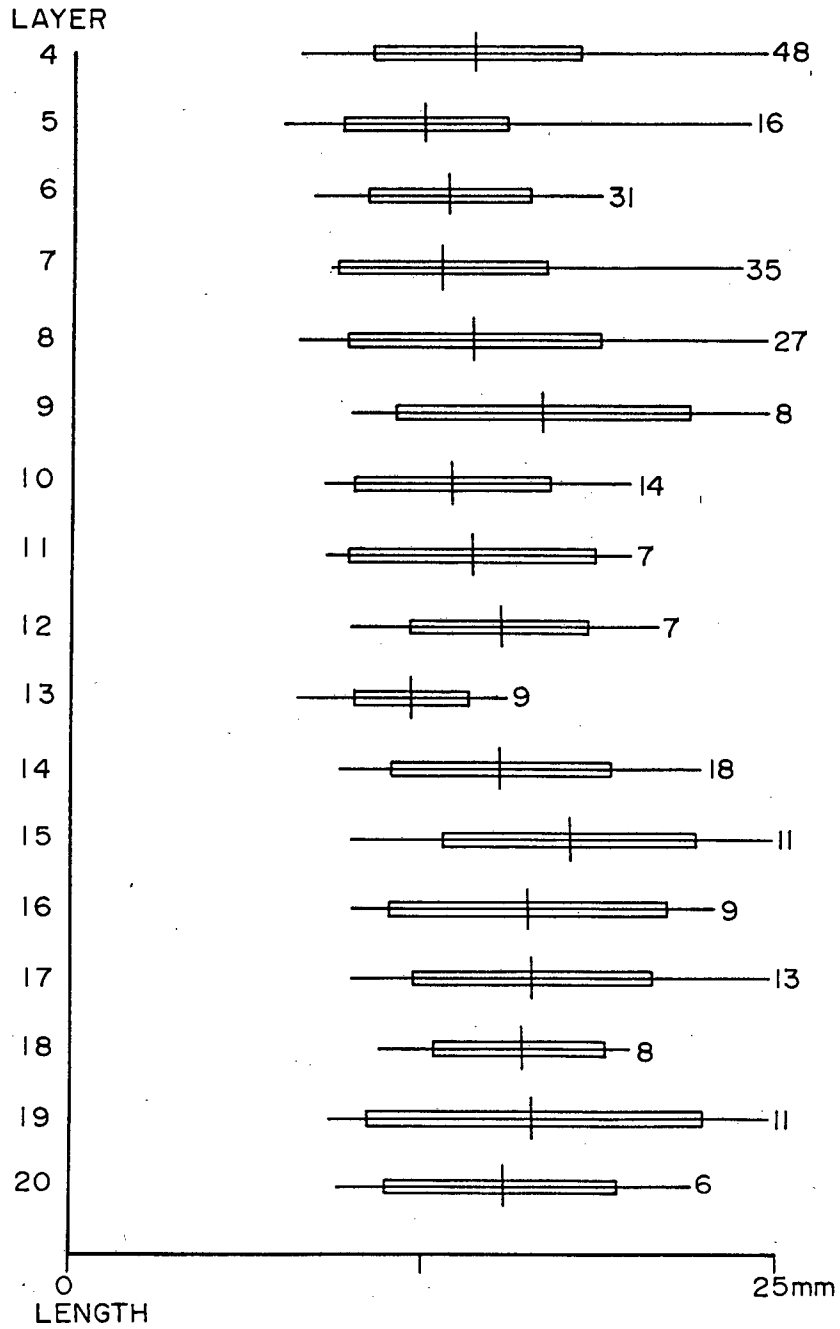
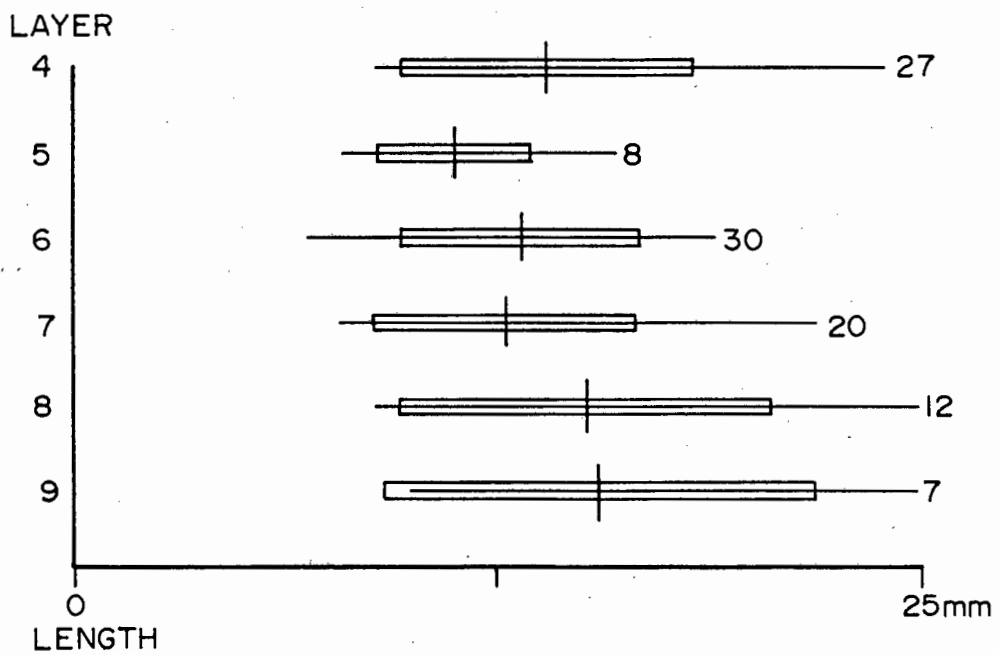


Fig. 3:13 Umhlatuzana Rock Shelter: Dice-Leraas diagram of CCS bladelet length dimensions.



hornfels bladelets in the late MSA and MSA/LSA transitional layers are greater than the corresponding mean lengths in the Robberg layers. Similarly, the mean length of quartz and hornfels bladelets is greater in the early Robberg than in the late Robberg. Thus a consistent reduction in the mean length of quartz and hornfels bladelets is evident from the late MSA to the late Robberg.

#### CCS bladelets: length

CCS bladelets occur in Layers 14-4, but only in Layers 9-4 are the sample sizes large enough for meaningful metrical analysis (Fig. 3:13). The mean lengths of CCS bladelets generally decrease between Layers 9-5, from 15.6mm to 11.4mm. Thereafter, the mean length of CCS bladelets in the terminal Robberg (Layer 4) increases to 14mm.

The width measurements on quartz, hornfels and CCS bladelets are illustrated in Figs. 3:14-3:16. Tables 30-32 in the Appendix present the mean and standard deviation statistics on width measurements for quartz, hornfels and CCS bladelets.

#### Quartz bladelets: width

There is a direct correlation between the decrease in the mean length of quartz bladelets and the decrease in the mean width of quartz bladelets. The mean width is 6.4mm in Layer 21 but thereafter, between Layers 19-10 (the late MSA, MSA/LSA transition and the early Robberg), the mean width varies between 5.9mm and 5.2mm. Between Layers 9 and 4 (the early and late Robberg) the mean width varies between 4.9mm and 4.5mm

(Fig. 3:14). There is a clear and consistent decrease in the width measurements of quartz bladelets.

#### Hornfels bladelets: width

In the late MSA layers (20-19) the mean widths of hornfels bladelets are 5.4mm and 6.0mm respectively. In the MSA/LSA layers (18-14) the mean width varies between 5.7mm and 6.9mm and between Layers 13-9 (the early Robberg), the mean width varies between 5mm and 6.3mm. Between Layers 8-4 (the late Robberg) the mean width is from 5.6mm to 4.4mm. It thus appears that from the late MSA to at least the beginning of the early Robberg, the mean widths of hornfels bladelets are quite similar. However, there is an indication of a general decrease in the mean width of hornfels bladelets in the late Robberg (Fig. 3:15).

#### CCS bladelets: width

Figure 3:16 illustrates the mean and standard deviations of width measurements of CCS bladelets between Layers 14-9, where the mean width varies between 5.9mm and 4.2mm.

#### Overview

It is clear, particularly from Figs. 3:9 and 3:11, that there is a direct correlation through time between a decrease in the mean length of quartz single platform cores and a decrease in the mean length of quartz bladelets, and to a lesser extent hornfels bladelets (Fig. 3:12). The mean width of quartz bladelets also reflects this trend (Fig. 3:14). Furthermore, it is significant that there appears to be a correspondence

Fig. 3:14 Umhlatuzana Rock Shelter: Dice-Leraas diagram of quartz bladelet width dimensions.

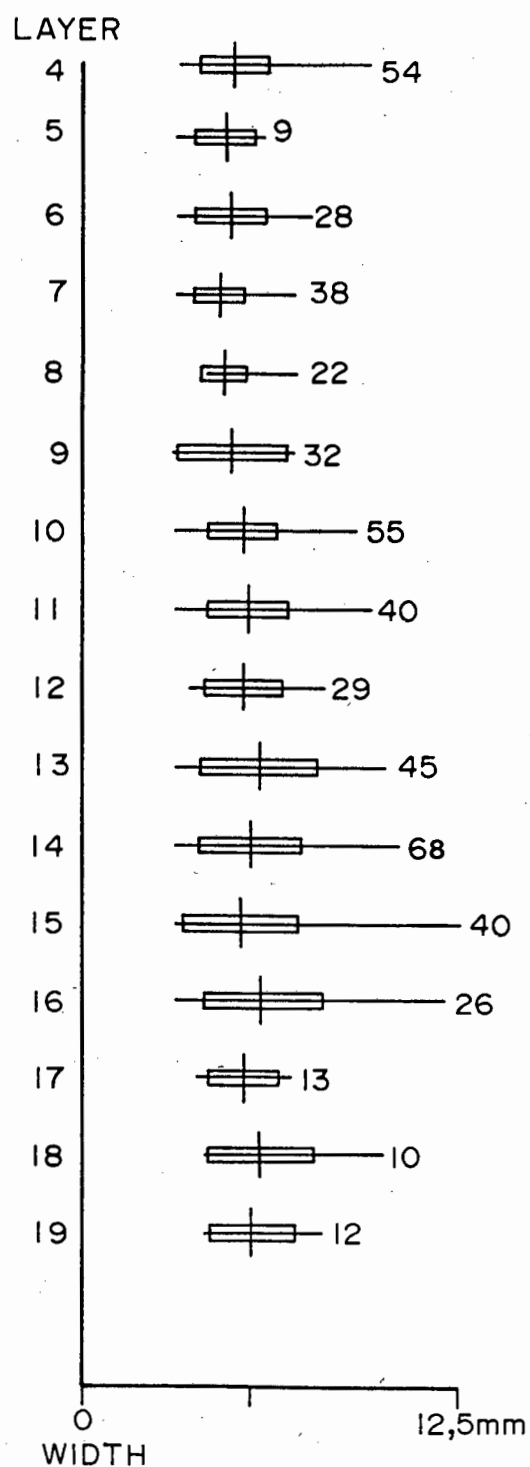


Fig. 3:15 Umhlatuzana Rock Shelter: Dice-Leraas diagram of hornfels width bladelet dimensions.

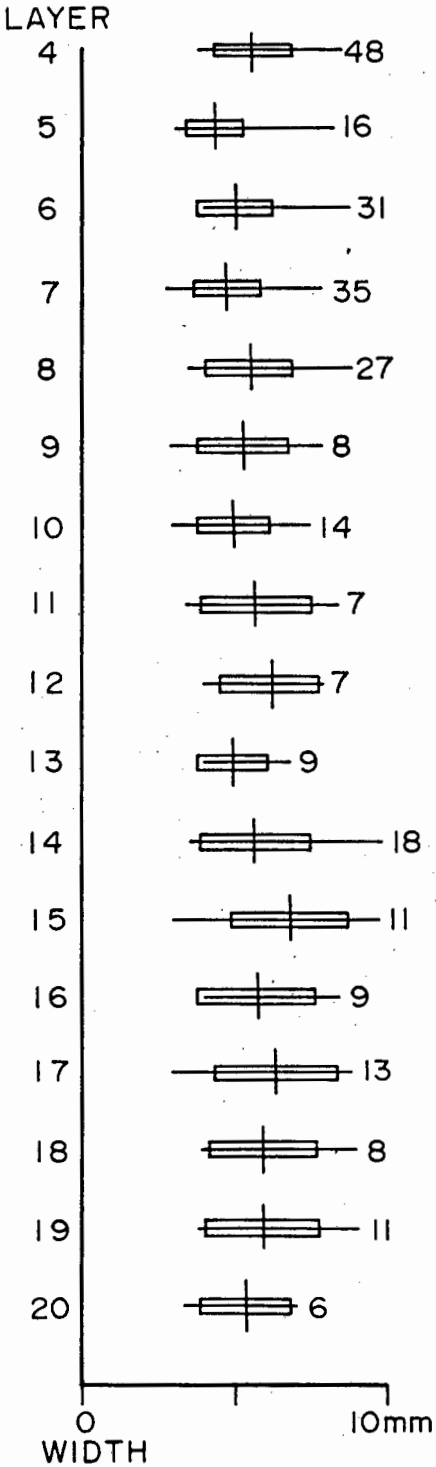
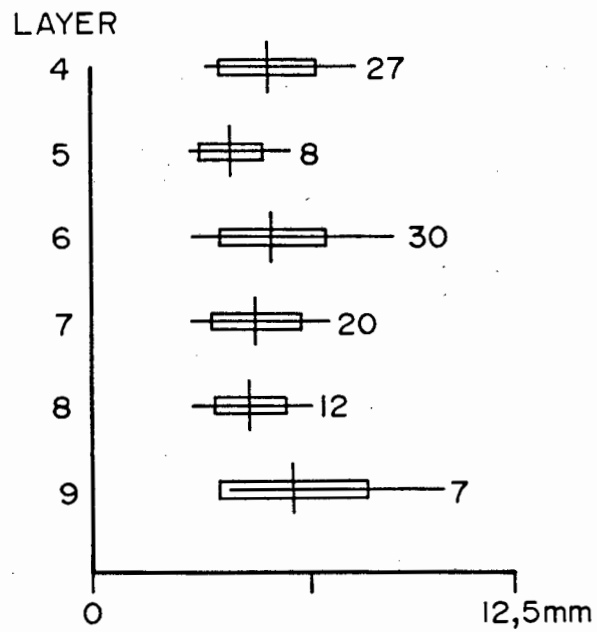


Fig. 3:16 Umhlatuzana Rock Shelter: Dice-Leraas diagram of CCS width bladelet dimensions.



between the results obtained from the metrical analysis of bladelet cores and quartz and hornfels bladelets, and the four phases that have been identified in the stone artefact sequence on the basis of artefacts types and frequencies, i.e.: the late MSA, MSA/LSA transition, early Robberg and late Robberg.

It is important to note that essentially similar results were obtained from the metrical analysis of unmodified bladelets from Sehonghong in eastern Lesotho (Carter et al. 1988:171-72).

To test the model of gradual change through time, the mean length measurements from quartz single platform and bipolar cores, and quartz and hornfels bladelets, were sub-divided into four groups (or 'periods') termed 'early' (Layers 21-17) vs 'middle' (Layers 16-10), 'middle' vs 'late' (Layers 9-5), and 'late' vs Layer 4. The arbitrary sub-divisions at Layers 16, 9, and 4 were chosen because, on inspection, those layers appeared to mark three separation points which might correspond to maximal differences in average sizes for these artefacts. Core and bladelet sizes would appear to differ through the 'periods' thus formed. If that were so, it might be possible to illustrate two points: firstly, the plausibility of the current hypothesis of distinct cultural episodes in the Upper and Late Pleistocene archaeological record (Deacon, H.J. 1976; Deacon, J. 1978, 1984a, b); secondly, the possibility of alternative hypotheses of tool development given this extraordinary continuous record at Umhlatuzana Rock Shelter.

The mean and standard deviation for each group of measurements was then calculated, and t-tests, to determine the statistical significance of differences between means (Miller 1975), were performed (Table 3:15).

Grouping Layers 21-4 into four 'periods' (rather than seeing them as a continuous sequence) and calculating the mean and standard deviation for each group, we can show that between early and middle, middle and late, and late and Layer 4, there are differences which achieve statistical significance (Table 3:15). If, however, we compare Layers 21-4 successively layer by layer, we obtain no statistical evidence appearing consistently across tool categories for differences between succeeding layers, except between Layers 4 and 5 in each category (Appendix, Tables 25-28). At that point there is a statistically significant increase in size. We may argue that in calculating and then comparing the means and standard deviations for each group of layers, some evidence suggesting 'punctuated change' (Deacon, H.J. 1976; Deacon, J. 1978, 1984a, b) does indeed arise, but if we examine the statistics layer by layer, gradualism seems more plausible. In other words, the act of grouping or using the punctuated change hypothesis may tend to introduce artificially more marked differences between groups than need necessarily be the case. If that is so, the hypothesis is in some sense self-validating, although misleading.

In the case of the quartz single platform and bipolar cores and quartz bladelets (but not to hornfels bladelets), the model for gradualism is apparently corroborated by the absence

Table 3:15 Umhlatuzana Rock Shelter: t-statistics for differences between means. A= Layer 4; B= Layers 9-5; C= Layers 16-10; D= Layers 21-17.

	Quartz single platform cores	Quartz bipolar cores	Quartz bladelets	Hornfels bladelets	
A vs B	3.20	3.87	2.74	1.13	A vs B
B vs C	-11.98	-3.82	-8.91	-2.2	B vs C
C vs D	-5.43	-2.70	-2.03	-1.28	C vs D

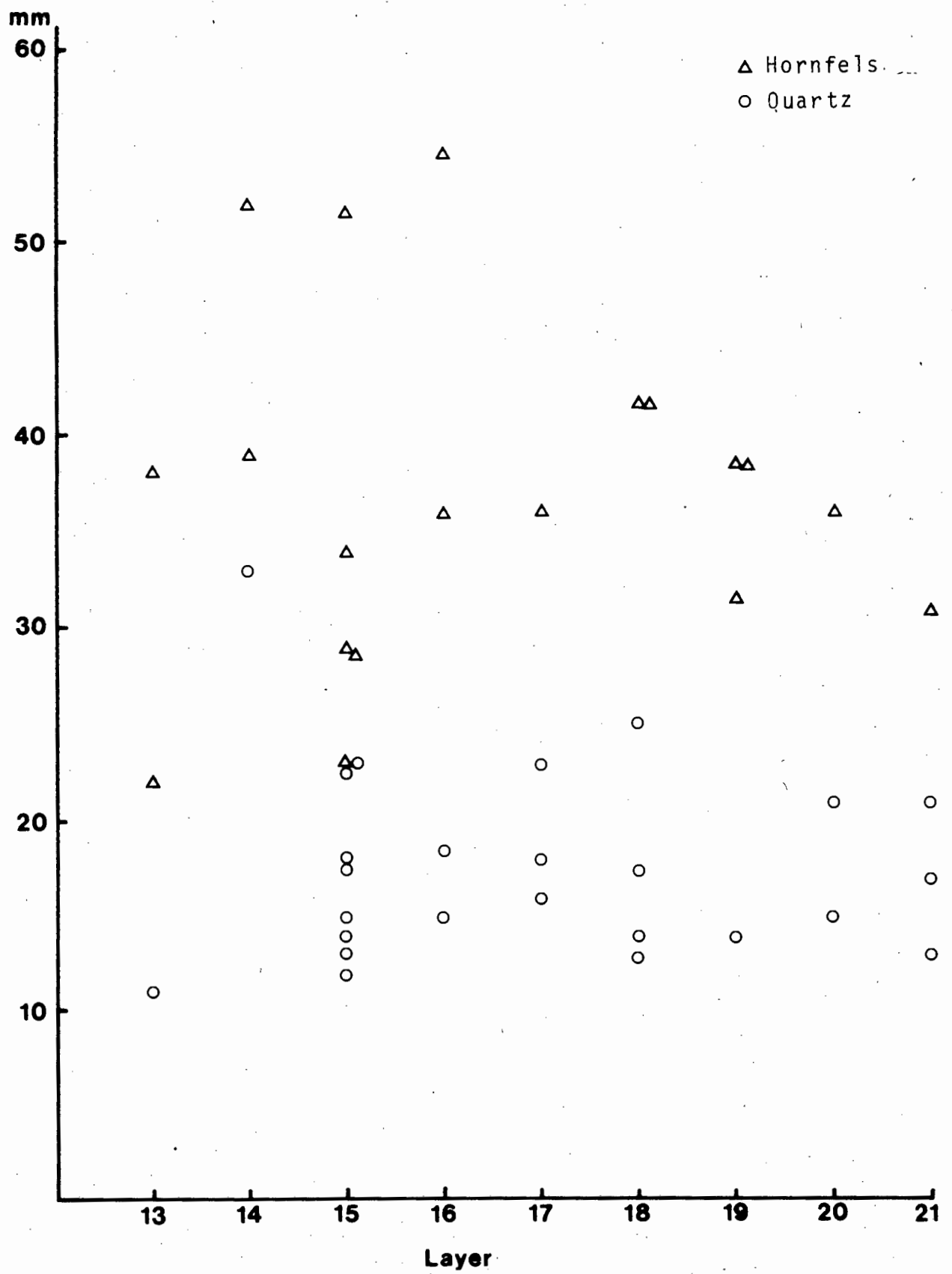
of significant t-statistics for differences in consecutive layers (Table 3:15).

The competing model for discontinuous change (i.e. plateaux separated by periods of rapid change) is not unreasonable, but probably a reflection in earlier studies of either insufficient data or data from separated time segments. The data from Umhlatuzana Rock Shelter as a continuous record therefore allows one to open the question of continuous change through time, where segmented data previously may have misled us.

### Segments

Large and small segments are significant features of the Umhlatuzana Rock Shelter stone artefact assemblage, particularly in Layers 28-22 (Kaplan 1989b), but the Layers 28-22 metrical results are not included here. For the purpose of this thesis the majority of segments were recovered from the late MSA and MSA/LSA transitional layers, but smaller samples were also found in the Robberg and Holocene layers. The lengths of quartz and hornfels segments have been metrically analysed (Fig. 3:17), and the mean and standard deviation statistics on quartz and hornfels segments length measurements are presented in Tables 33 and 34 respectively in the Appendix. It is clear that hornfels segments are considerably larger than quartz segments, with the mean length varying between 30mm and 47mm and that of quartz varying between 16.8mm and 19.0mm (Appendix, Tables 33 & 34).

Fig. 3:17 Umhlatuzana Rock Shelter: distribution of segments from Layers 21-13.



## CHAPTER FOUR

### THE NON-LITHIC ARTEFACTS AND OCHRE

The non-lithic artefacts from Umhlatuzana Rock Shelter include worked bone, beads and pottery. In addition, the ochre finds are described.

#### Worked bone

Worked bone (Fig: 4:1) was recovered from Layers 8-1 (Table 4:1). Points are the most common diagnostic tools and occur between Layers 5-2, followed by awls which occur in Layers 4 and 2. Bone points probably served as projectile points. A few bone points have been found in secure MSA and Late Pleistocene LSA contexts (Deacon, J. 1984a), but they first appear in the archaeological record in larger numbers c. 10 000 BP. The very small sample of bone points recovered from Umhlatuzana Rock Shelter suggests that stone projectiles may have been important throughout the sequence. The fish hook from Layer 2 is similar to those which have been found in late Holocene sites in the Thukela Basin (Maggs & Ward 1980; Mazel 1986b), southern Natal (Cable *et al.* 1984), north-eastern Cape (Opperman 1987), and at Belleview in Lesotho (Carter & Vogel 1974). Nine miscellaneous ground bone pieces were found, as well as one large bone fragment with heavy edge damage. Only two of the bone points found were complete: one mini-point from Layer 5 is 13mm long, and one, from Layer 2, is 92mm long. Mini bone points have also been found at Mgede Shelter and Nkupe Shelter in the Thukela Basin (Mazel 1986b, Mazel

Fig. 4:1 Umhlatuzana Rock Shelter: worked bone. Points. Layers 2: 1 & 3; Layer 4: 2 & 5. Mini-points. Layer 3: 4; Layer 5: 6. Awls. Layer 4: 7-9. Spatula. Layer 4: 10. Fishhook. Layer 2: 11. Engraved bone. Layer 3: 12. Pendant. Layer 3: 13.

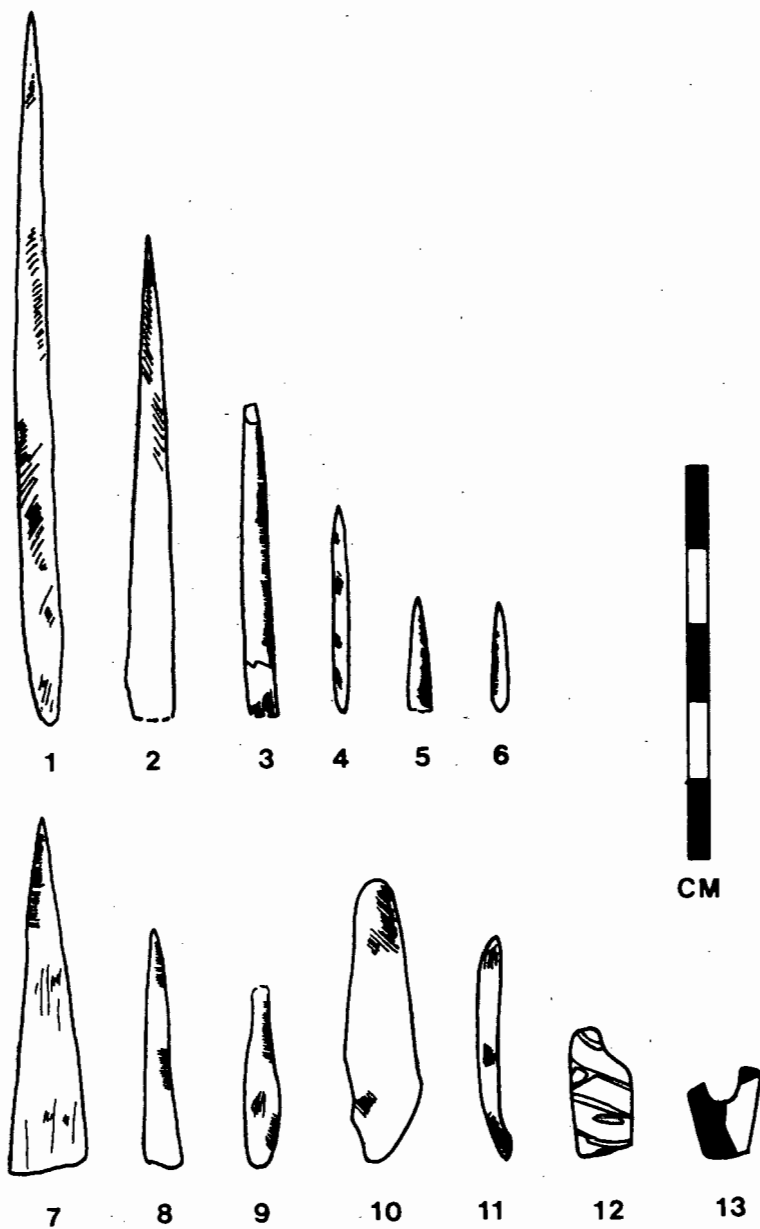


Table 4:1 Umhlatuzana Rock Shelter: worked bone.

	Layer							
	1	2	3	4	5	6	7	8
Points	-	6	1	3	1	-	-	-
Awls	-	1	-	2	-	-	-	-
Fishhook	-	1	-	-	-	-	-	-
Bead	-	-	1	-	-	-	-	-
Spatula	-	-	-	1	-	-	-	-
Linkshaft	-	1	-	-	-	-	-	-
Pendant	-	1	-	-	-	-	-	-
Miscellaneous								
ground bone	1	3	1	1	1	-	1	1
Total	1	13	3	7	2	-	1	1

1988b). Four bone flakes were found, one each in Layers 15, 5, 4 and 1.

Beads: ostrich eggshell, land and marine shell

Manufactured beads have always tended to be interpreted as forms of decoration. Ostrich eggshell beads are most common in Holocene LSA deposits. Elsewhere in southern Africa, a few examples appear in Late Pleistocene LSA and MSA contexts (Deacon, J. 1984a; Volman 1984). Ostrich eggshell beads were used for bangles, necklaces, anklets and various facial and head ornaments, and were also sewn onto bags and clothing. Beads have recently been interpreted as evidence for exchange networks, aggregation and dispersal, social change, and as a means of identifying social groups (Maggs 1980; Wadley 1986a; Jacobson 1987a, b; Mazel 1988a; Yates 1988).

Disc and marine shell beads were recovered from Layers 6-1 (Table 4:2). All the beads were cleaned in an ultra-sonic cleaner and were identified with the aid of an optical microscope, using a comparative modern sample of unmodified shell fragments identified by Ward and Maggs (1988).

There is a dramatic increase in the frequency of all types of beads from Layers 4-2, followed by an abrupt drop in Layer 1 (Table 4:2). A similar pattern occurred with bone points. The majority of ostrich eggshell beads (28) came from between Layers 4-2. No ostrich egg-shell beads were found in Layer 1, and only two were found in each of Layers 5 and 6. No ostrich eggshell fragments and no unfinished beads were recovered from the excavations. Ostriches were not historically recorded in

the Natal coastal region, and their habitat varies from lightly wooded savanna to open grassland and semi-desert (Clancey 1964). Whole ostrich eggs or beads must therefore have been brought into the region from further inland.

Ostrich eggshell beads are fairly common in Late Pleistocene deposits and a few have been found in deposits older than 20 000 BP (Deacon, J. 1984a). Four of the Umhlatuzana Rock Shelter ostrich eggshell beads came from the Late Pleistocene deposits. Two came from Layer 5 which was dated to 13 400 BP and two came from Layer 6 (Table 4:2).

Beads from the shell of the large landsnails, Achatinidae, were confined to Layers 1 and 2. One Metachatina kraussi and two Achatina immaculata beads came from Layer 1, and three Metachatina kraussi and four Achatina immaculata beads came from Layer 2 (Table 4:2).

Three different types of marine shell beads were recovered. The presence of the marine shell beads in the LSA deposits is significant, as they are more commonly found on farming sites. Nassarius kraussianus beads came from Layer 4 (n=18), Layer 3 (n=7) and Layer 2 (n=9). Tricola capensis beads came from Layer 5 (n=1) and Layer 4 (n=3). One Bullia dilata bead came from Layer 4 (Table 4:2).

The ostrich eggshell at Umhlatuzana Rock Shelter has come from some distance away, while the Achatinidae shell could have been collected locally. The marine shell came from the coast some 40 kilometers to the east. It is significant that neither ostrich eggshell beads nor marine shell beads were found in

Layer 1, while only beads from landsnail shell were found. A similar pattern occurred at Shongweni South Cave (Davies 1975).

### Pottery

Pottery was recovered from Layers 3-1. Two hundred and eleven pieces were recovered from Layer 1, 40 pieces from Layer 2, and one piece from Layer 3. The single sherd from Layer 3 is more than likely intrusive, as this layer was radiocarbon dated to 2840 BP. The Umhlatuzana Rock Shelter pottery was very fragmented with only two large sherds present. All the sherds were grit tempered. Twenty rim sherds and 14 decorated sherds were recovered. The majority of decorated sherds were only slightly decorated. Most of the decorated sherds (n=17) came from Layer 1 and an equal number of rim sherds (10 each) came from Layers 2 and 1. Forty-four burnished body sherds were found and all came from Layer 1. Twenty-five were black burnished, 14 red burnished and five were plain (clear) burnished.

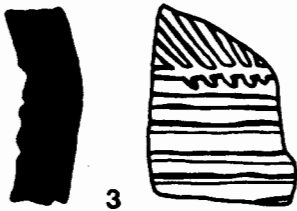
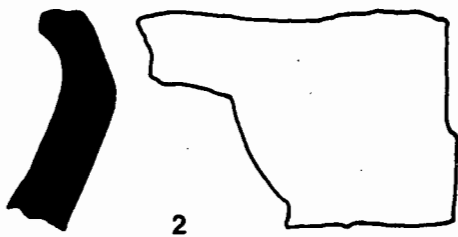
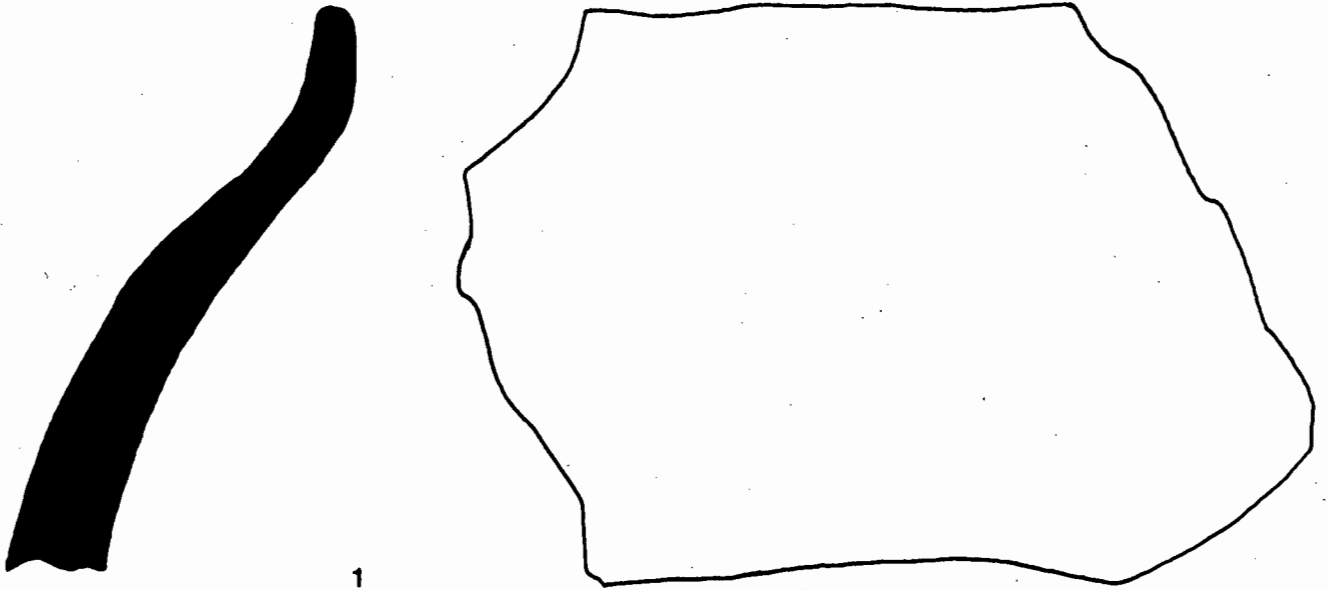
According to Dr Tim Maggs (pers. comm.), both Early Iron Age (EIA) and Late Iron Age (LIA) wares are present at Umhlatuzana Rock Shelter. The majority of sherds from Layer 1 are LIA, and those from Layer 2 are EIA. Two sherds which might belong to the EIA, came from Layer 1 (Maggs pers. comm.). One small, thin-walled and decorated piece from TBS II in Layer 1 resembles a very early expression of the LIA, and is similar to pottery found at Mpambanyoni (Robey 1980) and Blackburn (Davies 1971), dated around AD 1050. One rim sherd from GBS II

(Layer 2) was not typical EIA and is probably LIA. A few vessel types have been identified. Two globular pots, one small hemispherical bowl and one bag-shaped pot were recovered from Layer 1. One globular pot or deep hemispherical bowl and one large globular pot came from Layer 2 (Fig: 4:2).

Seven decorated body sherds came from Layer 1. Two sherds have a single horizontal line below the lip. One thin walled sherd from TBS II was too small to describe the nature of the decoration. One rim sherd in TBS II, with a short neck and a single horizontal line and lip curled to the exterior, fits onto a larger rim in GBS (Fig. 4:2), and was possibly from a bag-shaped pot. Two small body sherds from GBS have single horizontal line decoration and according to Maggs (pers. comm.) may be Msuluzi type pottery, dating to the 6th/7th century AD (Maggs 1980).

Seven decorated body sherds were found in Layer 2. One small body sherd had rectangular (pendant-shaped) decoration on the shoulder, attached to the body-neck junction. The shape of the body-neck junction suggested that this sherd was probably 4th-8th century AD (Maggs pers. comm.). One body sherd from GBS II was too small to describe as were two slightly decorated body sherds from GBS III. However, these sherds are probably 4th-6th century AD (Maggs pers. comm.). Four decorated body sherds from MBS III and BS are too small to describe, but are probably 6th/7th century AD (Maggs pers. comm.).

Fig. 4:2 Umhlatuzana Rock Shelter: pottery. No. 1, Layer 2; No. 2, Layer 1; No. 3, Layer 2; No. 4, Layer 2.



## Ochre

Ground and unmodified lumps of ochre occur in almost all LSA sites in southern Africa. Modified ochre is also found in secure MSA contexts, for example at Apollo 11 (Wendt 1972, 1976), Border Cave (Beaumont 1978), Montagu Cave (Keller 1973), Klasies River Mouth (Singer & Wymer 1982), Diepkloof (Yates pers. comm.) and Rose Cottage Cave (Wadley pers. comm.). There is also evidence that MSA people were mining for specular hematite as early as 48 000 years ago (Beaumont 1973). Ochre was crushed and the powder served as a source of pigment for painting, or as means of body decoration (for ritual purposes).

There is no doubt that ochre was systematically collected by LSA and MSA people at Umhlatuzana Rock Shelter as over 2300 pieces were recovered (Table 4:3). This does not include the ochre from the MSA 28-22 Layers, where over 400 pieces were recovered, including 35 pieces of ground ochre (Kaplan 1989b). An ochre-stained cobble was recovered from Layer 7. Thirty-five pieces of ground ochre and eight ochre pencils were recovered between Layers 23-1 (Table 4:3). Six ground pieces and one pencil came from the Holocene deposits and 21 pieces of ground ochre and seven pencils came from the Late Pleistocene deposits.

Five pieces of ground ochre and three ochre pencils came from the late Robberg and four pieces of ground ochre and one pencil came from the early Robberg deposits. Eleven pieces of ground ochre and three ochre pencils came from between Layers

Table 4:3 Umhlatuzana Rock Shelter: ochre.

Layer	Unmodified ochre	Ground	Pencils	Total
	n	n	n	n
1	16	-	-	16
2	96	2	1	99
3	46	-	-	46
4	91	4	-	95
5	55	1	-	56
6	117	-	1	118
7	117	1	1	119
8	164	3	1	168
9	143	2	-	145
10	56	-	-	56
11	146	-	1	147
12	76	1	-	77
13	42	1	-	43
14	145	7	-	152
15	96	2	1	99
16	175	2	1	178
17	186	-	-	186
18	236	-	1	237
19	134	-	-	134
20	113	-	-	113
21	76	1	-	77
22	48	4	-	52
23	104	4	-	108

18-14, which are considered to be transitional between the MSA and LSA. Nine pieces of ground ochre came from the MSA layers; one piece of ground ochre came from Layer 21 dated to 37 100 BP, four came from Layer 22, and four pieces came from Layer 23 which is dated to 45 200 BP (Table 4:3).

The non-lithic artefacts and ochre finds from Umhlatuzana Rock Shelter should not be seen in isolation from the rest of the archaeological record, which includes stone tools, charcoal, animal and plant remains. Beads especially, have potential for analysis from a sociological perspective and are particularly important. Ochre was found in the MSA levels at Umhlatuzana Rock Shelter (Kaplan 1989b) and at other sites of a comparable age. The presence of farming community pottery at Umhlatuzana Rock Shelter suggests interaction between two groups with different economic, cultural and social status. Marine shell represents contact with the coast and/or coastal people. Ostriches did not occur in the coastal forest area, and therefore whole eggs or disc beads must have been brought into the area by groups living further inland in the open grasslands where ostriches did occur. That no fragments were found at Umhlatuzana Rock Shelter suggests that complete disc beads were brought in.

## CHAPTER FIVE

### ANIMAL AND PLANT REMAINS

The studies of animal and plant remains had not, until the 1960's (with the 'New Archaeology'), been accorded as much significance as stone artefacts as a means of reconstructing the past. This has now changed and the studies of animal and plant remains are as important in elucidating past lifestyles as are stone artefacts.

The large animal remains from Umhlatuzana Rock Shelter were analysed by Professor Richard Klein and the small animals by Dr Margaret Avery.

The Holocene animal remains

It is clear from Table 5:1, that large animal bone is best preserved in the Holocene LSA deposits (Layers 1-4), especially those deposits which are dated within the last 2000 years BP, particularly Layer 2. Table 5:2 includes the minimum number of individual animals identified from the DBS units which are not included in Table 5:1 (see Chapter 2 for a discussion on the position of the DBS units). Of note is that only one small bovid and one small-medium bovid were identified from the DBS units. A wide range of large animal species has been identified in the late Holocene levels, including hare, rat, porcupine (Hystrix africaeaustralis), baboon, vervet monkey (Cercopithecus aethiops), honey badger (Mellivora capensis), water mongoose (Atilax paludinosus), bushpig (Potamochoerus porcus) and a range of small, medium and large sized bovids. Wildcats (Felis libyca) in Layers 2

Table 5:1 Umhlatuzana Rock Shelter: minimum numbers of individuals in macrofaunal assemblage.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Hare	1/1	18/3	8/1	29/6	2/1	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cane rat	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cf. Porcupine	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pangolin	-	-	1/1	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Baboon	1/1	16/2	4/2	4/1	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vervet Monkey	2/1	38/3	11/1	10/1	1/1	-	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
People	3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cf. Jackal	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honey badger	1/1	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Genet	-	3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water mongoose	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Egyptian mongoose	cf. 1/1	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small Carnivore	-	3/1	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1/1	-	-	-	-
Indet. Hyena	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wildcat	-	3/1	4/1	3/1	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caracal/Serval	-	-	-	2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leopard	-	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aardvark	-	3/1	2/1	5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rock hyrax	15/3	78/7	16/2	27/2	-	1/1	1/1	-	1/1	-	1/1	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-
Zebra	-	-	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bushpig	6/1	104/4	54/3	117/4	11/2	15/2	6/1	4/1	1/1	1/1	1/1	-	-	-	-	-	-	-	-	-	-	1/1	1/1	1/1	1/1	-
Blue duiker	40/3	413/9	41/2	94/5	11/1	1/1	1/1	1/1	3/1	-	-	-	2/1	1/1	1/1	1/1	1/1	-	-	-	-	-	-	-	-	-
Small Bovids (all)	8/1	139/4	39/2	42/2	8/1	4/1	1/1	-	-	1/1	1/1	-	1/1	1/1	-	-	-	-	-	-	-	-	-	6/1	-	-
Klipspringer	1/1	4/3	-	2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oribi	-	2/1	4/1	2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Red duiker	-	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Small-Med Bov (all)	7/2	176/7	75/2	175/4	15/1	9/1	10/1	6/1	4/1	-	1/1	2/1	2/1	1/1	-	-	-	-	-	1/1	1/1	2/1	4/1	4/1	-	-
Mtn. Reedbuck	-	6/1	2/1	2/1	1/1	-	-	1/1	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bushbuck	1/1	10/1	4/1	6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Large-Med Bov (all)	2/1	24/2	14/1	20/1	1/1	2/1	1/1	2/1	2/1	1/1	1/1	-	1/1	1/1	1/1	1/1	1/1	-	-	1/1	-	-	-	1/1	2/1	-
Roan/Sable	-	2/1	1/1	2/1	-	1/1	-	-	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alcelaphine	-	-	-	-	-	-	-	-	1/1	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Large Bovid (all)	4/1	6/1	5/1	19/1	2/1	7/1	1/1	1/1	1/1	-	-	-	1/1	-	1/1	-	-	-	-	-	-	-	-	-	1/1	-
Cape Buffalo	4/1	1/1	1/1	4/1	-	2/1	1/1	-	-	-	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-
cf. Eland	-	-	1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TOTAL: 2149/203

Table 5:2 Umhlatuzana Rock Shelter: minimum numbers of individuals in macrofaunal assemblage from DBS units.

	Layer 8 (DBS)	Layer 9 (DBS2)
Small-Med Bov (all)	-	1/1
Large Bovid (all)	1/1	-

and 4 and hyena (Hyaenidae) in Layer 2 may have been agents responsible for part of the accumulation of animal bones (Avery, G. 1984). A single porcupine was recovered from Layer 2. It is interesting to note that gnaw marks on some of the bones in Layer 2 were consistent with porcupine damage.

Other animals which were identified in the Holocene deposits included bushpig, which are associated with forests, thickets or heavy cover of tall grass close to water (Skead 1980). Some of the smaller bovids, such as blue duiker (Cephalophus monticola) and red duiker (Cephalophus natalensis), are characteristic forest species. Klipspringer (Oreotragus oreotragus) prefer rocky areas with krantzes, rocky hills or outcrops. Some of the larger bovids, such as mountain reedbuck (Redunca fulvorufula), prefer slopes of mountains where there is cover amongst the rocks, shrubs and boulders. Roan/sable antelope (Hippotragus sp.) are characteristic woodland species, and bushbuck (Tragelaphus scriptus) prefer dense thickets of bush. Cape buffalo (Syncerus caffer) depend on plentiful supplies of grass, shade and water (Zaloumis & Cross 1974). One may assume from such a wide range of animals identified in these levels, that the Umhlatuzana Rock Shelter inhabitants exploited several ecological niches.

Blue duiker is the most common animal in the late Holocene levels, particularly in Layer 2, followed by small-medium bovids, dassies, bushpigs, small bovids, hares and vervet monkeys (Table 5:1). It is interesting to note that Layer 2 contained a wider range of species than Layer 1. This is

probably due to sample size, but may also suggest more intensive occupation of the site during this time.

Forest blue duiker, bushpig, mountain reedbuck, bushbuck, woodland roan/sable antelope and Cape buffalo, were among the animals recovered from Layer 3. Eland (Taurotragus oryx), positively identified at Umhlatuzana Rock Shelter, came from Layer 3. The largest of the African antelopes, eland are versatile in their habitat requirements, but prefer areas of savanna woodland, dry forests, mountain grassland and open plains (Zaloumis & Cross 1974; Skead 1980).

Layer 4 was dated to 9180 BP and is separated from Layer 3 by an occupation hiatus of about 6000 years. There is a smaller range of species in Layer 4 when compared to Layers 3-1, but blue duiker are proportionately more common in Layer 4 than in Layers 3 and 1. There is a greater proportion of small-medium sized bovids in Layer 4 compared to Layers 3 and 1, and more small bovids compared to Layer 1. Large bovids are not very common in the Holocene layers with only a few individuals represented in Layers 4-1. The highest MNI's of hare came from Layer 4. Vervet monkey and baboon were possibly taken as well. Dassies are found throughout Layers 4-1, as well as bushpig, which are more common in Layer 4, compared to the overlying layers. Leopard (Panthera pardus), caracal/serval (Felis sp.) and a wildcat were also identified from Layer 4.

### The Late Pleistocene animal remains

Layers 8-4 have been identified as belonging to the late Robberg. The Robberg assemblages of the southern Cape, where the 18-12 000 BP environment was grassland dominated (Deacon, J. & Lancaster 1988) and favorable for large grasses, are associated with either big-game hunting (Klein 1978), or scavenging (Parkington 1984). Three large bovids (including Cape buffalo), and six large-medium bovids (including two roan/sable antelope), were identified in Layers 8-5. One zebra (Eguus sp.), a large open grassland browser, was identified from Layer 5. These results suggest that large game dominated the diet of the Umhlatuzana Rock Shelter Late Pleistocene inhabitants. Smaller bovids were also taken, probably snared (Klein 1976, 1980), and blue duiker has been identified from these deposits. Bushpig are also fairly common in these deposits. Other animals identified include dassies, wildcats, a water mongoose, a vervet monkey, a baboon and two hares (Table 5:1).

Layers 13-9 have been identified as belonging to the early Robberg. In these deposits, five large-medium sized bovids (including two alcelaphines) and three large bovids (including one Cape buffalo), were identified. Large-medium sized and large bovids are more common than small bovids in the early Robberg layers (Table 5:1). Klein (1976, 1978) has argued that the buffalo, the most dangerous of the large grasses, was avoided by both MSA and LSA hunters. When they do appear in the archaeological record, it is usually old/sick or very young individuals which are represented.

Layers 18-14 have been identified as a MSA/LSA transitional phase. Three large-medium sized bovids and one large bovid were identified in these layers. Blue duiker are present in Layers 17-15. One small bovid and one small-medium sized bovid also came from between Layers 18-14 (Table 5:1).

Diagnostic bone in the late MSA layers (21-19) is poorly preserved and only one small-medium sized bovid and one large-medium sized bovid were identified. Bushpig appear in Layers 25-22 for the first time since Layer 11. One small bovid, two small-medium bovids, two large-medium bovids and one large bovid, also came from these layers (Table 5:1). Considering the depth at which these faunal assemblages were recovered, the information is valuable and suggests that a wide range of bovids was taken. No animals were identified from Layers 28-26, although burnt bone fragments do occur. The large mammals identified from the MSA and MSA/LSA deposits at Umhlatuzana Rock Shelter are important, as there is little information on animals from this period in the southern African archaeological record.

#### Overview

Bone is preserved best in Layers 4-1, relatively well in Layers 9-5, and poorly in Layers 25-10. Significant patterns of exploitation are discernible in the faunal assemblages which have been identified (Table 5:1). Blue duiker, a characteristic forest species, is the most common small bovid identified. These animals were probably hunted with snares and traps set in their regular runs through the bush (Klein 1976,

1980). The larger game were probably hunted with spears. The largest numbers of small and small-medium sized bovids, particularly blue duiker, came from the Holocene LSA deposits. Bushpig, a species which is associated with forests, thickets or heavy grass cover close to water, occur in Layers 11, 9-1 and appear again in Layers 25-23. This gap may suggest a substantial reduction in the forest cover during the Last Glacial Maximum (LGM), between about 25 000 and 17 000 BP (Deacon, H.J. & Deacon, J. 1986).

Large bovids are more common in the Late Pleistocene than small bovids (Table 5:1). The Robberg inhabitants at Umhlatuzana Rock Shelter may have been either actively hunting or scavenging animals. Poor preservation of the faunal assemblages from the Upper and Late Pleistocene deposits may also obscure or alter patterns which were present, and may mean that some species are under-represented. We also cannot discount the fact that carnivores may have been responsible for some of the bone accumulations during periods of non-occupation.

#### Small animals

Small animals were identified from Layers 6-1, but only in appreciable numbers from Layers 4-2 (Table 5:3). According to M. Avery (pers. comm.), the samples also contained remains of snakes, frogs, small birds and fish. The small mammals are likely to have been introduced into the cave by owls, but could have been introduced by people (Mazel 1988a). Fish were probably introduced into the site by the inhabitants.

Table 5:3 Umhlatuzana Rock Shelter: minimum numbers of individuals in microfaunal assemblage.

SPECIES	Layer					
	1	2	3	4	5	6
<u>Myosorex varius</u> forest shrew	4	43	12	35	5	1
<u>Crocidura flavescens</u> greater musk shrew	1	10	6	14	2	1
<u>Suncus varilla</u> lesser dwarf shrew	-	5	7	3	1	-
<u>Chrysospalax villosus</u>						
rough-haired golden mole	2	3	3	4	-	-
<u>Amblysomus hottentotus/iris</u>						
Hottentot/Zulu golden mole	-	4	2	6	-	-
<u>Cryptomys hottentotus</u> common molerat	-	6	2	5	1	-
<u>Georychus capensis</u> Cape molerat	1	4	2	5	-	-
<u>Otomys laminatus</u> laminate vlei rat	1	6	3	8	2	1
<u>Otomys irroratus</u> vlei rat	1	25	12	23	4	4
<u>Dendromus</u> sp.climbing mouse	-	3	2	4	-	-
<u>Steatomys pratensis</u> fat mouse	-	1	1	1	-	-
<u>Rhabdomys pumilio</u> striped mouse	1	5	5	10	2	1
<u>DAsymys incomtus</u> water rat	1	4	2	4	-	-
<u>Grammomys dolichurus</u> woodland mouse	1	19	10	18	2	1
<u>Mus minutoides</u> pygmy mouse	-	3	2	3	-	-
<u>Mastomys natalensis</u> multimammate mouse	1	6	2	10	-	-
<u>Aethomys chrysophilus</u> red veld rat	2	4	1	12	1	-
<b>TOTAL</b>	<b>16</b>	<b>151</b>	<b>74</b>	<b>165</b>	<b>20</b>	<b>9</b>

According to M. Avery (pers. comm.), the fat mouse (Steatomys pratensis) is eaten by humans, so it is not unlikely that the few individuals identified in Layers 4-2 were eaten by people.

The small animals identified at Umhlatuzana Rock Shelter are compatible with the immediate surrounding environment of Kloof forest, as well as the surrounding secondary Aristidia junciformis Grassland and, according to M. Avery (pers. comm.), there is no suggestion that any real change occurred in environmental conditions during this period. There is, however, some indication that at the time Layer 4 (9180 BP) was deposited, the vegetation was grassier.

#### Plant remains

Botanical remains in the form of seeds, unworked wood, twigs, leaves and bark, were recovered from the Holocene and Late Pleistocene deposits at Umhlatuzana Rock Shelter. The late Holocene deposits produced the widest range of types of seeds identified, while botanical remains were poorly represented in the Late Pleistocene deposits. A comparative seed assemblage sample from Umhlatuzana Rock Shelter was identified by Mrs E.J. du Plessis, formerly of the Department of Plant and Seed Control, Pretoria.

#### The Holocene seed assemblage

Table 5:4 presents the quantitative data on seed remains from the Holocene LSA deposits. Sixty-two types of seed have been identified in these deposits. It is clear from Table 5:4 that the majority are present in Layers 1 and 2, while a wider

Table 5:4 Umhlatuzana Rock Shelter: Holocene seed assemblage.

	Layer 1		Layer 2		Layer 3		Layer 4	
	n	%	n	%	n	%	n	%
<u>Allophylus natalensis</u>	2	0,17	-	-	-	-	-	-
<u>Annonaceae</u>	12	1,03	-	-	-	-	-	-
<u>Apodytes dimidiata</u>	4	0,34	-	-	-	-	-	-
<u>Asparagus sp.</u>	223	19,11	41	20,1	2	4,88	-	-
<u>c.f. Atalaya sp.</u>	5	0,43	1	0,49	-	-	-	-
<u>Barleria</u>	7	0,60	4	1,96	-	-	-	-
<u>Berchemia discolor</u>	-	-	-	-	-	-	-	-
<u>Bridelia sp.</u>	1	0,09	-	-	-	-	-	-
<u>Blepharis sp.</u>	65	5,57	7	3,43	-	-	-	-
<u>Canthium inerme</u>	39	3,34	2	0,98	-	-	9	3,75
<u>c.f. Cantunaregum obovatus</u>	1	0,09	-	-	-	-	-	-
<u>Capparis sp.</u>	3	0,26	1	0,49	-	-	-	-
<u>Cassine sp.</u>	5	0,43	-	-	-	-	2	0,83
<u>Cassinopsis tinifolia</u>	1	0,09	-	-	-	-	-	-
<u>Celtis africana</u>	36	3,08	67	32,84	37	90,24	178	74,17
<u>Cephalanthus sp.</u>	1	0,09	-	-	-	-	-	-
<u>Chrysanthemoides sp.</u>	11	0,94	-	-	-	-	-	-
<u>Chrysophyllum viridifolium</u>	36	3,08	11	5,39	-	-	6	2,50
<u>Clerodendrum sp.</u>	2	0,17	-	-	-	-	-	-
<u>Commiphora sp.</u>	2	0,17	2	0,98	-	-	-	-
<u>Corallocarpus bainesii</u>	-	-	1	0,49	-	-	1	0,42
<u>Croton testa</u>	1	0,09	8	3,92	-	-	-	-
<u>Cucurbitaceae testa</u>	-	-	2	0,98	-	-	1	0,42
<u>Curtisia dentata</u>	-	-	-	-	-	-	1	0,42
<u>Cussonia sp.</u>	3	0,26	-	-	-	-	-	-
<u>Delbergia obovata</u>	3	0,26	-	-	-	-	-	-
<u>Draceana sp.</u>	-	-	1	0,49	-	-	11	4,58
<u>Ephippiocarpa orientalis</u>	-	-	1	0,49	-	-	-	-
<u>Euclea natalensis</u>	1	0,09	-	-	-	-	-	-
<u>Eugenia sp.</u>	4	0,34	-	-	-	-	-	-
<u>Ficus sp.</u>	2	0,17	-	-	-	-	-	-
<u>Flacourtia indica</u>	1	0,09	-	-	-	-	-	-
<u>Grewia lasiocarpa</u>	6	0,51	-	-	-	-	-	-
<u>Grewia occidentalis</u>	99	8,48	1	0,49	-	-	-	-
<u>Grewia sp.</u>	9	0,77	-	-	-	-	-	-
<u>Harpephyllum caffrum</u>	46	3,94	2	0,98	-	-	-	-
<u>Kedrostis sp.</u>	113	9,68	1	0,49	-	-	-	-
<u>Kiggelaria africana</u>	1	0,09	-	-	-	-	-	-
<u>Lagenaria sinceraria</u>	1	0,09	-	-	-	-	-	-
<u>Lantana camara</u>	7	0,60	-	-	-	-	-	-
<u>Liliaceae c.f. Littonia sp.</u>	1	0,07	1	0,49	-	-	-	-
<u>Linociera sp.</u>	1	0,09	32	15,69	1	2,44	7	2,92
<u>Melia azedarach</u>	2	0,17	-	-	-	-	-	-
<u>Momordica clematidea</u>	5	0,43	-	-	-	-	1	0,42
<u>Ochna sp.</u>	25	2,14	1	0,49	-	-	-	-
<u>Olea sp.</u>	2	0,17	-	-	-	-	-	-
<u>Oricia bachmannii</u>	2	0,17	4	1,96	-	-	15	6,25
<u>Passiflora sp.</u>	133	11,40	-	-	-	-	-	-
<u>Pavetta sp.</u>	3	0,26	-	-	-	-	-	-
<u>Peponium mackenii</u>	1	0,09	3	1,47	-	-	-	-
<u>Rauvolfia caffra</u>	10	0,86	1	0,49	-	-	6	2,50
<u>Rapanea melanophloes</u>	1	0,09	-	-	-	-	-	-
<u>Rhoicissus digitata</u>	7	0,60	-	-	-	-	-	-
<u>Ricinus communis</u>	8	0,68	2	0,98	-	-	-	-
<u>Rubiaceae</u>	2	0,17	-	-	-	-	-	-
<u>Sclerocarya birrea</u>	3	0,26	-	-	-	-	-	-
<u>Vangueria infausta</u>	24	2,06	2	0,98	1	2,44	-	-
<u>Vepris lanceolata</u>	-	-	-	-	-	-	-	-
<u>Vitex sp.</u>	3	0,26	-	-	-	-	-	-
<u>Ziziphus sp.</u>	68	5,83	-	-	-	-	-	-
<u>Ziziphus mucronata</u>	112	9,60	4	1,96	-	-	-	-
<u>Zea mays</u>	1	0,09	-	-	-	-	2	0,83
Unknown	-	-	1	0,49	-	-	-	-
Total	1167		204		41		240	

range of seed types came from Layer 1. Asparagus sp. was the most abundant seed in Layer 1 and comprised 19.0% of the total number of seeds from this layer, followed by Passiflora sp. 11.0%, Kedrostis sp. and Ziziphus mucronata 10.0%, Grewia occidentalis 8.0%, and Ziziphus sp. 6.0%. The domestic cultigens, Lagenaria sinceraria (bottle gourd) and Zea mays (maize cereal), came from Layer 1.

Celtis africana comprised 33.0% of the total number of seeds in Layer 2, followed by Asparagus sp. 20.0%, Linociera sp. 16.0%, Chrysophyllum viridifolium 5.0%, and Blepharis sp. 3.0%.

Four types of seeds were identified from Layer 3. Celtis africana comprised 90.0%, Asparagus sp. 5.0% and Linociera sp. and Vanqueria infausta, 2.5% each. Celtis africana are the most common seeds in Layers 3-5. These seeds are not eaten by humans, but are eaten by birds (Fox & Norwood-Young 1982).

The range of seed types from Layer 4 is broader than from Layer 3, but this may be a result of the greater volume of deposit excavated in this layer. Celtis africana was the most abundant seed in Layer 4 and comprised 74.0% of the seed assemblage. Oricia bachmannii comprised 6.0%, Draceana sp. 5.0%, Canthium inerme 4.0% and Linociera sp. 3.0%.

Known human usage of the plants identified is presented in Table 5:5. Most of the plants have edible fruits and berries, as well as medicinal value. In addition, the leaves of Asparagus sp., Capparis sp., Corallocarpus bainesii,

Table 5:5 Human uses of plants identified from Umhlatuzana Rock Shelter: information from Fox & Norwood-Young (1982) and Breyer-Brandwijk (1962).

	Fruit/ seed	Medicinal	Spinach	Beverage	Other details
<u>Annonaceae</u>	x	x	-	-	-
<u>Apodytes dimidiata</u>	-	x	-	-	-
<u>Asparagus sp.</u>	-	x	x	-	-
<u>Barleria</u>	-	x	-	-	-
<u>Berchemia discolor</u>	x	-	-	x	-
<u>Blepharis sp.</u>	-	x	-	-	-
<u>Bridelia sp.</u>	x	x	-	-	-
<u>Canthium inerme</u>	x	-	-	-	-
<u>Capparis sp.</u>	x	x	x	-	-
<u>Cassine sp.</u>	x	-	-	-	-
<u>Cephalanthus</u>	x	-	-	-	-
<u>Chrysophyllum viridifolium</u>	x	-	-	-	-
<u>Commiphora sp.</u>	x	x	-	-	Tubers eaten
<u>Clerodendrum sp.</u>	-	x	-	-	-
<u>Corallocarpus bainesii</u>	x	-	x	-	-
<u>Croton testa</u>	-	x	-	-	-
<u>Cucurbitaceae testa</u>	x	-	x	-	-
<u>Curtisia dentata</u>	x	-	-	-	Roots eaten
<u>Cussonia sp.</u>	x	x	-	-	Roots eaten
<u>Dalbergia obovata</u>	-	x	-	-	-
<u>Euclea natalensis</u>	x	x	-	-	-
<u>Eugenia</u>	x	x	-	-	-
<u>Ficus sp.</u>	x	x	-	x	Bark chewed
<u>Flacourtia indica</u>	x	-	-	-	-
<u>Grewia sp.</u>	x	x	-	-	-
<u>Grewia lasiocarpa</u>	x	-	-	-	-
<u>Grewia occidentalis</u>	x	x	-	-	-
<u>Harpephyllum caffrum</u>	x	x	-	-	-
<u>Kedrotis sp.</u>	-	-	x	-	-
<u>Kigelia africana</u>	x	x	-	x	flowers eaten
<u>Lagenaria sinceraria</u>	x	-	x	-	utensil
<u>Lantana camara</u>	x	-	-	-	exotic
<u>Liliaceae c.f. Littonia sp.</u>	-	-	-	-	shoots eaten
<u>Momordica clematidea</u>	x	x	x	-	-
<u>Ochna sp.</u>	x	x	-	-	-
<u>Olea sp.</u>	x	x	x	-	-
<u>Oricia bachmannii</u>	x	-	-	-	-
<u>Pavetta sp.</u>	-	x	x	-	-
<u>Rapanea Melanaphloes</u>	-	x	-	-	-
<u>Rauwolfia caffra</u>	-	x	-	-	-
<u>Rhoicissus digitata</u>	-	x	-	-	Stems eaten
<u>Ricinus communis</u>	-	x	-	-	-
<u>Rubiaceae</u>	x	-	-	-	-
<u>Sclerocarya birrea</u>	x	x	-	x	Rich in oil
<u>Vangueria infausta</u>	x	x	-	-	-
<u>Vepris lanceolata</u>	-	x	-	-	-
<u>Vitex sp.</u>	x	x	-	-	-
<u>Ziziphus sp.</u>	x	x	x	-	-
<u>Ziziphus mucronata</u>	x	x	-	x	-

Cucubitaceae testa, Kedrotis sp., Lagenaria sinceraria, Olea sp., Pavetta sp., and Ziziphus sp., may be eaten as spinach, and the fruits of Berchemia discolor, Ficus sp., Kigalaria africana and Sclerocarya birrea can be processed into a beverage. Some of the plants identified are not edible by humans and have no known medicinal value. These include; Allophylus natalensis, c. f. Atalaya sp., c. f. Cantunaregum obovatus, Cassinopsis tinifolia, Celtis africana, Chrysanthemoides sp., Draceana sp., Ehippiocarpa orientalis, Linociera sp., Melia azedarach, Passiflora sp., Peponium mackenii and Rapanea melanophloes (Watt & Breyer-Brandwijk 1962; Fox & Norwood-Young 1982). These seeds may have been deposited by birds and smaller animals and were then incorporated into the deposits. Melia azedarach in Layer 1 is not indigenous to South Africa. It originated in India and is a recent arrival in Africa (Palgrave 1977:381-82). The fruit of this seed is very poisonous.

The Late Pleistocene seed assemblage

Thirteen types of seeds were identified from the Umhlatuzana Rock Shelter Late Pleistocene deposits between Layers 5 and 24 (Table 5:6). Layer 5, dated to 13 400 BP, contained three types of seeds: Celtis africana, Draceana sp., and Kedrostis sp. Layer 6 contained two types of seeds: Berchemia discolor and Curtisia dentata. The fruit of Berchemia discolor is edible and the fruit and tubers of Curtisia dentata can also be eaten (Fox & Norwood-Young 1982). Two types of seeds were identified from Layer 7: Apodytes dimidiata, and Pavetta sp,

Table 5:6. Umhlatuzana Rock Shelter: Late Pleistocene seed assemblage.

	LAYER																		
	5	6	7	8	9	13	14	15	16	18	20	21	24						
<i>Apodytes dimidiata</i>			1						1										
<i>Baobab</i>				1															
<i>Berchemia discolor</i>		1										1							
<i>Celtis africana</i>	6	75,00			2	66,67	1	100,00			1	50,00							
<i>Croton testa</i>				1															
<i>Curtisia dentata</i>		1			1	33,33					1	50,00							
<i>Dracaena</i> sp.	1	12,50								1	100,00								
<i>Grewia occidentalis</i>										1	100,00								
<i>Harpephyllum caffrum</i>						1	50,00												
<i>Kedrostis</i> sp.	1	12,50																	
<i>Melia azedarach</i>																			
<i>Pavetta</i> sp.			1	33,33															
<i>Rauwolfia caffra</i>			1	33,33															
<i>Vepris lanceolata</i>													1						
Unknown										1	50,00		1						
Total	8	2	3	3	3	2	1	1	1	1	2	1	1						

both of which have medicinal value (Watt & Breyer-Brandwijk 1962).

Three types of seeds came from Layer 8: Barleria, Croton testa, and Rauvolfia caffra. All three plants have medicinal value. Two types of seeds came from Layer 9: Celtis africana and Draceana sp., neither is eaten by humans nor has medicinal value (Watt & Breyer-Brandwijk 1962; Fox & Norwood-Young 1982). Layer 13 contained two types of seeds: Harpephyllum caffrum, which has an edible fruit and is also known to be of medicinal value (Watt & Breyer-Brandwijk 1962; Fox & Norwood-Young 1982), and an unidentified seed .

Eight types of seeds were identified from between Layers 14 and 24. Layer 14 contained Celtis africana, and two Grewia occidentalis seeds came from Layers 15 and 18. The fruit of Grewia occidentalis is edible and the plant has medicinal value. Layer 18 produced two radiocarbon dates, 35 300 BP and 35 100 BP respectively. Apodytes dimidiata, identified from Layer 16, has medicinal value, but the fruit is not edible. Layer 20 contained two types of seeds: Celtis africana and Curtisia dentata. The fruit and root of the latter are edible. Layer 20 produced five radiocarbon dates between 34 400 BP and 40 600 BP. One Celtis africana seed came from Layer 22. One Vepris lanceolata seed came from Layer 24, and the plant is known to have medicinal value (Watt & Breyer-Brandwijk 1962). It is possible that the seeds from the MSA deposits may have been displaced from deposits higher up in the sequence, but

the fact that grindstone fragments were associated with these deposits strongly suggests food processing.

#### Overview

Plant remains have been recovered from Late Pleistocene deposits at sites elsewhere in southern Africa, but they are much less common than in Holocene deposits. This is as much due to poor preservation as to the possibility that plant food was not as important in hunter-gatherer diet in the Late Pleistocene as it was during the late Holocene, where plant food remains are abundant (Deacon, H.J. 1976). Umhlatuzana Rock Shelter contains the most numbers and types of seed remains yet recovered from a Late Pleistocene deposit in southern Africa. This suggests that plant foods may have played a significantly greater role in subsistence strategies than has previously been thought. It should be noted, however, that the LGM, characterised by cold, dry glacial climates, was probably associated with unusually low species diversity in both plant and animal remains (Deacon, J. & Lancaster 1988:156). The Umhlatuzana Rock Shelter plant food information tends to support the faunal evidence, and it is tentatively suggested that an open grassland on the hilltops with restricted forest in the kloofs, occurred during the Late Pleistocene.

Further evidence for plant food exploitation in the Late Pleistocene comes from the recovery of grindstones and grindstone fragments. One grindstone was found in Layer 15, dated to 27 800 BP, and numerous grindstone fragments were

found between Layers 5 and 23, which date to between 13 300 and 45 200 BP (Kaplan 1989b). This may suggest that plant foods were being processed during this time. Grindstones may also have been used for grinding ochre and not for plant foods; however, none were found to have ochre traces adhering, except for an ochre-stained upper grindstone recovered from Layer 5.

Carbonised seeds were recovered from the MSA deposits at Border Cave (Beaumont 1978). It has also been pointed out that the Howiesonspoor levels at Klasies River Mouth are associated with carbonised geophyte residues. This suggests that the Klasies River Mouth inhabitants were burning the veld to stimulate the growth of underground geophytes (Deacon, H.J 1987; Deacon, H.J. & Geleijnse 1988).

## CHAPTER SIX

### DISCUSSION

The Umhlatuzana Rock Shelter excavations exposed an unexpectedly rich cultural deposit which reached more than 2,6m to bedrock. Stone artefacts comparable to the Howiesonspoot group of assemblages were recovered from above bedrock (Kaplan 1989a, b). The Late Pleistocene-Holocene sequence includes a series of occupation horizons in the time period ranging between 45 000 and 9000 BP. This long sequence extended considerably the scope and nature of the project, both in terms of the quality of material recovered and the time span covered.

A major aim of the analysis of the Umhlatuzana Rock Shelter stone artefact assemblage was to identify cultural changes through time and to differentiate between the Late Pleistocene microlithic bladelet assemblages and their immediate MSA predecessors.

This chapter will consider aspects of flaking technology and will summarise the industrial sequence at the site. Thereafter, the previous hypotheses about the MSA/LSA transition and the Robberg-like assemblages will be assessed (see Chapter 1). Finally it will be shown how the Umhlatuzana Rock Shelter data adds to our knowledge of the MSA/LSA transition and Stone Age 'technological evolution'. The final section will address the relationship between hunter-gatherers and farmers as seen from Umhlatuzana Rock Shelter.

## Flaking technology

Mitchell (1988a) has argued that bipolar flaking as a means of producing bladelets is closely linked to a dependence on quartz "as the major lithic raw material" (Mitchell 1988a:150). While locally available vein quartz is the primary raw material used in the microlithic assemblages between Layers 15 and 1, the bipolar technique is not the dominant flaking technology employed. Instead, the vast majority of bladelet cores found are of the single platform variety, with few bipolar cores present (Table 3:1).

A possible explanation for the absence of bipolar flaking is that quartz was found in sufficiently large chunks making the use of a 'wrapped' bipolar technology unnecessary. This interpretation is supported by the experimental work of Barham (1987), who replicated the stages of bipolar flaking to determine the factors which favoured the use of this technique. Barham (1987:48) showed that the employment of the bipolar technique was closely linked to raw material size and availability. Where fairly large pieces of vein quartz are available, flaking can be done by freehand percussion. Pebble quartz however, necessitated the use of a bipolar technique to facilitate bladelet production. It is only when raw materials are scarce, and occur in a form that cannot be readily flaked by other means, that the bipolar technique becomes necessary (Barham 1987:49).

More than 99.0% of the artefactual stone recovered from the large Umhlatuzana Rock Shelter lithic assemblage were chips, chunks and flakes. Extensive on-site knapping is a

particularly significant feature of the site's assemblage, and is associated with a range of formal tools which includes numerous segments. Wadley (1986a) has suggested that assemblages which are characterised by extensive stone knapping, inferred from the quantities of flaking debris and many cores, and highly curated and standardised artefacts (for example segments), may represent aggregation sites where groups came together, artefacts were made and exchanged and alliances were established. Unlike Klasies River Mouth (Deacon, H.J. & Geleijnse 1988), which probably represents a series of episodic human occupation (possibly short visits to the coast to exploit the rich coastal resources), occupation at Umhlatuzana Rock Shelter was more intensive.

J. Deacon (1984a:226) has noted that the MSA and LSA lithic technologies are so different that a completely different typology is required for their analysis. It is therefore significant that bladelet production, previously considered a hallmark of LSA technology, is a feature of the late MSA and MSA/LSA transitional layers at Umhlatuzana Rock Shelter (Table 3:1), with the former dating to 45 200 BP. Bladelet production is also a feature of the Howiesonspoot assemblages at the site (Kaplan 1989a, b). Bladelet production increases dramatically in the MSA/LSA transitional and Robberg layers between Layers 21-4 (Fig. 3:2). There is also a correlation between the increase in bladelet production and the increase in the frequency of outils écaillés in these layers (Table 3:1). Bladelet production is also present in the late Holocene assemblages in Layers 3-1, but the frequency of

bladelet cores and outils écaillés declined noticeably in these layers compared to the underlying layers (Table 3:13).

There is a consistent reduction in the mean length and width of quartz and hornfels bladelets, and the mean length of quartz bladelet cores from the late MSA (Layer 21) to the end of the late Robberg (Layer 5); while an increase is apparent in the length of bladelets in the terminal Robberg (Layer 4) (Figs. 3:9-3:12). It is interesting that a similar increase is discernible at Robberg sites where bladelets have been measured (Deacon, J. 1984b; Carter et al. 1988; Mitchell 1988a). This increase may reflect the changing function of bladelets, for example, from multiple inserts in composite tools during the Late Pleistocene (Deacon, H.J 1983; Parkington 1984; Mitchell 1988a), to cutting tools in the Holocene.

As bladelet production is a consistent feature of the lithic technology in the Umhlatuzana Rock Shelter late MSA, MSA/LSA and LSA assemblages, I suggest that the origins of the early microlithic bladelet assemblages of southern Africa may be located in the MSA where bladelet production is already apparent (Kaplan 1989a, b). This conclusion has important implications for our understanding of the concept of a boundary between the MSA and the LSA and the origins of LSA assemblages, as well as the nature of MSA assemblages in southern Africa.

## Formally retouched artefacts

Formally retouched tools account for less than 0,12% of all the artefacts at Umhlatuzana Rock Shelter. Relatively higher frequencies of formally retouched pieces occur in the late MSA and transitional MSA/LSA layers, while the lowest numbers occur in the bladelet-rich Robberg assemblages. Low formal tool frequencies are a hallmark of Robberg Industry assemblages in the southern Cape (Deacon, J. 1984a, b), as well as the early microlithic assemblages in the rest of southern Africa (Mitchell 1988a). Scrapers are the most common artefact in all these assemblages, including those at Umhlatuzana Rock Shelter (Table 3:1). The proportion of formal tools is highest in the Holocene layers (Tables 3:1 & 3:13).

Numerous unifacial and bifacial points, similar to those found in the MSA levels, were recovered from the LSA Layers 9 and 8 (Table 3:1). Formally retouched MSA artefacts, including flakes with faceted platforms, are found throughout the Late Pleistocene and even in the Holocene at Umhlatuzana Rock Shelter. It seems unlikely that these points were manufactured by the inhabitants during this time. They were probably picked up elsewhere, or at the site itself. Re-used MSA flakes are common in the open deflation sites and caves of the southwestern Cape where they are made into adzes, MRP's and occasionally scrapers (Kaplan unpub. data & Poggenpoel pers. comm.). This may explain the late MSA component at numerous LSA sites. At Rose Cottage Cave, for example (Wadley pers. comm.), MSA tools and reworked MSA tools occur prolifically even in the Wilton, but it would be unwise to suggest that MSA

traditions were still operating in the mid-Holocene. It is quite possible that MSA tools were being recycled, but that not all of them brought back to the cave were reworked.

Layers 9 and 8 lie adjacent to the DBS deposits where some large, atypical MSA artefacts were found. It may also be that these MSA artefacts were derived from the DBS deposits. The DBS hornfels assemblages are patinated, while the hornfels assemblages found in Layers 9 and 8 are mostly unpatinated. It is also possible that some of these artefacts may have become mixed in the LSA deposits due to rotational slipping, reported earlier in Chapter 2.

Yet another possible explanation is that these MSA retouched points may be related to shamanistic practices at the site. Wadley (1986a:141-142) has suggested that a cache of MSA points found in the Wilton layers at Jubilee Shelter may be part of a shaman's paraphernalia, which includes quartz crystals, "and even stone artefacts that shamans recognize as being of great antiquity" (Wadley 1986a:91).

Another important feature of the Umhlatuzana Rock Shelter formal tool assemblage is the occurrence of segments. Large (hornfels) and small (quartz) segments were recovered from Layers 28-12, 7, 4 and 2 (Table 3:1 & 3:13, Kaplan 1989b). The small quartz segments, some less than 20mm long (Fig. 3:17), are identical to those found in the LSA Wilton between 7000 and 5000 BP (Deacon, J. 1984a). Volman (1984:219) has claimed that metrical data for southern Cape assemblages indicate a clear size difference between Howiesonspoot and Wilton (LSA)

assemblages. Howiesonspoot segments are usually between 50mm and 25mm in length, while Wilton segments are rarely more than 20mm long. Figure 3:1 clearly shows that at Umhlatuzana Rock Shelter numerous quartz segments are less than 20mm, while some are even less than 10mm (Kaplan 1989b). It is also worth mentioning that Volman (1981:190-191) attributed a small quartz segment from the Howiesonspoot levels at Montagu Cave (Keller 1973) to the Wilton occupation at the site. It is therefore important to note that at Umhlatuzana Rock Shelter there was no Wilton occupation excavated. The quartz segment from the Montagu Cave MSA assemblage may therefore have been derived from the in situ Howiesonspoot deposits.

Since LSA people are known to have mounted small backed artefacts, including segments, in mastic as parts of projectile points (Deacon, J. 1984a), it is not unlikely that the comparable late MSA and Howiesonspoot segments were also mounted (Kaplan 1989b) and perhaps used as composite tools in hunting. This suggests that the miniaturization of hafted and composite tools took place perhaps as early as 70 000 years ago (Kaplan 1989b). The presence of microlithic segments from the earliest MSA at Umhlatuzana Rock Shelter through to the Holocene is further evidence of the MSA-LSA continuity in the lithic manufacturing systems that were employed at the site.

#### The MSA/LSA transition

Umhlatuzana Rock Shelter contains a near continuous sequence of stone artefact assemblages which spans the late MSA and LSA within the time range c. 45 000-13 000 BP.

In six broad regions in southern Africa, including Swaziland, the southern Cape, the Magaliesberg, Lesotho, Namibia and Natal, there is a growing body of evidence which suggests that the MSA lithic technology persisted until at least 30 000 BP (Price-Williams & Watson 1982; Deacon, H.J. & Thackeray, J.F. 1984; Wadley 1986b; Mitchell 1988a, b; Deacon, J. in press; Mazel n.d.). Beaumont and Vogel (1972:156), on the other hand, have claimed that "the 'Early LSA/Final MSA' transition took place at an earlier date, or that an already developed 'Early LSA' intruded into South Africa shortly before 35 000 BP". Beaumont et al. (1978:414) later argued that this transition took place at an even earlier date, as far back as between 60 000 and 40 000 BP.

Mazel (n.d.) and Mitchell (1988a, b) have argued that claims for a pre-30 000 BP LSA (Beaumont 1978; Beaumont & Vogel 1972; Beaumont et al. 1978), are unconvincing. They have pointed out serious problems with the dating of Heuningneskrans and Rose Cottage Cave, sites for which claims for an Early LSA have been made. They also stress problems with the interpretation of the stratigraphy and associated assemblages at these sites. Mazel (n.d.) has argued that, apart from Beaumont's (1978) own admission that three out of his six criteria which distinguish the Early LSA at Border Cave have not been met, the other three are not met either. Consequently, his claims that a date of pre-30 000 BP for the Early LSA, cannot be accepted.

At this point it is worthwhile considering the criteria which Beaumont (1978:101) uses to characterise the Early LSA (see Chapter 1).

Of the six criteria mentioned in Chapter 1, convex-edged scrapers, scaled pieces/outils écaillés, microbladelets and bladelet cores are all present in the Howiesonspoot and late MSA layers at Umhlatuzana Rock Shelter (Kaplan 1989b). Scaled pieces are present in significant proportions in the levels dated between c. 38/45 000 BP - >49/ c. 55 000 BP at Border Cave (Beaumont 1978), as well as in the MSA 1 Industry at Moshebi's Shelter and Sehonghong in Lesotho (Carter 1978). The proportion of scrapers found in the pre-55 000 BP levels at Border Cave (Beaumont 1978: Appendix 9) is higher than in the upper Early LSA levels. Scrapers are present in the MSA 1 Industry at Moshebi's Shelter and Sehonghong (Carter 1978). At Rose Cottage Cave, only a few scrapers are present in levels designated Howiesonspoot. They are most common in the post Howiesonspoot MSA (Beaumont 1978; Wadley & Harper 1989).

Referring again to Beaumont's (1978:101) criteria, unmodified flakes in the Howiesonspoot and late MSA layers at Umhlatuzana Rock Shelter have plain platforms as well as faceted examples (Kaplan 1989b). Thirty-five pieces of ground ochre were also found in these layers (Kaplan 1989b). Ground ochre has also been recovered from the MSA levels at Apollo 11 (Wendt 1972, 1976), Montagu Cave (Keller 1973), Diepkloof Cave (Yates pers. comm.), Boomplaas and Sehonghong (Mitchell 1988a), Rose Cottage Cave (Wadley pers. comm.), Klasies River Mouth (Singer & Wymer 1982) and Border Cave (Beaumont 1978),

while a slightly hollow ochreous slab was recovered from a secure MSA context at Cecilia Forest in the Cape Province (Yates pers. comm.). As regards ground bone objects, a point was recovered from the Howiesonspoot levels at Klasies River Mouth (Deacon, J. 1984a) and at Border Cave (Beaumont 1978); notched pieces of bone and seven 'daggers' of split and ground tusks of warthog or bushpig were recovered from the MSA levels. Ground bored stones are also present in the MSA levels at Zombepata Cave in Zimbabwe (Cooke 1971).

The above information invalidates the claims made by Beaumont (1978) that scrapers, scaled pieces, bladelets and bladelet cores, and ground/modified bone and stone, distinguish the Early LSA from the LSA. By his own admission, some of these artefacts are present in the MSA at Border Cave, and they also occur at some southern African MSA sites, particularly at Umhlatuzana Rock Shelter (Kaplan 1989b). Claims for a pre-30 000 BP Early LSA (Beaumont & Vogel 1972; Beaumont 1978; Beaumont et al. 1978) have thus not been met. The six criteria appear in the MSA and therefore do not make reliable Early LSA indicators. That they occur at 45 000 BP at Border Cave (Beaumont 1978) does not necessarily imply Early LSA. Ironically, the observations that aspects of LSA technology and material culture items are also found in the MSA substantiate the idea of MSA and LSA continuity.

The evidence from Umhlatuzana Rock Shelter, based on the dating of the deposits and the flaking technology, suggests that the MSA/LSA transition and the onset of the early microlithic LSA tradition in southern Africa took place

between 35 000 and 20 000 BP. A LSA industry may have occurred shortly before 20 000 BP. The first appearance of assemblages containing beads, ground and notched bone, and engraved ostrich eggshell between 30 000 and 20 000 BP (Deacon, J. 1984a, in press), may mark the onset of the LSA. In fact, it was Goodwin and Van Riet Lowe (1929) who initially defined the LSA as the first appearance of ostrich eggshell beads alongside the occurrence of microlithic elements. The appearance of these items in archaeological deposits, dated to between 30 000 and 20 000 BP, may signify social responses rather than environmental adaptations. These may point to the importance of considering changes in hunter-gatherer social organisation, and the link between technological and social change, as a central theme in the MSA/LSA transition.

The value of Umhlatuzana Rock Shelter is that it shows continuity in the flaking technology from the Howiesonspoot to the Early LSA (Kaplan 1989b). This may indicate that the major problem in the MSA/LSA debate has been one of technological interpretation. For example, the MSA 9 at Sehonghong, dated to 20 000 BP, also contains bladelets (Carter et al 1988:195). There is therefore no reason why it should not be called Early LSA. Carter (1978:161) previously called this assemblage LSA. Carter et al. (1988:172) also show that between the Sehonghong MSA 5 and the LSA bladelet-rich industry, there is a trend towards increasing bladelet production. A pre-Howiesonspoot bladelet component is also present at Rose Cottage Cave (Wadley & Harper 1989), and at Border Cave, bladelets and scaled pieces occur in the MSA

(Beaumont pers. comm.). Perhaps what we are seeing is the early MSA microlithisation mentioned before.

According to Mitchell (1988a), the "principal differences" between the MSA and the Early LSA include:

"1. Artefact size. Microlithisation is one of the hallmarks of the majority of LSA assemblages.

2. Changes in production technology; disappearance of faceted platformed flakes and of prepared cores.

3. Disappearance of retouched points and flake-blades, suggesting the use in the Early Later Stone Age of a different kind of projectile weapon.

Associated with these changes may go changes in the relative frequency with which different raw materials were used and, possibly, of formally retouched artefacts within assemblages" (Mitchell 1988a:257-262).

A similar, though more restricted definition of the LSA has been presented by J. Deacon (1984a) whereby

"the main factor which distinguishes LSA from MSA assemblages, however, remains the technique of stone tool manufacture as evident in the range of core types and the size and shape of the flakes" (Deacon, J. 1984a:221).

The Umhlatuzana Rock Shelter MSA/LSA transitional assemblage contains features of the above definitions: the almost complete disappearance of faceted platform flakes; the complete disappearance of prepared cores; a trend towards increasing bladelet production; and changes in the frequency of raw material usage. Bladelet production and microlithisation, however, is present in the Howiesonspoot and late MSA assemblages, evidenced by the presence of small quartz segments and bladelets (Kaplan 1989b).

Mitchell's (1988a) and J. Deacon's (1984b) definitions imply a clear technological shift between the MSA and LSA. At Umhlatuzana Rock Shelter there is continuity in the stone working technology, a disappearance of traditional MSA elements, and an increase in emphasis towards bladelet production.

The above definitions do not consider what a transitional MSA/LSA might look like. Howiesonspoot assemblages were once considered local expressions of the 'Magosian Culture' or 'Second Intermediate' (Clark 1959), an industry which was thought to be transitional typologically and chronologically between the MSA and LSA. It has since been shown that the Howiesonspoot is an integral phase of the MSA (Singer & Wymer 1982) and has been found at various sites in southern Africa over and underlain by MSA assemblages. A MSA/LSA transitional assemblage has not been described in the southern African archaeological record. I would suggest that such an assemblage contains elements of both the MSA and LSA, with a shift toward the increasing employment of a microlithic element. An indication of this trend would be an increase in the frequency of bladelet production relative to the MSA, and a gradual shift away from traditional MSA flake production, specifically the prepared core technique.

There is no MSA/LSA boundary at Umhlatuzana Rock Shelter. It is doubtful whether a MSA/LSA boundary exists at any other site. MSA assemblages containing flakes with faceted platforms, blade points and radial cores, were gradually replaced by assemblages characterised by increased bladelet

production and containing increasing numbers of beads, worked/notched bone and engraved ostrich eggshell. Stone artefact continuity between MSA and LSA assemblages can be shown to occur at other sites, too; for example at Sehonghong (Carter et al. 1988), Montagu Cave (Keller 1973), Rose Cottage Cave (Wadley & Harper 1989), Boomplaas Cave (Mitchell 1988a) and Border Cave (Beaumont 1978).

Barham (1987:49) has shown that artefacts which are derived from the bipolar and direct percussion technique are not restricted in their occurrence to specific time periods, but are conditioned by raw material quality and availability. It is difficult to perceive how time spent collecting new types of raw material brought about the change from the MSA to the LSA, as Mitchell (1988a, b) claims it did. Fine-grained quartz was used in bladelet production prior to the MSA/LSA transition at Umhlatuzana Rock Shelter. Thus, Mitchell's (1988a, b) "time-stressed environment" model does not explain why bladelet production should occur in the Umhlatuzana Rock Shelter MSA layers.

Technological change did not coincide with a change in the environment. Bladelet production is a feature of the Howiesonspoor group of assemblages at the site (Kaplan 1989b), which increases in the MSA/LSA transition, and peaks in the Robberg (Fig. 3:2). Mitchell's (1988a, b) model for the MSA/LSA transition therefore does not fit the data from Umhlatuzana Rock Shelter.

The Umhlatuzana Rock Shelter assemblages reflect the choices made from a range of technological possibilities. Parkington (1980) has argued that regional stone artefact assemblage variability occurred during the LSA, and was influenced by people's access to raw materials and subsistence resources. It is therefore not unlikely that such complexity occurred during the MSA as well. More sites would need to be excavated to demonstrate this. I believe such variability is also a reflection of different social, subsistence and settlement activities taking place at coastal and inland sites. Aggregation and dispersal sites, temporary settlement sites, and home base sites, would also condition different assemblage patterns. Microenvironmental factors such as available plant foods, animal and/or marine resources and raw materials also influenced the choices open to the groups living there. All these factors would condition the 'package' of assemblages left behind. A re-evaluation of the southern African MSA and Early LSA culture-history sequence in terms of regional spatial variability is needed to test this model.

Certain environmental changes may have influenced technological changes, but not the way in which they change (Deacon, J. 1988, in press). The environment would have acted as a constraining factor on the changes brought about by people, and not as a positively determining factor. In other words, changes in the environment "tell" people what they cannot do, but not what they should do. J. Deacon (in press) has pointed out that no "simple correlation between environmental and technological change" exists, and that the changes from a MSA lithic technology to a LSA microlithic

technology "did not all appear at once as a 'package' in the archaeological record".

A discussion of the possible social factors that may have influenced the MSA/LSA transition is beyond the scope of this thesis, but a consideration of social theory may provide a valuable basis from which to attempt to answer the vexing problems of 'why' and 'how' in the archaeological record.

#### The Robberg or early microlithic assemblages

Late Pleistocene (18 000-12 000 BP) LSA Robberg sites are characterised by the systematic production of bladelets from single platform cores, and are widespread in southern Africa (Deacon, J. 1984a, b, 1988; Mitchell 1988a), occurring, for example, at Nelson Bay Cave (Deacon, J. 1978, 1984b), Boomplaas Cave (Deacon, J. 1984b), Elands Bay Cave (Davis 1980) and Sehonghong (Carter *et al.* 1988). Until the Umhlatuzana Rock Shelter excavations, no Robberg assemblage had been excavated in Natal, with the possible exception of Shongweni South Cave (Davies 1975; Mitchell 1988a; Deacon, J. in press). The systematic production of unmodified bladelets at Umhlatuzana Rock Shelter both pre-dates 18 000 BP and post-dates 12 000 BP, showing that bladelet-rich assemblages were produced earlier and later in Natal than in the western and southern Cape and Lesotho.

Layers 13-4 at Umhlatuzana Rock Shelter have precisely the attributes that are used by J. Deacon (1978) to define the Robberg at Nelson Bay Cave. These include systematic bladelet production, the occurrence of numerous bladelet cores, and few

formal tools (Table 3:1). There appears to be widespread acceptance that ouils écaillés, pièces esquillées, scaled pieces and core-reduced pieces are worked out bipolar cores or, the product of bipolar flaking (Parkington pers. comm.). Fewer formal tools, a hallmark of Robberg assemblages (Deacon, J. 1978, 1984a, b), are found in the Umhlatuzana Rock Shelter Layers 13-4 assemblages when compared to the underlying transitional MSA/LSA, late MSA, and overlying Holocene assemblages.

Yet, systematic bladelet production pre-dates 18 000 BP at Umhlatuzana Rock Shelter. These results are at variance with the sequence described by J. Deacon (1978, 1984b) from Nelson Bay Cave and Boomplaas Cave in the southern Cape. These observations have significant implications for our understanding of the culture-stratigraphic record in South Africa.

The preferred model follows the suggestion, made by Parkington (1980), that stone artefact change is seen as continuous, and variability as "reflections of activity differences from place to place" (Parkington 1980:73). Parkington (1984) has argued, that change was a response to peoples' needs such as raw materials and food, in addition to a range of social factors.

Naturally backed knives (NBK's) occur in the late Robberg (Layers 8-4) at Umhlatuzana Rock Shelter. NBK's have been found at Elands Bay Cave where they date to between 13 600 and 9000 BP (Parkington pers. comm.). Parkington (1984) argues that the Robberg assemblages of the Cape Province should be seen as marginal to and contemporary with a focus of

settlement located in the interior of South Africa, and termed the Lockshoek Industry (Sampson 1974). This industry has the NBK as its 'type-tool' and bladelet production is absent. Parkington (1984) argues that the use of quartz in the Robberg was a response to the lack of suitable available raw materials such as hornfels. Mitchell (1988a), however, has shown that only one NBK was recovered from Sehonghong, ironically in a hornfels-rich area. Unlike the Lockshoek Industry, bladelet production is characteristic of the lithic technology in Layers 8-4 (Table 3:1). The association of NBK's with bladelets indicates that these artefacts were part of the same tool-kit. The character of an assemblage and differences between assemblages may therefore not depend primarily on the availability of raw materials, but on the choice of raw material.

Mitchell (1988a:225) has pointed out that "without exception" the oldest Albany assemblages are dated to not later than 1400 years after the final Robberg occurrence. Parkington (1984:129) has noted that the period following the Robberg in the southern Cape was not as rapid as has sometimes been claimed. He has shown that the period after 12 000 BP in the southern Cape was followed by a hiatus in occupation. Parkington (1980) also argues out that

"regardless of the strong evidence for chronological change in toolkits, the boundaries between plateaux (the episodes of rapid change or positive feedback) have tended to be drawn along significant time breaks" (Parkington 1980:81).

The Robberg and Albany share several common features (especially when compared with later Holocene Wilton assemblages), such as low formal tool composition, bladelet cores and unmodified bladelets, and flake size distributions. At Elands Bay Cave, a phasing out of the late Pleistocene bladelet technology "suggests drift rather than a plateau" (Parkington 1980:81, also see Parkington 1984, 1986).

The continuity between the early Holocene and underlying Late Pleistocene bladelet assemblages at Umhlatuzana Rock Shelter invalidates the claim made by H.J. Deacon (1976) for a rapid, punctuated pattern of stone artefact change. Bladelet production in the Holocene occurs at Ravenscraig Rock Shelter in the north-eastern Cape (Opperman 1987) at  $10\ 200 \pm 100$  BP (Pta-3451), at  $6870 \pm 60$  BP (Q-3174), at Sehonghong in Lesotho (Carter et al. 1988), and at  $9570 \pm 450$  (Pta-004) at Siphiso Shelter in Swaziland (Barham 1989). Thus, there is evidence which suggests that there may be some regionality to the continuation of post-10 000 BP bladelet production in the north-east of the country. J. Deacon (1988:153), however, has also pointed out that post-12 000 BP bladelet production occurs at Nelson Bay Cave and Boomplaas Cave in the southern Cape. In time, more sites may be excavated which will produce post-12 000 BP bladelet assemblages.

The Robberg/Albany technological response does not coincide with the timing of the change from larger to smaller mammals. Indeed, the changeover from large to small bovids actually postdates the transition from the Robberg to the Albany (Deacon, J. 1984b:287). In Layer 4 at Umhlatuzana Rock

Shelter, dated to 9180 BP, both large and large-medium sized bovids occur alongside small-medium and small sized bovids, thus supporting the above scenario.

The disappearance of systematic bladelet production by 12 000 BP, or shortly thereafter, implies the replacement of death spears by bone-tipped bow and arrow. Coinciding with the virtual disappearance of unmodified bladelets in the terminal Pleistocene is the appearance of many more worked bone implements, including bone points (Deacon, J. 1984a). Only one bone point was found in the Late Pleistocene deposits at Umhlatuzana Rock Shelter, compared to ten in the Holocene deposits (Table 4:1).

Various animal species became extinct between 12 000 and 9500 years ago (Klein 1984:557). These included the giant buffalo (Pelorovis antiquus), the giant hartebeest (Megalotragus priscus), the Cape horse (Equus capensis) and the southern springbok (Antidorcas australis). Klein (1983) has argued that the development of the bow and arrow was a principle factor in the extinction of these large mammals at the end of the Pleistocene. This represented a technological advance in the ability of hunters to take a much wider range of game which included both large, medium and small bovids. It was, he suggested, not environmental stress alone which brought about the terminal Pleistocene extinctions, but a combination of environmental stress and technological improvements (Klein 1980, 1983, 1984).

In considering the relationship between environmental change and artefact assemblage change after 12 000 BP, J. Deacon (in press) has noted that

"Technological changes, on the one hand, occurred at irregular intervals apparently independently of environmental factors. This means that we cannot infer changes in environment and economy from changes in an artefact sequence and it gives general support to the historical materialist stance that changes in technology (the forces of production) do not necessarily coincide with and do not precipitate a change in the relations of production (ideology and the related systems of kinship and distribution of food and material)" (Deacon, J. in press).

Indeed, J. Deacon (1988) submits

"that there is little evidence to support any hypothesis that environment determines technology or that environmental change stimulates technological change in any direct way" (Deacon, J. 1988:155).

It is clear that the ecological approach, which has dominated LSA archaeological research since the 1960's, has its limitations (Mazel 1985, 1987, 1988a, 1989).

Nevertheless, a body of information in understanding human history has been generated by studies of past environments, since the mid-1960's (Deacon, H.J. 1972, 1976, 1983, 1987; Deacon, H.J. & Brooker 1976; Deacon, H.J. & Thackeray, J.F. 1984; Deacon, J. 1984a; Deacon, J. et al. 1984; Deacon, J. & Lancaster 1988). But it has been argued (Mazel 1985, 1987, 1988a, 1989) that environmental information is merely a means to an end in archaeological studies; the end being the study of people and society, the means being the use of an appropriate social framework to realise this.

## Hunter-gatherers and farmers

The final section of this chapter considers the relationship between hunter-gatherers and farmers in the coastal and inland regions around Umhlatuzana Rock Shelter. Material culture remains of farming community origin (e.g. pottery) were recovered from Maud's sounding in 1982. The 1985 excavation generated important contextual data which enabled an investigation into this aspect of LSA history. Mazel (1986a, 1988a) has written in some detail about hunter-gatherer/farmer interaction during the final 2000 years of hunter-gatherer settlement in the central Thukela Basin. Maggs (1980, 1984b, c) and Whitelaw (pers. comm.) have recovered LSA cultural items such as bone points, linkshafts, stone adzes, scrapers, flakes and ostrich eggshell beads on EIA farming sites in Natal. Maggs and Ward (1980) also recovered LIA material culture remains and domesticated plant foods from the LSA site at Driel Shelter. Rock painting studies (Manhire *et al.* 1986) have also generated information on the changing social relations between these two economic and cultural groups. A corpus of information on interaction between hunter-gatherers and farmers therefore exists in Natal.

From the material cultural patterning there is no reason to believe that the relationship between the Umhlatuzana Rock Shelter hunter-gatherers and farming communities living in the region was any different from that between the hunter-gatherers and farmers of the central Thukela Basin. A close inspection of the inter-assemblage material culture patterning in the most recent deposits, however, may point towards a

further understanding of the history during this period.

It has been established that EIA and LIA pottery have been identified at Umhlatuzana Rock Shelter, and we may now suggest what the nature of hunter-gatherer/farmer relationships may have been.

The Umhlatuzana Rock Shelter Layer 2 pottery was identified as EIA. I believe that the inhabitants of the site during this time were hunter-gatherers who were interacting with farming communities. Items of material culture that signify this relationship include the pottery remains and beads from freshwater snails, traditional items of farming community material culture. Judging from the ceramic styles and decorative motifs of the Layer 2 pottery, the period covered was probably AD 400-AD 800 (Maggs pers. comm.), the same period considered by Mazel (1986a, 1988a).

The Layer 1 pottery at Umhlatuzana Rock Shelter was LIA. The analysis of the material culture from these deposits, and at Shongweni South Cave (Davies 1975), has led me to believe that the final occupants of Umhlatuzana Rock Shelter may have been displaced farmers fleeing the upheavals of the Mfecane in the 1870's (Thompson 1982).

The Mfecane, meaning 'forced migration' (Thompson 1982:391), was a result of the rise of the Zulu kingdom. Disruption and violence was widespread during this time as groups competed with one another for diminishing supplies of grain and cattle. Villages were abandoned, political entities were destroyed, new groups came into being and, in turn, dissolved. During

these widespread social upheavals farming people may have occupied caves or rock shelters as temporary refugia, and cultural patterning in the archaeological record may reflect this.

The cultural remains from Layers 2 and 1 at Umhlatuzana Rock Shelter are so different (similar amounts of deposit were removed from each layer) that they imply that the occupations that gave rise to them were quite different. In Layer 2 for example, more than 11 500 pieces of artefactual stone were recovered, including over 41 formal tools, while in Layer 1 less than 3000 artefacts, including three formal tools, were found (Table 3:13). The frequency of cores and the differences among the non-lithic artefacts recovered from Layers 2 and 1 is highly significant (Table 3:13). Ten worked bone tools and eight ostrich eggshell beads (both traditional items of hunter-gatherer material culture) were recovered from Layer 2, while none were found in Layer 1 (Table 4:1 & 4:2). Landsnail shell beads, common on farming sites, are the only beads found in Layer 1.

The most recent deposits at Shongweni South Cave (Davies 1975) share almost identical features with Umhlatuzana Rock Shelter Layer 1. Well preserved remains of domesticated cultigens were recovered from these deposits, and there were also pits (Hall & Vogel 1980). The stone artefact assemblage is very small, and LIA pottery was recovered. Seven beads, all made from the shell of landsnails, and only two minimally polished bone implements, came from the upper occupation at Shongweni South Cave (Davies 1975:646).

Stone-walled caves have been located in the southern Natal Drakensberg (Mazel pers. comm), which may have been occupied by displaced farmers, and at Border Cave (Beaumont 1978) a terminal LIA occupation was uncovered. Empty storage pits at Border Cave may, according to Beaumont (1978), represent food caches and the use of the cave as a temporary refuge during the upheavals. At Sibudu Shelter near the mouth of the Tongaat River, a LIA occupation immediately overlay a MSA occupation, and the cultural material recovered included pottery, slag, iron and shell beads (Mazel pers. comm.). Sibudu Shelter may also have been a refuge for displaced farmers. Although there is no written record that Iron Age farmers occupied caves or rock shelters during precolonial times, there are historical accounts of farmers occupying caves and rock shelters during the Anglo-Boer War between 1879 and 1884 (Guy 1979; Dlamini 1982).

In conclusion, there is some evidence that the final occupants of Umhlatuzana Rock Shelter may have been displaced farmers fleeing the disruptions caused by the Mfecane, and that Shongweni South Cave (Davies 1975), Border Cave (Beaumont 1978) and Sibudu Shelter reflect a similar refuge situation. Stone walled caves in the southern Drakensberg may also reflect a pattern of occupation during this time. I suspect that a number of sites in the well vegetated kloofs of the coastal zone and further inland as well as in northern Natal and KwaZulu will similarly reflect this type of refuge situation, particularly in areas where rock shelters or overhangs are located. Systematic excavations of these sites

and the fine dating of deposits, coupled with research oriented towards this study, would test this hypothesis.

## CHAPTER SEVEN

### CONCLUSION

This chapter summarises the major conclusions arising from the analysis of the stone artefact assemblages at Umhlatuzana Rock Shelter.

The value of Umhlatuzana Rock Shelter is in providing evidence for the continuity in MSA and LSA technology. The microlithic flaking tradition has its origins in the MSA. This can be demonstrated by the emphasis on bladelet production, which is visible from the earliest MSA assemblages until the Holocene LSA (Fig. 3:2, Kaplan 1989b). The metrical analysis has shown that there is a consistent reduction in the mean length of bladelets and bladelet cores between the MSA and LSA (Figs. 3:9-3:12, Appendix, Tables 25-28). Consequently, it has been argued that the origins of the early microlithic bladelet assemblages of the Late Pleistocene are in the local MSA. Our understanding of the nature of the MSA and early microlithic LSA assemblages in southern Africa therefore needs to be revised in the light of these results.

In Chapter 2 it was argued that the Upper and lower Late Pleistocene deposits at Umhlatuzana Rock Shelter were displaced by rotational slipping. A detailed analysis of the stone artefacts was undertaken in order to understand the sequence. This included the analysis of the stone artefacts and raw material frequencies of the waste materials of each unit in individual squares (Appendix, Tables 1-24). Figure 2:3 shows that there is an internal consistency between the raw

material composition of the waste component in the slipped and stable deposits, revealing that the sequence was only minimally affected by rotational slipping. The distribution of hollow-based points in Layers 18-16, and the radiocarbon dating of the lower Late Pleistocene deposits, provided further independent confirmation that a dislocation of the deposits had taken place.

Three themes have been addressed in this thesis: the MSA/LSA transition, the early microlithic bladelet assemblages of the Late Pleistocene, and the relationship between hunter-gatherers and farmers.

There are two sets of opinions about the dating of the MSA/LSA transition: the final occurrence of MSA assemblages in southern Africa took place (1) sometime between 30 000 and 20 000 BP (Deacon, H.J. 1979; Price-Williams & Watson 1982; Carter et al. 1988; Wadley 1986b; Mitchell 1988a, b) or, (2) even earlier, between 60 000 and 40 000 BP (Beaumont & Vogel 1972; Beaumont 1978; Beaumont et al. 1978).

The results of the analysis of material from Umhlatuzana Rock Shelter have been compared with the two current MSA/LSA models in southern Africa, that of Mitchell (1988a, b) and Beaumont (1978). The results show that bladelet production was a significant feature of the earliest MSA assemblages at Umhlatuzana Rock Shelter (Fig 3:2, Kaplan 1989b), and that fine-grained quartz was used prior to the onset of the LSA. Although Mitchell (1988a) argues that the transition to a microlithic LSA technology was rapid and coincided with a

time-stressed environment between 25 000 and 18 000 BP, the Umhlatuzana Rock Shelter results show that the MSA/LSA transition had its microlithic origins in the MSA.

Beaumont and others (Beaumont & Vogel 1972; Beaumont 1978; Beaumont et al. 1978) argue that the MSA/LSA transition took place at an even earlier date, between 60 000 and 40 000 BP at Border Cave. Apart from Beaumont's (1978) own admission that three out of the six criteria, which, according to him, characterise the Early LSA, have not been met at Border Cave, it has been shown that the other three criteria are not met either. They occur not only in the MSA at Umhlatuzana Rock Shelter (Kaplan 1989b), but occasionally in other MSA assemblages too, for example at Montagu Cave (Keller 1973), Apollo 11 (Wendt 1976), Klasies River Mouth (Singer & Wymer 1982), Rose Cottage Cave (Wadley & Harper 1989), Sehonghong (Carter et al. 1988), Moshebis Shelter (Carter 1978) and even at Border Cave (Beaumont 1978). The six criteria are thus not good indicators of the Early LSA as they appear in the MSA as well. Ironically, their appearance supports the notion of MSA to LSA continuity.

The analysis of the Umhlatuzana Rock Shelter stone artefact assemblages, show that the MSA/LSA transition took place sometime between Layers 18-14, that is, between 35 000 and 20 000 BP. There is a consistent increase in bladelet production (Fig. 3:2) between these layers, a change in raw material usage (Fig. 3:5), and the gradual disappearance of traditional MSA elements, including blade points, flakes with

faceted platforms and prepared core technique. A true LSA industry was present as late as 20 000 BP when systematic bladelet production is apparent, and rare examples of beads, ground bone, notched bone and engraved ostrich eggshell are found. The appearance of these items of material culture in archaeological deposits, dated to between 30 000 and 20 000 BP, may signify social responses rather than environmental adaptations. They may point to the importance of considering changes in hunter-gatherer social organisation and the link between technological and social change as a central theme in the MSA/LSA transition.

It was therefore suggested that social, rather than environmental factors determined the pace, timing and nature of the MSA/LSA transition. Environments probably did influence the process of transition, but acted as a constraining factor, not as a determining factor in change.

Traditionally, the criteria used to demonstrate changes in stone artefact sequences in southern Africa have been technological changes and attributes. While it has been shown that the use of such criteria is valid, there is a need to move beyond a techno-economic model to understand the nature of change. A consideration of social factors can contribute towards a richer understanding of the nature of MSA and Early LSA populations. It is, however, beyond the scope of this thesis to attempt to link technological and social change as a theme in the MSA/LSA transition. It is a theme that should be considered in future research.

I have argued that it is not appropriate to speak of a MSA/LSA boundary at Umhlatuzana Rock Shelter, nor at any other site where claims for an Early LSA have been made. The concept of a boundary implies a break or a discontinuity between two different sets of assemblages. It is clear that no discontinuity occurred but that MSA assemblages containing flakes with faceted platforms, blade points and disc cores, were gradually replaced by assemblages characterised by systematic bladelet production.

Late Pleistocene bladelet-rich assemblages occur most commonly between 18 000 and 12 000 BP in the southern Cape (Deacon, J. 1984a, b, 1988, in press), the southwestern Cape (Davis 1980) and Lesotho (Carter et al. 1988; Mitchell 1988a). Systematic bladelet production both pre-dates 18 000 BP and post-dates 12 000 BP at Umhlatuzana Rock Shelter, showing that early and late assemblages of this kind were produced in Natal. It has been pointed out, however, that bladelet production both predates 18 000 BP and postdates 12 000 BP at Sehonghong (Carter et al. 1988), Rose Cottage Cave (Wadley & Harper 1989), Nelson Bay Cave and Boomplaas Cave (Deacon, J. 1978, 1984b), while pre-18 000 BP bladelet production occurs at Cave James (Wadley pers. comm.). Post-12 000 BP bladelet production has been reported from Ravenscraig Rock Shelter (Opperman 1987) and Siphiso Shelter (Barham 1989). There is evidence which suggests that there is some regionality to the continuation of bladelet production after 10 000 BP, centered in the north-east of the country. These results thus invalidate claims made for a rapid, punctuated change of different sets of assemblages between the Late Pleistocene and

early Holocene (Deacon, H.J. 1976), and confirm the model of continuity. The metrical results of bladelets and bladelet cores also corroborate the continuity model.

A distinction was made at Umhlatuzana Rock Shelter between an early Robberg assemblage, where naturally backed knives (NBK's) are absent, and a late Robberg assemblage, where NBK's are present. Differences in the percentage frequencies of single platform cores, bladelets, and outils écaillés (Table 3:1), as well as the incidence of scrapers and MRP's (see Chapter 3), have also been shown to occur between the early and late Robberg. The terms early and late Robberg are not used to imply discontinuity, but to highlight observed differences between assemblages.

The presence of NBK's associated with bladelet production in the late Robberg layers suggests that these artefacts were part of the same tool kit, contemporary with the Lockshoek Industry (Sampson 1974) of the South African interior (Parkington 1984), where bladelet production is absent and where the NBK is the 'type tool'. Parkington (1984) argued that the use of quartz in the Robberg was a response to a lack of suitable available raw materials such as hornfels. The Umhlatuzana Rock Shelter results show that the character of an assemblage, and differences between assemblages, depends as much on human selection as on the availability of raw materials.

There are no major differences in the animal species represented in the Late Pleistocene (Robberg) and early Holocene deposits at Umhlatuzana Rock Shelter. Large grazers

occur in both deposits, and it is only in the late Holocene (Layers 2-1) that small browsers dominate the faunal assemblage (Table 5:1). Similar results were noted by Mitchell (1988a), while Klein (1983) argued that hafted bone points replaced stone-tipped death spears as projectile points during this time.

Bladelet production is a significant feature of the early Holocene assemblages at Umhlatuzana Rock Shelter, and it coincides with an increase in the number of bone points (Table 4:1). Bladelets may have been used as multiple inserts in death spears during the Late Pleistocene (Deacon, H.J. 1983; Parkington 1984; Mitchell 1988a, b), but may have changed their function to cutting tools in the early Holocene. The fact that the mean length of bladelets increases in the Umhlatuzana Rock Shelter terminal Robberg, and elsewhere, may be evidence for a functional change in these tools. Alternatively, both bone and stone projectile points may have been used during the terminal Pleistocene/early Holocene.

The final theme addressed in this thesis was that of the relationship between hunter-gatherers and farmers at Umhlatuzana Rock Shelter. Pottery was found in both Layers 2 and 1 (EIA in Layer 2 & LIA in Layer 1), which implied a relationship between two groups with different economic, cultural and social status. It was shown in Chapter 6 that the lithic and non-lithic cultural assemblages of Layers 2 and 1 were so different that social groups seem to be implied. The frequencies of formal tools and cores in Layers 2 and 1 are equally different (Table 3:13), and most of the worked bone

tools and the majority of ostrich egg-shell beads (both traditional items of hunter-gatherer material culture), came from Layer 2 (Tables 4:1 & 4:2). Achatina shell beads, traditional items of farming community material culture (Maggs 1982), were recovered from Layer 1 only, while domesticated maize and bottle gourd were also recovered from this layer.

It was shown that the most recent deposits at Shongweni South Cave (Davies 1975) and at Umhlatuzana Rock Shelter shared similar features. This evidence led to the conclusion that the Layer 2 occupants at Umhlatuzana Rock Shelter were hunter-gatherers who were involved in a relationship with farmers, while the final occupants of the site, as well as of the Shongweni South Cave, were displaced farmers who fled from the upheavals caused by the Mfecane in the 1800s (Thompson 1982). The most recent deposits at Sibudu Shelter (Mazel pers. comm.) and Border Cave (Beaumont 1978) may reflect a similar pattern of occupation. Small rock shelters with defensive walling in the southern Drakensberg may also reflect a response to a period of social tension during this time.

Umhlatuzana Rock Shelter represents a detailed and complex expression of hunter-gatherer settlement in Natal. The sets of assemblages at the rock shelter reflect the choices made by the inhabitants. The sequence of assemblages sealed in the rock shelter reflect those choices. I have shown that Umhlatuzana Rock Shelter must be located in its specific geographical context, while at the same time highlighting the affinities with contemporary sites elsewhere in southern Africa. The assemblages generated at Umhlatuzana Rock Shelter

should be acknowledged as part of a people's expression of past lifestyles.

The results and conclusions reached from the analysis of the Umhlatuzana Rock Shelter stone artefact assemblages probably raise more questions than they answer in terms of the nature of the MSA and early microlithic LSA assemblages in southern Africa. It is our responsibility as archaeologists and historians to try to find the answers.

## REFERENCES

- Acocks, J. P. H. 1975. Veld types of South Africa. Pretoria: Botanical Survey of South Africa Memoir 40.
- Alexander, J. 1984. Early frontiers in southern Africa. In: Hall, M.J., Avery, G., Avery, D.M., Wilson, M.L., & Humphreys, A.J.B. (eds) Frontiers: southern African archaeology today: 12-23. Oxford: British Archaeological Reports International Series 207.
- Avery, G. 1984. Agencies and numbers: the faunal workshop. In: Hall, M.J., Avery, G., Avery, D.M., Wilson, M.L., & Humphreys, A.J.B. (eds) Frontiers: southern African archaeology today: 329-333. Oxford: British Archaeological Reports International Series 207.
- Barham, L. S. 1987. The bipolar technique in southern Africa: a replication experiment. South African Archaeological Bulletin 42: 45-50.
- Barham, L. S. 1989. A preliminary report on the Later Stone Age artefacts from Siphiso Shelter in Swaziland. South African Archaeological Bulletin 44: 33-43.
- Beaumont, P. B. 1973. The ancient pigment mines of southern Africa. South African Journal of Science 69: 140-146.
- Beaumont, P. B. 1978. Border Cave. Unpublished M.A. thesis: University of Cape Town.

- Beaumont, P. B. & Vogel, J. C. 1972. On a new radiocarbon chronology for Africa south of the equator. Part 1. African Studies 31: 66-89.
- Beaumont, P. B., de Villiers, H. & Vogel, J. C. 1978. Modern man in sub-saharan Africa prior to 49 000 years BP: a review and evaluation with particular reference to Border Cave. South African Journal of Science 74: 401-419.
- Blythe, F. G. H. & de Freitas, M. H. 1974. Geology and the movement of slopes. Edward Arnold.
- Cable, J. H. C., Scott, K. & Carter, P. L. 1984. Excavations at Good Hope Shelter, Underberg District, Natal. Annals of the Natal Museum 24: 1-34.
- Carter, P. L. 1978. The prehistory of eastern Lesotho. Unpublished Ph.D thesis: University of Cambridge.
- Carter, P. L. & Vogel, J. C. 1974. The dating of industrial assemblages from stratified sites in eastern Lesotho. Man 9: 557-570.
- Carter, P. L., Mitchell, P. J. & Vinnicombe, P. 1988. Sehonghong. the Middle and Later Stone Age industrial sequence at a Lesotho rockshelter. British Archaeological Reports International Series 406.
- Childe, V. G. 1929. The Danube in prehistory. Oxford: Oxford University Press.
- Clancey, P. A. 1964. The birds of Natal and Zululand. Edinburgh: Oliver and Boyd.

- Clark, J. D. 1959. The prehistory of southern Africa. Harmondsworth: Penguin.
- Cooke, C. K. 1971. Excavations in Zombepata Cave, Sipolilo District, Mashonaland, Rhodesia. South African Archaeological Bulletin 26: 104-126.
- Davies, O. 1971. Excavations at Blackburn. South African Archaeological Bulletin 26: 165-178.
- Davies, O. 1975. Excavations at Shongweni South Cave. Annals of the Natal Museum 22: 627-62.
- Davis, M. F. 1980. Some aspects of Elands Bay Cave stone artefacts. Unpublished Honours thesis: University of Cape Town.
- Deacon, H. J. 1972. A review of the post-Pleistocene in South Africa. South African Archaeological Society Goodwin Series 1: 26-45.
- Deacon, H. J. 1976. Where hunters gathered: a study of Holocene Stone Age people in the eastern Cape. Claremont: South African Archaeological Society Monograph Series 1.
- Deacon, H. J. 1979. Excavations at Boomplass Cave - a sequence through the Upper Pleistocene and Holocene in South Africa. World Archaeology 10: 241-257.

Deacon, H. J. 1983. The peopling of the fynbos region. In: Deacon, H. J., Hendey, Q. B. & Lamprechts, J. J. N. (eds) Fynbos palaeoecology: a preliminary synthesis. Pretoria: CSIR. South African National Scientific Programmes Report 72: 183-204.

Deacon, H. J. 1987. Late Pleistocene palaeoecology and archaeology of the southern Cape, South Africa. Unpublished paper delivered at a symposium on the Origins and Dispersal of Modern Humans: Behavioural and Biological Perspectives, Cambridge, March.

Deacon, H. J. & Brooker, M. 1976. The Holocene and Upper Pleistocene sequence in the southern Cape. Annals of the South African Museum 71: 203-214.

Deacon, H. J. & Thackeray, J. F. 1984. Late Pleistocene environmental changes and implications for the archaeological record in southern Africa, In: Vogel, J. C. (ed.) Late Cainozoic palaeoclimates of the southern African hemisphere: 375-390. Rotterdam: Balkema.

Deacon, H. J. & Deacon, J. 1986. Late Pleistocene and Holocene climates and human responses. South African Journal of Science 82: 74-75.

Deacon, H. J. & Geleijnse, V. B. 1988. The stratigraphy and sedimentology of the main site sequence, Klasies river, South Africa. South African Archaeological Bulletin 43: 5-14.

- Deacon, J. 1978. Changing patterns in the late Pleistocene\early Holocene prehistory of southern Africa as seen from the Nelson Bay Cave stone artefact sequence. *Quaternary Research* (N.Y.) 10: 84-111.
- Deacon, J. 1984a. Later Stone Age people and their descendants in southern Africa. In: Klein, R. G. (ed.) *Southern African prehistory and paleoenvironments*: 221-328. Rotterdam: Balkema.
- Deacon, J. 1984b. The Later Stone Age of southernmost Africa. Oxford: *British Archaeological Reports International Series* 213.
- Deacon, J. 1988. The scale and timing of technological and environmental changes over the last 20 000 years in the southern Cape Province, South Africa. In: Bower, J. & Lubell, D. (eds) *Prehistoric cultures and environments in the late Quaternary of Africa*: 145-161. Oxford: *British Archaeological Reports International Series* 405.
- Deacon, J. in press. Changes in the archaeological record in South Africa at 18 000 BP. In: Gamble, C. & Soffer, O. (eds) *The late Palaeolithic global record*. London: Unwin.
- Deacon, J. n.d. Typology of the Late Pleistocene and early Holocene industries of the southern Cape with special reference to Nelson Bay Cave.

Deacon, J., Lancaster, N. & Scott, L. 1984. Evidence for Late Quaternary climatic change in southern Africa. In: Vogel, J. C. (ed). Proceedings of the International Symposium on Late Cenozoic palaeoclimates of the southern hemisphere, Swaziland 1983: 391-404. Rotterdam: Balkema.

Deacon, J. & Lancaster, N. 1988. Late Quaternary palaeoenvironments of southern Africa. Oxford: Oxford University Press.

Dlamini, P. 1982. Servant of two kings. University of Natal Press: Pietermaritzburg.

Fox, F. W. & Norwood-Young, M. E. 1982. Food from the veld: edible wild plants of southern Africa botanically identified and described. Johannesburg: Delta Books.

Goodwin, A. J. H. & Van Riet Lowe. 1929. The Stone Age cultures of South Africa. Annals of the South African Museum 27: 1-289.

Guy, J. 1979. The destruction of the Zulu kingdom. Longham: England.

Hall, M. J. 1984. Frontiers in southern Africa. In: Hall, M. J., Avery, G., Avery, D. M., Wilson, M. L., & Humphreys, A. J. B. (eds) Frontiers: southern African archaeology today: 1-12. Oxford: British Archaeological Reports International Series 207.

- Hall, M. & Vogel, J. C. 1980. Some recent radiocarbon dates from southern Africa. *Journal of African History* 21 (4): 431-455.
- Hutchinson, J. N. 1968. Mass movement. In: Fairbridge, R. W. (ed.) *The encyclopedia of geomorphology* vol 111: 688-695. Stordsberg: Dowden, Hutchinson & Ross.
- Jacobson, L. 1987a. The size variability of ostrich eggshell beads from central Namibia and it's relevance as a stylistic and temporal marker. *South African Archaeological Bulletin* 42: 55- 58.
- Jacobson, L. 1987b. More on ostrich eggshell bead size variability: the Geduld herder assemblage. *South African Archaeological Bulletin* 42: 174-175.
- Kaplan, J. M. 1989a. 45 000 years of hunter-gatherer history as seen from Umhlatuzana Rock Shelter. *South African Archaeological Society Goodwin Series* 6: 7-16.
- Kaplan, J. M. 1989b. The Middle Stone Age at Umhlatuzana Rock Shelter with emphasis on Layers 28-22. Unpublished report: Natal Museum, Pietermaritzburg.
- Keller, C. M. 1973. Montagu Cave in prehistory. *University of California Anthropology Records* 28: 1-150.
- Klein, R. G. 1974. Environment and subsistence of prehistoric man in the southern Cape Province, South Africa. *World Archaeology* 5: 249-284.

- Klein, R. G. 1976. The mammalian fauna from the Klasies River Mouth sites, southern Cape Province, South Africa. *South African Archaeological Bulletin* 31: 75-98.
- Klein, R. G. 1978. Stone Age predation on large African bovids. *Journal of Archaeological Science* 5: 195-217.
- Klein, R. G. 1980. Environmental and ecological implications of large mammals from Upper Pleistocene and Holocene sites in southern Africa. *Annals of the South African Museum* 81(7): 223-283.
- Klein, R. G. 1983. The Stone Age prehistory of South Africa. *Annual Review of Anthropology* 12: 25-48.
- Klein, R. G. 1984. Mammalian extinctions and Stone Age people in Africa. In: Martin, P. S. & Klein, R. G. (eds) *Quaternary extinctions: a prehistoric revolution*: 553-574. Tuscon: University of Arizona Press.
- Maggs, T. 1980. Msuluzi Confluence: a seventh century Early Iron Age site on the Tugela River. *Annals of the Natal Museum* 24(1): 111-145.
- Maggs, T. 1984a. Iron Age settlement and subsistence patterns in the Tugela River basin, Natal. In: Hall, M. J., Avery, G., Avery, D. M., Wilson, M. L., & Humphreys, A. J. B. (eds) *Frontiers. southern African archaeology today*: 194-296. Oxford: British Archaeological Reports International Series 207.

- Maggs, T. 1984b. The Iron Age sequence south of the Zambezi. In: Klein, R. G. (ed.) Southern African prehistory and paleoenvironments: 329-360. Rotterdam: Balkema.
- Maggs, T. 1984c. Ndongondwane: a preliminary report on an Early Iron Age site on the lower Tugela River. Annals of the Natal Museum 26(1): 71-93.
- Maggs, T. & Ward, V. 1980. Driel Shelter: rescue at a Later Stone Age site on the Tugela River. Annals of the Natal Museum 24(1): 35-70.
- Manhire, A. J., Parkington, J. E., Mazel, A. D. & Maggs, T. 1986. Cattle, sheep and horses: a review of domestic animals in the rock art of southern Africa. South African Archaeological Society Goodwin Series 5: 22-30.
- Mazel, A. D. 1985. Never mind the answers, are the questions right? An appraisal of research goals and results in the late Holocene Stone Age project of the Thukela Basin. Unpublished paper delivered at the Biennial Conference of the Southern African Association of Archaeologists, Grahamstown, September.
- Mazel, A. D. 1986a. Mbabane Shelter and eSinhlonhlweni Shelter: the last two thousand years of hunter-gatherer settlement in the central Thukela Basin, Natal, South Africa. Annals of the Natal Museum 27: 389-453.

Mazel, A. D. 1986b. Mgede Shelter: a mid and late Holocene observation in the western Biggarsberg, Thukela Basin, Natal, South Africa. *Annals of the South African Museum* 27: 357- 387.

Mazel, A. D. 1987. The archaeological past from the changing present: towards a critical assessment of South African Later Stone Age studies from the early 1960's to the early 1980's. In: Parkington, J. & Hall, M. J. (eds) *Papers in the prehistory of the western Cape, South Africa*: 504-529. Oxford: British Archaeological Reports International Series 332.

Mazel, A. D. 1988a. People making history: the last 10 000 years of hunter-gatherer communities in the Thukela Basin. Unpublished Ph.D thesis: University of Cape Town.

Mazel, A.D. 1988b. Nkupe Shelter: report on excavations in the Biggarsberg, Thukela Basin, Natal, South Africa. *Annals of the Natal Museum* 29(2): 321-377.

Mazel, A. D. 1989. Changing social relations in the Thukela Basin, Natal. 7000-2000 BP. *South African Archaeological Society Goodwin Series* 6: 33-41.

Mazel, A. D. n.d. An assessment of the evidence for a pre-25 000 BP Early Later Stone Age in South Africa.

Miller, S. 1975. *Experimental design and statistics*. London: Methuen.

Mitchell, P. J. 1988a. The early microlithic assemblages of southern Africa. Oxford: British Archaeological Reports International Series 338.

Mitchell, P. J. 1988b. The origins of the early Later Stone Age: a model for the MSA/LSA transition. Unpublished conference paper Southern African Association of Archaeologists.

Moll, E. J. 1976. The vegetation of the Three Rivers Region, Natal. Natal Town and Regional Planning Reports 33: 1-127.

Opperman, H. 1987. The Later Stone Age of the Drakensberg range and it's foothills. Oxford: British Archaeological Reports International Series 339.

Palgrave, K. C. 1977. Trees of southern Africa. Cape Town: Struik.

Parkington, J. E. 1980. Time and place: some observations on spatial and temporal patterning in the Later Stone Age sequence in southern Africa. South African Archaeological Bulletin 34: 73-83.

Parkington, J. E. 1984. Changing views of the Later Stone Age in South Africa. In: Wendorf, F. & Close, A. (eds) Advances in World Archaeology 3: 89-142. New York: Academic Press.

Parkington, J. E. 1986. Stone tool assemblages, raw material distributions and prehistoric subsistence activities: the Later Stone Age of southern Africa, In: Bailey, G. W. & Callow, P. (eds) Stone Age prehistory: 181-194. Cambridge: Cambridge University Press.

Price-Williams, D. & Watson, A. 1982. New observations on the prehistory and palaeoclimate of the late Pleistocene in southern Africa. World Archaeology 13: 372-381.

Robey, T. 1980. Mpambanyoni: a Late Iron age site on the Natal south coast. Annals of the Natal Museum 24: 147-164.

Sampson, C. G. 1974. The Stone Age cultures of southern Africa. New York: Academic Press.

Singer, R. & Wymer, J. 1982. The Middle Stone Age at Klasies River Mouth in South Africa. Chicago: University of Chicago Press.

Skead, C. J. 1980. Historical mammal incidence in the Cape Province. Vol. I: The western and northern Cape. Cape Town: Department of Nature and Environmental Conservation of the Provincial Administration of the Cape of Good Hope.

Stapleton, P. & Hewitt, J. 1927. Stone implements from a rock-shelter at Howieson's Poort near Grahamstown. South African Journal of Science 24: 574-587.

- Stapleton, P. & Hewitt, J. 1928. Stone implements from Howieson's Poort, near Grahamstown. South African Journal of Science 25: 399-409.
- Thompson, L. 1982. Co-operation and conflict: the High Veld. In: Wilson, M & Thompson, L. (eds) A history of South Africa to 1870: 391-405. Cape Town: David Philip.
- Thompson, L. & Lamar, H. 1981. Comparative frontier history. In: Lamar, H. & Thompson, L. (eds) The frontiers in history: North America and South Africa compared: 3-13. London: Yale University Press.
- Torrence, R. 1983. Time-budgeting and hunter-gatherer technology. In: Bailey, G. N. (ed). Hunter gatherer economy in prehistory: a European perspective: 11-22. Cambridge: Cambridge University Press.
- Van Noten, F. 1977. Excavations at Matupi Cave. Antiquity 51: 35-40.
- Volman, T. P. 1981. The Middle Stone Age in southern Africa. Unpublished Ph.D. thesis: University of Chicago.
- Volman, T. P. 1984. Early prehistory of southern Africa. In: Klein, R. G. (ed.) Southern African prehistory and paleoenvironments: 169-220. Rotterdam: Balkema.
- Wadley, L. 1986a. A social and ecological interpretation of the Later Stone Age in the southern Transvaal. Unpublished Ph.D. thesis: University of the Witwatersrand.

- Wadley, L. 1986b. Segments of time: a mid-Holocene Wilton site in the Transvaal. *South African Archaeological Bulletin* 41: 54-62.
- Wadley, L. & Harper, 1989. Rose Cottage cave revisited: Malan's Middle Stone Age collection. *South African Archaeological Bulletin* 44: 17-22.
- Ward, V. & Maggs, T. The slipped disc: a guide to the identification of shell disc-beads. *Annals of the Natal Museum* 29(2): 407-416.
- Watt, J. M. & Breyer-Brandwijk, M. G. 1962. Medicinal and poisonous plants of southern and eastern Africa. 2nd ed. Edinburgh: E. & S. Livingstone.
- Wendt, W. E. 1972. Preliminary report on an archaeological programme in South West Africa. *Cimbebasia B* 2(1): 1-61.
- Wendt, W. E. 1976. 'Art Mobilier' from the Apollo 11 Cave, South West Africa: Africa's oldest dated works of art. *South African Archaeological Bulletin* 31: 5-11.
- Yates, R. J. 1988. Patterning in ostrich eggshell bead assemblages in the southwestern Cape. Unpublished Archaeology additional project: University of Cape Town.
- Zaloumis, E. A. & Cross, R. 1974. A field guide to the antelope of southern Africa. Wildlife Society of Southern Africa.

**APPENDIX**

Table 1 Umhlatzana Rock Shelter: stone artefact frequencies in the RBS J2 units.

Table 1

	RBSA		RBS II		RBS III		RBS IV		RBS V		RBS VI		RBS VII		RBS VIII		RBS IX		RBS X		RBS XI		RBS XII		RBS XIII		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Waste	6714	98.50	4721	98.68	4405	98.97	4759	98.29	3902	98.96	7164	97.31	2408	98.05	7475	98.45	7963	98.87	13 228	99.02	16 298	99.55	8631	99.76	10 933	99.74	
Chips, chunks and flakes	17	0.25	10	0.21	8	0.18	3	0.06	3	0.08	9	0.12	1	0.04	4	0.05	6	0.07	14	0.10	9	0.05	2	0.02	2	0.02	
Irregular cores	23	0.34	14	0.29	15	0.34	39	0.81	18	0.46	87	1.18	26	1.06	52	0.68	40	0.50	61	0.46	28	0.17	13	0.15	6	0.05	
Single platform cores	3	0.04	6	0.13	2	0.04	2	0.04	2	0.05	5	0.07	3	0.12	9	0.12	6	0.07	13	0.10	3	0.02	-	-	-	-	
Bipolar cores	58	0.85	33	0.69	20	0.45	38	0.78	18	0.46	90	1.22	17	0.69	50	0.66	38	0.47	38	0.28	28	0.17	4	0.05	18	0.16	
Bladelets	-	-	-	-	-	-	-	-	-	-	7	0.10	1	0.04	3	0.04	1	0.01	5	0.04	4	0.02	2	0.02	3	0.03	
Blades	1	0.01	-	-	1	0.02	1	0.02	-	-	-	-	1	0.04	-	-	-	-	-	-	1	0.01	-	-	-	-	
Grindstone fragments	6816	99.72	4784	99.69	4451	99.61	4842	99.69	3943	99.87	7362	99.77	2456	99.96	7593	99.96	8054	99.98	13 359	99.98	16 371	99.91	8652	99.80	10 962	99.79	
Total	6835		4793		4465		4861		3948		7379		2457		7596		8064		13 362		16 366		8669		10 985		
Utilised	4	23.53	-	-	6	50.00	12	75.00	3	100.00	11	73.33	1	100.00	1	100.00	5	55.55	-	-	2	33.33	1	14.28	-	-	
Outils écaillés	12	70.59	7	100.00	6	50.00	4	25.00	-	-	4	26.66	-	-	-	-	4	66.66	-	-	4	66.66	6	85.71	9	100.00	
Utilised flakes	1	5.88	7	0.25	12	0.33	16	0.27	3	0.08	15	0.20	1	0.04	1	0.04	9	9	-	-	6	6	7	7	7	7	
Grindstones	17		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	6835		4793		4465		4861		3948		7379		2457		7596		8064		13 362		16 366		8669		10 985		
Formal	-	-	-	-	1	50.00	1	33.33	-	-	1	50.00	-	-	-	-	-	-	-	1	33.33	2	22.22	2	20.00	-	-
Scrapers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Backed points	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Backed blades	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Miscellaneous backed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Miscellaneous backed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Segments	1	50.00	-	-	-	-	-	-	-	-	-	-	-	-	1	50.00	-	-	-	-	-	-	2	20.00	-	-	
Azdes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10.00	-	-	
Miscellaneous retouched	1	50.00	2	100.00	1	50.00	2	66.66	2	100.00	-	-	-	-	-	-	-	-	-	-	-	-	4	40.00	6	42.86	
Pieces	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unifacial points	-	-	-	-	-	-	-	-	-	-	1	50.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bifacial points	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hollow-based points	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	2	0.03	2	0.04	2	0.06	3	0.06	2	0.05	2	0.03	2	0.03	2	0.03	1	0.01	3	0.02	9	0.05	10	0.12	14	0.13	
UNIT Total	6835		4793		4465		4861		3948		7379		2457		7596		8064		13 362		16 366		8669		10 985		

RBS XIV			RBS XV			RBS XVI			RBS XVII			RBS XVIII			RBS XIX		
n	% Category	UNIT Total	n	% Category	UNIT Total	n	% Category	UNIT Total	n	% Category	UNIT Total	n	% Category	UNIT Total	n	% Category	UNIT Total
19	99.33		27	99.86		11	99.93		5411	99.89		7774	99.73		12	930	99.75
21	0.10		5	0.02		-	-		4	0.07		8	0.10		9	0.07	
25	0.12		11	0.04		1	0.01		-	-		1	0.01		5	0.04	
1	0.01		1	0.01		3	0.02		1	0.02		1	0.01		4	0.03	
19	0.09		11	0.04		5	0.04		-	-		3	0.04		9	0.07	
6	0.03		7	0.02		-	-		-	-		8	0.10		5	0.04	
2	0.10		5	0.02		-	-		1	0.02		-	-		-	-	
20	0.46	99.71	27	918	99.78	12	006	99.71	5417	99.52	7795	99.85	12	952	99.73		
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	100.00		26	100.00		13	100.00		6	100.00		6	100.00		10	100.00	
34	0.17		26	0.09		13	0.11		6	0.11		6	0.08		10	0.08	
2	8.00		1	2.85		-	-		4	20.00		1	16.66		1	4.00	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	1	4.54		-	-	-	-	-	-	6	24.00	
1	4.00		-	-	-	-	-	-	2	10.00		1	16.66		4	16.00	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	48.00		17	48.57		10	45.45		9	45.00		3	50.00		9	36.00	
4	16.00		11	31.42		9	40.90		5	25.00		1	16.66		4	16.00	
5	20.00		6	17.14		2	9.09		-	-		-	-		-	-	
1	4.00		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	0.12		35	0.13		22	0.18		20	0.37		6	0.08		25	0.15	
20	105		27	979		12	041		5443		7807		12	997			

Table 2 Umhlatuzana Rock Shelter: stone artefact frequencies in the RBS K2 units.

RBS VII	RBS VIII	RBS IX	RBS X	RBS XI	RBS XII	RBS XIII	RBS XIV	RBS XV	RBS XVI	RBS XVII	RBS XVIII	RBS XIX
n	n	n	n	n	n	n	n	n	n	n	n	n
% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory
UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total
5114	2810	8159	13884	17229	10203	9562	16566	21261	20249	6656	7455	14792
98.42	97.60	96.84	98.85	99.05	99.12	99.43	99.53	99.72	99.83	99.81	99.06	99.24
3	1	9	14	20	14	5	19	8	4	10	9	59
0.06	0.03	0.11	0.10	0.11	0.14	0.05	0.11	0.04	0.02	0.15	0.12	0.40
35	21	61	65	53	25	12	24	20	8	1	11	8
0.67	0.73	0.34	0.46	0.30	0.24	0.12	0.14	0.09	0.04	0.01	0.15	0.05
5	2	7	13	7	2	-	5	4	-	2	36	3
0.52	0.07	0.08	0.09	0.04	0.02	0.25	0.03	0.03	0.07	0.03	0.48	0.02
32	43	15	58	65	39	24	26	21	15	2	13	23
1.49	1.49	0.18	0.41	0.37	0.38	0.11	0.15	0.10	0.07	-	0.17	0.15
7	2	4	11	20	5	3	3	7	7	-	2	20
0.13	0.07	0.05	0.08	0.11	0.05	0.02	0.02	0.03	0.03	-	0.03	0.13
5196	2879	8255	14045	17395	10288	9617	16744	21321	20283	6669	7526	14905
-	-	-	-	-	-	-	-	-	-	-	-	-
99.67	99.90	99.96	99.87	99.93	99.79	99.71	99.59	99.66	99.76	99.63	99.76	99.77
12	2	3	2	4	11	2	1	1	10	6	9	12
80.00	100.00	50.00	50.00	100.00	100.00	111.76	3.57	2.94	100.00	100.00	100.00	100.00
3	2	3	2	4	11	15	27	33	10	6	9	12
20.00	-	50.00	50.00	100.00	100.00	88.23	96.42	97.05	100.00	100.00	100.00	100.00
15	2	6	4	4	11	17	28	34	10	6	9	12
-	0.29	0.07	0.07	0.03	0.11	0.18	0.17	0.16	0.05	0.09	0.12	0.08
-	-	-	-	-	-	-	-	-	-	-	-	-
-	1	1	-	-	-	-	-	3	1	2	2	1
-	108.00	20.00	-	-	-	-	2.44	7.89	3.03	10.53	22.22	4.35
-	-	-	-	-	-	-	1	1	-	-	-	1
-	-	-	-	-	-	-	1	2.63	-	-	-	1
-	-	-	-	-	-	-	7	5.26	3	-	-	1
-	-	-	-	-	2	1	17.07	2	9.09	-	1	6
-	-	-	-	-	4	2	4	5	4	2	3	8
-	-	-	-	-	36.36	18.18	9.76	13.16	12.12	10.53	33.33	34.78
-	-	-	-	-	-	-	1	-	-	-	-	1
1	-	2	1	5	-	-	2	-	-	-	-	4
50.00	-	40.00	100.00	62.50	-	-	2.44	-	-	-	-	4.35
-	-	-	-	-	-	-	11	4	7	5	2	4
1	-	2	-	2	4	6	26.83	4	21.21	26.32	22.22	17.39
50.00	-	40.00	-	25.00	36.36	54.55	11	18	14	8	1	2
-	-	-	-	12.50	11.11	-	26.83	47.37	42.42	42.11	11.11	8.70
-	-	-	-	-	-	-	5	4	4	2	-	-
-	-	-	-	-	-	-	12.20	10.53	12.12	10.53	-	-
-	-	-	-	-	-	-	1	-	-	-	-	-
-	-	-	-	-	-	-	2.44	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
2	1	5	1	8	11	11	41	38	33	19	9	23
0.04	0.03	0.06	0.06	0.01	0.11	0.11	0.18	0.16	0.16	0.28	0.12	0.15
5213	2882	8266	14050	17407	10310	9645	16813	21393	20326	6694	7544	14940

	RBS			RBS II			RBS III			RBS IV			RBS V			RBS VI		
	n	% Cate- gory	UNIT Total	n	% Cate- gory	UNIT Total	n	% Cate- gory	UNIT Total	n	% Cate- gory	UNIT Total	n	% Cate- gory	UNIT Total	n	% Cate- gory	UNIT Total
<b>Waste</b>																		
Chips, chunks and flakes	3478	97.29		4782	98.46		4128	98.83		4396	98.85		8144	99.38		6427	98.12	
Irregular cores	16	0.45		10	0.21		8	0.19		3	0.02		4	0.05		2	0.03	
Single platform cores	43	1.20		18	0.37		15	0.36		9	0.20		17	0.21		22	0.34	
Bipolar cores	8	0.22		4	0.08		2	0.05		2	0.04		1	0.01		2	0.03	
Bladelets	30	0.84		40	0.82		24	0.57		35	0.79		29	0.35		93	1.42	
Blades	-	-		-	-		-	-		2	0.04		-	-		4	0.06	
Grindstone fragments	-	-		3	0.06		-	-		-	-		-	-		-	-	
Total	3575		99.33	4857		99.86	4177		99.55	4447		99.80	8195		99.94	6550		99.94
<b>Utilised</b>																		
Outils écaillés	12	52.17		2	50.00		3	23.08		3	60.00		2	50.00		3	75.00	
Utilised flakes	11	47.83		2	50.00		10	76.92		2	40.00		2	50.00		1	25.00	
Total	23		0.64	4		0.08	13		0.31	5		0.11	4		0.05	4		0.06
<b>Formal</b>																		
Scrapers	-	-		-	-		1	16.67		-	-		-	-		-	-	
Backed points	-	-		-	-		-	-		1	25.00		-	-		-	-	
Backed blades	-	-		-	-		-	-		-	-		-	-		-	-	
Miscellaneous backed	-	-		-	-		-	-		-	-		-	-		-	-	
Segments	-	-		-	-		-	-		-	-		-	-		-	-	
Adzes	-	-		-	-		-	-		-	-		1	100.00		-	-	
Miscellaneous retouched pieces	1	100.00		3	100.00		4	66.67		3	75.00		-	-		-	-	
Unifacial points	-	-		-	-		-	-		-	-		-	-		-	-	
Bifacial points	-	-		-	-		-	-		-	-		-	-		-	-	
Hollow-based points	-	-		-	-		-	-		-	-		-	-		-	-	
Natural backed knives	-	-		-	-		1	16.67		-	-		-	-		-	-	
Awls	-	-		-	-		-	-		-	-		-	-		-	-	
Total	1		0.03	3		0.06	6		0.14	4		0.09	1		0.01	-	-	
UNIT Total	3599			4864			4196			4456			8200			6554		

Table 3 Umhlatuzana Rock Shelter: stone artefact frequencies in the RBS J3 units.

	RBS	RBS II	RBS III	RBS IV	RBS V	RBS VI	RBS VII	RBS VIII	RBS IX	RBS X	RBS XI	RBS XII
	n	n	n	n	n	n	n	n	n	n	n	n
	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory	% Cate- gory
	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total	UNIT Total
Waste	1011	2369	2214	3465	3660	1547	2379	4831	3194	3639	8137	7239
Chips, chunks and flakes	6	15	4	5	3	7	6	6	4	3	16	2
Irregular cores	20	41	59	36	45	24	26	36	22	22	28	11
Single platform cores	2	7	6	3	7	3	7	7	3	6	3	-
Bipolar cores	12	77	57	38	29	9	45	45	10	14	24	21
Bladelets	-	-	2	6	5	4	3	10	4	3	17	-
Grindstone fragments	-	1	-	-	-	1	1	10	4	0.08	0.21	-
Total	1051	2510	2342	3553	3749	1591	2460	4935	3237	3688	8225	7274
	99.81	99.84	99.57	99.58	99.55	99.00	99.68	99.86	99.75	99.89	99.84	99.78
Utilised	2	3	7	5	7	5	7	2	4	3	-	1
Outills Écaillés	2	1	1	7	2	6	7	3	1	-	3	6
Utilised flakes	-	1	1	7	2	6	7	3	1	-	3	6
Hammerstones	2	4	8	12	10	11	7	5	5	-	3	7
Total	0.19	0.16	0.34	0.34	0.27	0.68	0.28	0.10	0.15	-	0.08	0.04
	100.00	75.00	87.50	41.67	70.00	45.45	100.00	40.00	80.00	100.00	100.00	14.28
	-	25.00	12.50	58.33	20.00	54.54	100.00	60.00	20.00	-	100.00	85.71
	-	-	-	-	10.00	-	-	-	-	-	-	-
Formal	-	-	-	-	-	-	-	-	-	-	-	-
Scrapers	-	-	-	1	-	1	-	-	-	1	1	-
Backed points	-	-	-	33.33	-	20.00	-	-	-	33.33	16.67	-
Backed blades	-	-	-	-	-	-	-	-	-	33.33	16.67	-
Miscellaneous backed	-	-	-	-	-	-	-	-	1	-	1	-
Segments	-	-	-	-	-	-	-	-	1	-	16.67	-
Azires	-	-	-	1	-	1	-	-	1	-	3	-
Miscellaneous retouched pieces	-	-	-	33.33	-	20.00	-	-	33.33	-	50.00	-
Unifacial points	-	-	1	-	2	1	1	1	-	-	-	4
Bifacial points	-	-	1	-	5	3	1	1	33.33	-	-	2
Hollow-based points	-	-	-	-	-	-	-	-	-	-	-	1
AWs	-	-	-	1	-	-	-	-	-	-	-	1
Total	-	2514	2352	3588	3766	1607	2468	4942	3245	3694	8234	7290
UNIT Total	1053	2514	2352	3588	3766	1607	2468	4942	3245	3694	8234	7290
	-	99.81	99.84	99.57	99.58	99.55	99.68	99.86	99.75	99.89	99.84	99.78
	0.09	0.08	0.09	0.08	0.19	0.31	0.04	0.04	0.09	0.07	0.08	0.12

RBS XIII			RBS XIV			RBS XV			RBS XVI		
n	% Cate- gory	% UNIT Total	n	% Cate- gory	% UNIT Total	n	% Cate- gory	% UNIT Total	n	% Cate- gory	% UNIT Total
3657	99.54		11 387	99.92		16 358	99.90		3211	99.97	
3	0.08		1	0.01		3	0.02		1	0.03	
4	0.11		2	0.02		1	0.01		-	-	
-	-		1	0.01		4	0.02		-	-	
6	0.16		6	0.05		7	0.04		-	-	
3	0.08		-	-		2	0.01		-	-	
1	0.03		-	-		-	-		-	-	
3674	99.22		11 397	99.83		16 375	99.84		3212	99.84	
1	5.26		-	-		-	-		-	-	
18	94.94		10	100.00		10	100.00		3	100.00	
-	-		-	-		-	-		-	-	
19	0.51		10	0.08		10	0.06		3	0.09	
1	10.00		-	-		1	5.88		-	-	
2	20.00		-	-		-	-		-	-	
-	-		-	-		-	-		-	-	
1	10.00		-	-		1	5.88		-	-	
-	-		-	-		-	-		-	-	
4	40.00		1	10.00		6	35.29		1	50.00	
1	10.00		5	50.00		7	41.18		1	50.00	
-	-		4	40.00		2	11.76		-	-	
1	10.00		-	-		-	-		-	-	
-	-		-	-		-	-		-	-	
10	0.27		10	0.08		17	0.10		2	0.06	
3703			11 917			16 402			3217		

Table 4 Umhlatuzana Rock Shelter: stone artefact frequencies in the RBS K3 units.

	RBS	RBS II	RBS III	RBS IV	RBS V	RBS VI	RBS VII	RBS VIII	RBS IX	RBS X	RBS XI												
	n	% Cate- gory	% UNIT Total	n	% Cate- gory	% UNIT Total	n	% Cate- gory	% UNIT Total	n	% Cate- gory	% UNIT Total											
Waste	1999	96.80	99.28	2011	99.41	2570	99.77	1589	99.50	2124	99.48	2592	98.07	2542	98.07	3740	97.75	4720	98.70	4528	99.06	4935	99.28
Chips, chunks and flakes	10	0.48		10	0.39	5	0.15	5	0.15	2	0.09	4	0.15	4	0.15	4	0.10	5	0.10	1	0.02	5	0.10
Irregular cores	18	0.87		29	1.44	16	1.01	16	0.85	15	0.71	22	0.85	22	0.85	26	0.68	37	0.77	13	0.28	16	0.32
Single platform cores	2	0.10		3	0.12	1	0.06	1	0.05	1	0.05	2	0.08	2	0.08	3	0.08	8	0.17	1	0.02	1	0.02
Bipolar cores	32	1.55		52	2.59	82	3.19	21	1.32	18	0.85	20	0.77	49	1.28	49	1.28	10	0.21	21	0.46	10	0.20
Bladelets	2	0.10		2	0.10	4	0.16	9	0.57	3	0.14	2	0.08	4	0.10	4	0.10	2	0.04	7	0.15	4	0.08
Blades	2	0.10		2	0.10	2	0.13	2	0.13	2	0.14	2	0.08	2	0.08	2	0.04	2	0.04	2	0.15	4	0.08
Grindstone fragments	2	0.10		2	0.10	2	0.13	2	0.13	2	0.14	2	0.08	2	0.08	2	0.04	2	0.04	2	0.15	4	0.08
Total	2065	99.28	99.28	2011	99.41	2570	99.77	1589	99.50	2124	99.48	2592	98.07	2542	98.07	3740	97.75	4720	98.70	4528	99.06	4935	99.28
Utilised	1	8.33		2	40.00	2	40.00	2	40.00	5	62.50	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Outils écaillés	11	91.67		3	60.00	3	60.00	3	60.00	3	37.50	3	42.86	3	42.86	3	50.00	3	50.00	3	50.00	6	85.71
Utilised flakes	1	16.67		1	100.00	1	100.00	1	100.00	1	33.33	1	100.00	1	100.00	1	100.00	1	100.00	1	100.00	1	14.28
Grindstones	12	0.58		5	0.19	5	0.19	5	0.31	8	0.37	7	0.27	7	0.27	6	0.16	6	0.16	1	0.02	7	0.14
Total	1	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Formal	1	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Scrapers	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Backed points	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Backed blades	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Miscellaneous backed	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Segments	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Adzes	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Miscellaneous retouched pieces	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Unifacial points	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Bifacial points	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Hollow-based points	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Natural backed knives	2	33.33		2	33.33	2	33.33	2	33.33	5	66.66	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Total	2	66.67		2	66.67	2	66.67	2	66.67	5	100.00	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
Total	3	66.67		3	66.67	3	66.67	3	66.67	5	100.00	4	57.14	4	57.14	3	50.00	3	50.00	3	50.00	6	85.71
UNIT Total	2080	99.28	99.28	2023	99.41	2576	99.77	1597	99.50	2135	99.48	2600	98.07	2542	98.07	3832	97.75	4784	98.70	4575	99.06	4982	99.28

RBS XII			RBS XIII			RBS XIV			RBS XV			RBS XVI			
% UNIT Total	n	% Category	% UNIT Total	n	% Category	% UNIT Total	n	% Category	% UNIT Total	n	% Category	% UNIT Total	n	% Category	% UNIT Total
	6193	99.68		3232	99.11		7632	99.54		2477	99.20		1252	100.00	
	1	0.02		4	0.12		4	0.05		3	0.12		-	-	
	7	0.11		4	0.12		7	0.09		1	0.04		-	-	
	3	0.05		-	-		1	0.01		-	-		-	-	
	6	0.10		11	0.34		11	0.14		12	0.48		-	-	
	3	0.05		10	0.31		10	0.13		4	0.16		-	-	
	-	-		-	-		2	0.03		-	-		-	-	
99.78	6213		99.68	3261		99.15	7667		99.89	2497		99.52	1252		99.76
	-	-		-	-		-	-		-	-		-	-	
	7	100.00		17	100.00		4	100.00		6	100.00		1	100.00	
0.14	7		0.11	17		0.52	4		0.05	6		0.24	1		0.08
	3	23.10		-	-		1	14.29		-	-		-	-	
	-	-		-	-		-	-		-	-		-	-	
	-	-		-	-		-	-		-	-		-	-	
	2	15.38		1	9.09		-	-		1	16.67		-	-	
	1	7.69		-	-		1	14.29		-	-		-	-	
	-	-		-	-		-	-		-	-		-	-	
	2	15.38		4	36.36		-	-		2	33.33		1	50.00	
	1	7.69		4	36.36		3	42.86		3	50.00		-	-	
	3	23.10		-	-		2	28.57		-	-		1	50.00	
	1	7.69		2	18.18		-	-		-	-		-	-	
	-	-		-	-		-	-		-	-		-	-	
0.08	13		0.21	11		0.33	7		0.09	6		0.24	2		0.16
	6233			3289			7678			2509			1255		

Table 5 Umhlatuzana Rock Shelter: stone artefact frequencies in the PBS J3 units.

	PBS		PBS II		PBS III		PBS IV		PBS V		PBS VI		PBS VII		PBS VIII		PBS IX		PBS X		PBS XI		
	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	
		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total		UNIT Total	
Waste	1276	96.45	365	96.05	2533	98.52	4861	99.45	8153	99.77	7868	99.87	1285	99.30	910	99.89	2583	99.73	5390	98.52	27 738	99.35	
Chips, chunks and flakes	4	0.30	1	0.26	4	0.16	2	0.04	-	-	1	0.01	3	0.23	-	-	1	0.04	9	0.16	56	0.20	
Irregular cores	11	0.83	-	-	13	0.51	11	0.23	8	0.10	-	-	-	-	-	-	-	-	63	1.15	37	0.13	
Single platform cores	1	0.08	1	0.26	1	0.04	1	0.02	1	0.01	-	-	-	-	-	-	-	-	2	0.04	4	0.01	
Bipolar cores	27	2.04	12	3.16	14	0.54	7	0.14	7	0.09	7	0.09	6	0.46	-	-	5	0.19	7	0.13	47	0.17	
Bladelets	4	0.30	1	0.26	6	0.23	6	0.12	2	0.02	2	0.03	-	-	1	0.11	1	0.04	-	-	37	0.13	
Grindstone fragments	-	-	-	-	-	-	-	-	1	0.01	-	-	-	-	-	-	-	-	-	-	-	1	0.01
Total	1323	99.77	380	99.74	2571	99.65	4888	99.84	8172	99.72	7878	99.72	1294	99.39	911	99.67	2590	99.73	5471	99.58	27 920	99.82	
Utilised	-	-	1	100.00	3	60.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8.00	
Outils écaillés	1	100.00	-	-	2	40.00	1	100.00	4	100.00	11	100.00	5	100.00	1	100.00	4	100.00	5	100.00	23	92.00	
Utilised flakes	1	0.08	1	0.26	5	0.19	1	0.02	4	0.05	11	0.14	5	0.38	1	0.11	4	0.15	5	0.09	25	0.09	
Total	1	50.00	-	-	-	-	1	14.29	5	19.23	1	9.09	1	33.33	1	50.00	1	33.33	2	11.11	1	4.00	
Formal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	24.00	
Scrapers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8.00	
Backed points	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	24.00	
Backed blades	1	50.00	-	-	-	-	1	14.29	1	3.85	-	-	-	-	-	-	-	-	-	4	22.22		
Miscellaneous backed	-	-	-	-	-	-	1	14.29	-	-	-	-	-	-	-	-	-	-	-	1	5.56		
Segments	-	-	-	-	1	25.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Adzes	-	-	-	-	-	-	-	-	-	-	1	9.09	-	-	-	-	-	-	-	-	-		
Miscellaneous retouched pieces	-	-	-	-	2	50.00	1	14.29	8	30.77	4	36.36	2	66.66	1	50.00	-	-	4	22.22	5	20.00	
Unifacial points	-	-	-	-	-	-	3	42.85	8	30.77	4	36.36	-	-	2	66.66	-	-	6	33.33	-		
Bifacial points	-	-	-	-	1	25.00	-	-	3	11.54	-	-	-	-	-	-	-	-	1	5.56	-		
Hollow-based points	-	-	-	-	-	-	-	-	1	3.85	1	9.09	-	-	-	-	-	-	-	-	-		
Total	2	0.15	-	-	4	0.16	7	0.14	26	0.32	11	0.14	3	0.23	2	0.22	3	0.12	18	0.33	25	0.09	
UNIT Total	1326	99.77	381	99.74	2580	99.65	4896	99.84	8202	99.72	7100	99.72	1302	99.39	914	99.67	2597	99.73	5494	99.58	27 970	99.82	

Table 6 Umhlatuzana Rock Shelter: stone artefact frequencies in the PBS K3 units.

Waste	PBS		PBS II		PBS III		PBS IV		PBS V		PBS VI		PBS VII		PBS VIII		PBS IX		PBS X		PBS XI			
	n	% Cate-gory	n	% Cate-gory	n	% Cate-gory	n	% Cate-gory	n	% CATE-gory	n	% Cate-gory	n	% Cate-gory	n	% Cate-gory	n	% Cate-gory	n	% Cate-gory	n	% Cate-gory		
886	96.95	3077	97.93	4219	99.27	5336	99.65	3907	99.90	2689	99.89	806	98.90	1143	99.91	2261	99.56	6738	99.29	31353	99.21	31604	99.72	
Chips, chunks and flakes	-	1	0.03	3	0.07	3	0.06	-	-	2	0.25	2	0.25	-	-	1	0.04	21	0.31	172	0.54	172	0.54	
Irregular cores	13	1.47	17	0.54	13	0.31	5	0.09	-	-	1	0.04	1	0.12	-	-	2	0.09	2	0.03	32	0.10	32	0.10
Single platform cores	4	0.45	1	0.03	2	0.05	1	0.02	-	-	-	-	-	-	-	-	-	-	2	0.03	4	0.01	4	0.01
Bipolar cores	10	1.13	42	1.34	12	0.28	7	0.13	1	0.025	-	-	1	0.12	1	0.09	4	0.18	17	0.25	16	0.05	16	0.05
Blades	-	-	4	0.13	1	0.02	3	0.06	2	0.05	1	0.04	5	0.61	-	-	2	0.09	5	0.07	27	0.09	27	0.09
Grindstone fragments	-	-	-	-	-	-	-	-	1	0.025	1	0.04	-	-	-	-	1	0.04	1	0.01	-	-	-	-
Total	886	99.55	3142	99.97	4250	99.84	5335	99.83	3911	99.80	2692	99.70	815	99.03	1144	99.82	2271	99.34	6786	99.57	31604	99.72	31604	99.72
Utilised	4	100.00	1	100.00	6	100.00	-	-	7	100.00	3	100.00	4	100.00	1	100.00	5	100.00	9	100.00	22	100.00	22	100.00
Outils écaillés	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utilised Flakes	4	0.45	1	0.03	6	0.14	-	-	7	0.18	3	0.11	4	0.49	1	0.09	5	0.22	9	0.13	22	0.07	22	0.07
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formal	-	-	-	-	1	100.00	1	11.11	-	-	1	20.00	1	25.00	-	-	1	10.00	-	-	3	4.55	3	4.55
Scrapers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	10.00	6	9.09	6	9.09
Backed points	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Backed blades	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous backed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	15.00	17	25.76	17	25.76
Segments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	40.00	24	36.36	24	36.36
Adzes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous retouched	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pieces	-	-	-	-	-	2	22.22	2	100.00	2	40.00	3	75.00	-	-	-	-	-	2	20.00	5	25.00	8	12.12
Unifacial points	-	-	-	-	-	2	22.22	2	100.00	2	40.00	2	50.00	-	-	-	-	-	4	40.00	2	10.00	6	9.09
Hollow-based points	-	-	-	-	-	3	33.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	1	0.02	9	0.21	9	0.17	1	0.02	5	0.19	4	0.49	1	0.09	10	0.44	20	0.29	66	0.21	66	0.21
UNIT Total	880	99.55	3143	99.97	4257	99.84	5364	99.83	3919	99.80	2700	99.70	823	99.03	1146	99.82	2286	99.34	6815	99.57	31604	99.72	31604	99.72

Table 7

Umhlatuzana Rock Shelter: stone artefact frequencies in the RBS J4 units.

	RBS		RBS II		RBS III		RBS IV		UNIT
	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	n	% Cate- gory	
<b>Waste</b>									
Chips, chunks and flakes	1374	97.79	1680	92.92	1654	92.82	3329	98.37	
Irregular cores	9	0.64	15	0.83	6	0.34	8	0.24	
Single platform cores	8	0.57	40	2.21	40	2.24	15	0.44	
Bipolar cores	2	0.14	4	0.22	4	0.22	-	-	
Bladelets	11	0.78	69	3.82	75	4.21	26	0.77	
Blades	-	-	-	-	3	0.17	6	0.18	
Grindstone fragments	1	0.07	-	-	-	-	-	-	
<b>Total</b>	<b>1405</b>		<b>99.43</b>	<b>1808</b>		<b>99.89</b>	<b>1782</b>		<b>99.39</b>
<b>Utilised</b>									
Outils écaillés	1	16.67	-	-	5	62.50	2	66.67	
Utilised flakes	5	83.33	2	100.00	3	37.50	1	33.33	
<b>Total</b>	<b>6</b>		<b>0.42</b>	<b>2</b>	<b>0.11</b>	<b>8</b>	<b>0.45</b>	<b>3</b>	<b>0.09</b>
<b>Formal</b>									
Scrapers	-	-	-	-	2	66.67	-	-	
Miscellaneous retouched pieces	2	100.00	-	-	1	33.33	2	100.00	
<b>Total</b>	<b>2</b>		<b>0.14</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>0.17</b>	<b>2</b>	<b>0.06</b>
<b>UNIT Total</b>	<b>1413</b>		<b>1810</b>		<b>1793</b>		<b>3389</b>		

Table 8 Umhlatuzana Rock Shelter: stone artefact frequencies in the RBS K4 units.

	RBS		RBS II		RBS III		RBS IV		RBS V	
	n	% Category	n	% Category	n	% Category	n	% Category	n	% Category
<b>Waste</b>										
Chips, chunks and flakes	1812	98.10	1543	91.90	2831	94.94	3649	98.54	3724	96.60
Irregular cores	7	0.38	9	0.54	12	0.38	11	0.30	8	0.21
Single platform cores	15	0.81	29	1.73	46	1.46	22	0.59	60	1.56
Bipolar cores	1	0.05	7	0.42	5	0.16	1	0.03	8	0.21
Bladelets	13	0.70	87	5.18	96	3.06	17	0.46	43	1.12
Blades	-	-	4	0.24	-	-	3	0.08	11	0.29
Grindstone fragments	-	-	-	-	-	-	-	-	1	0.03
Total	1848	99.84	1679	99.64	3140	99.62	3703	99.33	3855	99.41
<b>Utilised</b>										
Outils écaillés	3	100.00	-	-	4	44.44	7	63.64	18	81.82
Utilised flakes	-	-	5	83.33	5	55.56	4	36.36	4	18.18
Grindstones	-	-	1	16.67	-	-	-	-	-	-
Total	3	0.16	6	0.36	9	0.29	11	0.30	22	0.57
<b>Formal</b>										
Scrapers	-	-	-	-	-	-	1	7.14	-	-
Backed points	-	-	-	-	-	-	-	-	1	100.00
Miscellaneous backed	-	-	-	-	-	-	1	7.14	-	-
Segments	-	-	-	-	1	33.33	-	-	-	-
Miscellaneous retouched pieces	-	-	-	-	2	66.67	5	35.71	-	-
Unifacial points	-	-	-	-	-	-	2	14.29	-	-
Natural backed knives	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	3	0.09	14	0.38	1	0.02
UNIT Total	1851	-	1685	-	3152	-	3728	-	3878	-

Table 9

Umhlatuzana Rock Shelter: stone artefact frequencies in the PBS J4 units.

	PBSA			PBSB			PBS			PBS 11		
	n	% Category	% UNIT Total	n	% Category	% UNIT Total	n	% Category	% UNIT Total	n	% Category	% UNIT Total
<b>Waste</b>												
Chips churks and flakes	3 784	98.57	99.90	987	97.43	98.80	1 863	98.00	99.84	6 901	98.66	99.94
Irregular cores	1	0.03		2	0.20		5	0.26		7	0.10	
Single platform cores	22	0.57		11	1.09		9	0.47		33	0.47	
Bipolar cores	10	0.26		5	0.49		1	0.05		2	0.03	
Bladelets	21	0.55		8	0.79		20	1.05		44	0.63	
Blades	1	0.03		-	-		2	0.11		8	0.11	
Grindstone fragments	-	-		-	-		1	0.05		-	-	
<b>TOTAL</b>	<b>3 839</b>		<b>99.90</b>	<b>1 013</b>		<b>98.80</b>	<b>1 901</b>		<b>99.84</b>	<b>6 995</b>		<b>99.94</b>
<b>Utilised</b>												
Outils & caille's	2	50.00		1	100.00		2	66.66		-	-	
Utilised flakes	2	50.00		-	-		1	33.33		3	100.00	
<b>TOTAL</b>	<b>4</b>		<b>0.10</b>	<b>1</b>		<b>0.10</b>	<b>3</b>		<b>0.16</b>	<b>3</b>		<b>0.04</b>
<b>Formal</b>												
Scrapers	-	-		-	-		-	-		-	-	
Backed points	-	-		-	-		-	-		-	-	
Backed BLADES	-	-		-	-		-	-		-	-	
Miscellaneous BACKED	-	-		-	-		-	-		-	-	
Segments	-	-		1	100.00		-	-		1	100.00	
Adzes	-	-		-	-		-	-		-	-	
Miscellaneous Retouched pieces	-	-		-	-		-	-		-	-	
Unifacial points	-	-		-	-		-	-		-	-	
Bifacial points	-	-		-	-		-	-		-	-	
<b>TOTAL</b>	<b>-</b>		<b>-</b>	<b>1</b>		<b>0.10</b>	<b>-</b>		<b>-</b>	<b>1</b>		<b>0.01</b>
<b>UNIT TOTAL</b>	<b>3 843</b>			<b>1 015</b>			<b>1 904</b>			<b>6 999</b>		

Table 10

Umhlatuzana Rock Shelter: stone artefact frequencies in the PBS K4 units.

	PBSA		PBSB		PBS		PBS II		% UNIT Total	% Category	n	% Category	% UNIT Total
	n	% Category	n	% Category	n	% Category	n	% Category					
<b>Waste</b>													
Chips chunks and flakes	2 730	96,53	2 107	96,05	2 192	97,94	6 162	98,58					
Irregular cores	-	-	3	0,14	2	0,09	10	0,16					
Single platform cores	19	0,67	18	0,84	13	0,58	27	0,43					
Bipolar cores	10	0,35	2	0,33	4	0,18	2	0,03					
Bladelets	64	2,26	14	0,65	23	1,03	34	0,54					
Blades	5	0,12	-	-	4	0,18	16	0,26					
Grindstone fragments	-	-	-	-	-	-	-	-					
<b>TOTAL</b>	<b>2 828</b>	<b>99,68</b>	<b>2 149</b>	<b>99,81</b>	<b>2 238</b>	<b>99,82</b>	<b>6 251</b>	<b>99,86</b>					
<b>Utilised</b>													
Outils écaillés	5	71,42	2	50,00	-	-	-	-					
Utilised flakes	2	28,57	2	50,00	4	100,00	4	100,00					
<b>TOTAL</b>	<b>7</b>	<b>0,25</b>	<b>4</b>	<b>0,19</b>	<b>4</b>	<b>0,18</b>	<b>4</b>	<b>0,06</b>					
<b>Formal</b>													
Scrapers	-	-	-	-	-	-	-	-					
Backed points	-	-	-	-	-	-	-	-					
Backed blades	-	-	-	-	-	-	-	-					
Miscellaneous backed	-	-	-	-	-	-	-	-					
Segments	-	-	-	-	-	-	-	-					
Adzes	-	-	-	-	-	-	-	-					
Miscellaneous retouched pieces	1	50,00	-	-	-	-	-	-					
Unifacial points	1	50,00	-	-	-	-	-	-					
Bifacial points	-	-	-	-	-	-	-	-					
<b>TOTAL</b>	<b>2</b>	<b>0,07</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5</b>	<b>0,08</b>					
<b>UNIT TOTAL</b>	<b>2 837</b>		<b>2 153</b>		<b>2 242</b>		<b>6 260</b>						

Table 11

Umhlatuzana Rock Shelter: stone artefact frequencies in the DBS J4 units.

	DBS		DBS 11		DBS 111		DBS IV		DBS V	
	n	% Category	n	% Category	n	% Category	n	% Category	n	% Category
<b>Waste</b>										
Chips chunks and flakes	7 787	98,49	3 817	97,85	930	98,73	1 463	97,86	7 073	99,47
Irregular cores	8	0,10	-	-	1	0,11	3	0,20	7	0,10
Single platform cores	49	0,62	28	0,72	3	0,32	8	0,55	10	0,14
Bipolar cores	20	0,25	4	0,10	1	0,11	-	-	-	-
Bladelets	42	0,53	51	1,31	7	0,74	21	1,40	14	0,20
Blades	-	-	1	0,03	-	-	-	-	7	0,10
Grindstone fragments	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	7 906		3 901		942		1 495		7 111	
		99,72		99,72		99,79		98,87		99,83
<b>Utilised</b>										
Outils écaillés	8	61,54	11	100,00	-	-	1	100,00	-	-
Utilised flakes	5	38,46	-	-	2	-	-	-	2	100,00
<b>TOTAL</b>	13		11		2		1		2	
		0,16		0,28		0,21		0,07		0,03
<b>Formal tools</b>										
Scrapers	1	11,11	-	-	-	-	-	-	1	10,00
Backed points	-	-	-	-	-	-	-	-	-	-
Backed blades	-	-	-	-	-	-	-	-	-	-
Miscellaneous backed	-	-	-	-	-	-	-	-	1	10,00
Segments	-	-	-	-	-	-	1	100,00	1	10,00
Adzes	-	-	-	-	-	-	-	-	-	-
Miscellaneous retouched pieces	3	33,33	-	-	-	-	-	-	3	30,00
Unifacial points	4	44,44	-	-	-	-	-	-	2	20,00
Bifacial points	-	-	-	-	-	-	-	-	1	10,00
Natural backed knives	1	11,11	-	-	-	-	-	-	1	10,00
<b>TOTAL</b>	9		-		-		1		10	
		0,11		-		-		0,07		0,14
<b>UNIT TOTAL</b>	7 928		3 912		944		1 497		7 123	



Table 13

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the RBS J2 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
RBSA	5 642	82,78	878	12,88	215	3,15	81	1,19	6 816
RBS II	3 484	72,83	1 121	23,43	127	2,65	52	1,09	4 784
RBS III	2 785	62,57	1 452	32,62	200	4,49	14	0,31	4 451
RBS IV	3 605	74,45	1 131	23,36	94	1,94	12	0,25	4 842
RBS V	3 253	82,50	555	14,08	119	3,02	16	0,41	3 943
RBS VI	5 790	78,65	1 407	19,11	145	1,97	20	0,27	7 362
RBS VII	1 863	75,86	485	19,75	104	4,23	4	0,16	2 456
RBS VIII	6 053	79,72	1 416	18,65	112	1,48	12	0,16	7 593
RBS IX	6 246	77,55	1 708	21,21	91	1,13	9	0,11	8 054
RBS X	8 490	63,55	4 734	35,44	114	0,85	21	0,16	13 359
RBS XI	7 462	45,58	8 769	53,56	134	0,82	6	0,04	16 371
RBS XII	2 413	27,89	6 125	70,79	110	1,27	4	0,05	8 652
RBS XIII	1 235	11,27	9 561	87,22	165	1,51	1	0,01	10 962
RBS XIV	2 753	13,73	17 053	85,07	239	1,19	1	0,01	20 046
RBS XV	2 234	8,00	25 419	91,05	258	0,92	7	0,03	27 918
RBS XVI	1 217	10,14	10 526	87,67	260	2,17	3	0,02	12 006
RBS XVII	1 755	32,40	3 488	64,39	173	3,19	1	0,02	5 417

Table 14

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the RBS K2 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
RBSA	2 914	81,51	482	13,48	104	2,91	75	2,10	3 575
RBS II	3 829	78,83	871	17,93	78	1,61	79	1,63	4 857
RBS III	2 897	69,36	1 167	27,94	94	2,25	19	0,45	4 177
RBS IV	2 840	63,86	1 431	32,18	157	3,53	19	0,43	4 447
RBS V	6 431	78,47	1 597	19,49	141	1,72	26	0,32	8 195
RBS VI	5 090	77,71	1 334	20,37	111	1,69	15	0,23	6 550
RBS VII	4 067	78,27	1 038	19,98	74	1,42	17	0,33	5 196
RBS VIII	2 334	81,07	472	16,39	66	2,29	7	0,24	2 879
RBS IX	6 770	82,01	1 359	16,46	120	1,45	6	0,07	8 255
RBS X	10 341	73,63	3 584	25,52	104	0,74	16	0,11	14 045
RBS XI	11 012	63,31	6 211	35,71	157	0,90	15	0,09	17 395
RBS XII	5 372	52,22	4 791	46,57	117	1,14	8	0,08	10 288
RBS XIII	3 318	34,50	6 134	63,78	161	1,67	4	0,04	9 617
RBS XIV	4 390	26,22	12 112	72,34	237	1,42	5	0,03	16 744
RBS XV	3 283	15,40	17 830	83,63	201	0,94	7	0,03	21 321
RBS XVI	3 503	17,27	16 526	81,48	249	1,23	5	0,02	20 283
RBS XVII	2 390	35,84	4 024	60,34	248	3,72	7	0,10	6 669

Table 15

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the RBS J3 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
RBS	832	79,16	138	13,13	38	3,62	43	4,09	1 051
RBS II	2 102	83,75	299	11,91	62	2,47	47	1,87	2 510
RBS III	1 901	81,17	335	14,30	63	2,69	43	1,84	2 342
RBS IV	2 702	76,04	723	20,35	85	2,39	43	1,21	3 553
RBS V	2 494	66,52	1 112	29,66	103	2,75	40	1,07	3 749
RBS VI	1 072	67,38	453	28,47	57	3,58	9	0,57	1 591
RBS VII	1 641	66,71	724	29,43	84	3,41	11	0,45	2 460
RBS VIII	2 963	60,04	1 884	38,18	76	1,54	12	0,24	4 935
RBS IX	2 373	73,31	823	25,42	39	1,20	2	0,06	3 237
RBS X	2 405	65,21	1 203	32,62	75	2,03	5	0,14	3 688
RBS XI	6 848	83,26	1 228	14,93	145	1,76	4	0,05	8 225
RBS XII	2 121	29,16	5 043	69,33	104	1,43	6	0,08	7 274
RBS XIII	858	23,35	2 810	76,48	4	0,11	2	0,05	3 674
RBS XIV	1 152	9,68	10 597	89,07	148	1,24	-	-	11 897
RBS XV	1 460	8,92	14 744	90,04	171	1,04	-	-	16 375
RBS XVI	516	16,06	2 583	80,42	113	3,52	-	-	3 212

Table 16

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the RBS K3 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
RBS	1 551	75,12	382	18,50	61	2,95	71	3,44	2 065
RBS II	1 484	73,78	407	20,24	38	1,89	82	4,08	2 011
RBS III	2 080	80,93	399	15,53	33	1,28	58	2,26	2 570
RBS IV	943	59,35	558	35,12	58	3,65	30	1,89	1 589
RBS V	1 611	75,85	418	19,68	79	3,72	16	0,75	2 124
RBS VI	1 900	73,30	626	24,15	57	2,20	9	0,35	2 592
RBS VII	1 747	78,62	424	19,08	43	1,94	8	0,36	2 222
RBS VIII	2 954	77,21	809	21,14	53	1,39	10	0,26	3 826
RBS IX	3 710	77,58	1 028	21,50	42	0,88	2	0,04	4 782
RBS X	2 865	62,68	1 612	35,27	78	1,71	16	0,35	4 571
RBS XI	1 977	39,77	2 893	58,20	101	2,03	-	-	4 971
RBS XII	1 284	20,66	4 867	78,34	62	1,00	-	-	6 213
RBS XIII	627	19,23	2 541	77,92	92	2,82	1	0,03	3 261
RBS XIV	1 223	15,95	6 120	79,82	322	4,20	2	0,03	7 667
RBS XV	796	31,88	1 596	63,92	104	4,16	1	0,04	2 497
RBS XVI	366	29,23	811	64,78	75	5,99	-	-	1 252

Table 17

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the PBS J3 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
PBS	1 060	80,12	245	18,52	15	1,13	3	0,23	1 323
PBS II	311	81,84	61	16,05	7	1,84	1	0,26	380
PBS III	1 528	59,43	992	38,58	51	1,98	-	-	2 571
PBS IV	1 771	36,23	3 046	62,32	65	1,33	6	0,12	4 888
PBS V	1 057	12,93	7 053	86,31	62	0,76	-	-	8 172
PBS VI	950	12,06	6 861	87,09	67	0,85	-	-	7 878
PBS VII	120	9,27	1 112	85,93	62	4,79	-	-	1 294
PBS VIII	152	16,68	701	76,95	58	6,37	-	-	911
PBS IX	782	30,19	1 629	62,90	177	6,83	2	0,08	2 590

Table 18

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the PBS K3 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
PBS	770	86,91	105	11,85	8	0,90	3	0,34	886
PBS II	2 641	84,05	493	15,69	7	0,22	1	0,03	3 142
PBS III	2 608	61,36	1 610	37,88	32	0,75	-	-	4 250
PBS IV	942	17,59	4 372	81,64	38	0,71	3	0,06	5 355
PBS V	259	6,62	3 619	92,53	33	0,84	-	-	3 911
PBS VI	148	5,50	2 465	91,57	79	2,93	-	-	2 692
PBS VII	79	9,69	647	79,39	89	10,92	-	-	815
PBS VIII	298	26,05	772	67,48	74	6,47	-	-	1 144
PBS IX	934	41,13	1 183	52,09	154	6,78	-	-	2 271

Table 19 Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the RBS J4 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
RBS	1 128	80,28	201	14,31	48	3,42	28	1,99	1 405
RBS II	1 443	79,81	262	14,49	50	2,77	53	2,93	1 808
RBS III	1 389	77,95	296	16,61	65	3,65	32	1,80	1 782
RBS IV	2 551	75,38	675	19,95	110	3,25	48	1,42	3 384

Table 20 Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the RBS K4 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
RBS	1 323	71,59	425	23,00	38	2,06	62	3,35	1 848
RBS II	1 190	70,88	352	20,96	57	3,39	80	4,76	1 679
RBS III	2 441	77,34	585	18,63	92	2,93	22	0,70	3 140
RBS IV	2 754	74,37	750	20,25	161	4,45	38	1,02	3 703
RBS V	3 189	82,72	549	14,24	96	2,49	21	0,54	3 855

Table 21 Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the PBS J4 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
PBS A	3 151	82,08	631	16,44	46	1,20	11	0,29	3 839
PBS B	911	89,93	94	9,28	8	0,79	-	-	1 013
PBS III	1 595	83,90	284	14,94	20	1,05	2	0,11	1 901
PBS IV	5 472	78,23	1 444	20,64	72	1,03	7	0,10	6 995

Table 22 Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the PBS K4 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
PBS A	2 370	83,80	376	13,30	76	2,69	6	0,21	2 828
PBS B	1 970	91,67	170	7,91	7	0,33	2	0,09	2 149
PBS III	1 947	87,00	279	12,47	11	0,49	1	0,04	2 238
PBS IV	4 293	68,68	1 911	30,57	39	0,62	8	0,13	6 251

Table 23

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the DBS J4 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
DBS	6 830	86,39	891	11,27	152	1,92	33	0,42	7 906
DBS II	3 661	93,85	179	4,59	51	1,31	10	0,26	3 901
DBS III	902	95,75	34	3,61	5	0,53	1	0,11	942
DBS IV	1 261	84,35	223	14,92	11	0,74	-	-	1 495
DBS V	5 258	73,94	1 795	25,24	50	0,70	8	0,11	7 111

Table 24

Umhlatuzana Rock Shelter: raw material composition of the waste artefacts in the DBS K4 units.

Unit	Quartz		Hornfels		Quartzite		CCS		Total
	n	%	n	%	n	%	n	%	
DBS	2 349	84,59	312	11,24	106	3,82	10	0,36	2 777
DBS II	3 743	87,00	503	11,70	44	1,02	12	0,28	4 302
DBS III	1 006	89,98	108	9,66	1	0,09	3	0,27	1 118
DBS IV	487	92,41	37	7,02	3	0,57	-	-	527
DBS V	2 234	86,59	330	12,79	15	0,58	1	0,04	2 580

Table 25 Umhlatuzana Rock Shelter: mean and standard deviation statistics on quartz single platform cores.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Length	4	84	14.26	4.09
	5	115	12.33	3.36
	6	158	12.63	3.43
	7	206	12.83	3.89
	8	131	12.70	3.02
	9	151	13.27	3.39
	10	145	14.30	4.01
	11	156	14.28	3.70
	12	153	13.84	3.09
	13	201	14.57	4.49
	14	225	14.45	3.70
	15	123	16.61	4.68
	16	58	17.63	6.03
	17	28	17.38	4.48
	18	43	17.64	5.49
	19	30	16.68	4.17
	20	7	16.50	2.75
	21	3	19.83	4.54

Table 26 Umhlatuzana Rock Shelter: mean and standard deviation statistics on quartz bipolar cores.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Length	4	55	13.64	2.80
	5	17	11.00	1.68
	6	30	11.63	2.57
	7	21	12.17	3.41
	8	7	12.57	2.13
	9	18	12.22	2.65
	10	8	11.88	1.81
	11	29	14.40	5.74
	12	32	12.97	3.62
	13	34	12.41	2.91
	14	38	13.36	3.49
	15	16	12.25	2.91
	16	6	15.33	4.63
	17	1	15.00	-
	18	8	18.50	6.61
	19	9	17.67	6.67
	20	-	-	-
	21	1	12.00	-

Table 27 Umhlatuzana Rock Shelter: mean and standard deviation statistics on quartz bladelets.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Length	4	64	12.75	2.83
	5	9	11.78	2.39
	6	28	12.00	3.18
	7	38	11.26	2.11
	8	22	10.95	1.65
	9	32	12.11	2.26
	10	55	12.91	2.75
	11	40	13.88	2.89
	12	29	13.79	2.82
	13	45	14.18	3.80
	14	68	13.85	3.72
	15	40	13.34	3.80
	16	26	16.44	4.17
	17	13	14.15	2.90
	18	10	16.65	3.06
	19	12	14.08	3.15
	20	5	15.90	2.70
21	-	-	-	-

Table 28 Umhlatuzana Rock Shelter: mean and standard deviation statistics on hornfels bladelets.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Length	4	48	14.46	3.69
	5	16	12.63	2.87
	6	31	13.48	2.94
	7	35	13.23	3.82
	8	27	14.37	4.63
	9	8	16.88	5.28
	10	14	13.60	3.51
	11	7	14.36	4.38
	12	7	15.43	3.61
	13	9	12.22	2.03
	14	18	15.39	3.96
	15	11	17.82	4.58
	16	9	16.39	5.02
	17	13	16.50	4.27
	18	8	16.13	3.37
	19	11	16.50	5.89
	20	6	15.33	4.22
	21	3	15.17	4.19

Table 29 Umhlatuzana Rock Shelter: mean and standard deviation statistics on CCS bladelets. |

	Layer	Number	Mean (mm)	Standard deviation (mm)
Length	4	27	14,02	4,32
	5	8	11,38	2,39
	6	30	13,33	3,51
	7	20	12,83	3,88
	8	12	15,21	5,49
	9	7	15,57	6,39

Table 30 Umhlatuzana Rock Shelter: mean and standard deviation on quartz bladelets.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Width	4	64	4.94	1.14
	5	9	4.67	0.97
	6	28	4.79	1.20
	7	38	4.46	0.90
	8	22	4.61	0.79
	9	32	4.89	1.18
	10	55	5.27	1.24
	11	40	5.46	1.40
	12	29	5.32	1.36
	13	45	5.82	2.03
	14	68	5.56	1.84
	15	40	5.23	1.93
	16	26	5.92	1.96
	17	13	5.31	1.20
	18	10	5.90	1.71
	19	12	5.58	1.43
	20	5	6.40	2.30
	21	-	-	-

Table 31 Umhlatuzana Rock Shelter: mean and standard deviation statistics on hornfels bladelets.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Width	4	48	5.64	1.28
	5	16	4.44	0.93
	6	31	5.11	1.28
	7	35	4.79	1.19
	8	27	5.61	1.45
	9	8	5.38	1.60
	10	14	5.04	1.13
	11	7	5.79	1.87
	12	7	6.29	1.73
	13	9	5.06	1.21
	14	18	5.72	1.90
	15	11	6.91	1.96
	16	9	5.78	1.94
	17	13	6.38	2.13
	18	8	5.94	1.82
	19	11	5.95	1.97
	20	6	5.42	1.50
	21	3	5.67	0.76

Table 32 Umhlatuzana Rock Shelter: mean and standard deviation statistics on CCS bladelets.

	Layer	Number	Mean (mm)	Standard deviation (mm)
Width	4	27	5,26	1,42
	5	8	4,19	0,92
	6	30	5,38	1,53
	7	20	4,90	1,34
	8	12	4,21	1,03
	9	7	5,93	2,30

Table 33 Umhlatuzana Rock Shelter: mean and standard deviation statistics on quartz segments.

Quartz	Layer	Number	Mean (mm)	Standard deviation (mm)
Length	14	1	33.00	-
	15	8	16.88	4.16
	16	2	16.75	2.47
	17	3	19.00	3.61
	18	5	18.30	5.14
	19	1	14.00	-
	20	2	18.00	4.24
	21	3	17.00	4.00

Table 34 Umhlatuzana Rock Shelter: mean and standard deviation statistics on hornfels segments.

Hornfels

13	2	30.00	11.31
14	2	46.50	10.61
15	5	33.10	11.00
16	2	45.25	13.08
17	1	36.00	-
18	2	41.25	0.35
19	3	36.17	4.04
20	1	36.00	-
21	1	31.00	-