



An investigation of a Later Stone Age
open-air surface site on Blauwbosch
364, Northern Cape

by

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Submitted in fulfilment of the requirements
for the degree

Magister Artium (Archaeology)

The financial assistance of the Centre for Science
Development (CSD) South Africa towards this research is
hereby acknowledged in the Faculty of Humanities and conclusions
arrived at, are the responsibility of the author and are not necessarily
to be attributed to the Centre for Science Development.

Pretoria
August 2000



I wish to thank the following people:

My supervisor Prof. A. Meyer for seeing to administrative matters and for kindly commenting on the draft copies; my co-supervisor Mr. H.P. Prinsloo for introducing me to his Northern Cape as well as for his support with the field research; Prof. J.D. Kriel for his insights; Mr. P.B. Beaumont for the opportunity to analyse the Swartkop and Biesje Poort II assemblages; Mr. F. Liebenberg for his tremendous hospitality and passion for archaeology; my brother Pieter for assisting with the metric analysis with amazing enthusiasm; my friends and colleagues B. Ellis, A. Salomon and H. Steyn for their invaluable contributions to the field research; Mrs. E. Kruger for her brilliant advice on the layout of the final document; and Andrew for bravely editing the final draft copy.

I thank my spirited parents for teaching us courage and tenacity.

I thank John for his unfailing support and understanding.

Finally I would like to express my sincere appreciation to Dr. J.C. Vogel for his constant advice and unflinching encouragement throughout this study. He also provided the radiocarbon dates for the Bloubos sites and advised me on the use of the Vogel scale.

The financial assistance of the Centre for Science Development (HSRC South Africa) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at, are those of the author and are not necessarily to be attributed to the Centre for Science Development.



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Abstract

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Bloubos, chronological depth, Ewerfontein industry, herdard, homogeneous sample, hunters, Later Stone age, median, Northern Cape, open-air surface sites, subsistence strategies, Vogel scale, Walton variant.



**An investigation of a Later Stone Age
open-air surface site on Blauwbosch
364, Northern Cape**

by

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Department of Anthropology and Archaeology

Magister Artium (Archaeology)

The farm Blauwbosch 364 (known as Bloubos), situated some 50 kilometres north-north-west of Upington, would have been ideally suited for both hunters and herders during the last 2000 years. The property is characterised by several Later Stone Age (LSA) open-air surface sites consisting of lithic and ceramic scatters. One such site, Bloubos 5 (BB5), was closely investigated and a radiocarbon date of 1810 ± 45 years BP obtained for it. Results of the typological and metric analysis of the BB5 sample were compared to another open-air site on the farm, Bloubos 7 (BB7) as well as to other LSA cave and open-air sites in the study area in order to determine a temporal and spatial context for the site. It was established with the aid of the Vogel scale, that BB5 represents a homogeneous LSA lithic sample with little chronological depth. A limited number of ceramic fragments are also present. The BB7 sample was obtained from a stone circle containing some deposit which provided the dates 340 ± 50 (upper spits) and 2370 ± 45 (lower spits) years BP for the site. Comparison between the two assemblages indicated no significant differences and that they probably belong to the same LSA industry. The comparison between BB5 and contemporaneous samples from Wonderwerk cave, Klein Witkrans shelter, Limerock II, Swartkop Excavation I and Biesje Poort II, also indicated no significant differences. However, it is apparent that the Bloubos sample is most similar to that of Biesje Poort II. The latter has been identified as belonging to the local Wilton variant, the Doornfontein Industry (Beaumont, Smith & Vogel 1995). It thus follows that the BB5 sample too, belongs to the (early phase?) Doornfontein Industry. Beaumont associates the Doornfontein Industry with final LSA herders in the Northern Cape, thus pastoralism as a LSA subsistence strategy is a distinct possibility on Bloubos (Beaumont, Smith & Vogel 1995). It is concluded that documentation of all land use patterns in the environment which include open-air surface sites, open-air deposits and cave deposits, is crucial to the complete reconstruction of prehistoric subsistence strategies. Other issues addressed in this dissertation include the minimum number of artefacts needed to understand the nature of an open-air surface site, the need for standardisation of terminology and methods for typological and metric analysis, the use of the median instead of the mean when conducting a metric analysis, and the continuing relevance of stone tool analyses in Later Stone Age research.

Bloubos, chronological depth, Doornfontein Industry, herders, homogeneous sample, hunters, Later Stone Age, median, Northern Cape, open-air surface sites, subsistence strategies, Vogel scale, Wilton variant

**'n Onderzoek van 'n Latere Steentydperk-
opelug oppervlakterrein op Blauwbosch
364, Noord-Kaap**

deur

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Die plaas Blauwbosch 364 (bekend as Bloubos) wat ongeveer 50 kilometer noord-noord-wes buite Upington geleë is, sou teen ongeveer 2000 jaar gelede ideaal gewees het vir beide jagters en herders. Die eiendom word gekenmerk deur 'n hele paar Latere Steentydperk (LST) -opelug oppervlakterreine wat bestaan uit klipwerktuig- en keramiekversamelings. Een só 'n terrein, naamlik Bloubos 5 (BB5), is van nader ondersoek en 'n radiokoolstofdatum van 1810 ± 45 jaar VH is daarvoor verkry. Die resultate van die tipologiese en metriese analise van die BB5-monster is met nog 'n opelug terrein op die plaas, Bloubos 7 (BB7), asook met ander LST-grot- en -opelug terreine in die studiegebied vergelyk sodat 'n tyd-ruimtelike konteks vir die terrein bepaal kon word. Met behulp van die Vogelskaal is daar gevind dat BB5 'n homogene LST-klipwerktuigmonster met beperkte chronologiese diepte verteenwoordig. Dit is ook geassosieer met 'n beperkte aantal keramiekfragmente. Die BB7-monster asook die datums 340 ± 50 (boonste lae) en 2370 ± 45 (onderste lae) jaar VH vir die terrein, is verkry van die afsetting binne 'n klipsirkel. 'n Vergelyking tussen die twee versamelings het aangedui dat geen betekenisvolle verskille tussen hulle bestaan nie en dat hulle waarskynlik tot dieselfde LST-industrie behoort. Die vergelyking tussen BB5 en kontemporêre versamelings van Wonderwerk-grot, Klein Witransskuiling, Limerock II, Swartkop Opgrawing I en Biesje Poort II, het weereens geen betekenisvolle verskille aangedui nie. Die Bloubos-monster is egter mees soortgelyk aan die Biesje Poort II-versameling. Laasgenoemde is geïdentifiseer as behorende tot 'n plaaslike Wiltonvariant, die Doornfonteinindustrie (Beaumont, Smith & Vogel 1995). Dit volg dus dat die BB5-monster ook tot die (vroë fase?) Doornfonteinindustrie behoort. Aangesien Beaumont die Doornfonteinindustrie assosieer met finale LST-herders in die Noord-Kaap (Beaumont, Smith & Vogel 1995), is pastoralisme as 'n LST-bestaanswyse op Bloubos 'n sterk moontlikheid. Dit word gestel dat die dokumentering van alle patrone van grondgebruik in die omgewing, wat opelug oppervlakterreine, opelug afsettings en grotterreine insluit, van die uiterste belang is vir die volledige rekonstruksie van prehistoriese bestaanswyses. Ander temas wat in hierdie verhandeling aangespreek word sluit in die minimum aantal artefakte benodig om die aard van 'n opelug oppervlakterrein te identifiseer, die behoefte aan gestandaardiseerde terminologie en metodes vir tipologiese en metriese analise, die gebruik van die mediaan in plaas van die gemiddeld wanneer 'n metriese analise uitgevoer word, en die voortgesette belang van klipwerktuiganalises vir LST-navorsing.

Bloubos, chronologiese diepte, Doornfonteinindustrie, herders, homogene monster, jagters, Latere Steentydperk, mediaan, Noord-Kaap, opelug oppervlakterreine, bestaanswyses, Vogelskaal, Wiltonvariant

Introduction

1.1. Introduction

The farm Blauwbosch 364 (Bloubos), partly covered by the southern Kalahari sand sea, and partly by exposed bedrock, has drawn people to roam over both its rocky stretches and dunes to find refuge in its bounty for many millennia. The farm has not been previously subjected to archaeological investigation although it is rich in material remains of prehistoric occupants. It is particularly regarding the Later Stone Age (LSA) that Bloubos was found to be a source of worthwhile research possibilities. An unusually extensive surface scatter alongside a pan was selected for special attention.

1.2. Research motivation and objective

In order to evaluate the landscape utilisation and subsistence strategies of the LSA, the detailed understanding of not only cave sites but also open-air surface sites is essential. The archaeological value of surface assemblages has been underestimated for a long time by workers in the field, despite the accepted role played by these remains in locating stratified or subsurface sites. However, the potential and expanding role of surface assemblages has been discussed extensively by Lewarch and O'Brien (1981). The main argument against the use of these assemblages is the effect of post-depositional natural and cultural disturbances (Lewarch & O'Brien 1981:311-312). While not denying the processes that disturb or change the character of surface assemblages, it should be recognized that subsurface assemblages are also not without disturbance. Other arguments listed by them against the substantial use of surface assemblages are as follows:

- a perceived difficulty of chronological control;
- the destructive influence of agricultural activities;
- surface material is less likely to reflect the complexity of archaeological phenomena;

- possible bias due to previous amateur or professional collection of material at the site;
- the perceived lack of positive results when analysing surface collections.

Lewarch and O'Brien consider these arguments in detail and propose several solutions to each of them. They also mention several studies that have been undertaken in the United States in recent years that aim to illustrate the expanding role of surface collections in archaeology. Several studies focussing on intensive artefact collection at a single site in semi-arid environments undertaken especially in the southwest of the USA and in Mesoamerica are relevant to this project. Results of these studies include:

- the successful identification of specialised activity areas;
- the influence of site gradient on artefact disturbance;
- the description of community settlement patterns (Lewarch & O'Brien 1981:328-330).

The essence of the review by Lewarch and O'Brien is that the archaeological value of surface assemblages has been demonstrated to an increasing extent. In terms of the present research project, contributions made by the investigation of surface sites may include:

- an improved perception of the nature of living sites;
- an indication of where stratified cultural deposits are located;
- an improved perception of the utilisation of an area or region;
- previously uninvestigated regions characterised only by surface assemblages, may now be seen as having archaeological potential;
- comparisons between surface and stratified sites may lead to an improved insight into site utilisation;

- the investigation of surface assemblages may lead to a more complete reconstruction of subsistence strategies;
- instead of only concentrating on excavation, a wider range of field techniques may be employed, such as the investigation of settlement layouts (Lewarch & O'Brien 1981:312);
- practical implications regarding field research include that larger numbers of people may easily be involved and that this may prove to be educational to both students and amateurs. Simultaneously, it has been shown that smaller, dedicated research teams may be effective, even in large areas, due to the nature of the field work (Lewarch & O'Brien 1981:320);
- documentation of surface assemblages is an important part of cultural resource management (Lewarch & O'Brien 1981:320-321).

The main objectives of the present research project are:

- to determine to what extent the surface assemblage on Bloubos farm can add any new, relevant information to the existing chronological and spatial database of the LSA in the Northern Cape;
- to place the chosen surface assemblage on Bloubos into the broader LSA temporal and spatial framework of the Northern Cape in addition to the archaeological description of the site.

The importance of achieving these objectives lies in countering the notion that surface assemblages may be mentioned as additional information, but that they are seldom taken as reliable archaeological evidence.

**1.3. Historical review***1.3.1. The Orange River area*

The fertile banks of the Orange River are a true oasis on the edge of the southern Kalahari desert. In both prehistoric and historical times the river was a valuable source of food and water which drew man and animal alike. In this way, both hunter and herder societies were sustained. Today the waters of the Orange River support large-scale agricultural activities on the flood plains of the river and so it remains a settlement determinant of considerable importance to the present inhabitants of the Northern Cape as well as an integral part of the economy of the area (Smith & Metelerkamp 1995:1).

During early historical times the value of the Orange River or Gariep was well-known and the river resources were frequently exploited by various societies of Khoi and San descent. The Orange River was inhabited by these nomadic hunter and herder peoples from the river mouth in the west up to its confluence with the Seekoei River in the east. It was unlikely that herders would have ventured much further east than the Seekoei River with their livestock due to the Sotho-Tswana agro-pastoralist presence there. The Middle Orange River - that part of the river between the Vaal confluence and the Augrabies Falls - is characterised by numerous islands which were favoured by the herding (Khoi) societies for the natural protection barrier that they provided against wild animals and stock thieves, and this stretch of the river was therefore densely inhabited in precolonial times (Smith & Metelerkamp 1995:1; Penn 1995:22).

The resources of the river were, of course, shared by hunter-gatherer societies (San). Preceding the advent of colonial disruption in the Northern Cape, these two groups were apparently able to co-exist in relative harmony along the river. This was probably due to the fact that the Khoi mainly inhabited the islands in the river, and that the San realised the advantages of peacefully exploiting the riverine



resources without being in constant contest with the herders for their livestock (Penn 1995:22).

Penn (1995) reviewed this historical scenario extensively, drawing on the observations of eighteenth century travellers like Wikar and Gordon. These observations shed some light on the complex cultural composition along the Orange River at the dawn of colonial influence in this part of the country. Numerous hunting and herding groups were mentioned in these reports. During the eighteenth century, the Khoi or herding inhabitants of the Middle Orange River were the Einiqua. The Einiqua, Namaqua and Korana all belonged to the same language group, namely Orange River Khoi which can be divided into two dialects. -Nama was spoken by the Namaqua to the west and !Kora by the Korana to the east, with the Einiqua thus falling in between. The Einiqua were divided into several subdivisions on the grounds of their location and thus had affinities with either the Namaqua or Korana (Penn 1995:38).

These subdivisions seem to have been frequently at war although the Einiqua apparently had better relations with the various San groups who also inhabited the area from Augrabies Falls to Kheis. It is in the vicinity of the latter where the first Korana group, namely the Kouringeis, was to be found. These people displayed some Tswana influences with regard to their appearance, according to Gordon (Penn 1995:39-41).

Penn states that as the Northern Cape frontier steadily moved northwards during the eighteenth century, "Bastaards" and "Bastaard-Hottentots" gradually moved away towards Namaqualand and eventually also focussed on the Orange River as a sanctuary from colonial rule (Penn 1995:48). This influx disrupted the relatively stable situation along the Orange River. In 1751 the first loan farm next to the River was officially registered although other European trekboers unofficially utilised grazing lands in the area before the 1780's. The relative stable circumstances along the Orange River were increasingly complicated not only by the presence of the trekboers and "Bastaard", "Bastaard-Hottentot" or Khoi refugees in the second half of the eighteenth century, but also by the extreme

violence introduced by individuals searching for cattle and by big game hunters who frequented the area. A veritable Pandora's box was opened by the metamorphosis of the Orange River into the colonial frontier and by the inherent resistance of Khoi slaves, "Bastaard" and "Bastaard-Hottentot" groups and the Oorlams against European colonialism. The nineteenth century brought relief in the shape of European religion with the first Christian missionaries arriving at the Orange River in 1801 (Penn 1995:51-58, 91).

1.3.2. *The farm Bloubos*

Just beyond the fertile soils of the Orange River flood plain the first red dunes of the Kalahari start, and with them, the possibility of agriculture largely ends. The practice of pastoralism is however suited for this environment, especially so with present-day water exploitation strategies. As the crow flies, the farm Bloubos lies some 50 kilometres north-north-west from the town Upington, situated on the banks of the Orange River. Sheep farming is currently the main activity practised by inland farmers of the Northern Cape and on the farm Bloubos, sheep and springbok numbers are substantial.

The history of the immediate study area, i.e. Bloubos and its neighbouring farm Hakdooren Vlei is as follows:

Blauwbosch 364, registration number Gor Q4-3, was first deeded on the 19th of August 1896 under a system called *Quickrent*, whereby the farm was made available and registered by the British Government in the Cape of Good Hope. The original size of Bloubos was 12000 morgen. In 1899 however 3000 morgen was removed and in 1953 the bottom left corner, consisting of 18 morgen, was cut off from the original farm.

Hakdooren Vlei 428, registration number Gor Q5-35 was first deeded on the 13th of December 1897 to the trustees of the former Bechuanaland. In 1925 the farm was deeded in the name of the family Liebenberg and the western and eastern ends were removed. In 1951 and again in 1953 the farm was cut back by two smaller pieces of land. Both farms were first deeded by

the British Deeds Office for this part of the country (British Bechuanaland), located in Vryburg. Hakdooren Vlei is presently owned by the Liebenberg Family Trust while Bloubos is owned by Mr. F. Liebenberg.

1.4. Archaeological background

In an effort to move away from European terminology, the archaeological term Later Stone Age was coined in 1929 by Goodwin and Van Riet Lowe in their pioneering monograph, *The Stone Age Cultures of Southern Africa*, to describe the younger prehistoric finds in southern Africa. Within the Later Stone Age they defined the **Wilton** and **Smithfield** cultures (Goodwin & Van Riet Lowe 1929; Deacon 1990:44). The type description of the Wilton culture was based on data from the excavations at a rock shelter and cave on the farm Wilton near Alicedale in the eastern Cape, excavated by Hewitt in 1921 (Deacon 1972:10). Both the rock shelter and cave assemblages are dominated by scrapers while some segments and backed pieces were also present (Deacon 1972:12, 47). Since that time, the connotations and implications of the term Wilton have changed considerably, but it remains an important part of present-day South African LSA nomenclature.

In his *The Prehistory of Southern Africa*, Desmond Clark still identified "two great culture complexes" south of the Limpopo River, namely the macrolithic Smithfield and the microlithic Wilton Complexes (1959:190). He also distinguished four regional forms of the Wilton tradition in South Africa of which the fourth was named the **SWA** or **Kalahari Wilton**, found mainly along the Orange River and in the Upington area. Assemblages within this Wilton variant were said to contain single and double crescents, borers, backed bladelets, thumbnail scrapers as well as thin sidescrapers, high backed side- and endscrapers and shell beads, slate pendants and bone artefacts (Clark 1959:204).

It soon became apparent that the neat identification of two regional cultural complexes were not enough to explain the LSA sequence in South Africa. Between 1965 and 1968 Garth Sampson undertook extensive archaeological research in the Orange River Scheme area along the border



of the Free State. In examining the LSA of the Orange River, he identified six phases (typological units) which he subsequently classified into three LSA industrial complexes (Sampson 1972). He felt that the stone tools belonging to Phase 1 were representative of Van Riet Lowe's **Smithfield A**, that Phases 2 to 5 represented an **Early Wilton**, a **Middle Wilton**, a **Late Wilton** and a **Late-ceramic Wilton**. Phase 6 corresponded with the previously defined **Smithfield B** and **C** (Sampson 1972:188, 205, 287). According to Sampson, Phase 1 belonged to the **Oakhurst Complex**, Phases 2 to 5 to the **Wilton Complex**, and Phase 6 to the **Smithfield Complex** (Sampson 1972:285-287).

The emergence of the Wilton Industry during Phase 2, characterised by the appearance of microlithic stone tools including small convex scrapers, *outils écaillés*, backed blades and crescents (currently known as segments), was attributed by Sampson to a change in raw material preference, as was the development of long endscrapers during Phase 4 (Sampson 1972:199, 242). Specific mention was made of observed surface scatters in Namibia, Botswana and in the vicinity of Upington in the Northern Cape containing high proportions of backed blades, endscrapers and segments with associated pottery (Sampson 1972:262). The observed types seem to echo that of Clark (1959) with regard to his SWA or Kalahari Wilton variant.

In his publication titled *The Stone Age Archaeology of South Africa*, Sampson (1974) clearly distinguishes between a **Coastal** and **Interior Wilton** within the Wilton Complex. He also subdivides each into an **Early**, **Classic**, **Developed** and **Ceramic** phase, which broadly correspond to Phases 2 to 5 of his 1972 review (Sampson 1974:9). The importance attached by him to the role played by raw material preference and/or availability in the size and shape of stone tools is again evident in his 1974 publication. However, this tendency was already prominent in the 1920's when Goodwin and Van Riet Lowe attributed the occurrence of micro- and macrolithic assemblages to the choice of raw materials, and continued from then on to appear regularly in LSA studies in South Africa (Clark 1959:185; Deacon 1990:44).

Sampson again mentions a surface site close to Upington which he attributes to the Interior Wilton (1974:330). This site was one of two described by I. Rudner (1953), who mentioned a site located some 48 kilometres north of Upington within a dune depression. The stone implements found at both of the sites mentioned were originally ascribed to the Smithfield B but later considered to belong to the Wilton Industry, based on the discovery of several segments (Rudner 1953:82; Rudner & Rudner 1959:142-144). In 1959 I. and J. Rudner referred to thin walled Khoisan pottery at the Upington sites, which were similar to pottery found in coastal middens. They attributed thicker pottery with flat or rounded bases found on these sites to contact with Iron Age people (Rudner & Rudner 1959:142, 145). It seems as if the coastal pottery referred to represents their later defined type C, which is found both along the coast and inland, and which has pointed bases and internally reinforced lugs (Rudner 1979:11, 13; Sampson 1974:302-305).

In the period between 1966 and 1967 Janette Deacon examined material excavated at the Large Rock Shelter on the farm Wilton (Deacon 1972:10). Deacon's research not only revealed that the Wilton deposits were not representative of a single cultural entity as originally believed, but also shed some light on the relation of Wilton to other LSA sites in southern Africa. Until then, the term Wilton had been used to describe assemblages containing small scrapers and microlithic backed tools and especially segments (Deacon 1972:38). This trend is confirmed in the descriptions of the Wilton by the abovementioned researchers. Deacon identified a **Pre-Wilton** phase containing large and smaller scrapers, that reminds of the now defined Oakhurst typology. This unit was followed by a microlithic phase named the **Wilton**. The **Post-climax** and **Pottery Wilton** followed at about 2000 years ago (Deacon 1972:36, 38). Broadly similar trends were identified at other sites in the eastern Cape including Oakhurst shelter, but could not be identified without doubt in the interior, with the possible exception of sites excavated by Sampson along the Orange River (Deacon 1972:38-39).

In a subsequent review, *Later Stone Age People and their Descendants in Southern Africa* (1984a), Deacon divided the LSA into four culture-

stratigraphic units. These are **Late Pleistocene microlithic assemblages, Terminal Pleistocene/early Holocene non-microlithic assemblages, Holocene microlithic assemblages** and **Late Holocene assemblages associated with pottery**. The Holocene microlithic assemblages date from approximately 8000 years BP to a few hundred years ago. It encompasses fully microlithic traditions characterised by backed tools, small convex scrapers, and bone, shell and wooden tools. Terms falling within this unit include, among others, Goodwin and Van Riet Lowe's (1929) Wilton and Smithfield C, the southern and eastern Cape Wilton defined by Deacon (1972) and Sampson's (1974) Wilton Complex (Deacon 1984a:228).

According to Deacon, Late Holocene assemblages associated with pottery date to the last 2500 years with most sites younger than 2000 years BP. The pottery is, in some areas, associated with microlithic assemblages but Deacon specifically mentions that Northern Cape and former Transvaal and Natal pottery is associated with long endscraper dominated assemblages, with limited backed tools (Deacon 1984a:229).

Within the last culture-stratigraphic unit, terms referring to microlithic assemblages include Deacon's (1972) Post-Climax Wilton and Sampson's (1974) Ceramic Wilton. The terms Smithfield B of Goodwin and Van Riet Lowe (1929) and Sampson's (1974) Smithfield Complex are indicative of assemblages with long endscrapers associated with pottery (Deacon 1984a:229). These assemblages supposedly occur in the Northern Cape and Free State and are thus of interest to this study.

A.J.B. Humphreys and A.I. Thackeray (1983) also recognize the Wilton Complex as having been present in the Northern Cape by at least 8000 years BP. The definition for the Northern Cape used by them is however very broad, being that portion of the Cape Province lying north of the Orange River and bordering on Namibia, Botswana and the former Transvaal and Orange Free State (Humphreys & Thackeray 1983:283). According to Humphreys and Thackeray, the Wilton Complex overlies the regional variation of the Oakhurst Complex, which they named the **Kuruman Industry** (Humphreys & Thackeray 1983:278).

Assemblages characteristic of the Wilton Complex were excavated from several sites situated along the Ghaap escarpment and in the Kuruman hills. While the Northern Cape Wilton differs in some aspects from the southern and eastern Cape Wilton, it also mirrors some. Endsrapers are, for example, said to be longer in the Northern Cape, as also observed by Sampson (1974:328) in the Orange River Scheme area. However, according to these researchers backed tools, especially segments, are present as they are in Wilton assemblages of other South African regions. They also recognize that assemblages are not static in terms of lithic composition and stone tool dimensions, but that they changed throughout the middle and late Holocene (Humphreys & Thackeray 1983:283-284).

Based on his extensive survey of sites in the Northern Cape, P.B. Beaumont identifies two contemporaneous but distinct industries within the Ceramic LSA: the Swartkop and Doornfontein Industries. Predating these, Beaumont finds Oakhurst type aggregates in the region, followed by a local Wilton Complex industry he has named the **Springbokoog**, which dates between c.4300-4200 BP and 2600-2300 BP. The Springbokoog aggregates are characterised by a high incidence of backed blades (50-80%) within the formal tool sample, as opposed to the contemporaneous scraper dominated assemblages found in the southern and eastern parts of the country (Beaumont, Smith & Vogel 1995:242, 254).

The **Swartkop Industry** is characterised by a very large blade flake index as well as by an extremely high frequency (more than 60%) of backed blades within the formal tool component. The similarities between the Springbokoog and Swartkop industries, lead Beaumont to believe that the latter originated from the former. He also indicates that hunters or the historical /Xam (a San group) may be clearly associated with the Swartkop Industry in Bushmanland. The pottery associated with the Swartkop Industry, is usually coarse, undecorated, grass-tempered ware (Beaumont, Smith & Vogel 1995:254-255).

The **Doornfontein Industry**, recognized on sites close to the Orange River, on sites close to other water sources, and in regions bordering Bushmanland, is defined by Beaumont, mainly as containing large samples



of pottery (Beaumont, Smith & Vogel 1995:246). The pottery is usually amphora shaped, thin walled, with thickened bases, lugs, bosses, spouts and decorated necks or rims. The associated stone tools are predominantly amorphous, dominated by irregular flakes and with only a small formal component. Beaumont sees the Doornfontein Industry as being directly linked to herding groups, or the historical Khoi (Beaumont, Smith & Vogel 1995:246-247, 255).

It is clear that differing definitions of the Northern Cape and its borders have led to some conflicting and confusing conclusions. For example, Deacon clearly states that Northern Cape assemblages are dominated by long endscrapers and characterised by reduced backed blade figures (1984a:229). This might be so in the Orange River Scheme area in the East, but does not seem to be applicable throughout the whole area investigated by Beaumont (Beaumont, Smith & Vogel 1995). The Swartkop assemblages are obviously not characterised by endscrapers while they have high backed blade frequencies. Beaumont's research is an attempt to further refine the known database with regard to Ceramic LSA industries in the Northern Cape, and in so doing, he is claiming definite associations with either LSA hunting or herding societies. These most recently published research results are relevant to the present study.

An absence of studies based on samples from open-air surface site led to the formulation of the following research approach.

1.5. Research approach

1.5.1. Methodology

While keeping the existing state of knowledge regarding the LSA in South Africa and specifically the Northern Cape region (see paragraph 1.4), as well as the aforementioned research objectives (see paragraph 1.2), in mind, the following methodology was followed to determine the possible significance of a LSA open-air surface site on Bloubos.

1.5.1.1. *Field work*

The arguments against the substantial use of surface collections in archaeology strongly relates to the initial choice of appropriate sites as well as to the methodology used to retrieve archaeological material from open-air sites. In order to evaluate the nature and scope of the archaeological remains of the LSA surface sites on Bloubos, an extensive collection of surface material from one suitable site was undertaken. The choice of such a suitable site is largely dependant on the size and condition of the surface scatter. The collection had to be of sufficient size to enable meaningful comparison with other sites and to ensure positive results after analysis. The site preferably had to be undisturbed by recent human activity, such as farming. Such a surface scatter was located, lying on the edge of a dune adjacent to a pan on Bloubos. Initial inspection indicated that the scatter consists of a large number of stone artefacts.

The collection of an extensive sample of surface material was, as far as possible, conducted in an unbiased way so as to ensure that an accurate reflection of the archaeological phenomena on the site would be attained. All the artefacts on the site were obviously not collected since this would have prevented future inspection. A test sample of artefacts collected with the aid of a grid was taken from the site to achieve this goal. All archaeological material found within randomly chosen grid blocks was collected.

1.5.1.2. *Artefact analysis*

The question of chronological depth on a surface site can only be answered by means of typological classification and metric analysis. The analytical method used in this study consisted of a systematic process of typological classification of artefacts, followed by the measurement of the size and shape of each artefact.

- The material from each grid block was analysed separately, after which the results were compared and combined. These units (grid

blocks) were judged sufficient to indicate any significant variations in terms of typological composition and artefact size and/or shape, that might have pointed to chronological depth on the site.

- Additionally, a deposit of cultural material was located in the general vicinity of the surface site. A test excavation was conducted which enabled a typological and chronological assessment of the open-air site by cross-referencing the sets of data from the two sites.

1.5.1.3. *Site comparisons*

The results obtained from the artefact analysis were subsequently compared to other published archaeological sets in the Northern Cape region. Especially the work of Thackeray, Humphreys and Beaumont was considered since theirs is, geographically, the most relevant to this study. Adjustments were necessarily made where different methods of classification and/or size analysis were applied. These are discussed in Chapter 5.

1.5.1.4. *Synthesis*

Finally, a synthesis was made of all the relevant material. The results from both the artefact analysis and the site comparisons were considered in order to interpret the open-air surface site and to assess the degree to which the research objectives were achieved.

1.5.2. *Presentation*

The need for comprehensive studies on open-air surface sites in the Northern Cape as discussed in Chapter 1 is addressed as follows:

- Chapter 2, **Study area**, discusses the geographical extent of the study area as well as its environmental characteristics. The



suitability of the area for human occupation during the LSA is indicated by this discussion;

- Chapter 3, **Field work**, describes the sites and the archaeological field research conducted on them. The discussion of the dates of the sites indicate an LSA context while the artefacts on the sites confirm the latter;
- Chapter 4, **Artefact analysis**, gives a detailed description of the artefacts retrieved from the surface scatter on Bloubos. The results of the metric and typological analysis conducted on the sample are discussed and compared to those from a second site - a stone circle with a deposit containing LSA remains. This comparison indicates that they belong to the same LSA industry;
- Chapter 5, **Site comparisons**, describes the comparison made between the sample from the Bloubos open-air site and other contemporaneous samples within the study area. The results indicate to which LSA industry the Bloubos sample belong, and shed light on the economy of the site's occupants;
- Chapter 6, **Conclusions**, takes all the above into account to interpret the contribution of this open-air site to our understanding of the LSA in the Northern Cape.

1.6. Conclusions

The ideal outcome of this study was that the Bloubos site and its properties would fit into the existing chronological and typological LSA pattern of the Northern Cape and that it would not, by a process of elimination, simply represent a well documented but otherwise irrelevant surface site, dependant on further research for incorporation into this framework. Ideally, this project will begin to evaluate and demonstrate the contribution that a surface site can make to understanding the utilisation of the landscape by LSA communities.

The study area

2.1. Introduction

The farm Bloubos is located at 28° 05' S and 20° 50' E, within the area between the Orange River and the Kuruman River. To the west the area is bound by the derelict southward stretch of the Molopo River, and to the east by the Langeberg and Korannaberg (Figure 2.1). The farm lies 55 kilometres north-north-west of Upington in the most southern part of the Kalahari desert which stretches between the Okavango swamp in the north and the Orange River in the south. Between the two permanent water sources there is virtually no surface water available. The Aub and Nossob Rivers in the south-west and the Molopo and Kuiseb Rivers in the south occasionally carry floods for some days, but they never reach the outflow into the Orange River. After local showers the numerous pans in the landscape sometimes also carry water for a while.

2.2. Geology

The Kalahari "has acted as a major sedimentary basin" since the Cretaceous geological period (Deacon and Lancaster 1988:60). The result is that in some places, this basin can contain up to 500 metres of sediment consisting of sands and marls. Many of the sediments representing the Kalahari Group were calcified or silicified after deposition and have subsequently been covered by loose surface sand. These sediments extend far to the north and cover an area of approximately 2,5 million square kilometres (Deacon and Lancaster 1988:60). The sand cover in the study area between the Kuruman and Molopo Rivers in the north and the Orange River in the south is termed the Gordonia Sand Formation, a subdivision of the Kalahari geological sequence. On average its thickness is 10 to 20 metres. The colour of the aeolian sand is primarily red, although local variations in colour do occur. Next to a river course or a pan it is often white. A thin coating of haematite causes the red colouration (Thomas, Thomas & Malherbe 1988:14).

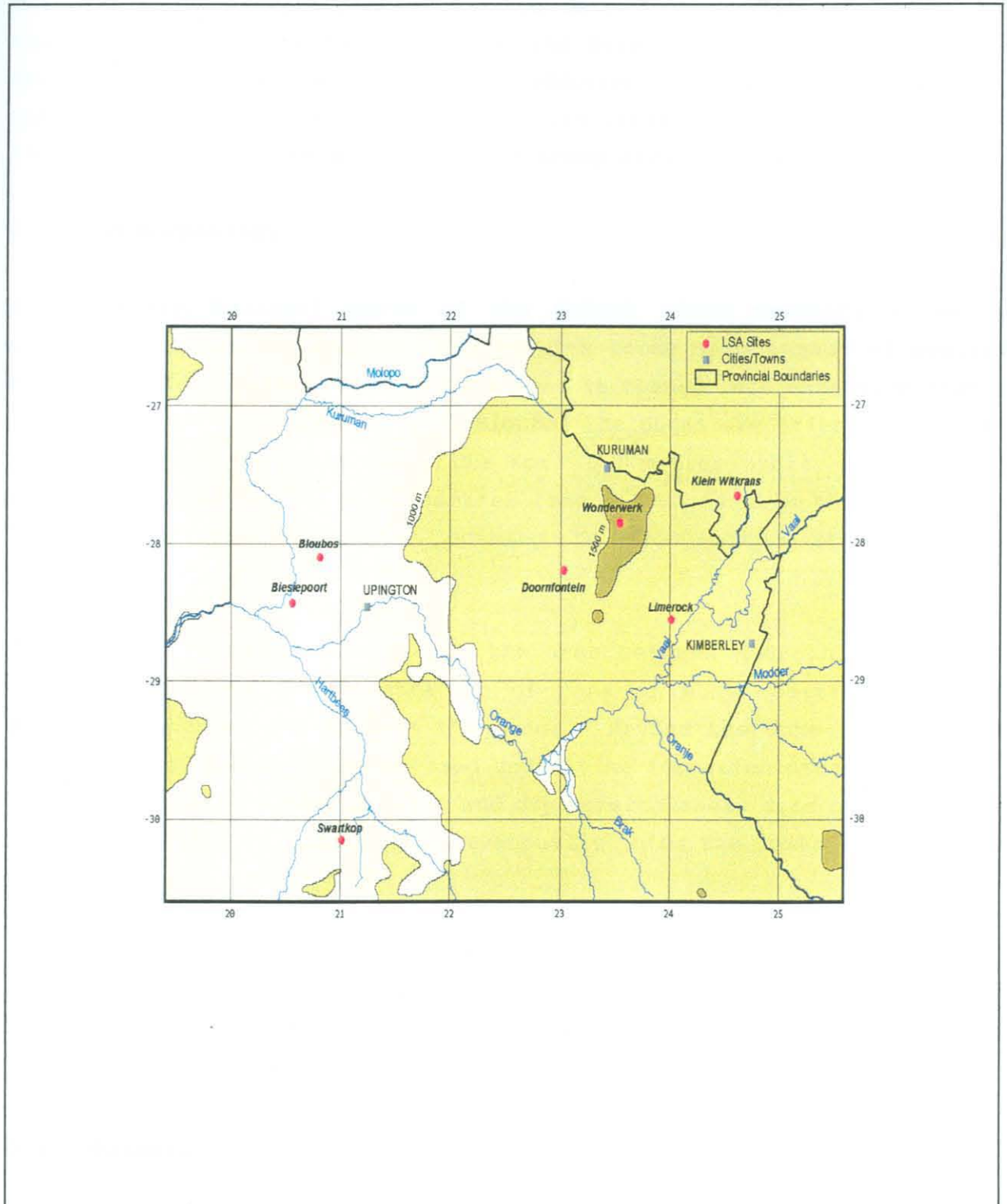


Figure 2.1: Topographical map of the study area. (Southern latitude, eastern longitude).

This map indicates the position of the farm Bloubos and other LSA sites as well as the location of towns, rivers and provincial borders within the study area.

Only the south-western part of Bloubos is covered by Kalahari sand. On the rest of the farm Dwyka tillite and Kuibis quartzites of the Nama Group form much of the surface. In addition there are several granite outcrops that form low mounds capped with large loose boulders (Du Toit 1954; SACS 1980). The geology of the study area is shown in Figure 2.2.

2.3. Geomorphology

The southern Kalahari south of the Kuiseb River presents a gently undulating landscape largely covered with loose desert sand of aeolian origin (Du Toit 1954). Much of this sand is formed into extensive stable linear dunes. In the vicinity of Bloubos the dunes are oriented in a NW-SE direction. They typically lie some 150 metres apart, are 5 to 15 metres high and may be 40 kilometres long. Occasionally they join in a Y-shaped junction with the opening to the north-west (Lancaster 1987:103).

In addition to these dune fields the area between Koës in Namibia and Upington features a concentration of pans of which several occur on Bloubos alongside and between the dunes. Beyond the dune field in the south-west of the farm the exposed underlying formation presents a rocky flat surface with numerous faint and dry watercourses, some of which join to form a fossil tributary which eventually joins the lower Molopo River in the west.

In contrast to the monotonous sand-dunes and rocky surface on Bloubos, are the granite rock outcrops on the property which occur on the northern part of the farm. They consist of huge to medium sized boulders that stand out in the landscape.

2.4. Climate

In the time span covered by this investigation, i.e. the late Holocene, some fluctuations in climate are known to have occurred, but these are of minor magnitude and probably did not have any effect on the semi-desert environment of the Northern Cape area (Tyson & Lindesay 1992).

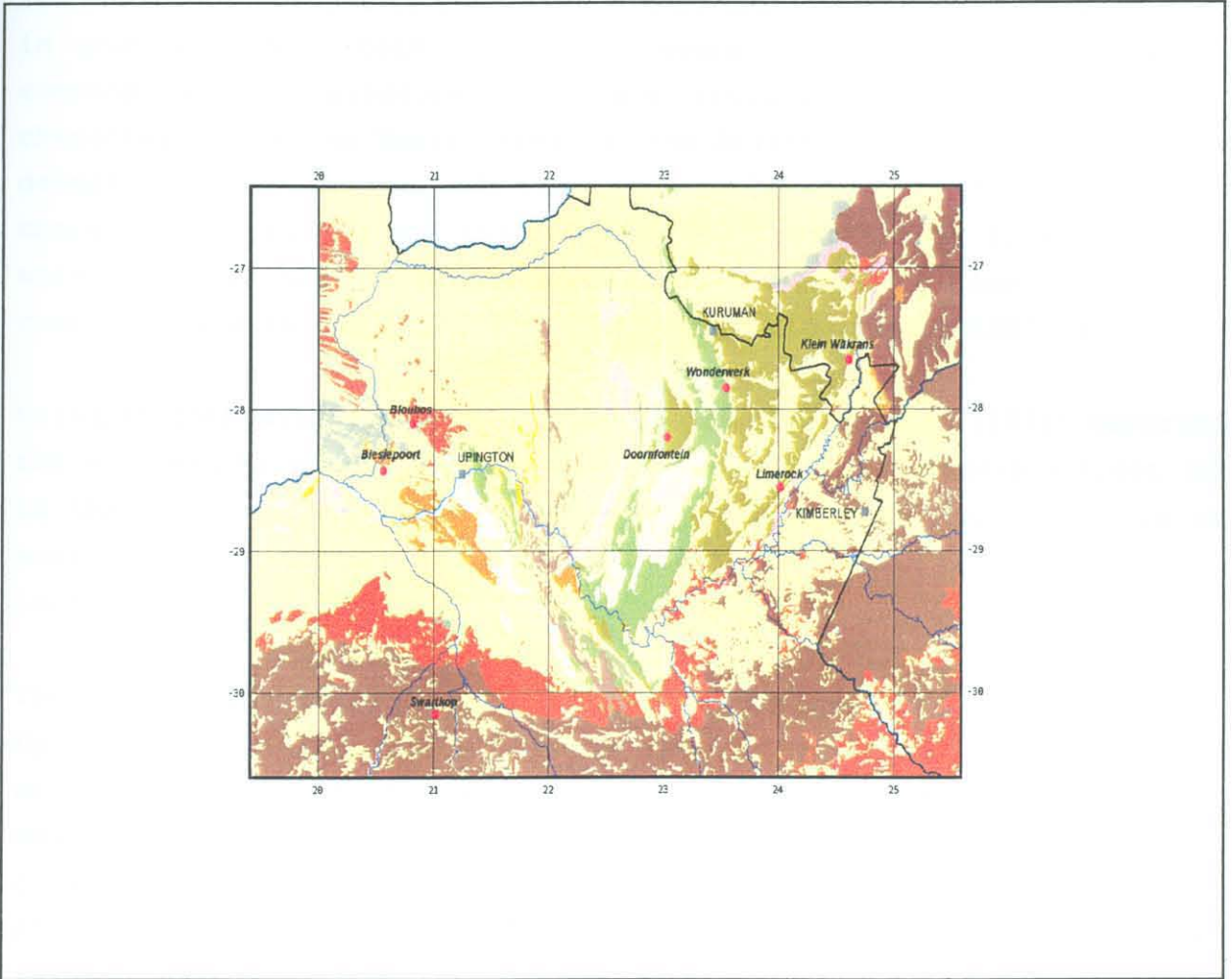


Figure 2.2: Geological map of the study area. (Southern latitude, eastern longitude).

This map indicates the position of the farm Bloubaos and other LSA sites in terms of the geological formations in the study area.

Legend	
Yellow:	Kalahari Beds & Sands
Brown:	Ecca shales of the Karroo Sequence
Orange:	Dwyka tillite of the Karroo Sequence
Grey:	Kuibis quartzites of the Nama Group
Dark yellow:	Schists & gneisses of the Korannaland Sequence
Light brown & pink:	Schists & Quartzites of the Olifantshoek Sequence
Green:	Banded ironstone of the Griqualand West Sequence
Olive:	Dolomites of the Griqualand West Sequence
Dark brown:	Ventersdorp lavas etc.

The African continent is characterised by desert and semi-desert climates in mid-latitudes, both north and south of the equator where the subtropical high-pressure cells are situated. Southern Africa is characterised by the Namib desert on the Atlantic coast and the Kalahari desert in the centre of the sub-continent. These deserts are characterised by low and irregular rainfall, very high solar radiation which produces high rates of evaporation and high day-time temperatures contrasting with low night-time temperatures (Nyamweru 1997:34).

Using Thornthwaite's classification of climate, Poynton (1971) describes the southern Kalahari region as Arid Mesothermal with moderate frost (E5) in the west and Semi-arid Mesothermal with moderate frost (D5) in the east. Bloubaos itself lies in the western arid zone, close to the 200mm isohyet.

The nearest long-term climatic station of the Weather Bureau is that of Upington. Here the rainfall during the 20th century averages 180mm per annum, but it is highly variable. In 1903 and again in the 1932/33 season only 34mm fell, while in 1950, 500mm was recorded and on three occasions more than 300mm a year was experienced since 1960 (South African Weather Bureau data). The area is well within the summer rainfall region with most of the precipitation occurring between November and April. The rain is rapidly absorbed in the sandy soils and it is only after heavier showers that runoff accumulates in the pans for a while (Butzer 1984:117).

The desert climate of the region is characterised by large daily variations in temperature. At Upington the average maximum and minimum temperatures recorded during the hottest month, January, are 36°C and 20°C. In midwinter the average maximum reaches 21°C and the minimum temperature is 4°C on average (South African Weather Bureau data). During the dry season, frosts in the early morning are not uncommon (Grove 1969:191).

In winter the winds blow mainly from the north and occasionally reach velocities of over 14m/sec. Between October and January it is



predominantly from the south-west. However, significant sand movement is not induced by these winds (Lancaster 1987:104).

2.5. Flora

The study area is situated within the Kalaharian ecozone as identified by Devred (Klein 1984:117).

2.5.1. Vegetation

Desert vegetation is inherently drought-resistant. The flora is characterised by deep roots, thick bark, thorns and small waxy or hairy leaves and tend to show rapid growth after rains (Nyamweru 1997:34). The veld type in the study area falls within Acocks's (1988) western and north-western form of the Kalahari Thornveld Proper. The Western Form is typically an open savannah of *Acacia erioloba* and *A. haematoxylon* with desert grasses and is found mainly west of the Asbestos, Kuruman and other hills. The crests of linear dunes are mostly bare in this drier part of the Kalahari region (Lancaster 1987:103-104). On Blouboos, dunes as a whole carry rather sparse vegetation with plants mostly growing along their edges. Acocks mentions that in the Gordonia district calcareous tufa and silcrete outcrops are associated with Arid Karoo or Orange River Broken Veld vegetation (Acocks 1988:44-46).

The subdivision of the abovementioned Arid Karoo Veld type relevant to the research area is the Blomkoolganna Veld which is found on sandy calcareous tufa. This veld type is characterised by a uniform and dense growth of desert grasses *Salsola tuberculata*, *Stipagrostis obtusa* and *S. ciliata*. Short grasses which include *Oropetium capense* and *Stipagrostis brevifolia* often also cover the ground. The latter is an extremely hardy plant which, even in droughts, manages to survive by shedding its leaves, forming a "little woody yellow-brown bush" (Acocks 1988:74). Annuals and geophytes also occur in the Blomkoolganna Veld and are numerous after good rains. The relevant subdivision of the Orange River Broken Veld is mainly associated with calcareous tufa of great depth and stony terrain, and is called *Acacia mellifera* subsp. *detinens* Veld. The latter, as well

as a variety of Karoo bushes and grasses are in this veld type. Acocks specifically mentions that the grasses would have been more plentiful in the past (Acocks 1988:75, 83).

Grass types which occur specifically on the Bloubos dunes include tall bushman grass (*Stipagrostis ciliata* var. *Capensis*), small bushman grass (*Stipagrostis obtusa*) and sour grass (*Schmidtia kalahariensis*) (pers. comm. F. Liebenberg). These grass types all prefer sandy soil as habitat and consequently occur regularly on dune sand (Van Oudtshoorn 1992:200, 204-205). The annual sour grass flourishes after adequate precipitation and grows in large clusters next to watercourses as well as on dunes. The sour grass is a valuable food source for animals when young and tender (Mills & Haagner 1989:14). Duwweltjies (*Tribulus terrestris*) whose bright yellow flowers enliven the sand coloured landscape, occur in broad stands after rain on the farm (Leistner 1967:111).

2.5.2. Trees and shrubs

The area also features shrubs and trees. Smaller shrubs occurring on Bloubos include the kapokbossie (*Eriocephalus ericoides*) which is found primarily on the 'hardeveld' (Milton & Dean 1996:88). Another shrub found on Bloubos, especially on the dunes, is the driedoringbossie (*Rhigozum trichotomum*) (Milton & Dean 1996:87). The driedoringbossie is an important source of food for sheep and other browsers since both the bushman grass types are annuals which only thrive after rain (Smith & Metelerkamp 1995:9). On the hardeveld one finds the swarthaak (*Acacia mellifera* subsp. *detinens*) (Palmer 1961:160).

Trees growing on dunes on Bloubos include the vaalkameeldoring (*Acacia haematoxylon*), the kameeldoring (*Acacia erioloba*) and the witgat (*Boscia albitrunca*) (Mills & Haagner 1989:96; Palmer 1977:109, 127). The *Acacia* species grow in dune sand but also in riverbeds since their extensive root systems are able to penetrate deep into the sand to reach the ground water below. Due to the shortage of water on the dunes though,

they tend to grow only into bushes. The witgat is a common sight on dunes (Mills & Haagner 1989:13).

2.5.3. Edible plants

On Bloubos, the rosyntjieboom or korentebessie (*Rhus* genus) is found on the hardeveld. The fruits of this *Rhus* species are small and fleshy and can differ in colour from brightly coloured to brown. These fruits are nowadays eaten by most indigenous people as well as by birds (Palmer 1977:185). The tsama melon (*Citrullus lanatus*) represents another edible wild fruit found on dunes and in riverbeds on the farm. The tsama melon grows along the ground and is a very valuable source of refreshment to humans, birds, mammals and insects with 90% to 95% of the fruit being water. While the tsama is an annual plant, the gemsbokkomkommer (*Acanthosicyos naudinianus*) is a perennial wild fruit. The cucumber has the same nutritional value as the tsama, both being rich in Vitamin C (Mills & Haagner 1989:16, 96).

Further edible plants occurring in the southern Kalahari include *Caralluma knobelli* and the bobbejaankomkommertjie (*C. lugardii*) of which the stems can be eaten, *Coccinia rehmannii* and *C. sessilifolia*, the wildekomkommer (*Cucumis africanus*) and *Ipomoea bolusiana* (Leistner 1967:106-108).

The exploitation of plant foods in historical times mentioned in connection with the immediate area along, and north and south of the Orange River, could also be applicable to Bloubos itself. Early travellers mention the collection of root plants, fruits and seeds by 'bushmen'. Tree gum, beans from pods and honey were also eaten. The eighteenth century traveller, Mossop, described how *Acacia* seeds were crushed and mixed with wild lily and wild raisins and then stored and used when needed (Smith 1995:7).

2.6. Fauna

2.6.1. Present-day fauna

At present, a variety of wild animals still occur on the farm. A comprehensive list compiled by the owner, Mr. F. Liebenberg, is presented in Appendix A. Scientific names were quoted from Skinner and Smithers (1990). Several other species were undoubtedly also present in prehistoric times. The Kalahari Gemsbok National Park belongs to the same Kalaharian ecozone and the animals there would also have occurred on Bloubos. A list of the mammals in that park is presented in Appendix B. In addition to those presently on Bloubos, this list includes game animals such as eland, red hartebeest, jackals and hyaenas.

2.6.2. Earlier records

In prehistoric and early historical times the faunal composition of the study area was more extensive. Eye-witness accounts of eighteenth century travellers are, since these explorers were mainly hunters, somewhat biased as to which species of animals they report, but they do give some indication of the wildlife in the area in those days (Smith & Metelerkamp 1995:5). During his voyage to the mouth of the Orange River and further along it in 1779 to 1780, Gordon witnessed the hunting of giraffes near the Augrabies Falls and several hippopotamus herds and rhinoceros along the river. On the islands between the Falls and the confluence with the Hartebeest River baboons, ducks and cormorants were seen (Raper & Boucher 1988:320-324). The amount of wildlife along the river in early historical times is clear from Gordon's mention of elephant and hippo hunting, his sighting of a herd of 8 kudu bulls and his comments on the mountain zebra. Other animals mentioned by Gordon in his recordings are hyenas, jackals, caracals and hartebeest (Raper & Boucher 1988:332-340).

The subsistence value of fish from the Orange River should not be overlooked. Smith & Metelerkamp identify the smallmouth yellowfish (*Barbus holubi*), the orange river mudfish (*Labeo capensis*), the



largemouth yellowfish (*Barbus kimberleyensis*), the moggel (*Labeo umbratus*) and the sharptooth catfish (*Clarias gariepinus*) as being of economic importance (1995:5, 7). Gordon mentions not only the fishing for moggels by means of traps, but also that dried fish were eaten by the inhabitants along the River (Raper & Boucher 1988:322-324).

2.7. Conclusions

Despite the obvious drawbacks to living in a desert environment, the southern Kalahari should not be seen as entirely inhospitable. The geomorphological, floral, and faunal conditions on Bloubos provided good hunting ground, some shelter, and plant foods for nomadic hunter-gatherers. During the rainy season, normally dry riverbeds and pans could provide water. During this brief interval the possibility of nomadic pastoralism in the area can not be ignored. The environmental setting on Bloubos and the southern Kalahari as a whole, could clearly have sustained a variety of economic customs in prehistoric times.

Field work**3.1. Introduction**

It is clear from the typological range of stone tools found on Bloubos that the environmental setting on the farm facilitated occupation over many millennia. In particular on the northern part of the farm Early Stone Age (ESA) and Middle Stone Age (MSA) stone tools lie exposed on the surface (see Photographs 3.1 and 3.2). The ESA finds include Acheulian hand axes and cleavers and Victoria West I and II cores. MSA artefacts include cores with prepared striking platforms, large blades and points. Along with the ESA and MSA finds, clusters of Later Stone Age (LSA) artefacts occur at various places on the farm.

The majority of LSA sites on Bloubos are surface scatters on the slopes of dunes close to pans as well as in the areas between the dunes, although some LSA sites are located within the granite outcrops on the farm. One site of each type was chosen for closer inspection. The main site, Bloubos 5 (BB5), is a surface scatter comprising an unusually large archaeological sample. Bloubos 7 (BB7), a stone circle situated on a granite outcrop some kilometres from BB5, was chosen as an example of the second type of site. Bloubos 6 (BB6), Hakdooren Vlei 1 (HD1) and Hakdooren Vlei 2 (HD2), are surface scatters which were also recorded during the field work. The positions of the various sites are shown on the map (Figure 3.1).

3.2. Bloubos 5

The site BB5 ($28^{\circ} 08.83' S$; $20^{\circ} 48.60' E$), is a surface scatter lying on the lower slope of a linear dune adjacent to a sizeable pan (see Photograph 3.3). To investigate the site further, an extensive collection of the material remains from BB5 was undertaken. A grid of 80m x 30m was laid out (Figure 3.2) along the base of the dune and divided into 5m x 5m squares. Wooden poles were used to demarcate the four corners of each square. A rather extensive, random sample was collected from BB5. All the material, including manuports and waste



Photograph 3.1: ESA stone tools from Bloubos.

ESA cores and hand axes are a familiar sight on the farm.



Photograph 3.2: MSA stone tools from Bloubos.

MSA points and blades indicate a continuous occupation of the farm from the ESA to the LSA.



Figure 3.1: Map of the farm Bloubos.

The 1:50 000 topographical map indicates the position of the sites considered in this project. BB5: 1; BB7: 2; BB6: 3; HD1: 4; HD2: 5.



Photograph 3.3: Site BB5.

The LSA surface scatter lies on a sand-dune next to a prominent pan. The margin of the latter is clearly visible on the photograph.

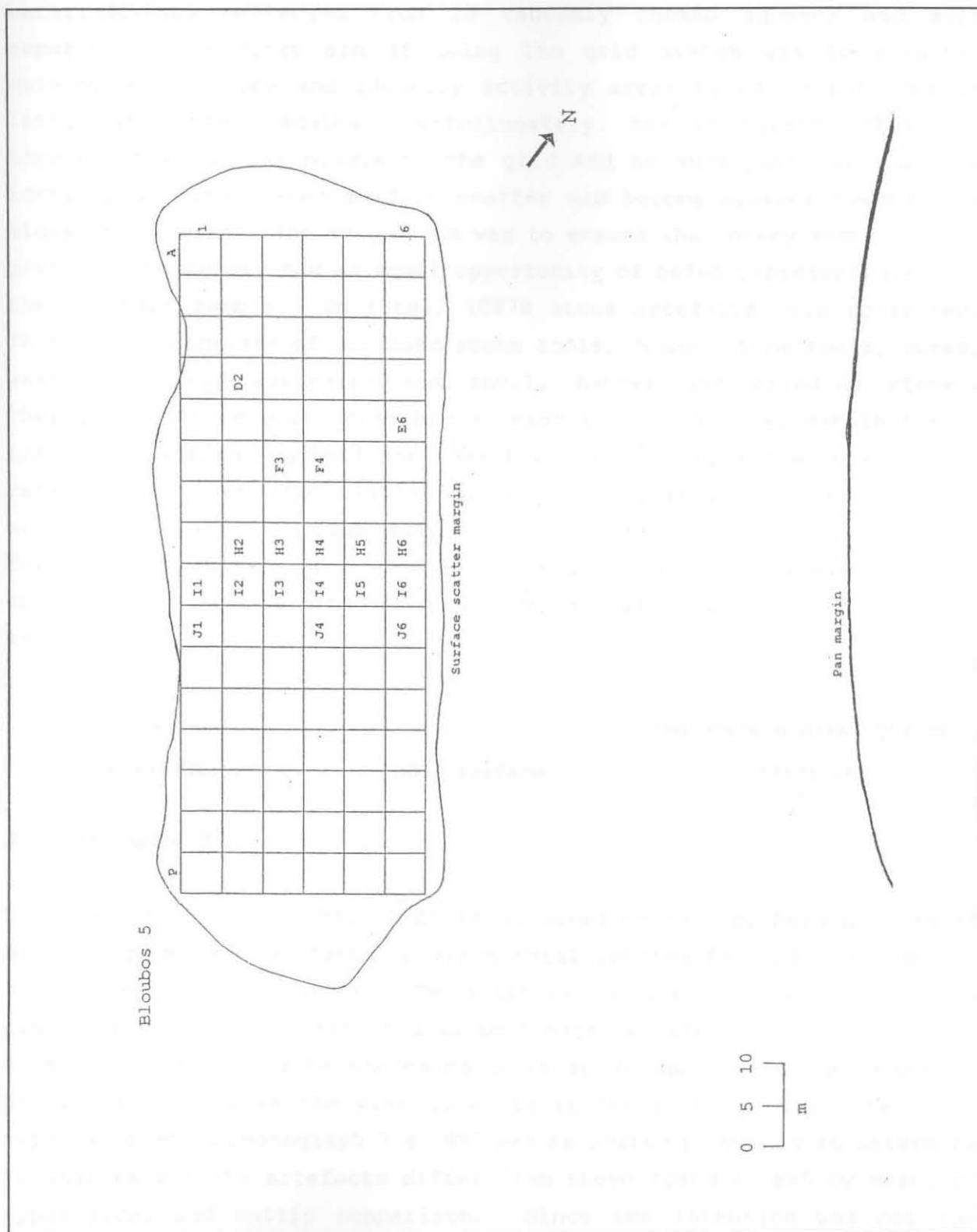


Figure 3.2: Survey plan of BB5. (Free-hand sketch).

The position of the 80m x 30m grid which was placed over the surface scatter is shown in relation to the pan margin.



material, was collected from 18 randomly chosen squares and kept separate. The first aim of using the grid system was to possibly determine site type and identify activity areas based on patterns of lithic and other remains. Unfortunately, the 18 squares clustered together towards the middle of the grid and no such patterns could be identified. The uneven surface scatter did become sparser towards the sides of the grid. The second aim was to ensure that every member of the prehistoric society had an equal opportunity of being represented within the artefact sample. In total, 10878 stone artefacts were collected. This sample consists of utilised stone tools, formal stone tools, cores, waste material, manuports and anvil, hammer and grinding stones. Therefore, BB5 is quite possibly an example of a factory/manufacturing LSA site. Ostrich eggshell and some fragments of ceramic ware were also retrieved. That the LSA on Bloubos was fairly untouched by the encroaching colonial Cape border, is evident from the lack of any European artefacts - for example porcelain fragments, glass or metal objects. The date obtained from ostrich eggshell fragments (OES) for BB5 is:

Analysis no		Radiocarbon date (yrs BP)
Pta-7381	BB5, surface	1810± 45

3.3. Bloubos 7

BB7 (28° 04.15' S; 20° 51.56' E) is situated on the northern portion of Bloubos in quite a different environmental setting from BB5 and some 10 kilometres from the latter. The earth is rocky without a sand-dune or pan nearby. The site, situated amongst huge granite boulders, comprises a definite stone circle enclosing a sandy accumulation. A prominent granite knoll blocks the view directly to the south of the site. The site is shown in Photograph 3.4. BB7 was excavated primarily to determine to what extent its artefacts differ from those found at BB5 by means of typological and metric comparison. Since the intention was not the large-scale accumulation of material remains, only a 50cm x 50cm test block was excavated in a randomly chosen position within the circle. It was excavated in 5cm spits down to 35cm and in 10cm spits



Photograph 3.4: Site BB7. (Scale = 40cm).

Site BB7 is a 5m x 4m stone circle containing LSA deposits.

down to sterile soil at 75cm depth. Utilised stone tools, formal stone tools, cores, waste material, decorated and undecorated OES fragments, OES beads, bone fragments, some potsherds and charcoal fragments were found while there were no manuports, anvil or upper grinding stones. BB7 most probably represents a living site. The particulars of the BB7 test pit are summarized in Table 3.1 and the survey plan shown in Figure 3.3.

No European artefacts were recovered from BB7. The radiocarbon dates for the site, obtained from OES fragments are the following:

Analysis no		Radiocarbon date (yrs BP)
Pta-7730	BB7, spit 2	340± 50
Pta-7755	BB7, spit 6	2370± 45

An earlier surface sample, presumably from this site was also dated and gave the following result:

Analysis no		Radiocarbon date (yrs BP)
Pta-7367	BB7, surface	440± 50

3.4. Bloubos 6

BB6 (28° 07.93' S; 20° 47.58' E) is a sparser surface scatter 1,8 kilometres from BB5, in the depression between dunes and close to a dry watercourse. The site contained utilised stone tools, cores and waste material as well as several anvil stones (see Photographs 3.5 and 3.6), suggesting that it too was a factory/manufacturing site. No lithic artefacts were collected from BB6 but OES fragments from the site were used to determine a date:

Analysis no		Radiocarbon date (yrs BP)
Pta-7819	BB6, surface	840± 80

Again no European artefacts were recovered from the site.


Table 3.1: Summary of the BB7 excavation.

Spit	Depth	Colour	Compaction	Texture	Nature
Surface	0cm	Grey/red	Very loose	Sandy	Slightly ashy
Spit 1	0-5cm	Grey/red	Medium	Sandy/fine	Ashy
Spit 2	5-10cm	Grey	Medium	Very fine	Ashy
Spit 3	10-15cm	Grey	Medium	Sandy/fine	Ashy/sandy
Spit 4	15-20cm	Grey	Medium	Sandy/fine	Ashy/sandy
Spit 5	20-25cm	Grey	Medium/loose	Very fine	Ashy/sandy
Spit 6	25-30cm	Grey	Loose	Sandy/fine	Ashy/sandy
Spit 7	30-35cm	Grey	Very loose	Sandy	Sandy/soil
Spit 8	35-45cm	Grey	Loose	Sandy/fine	Sandy
Spit 9	45-55cm	Grey	Medium	Fine	Sandy
Spit 10	55-65cm	Grey/red	Medium/loose	Sandy/fine	Sandy/rocky
Spit 11	65-75cm	Reddish	Very loose	Sandy/fine	Sandy/rocky

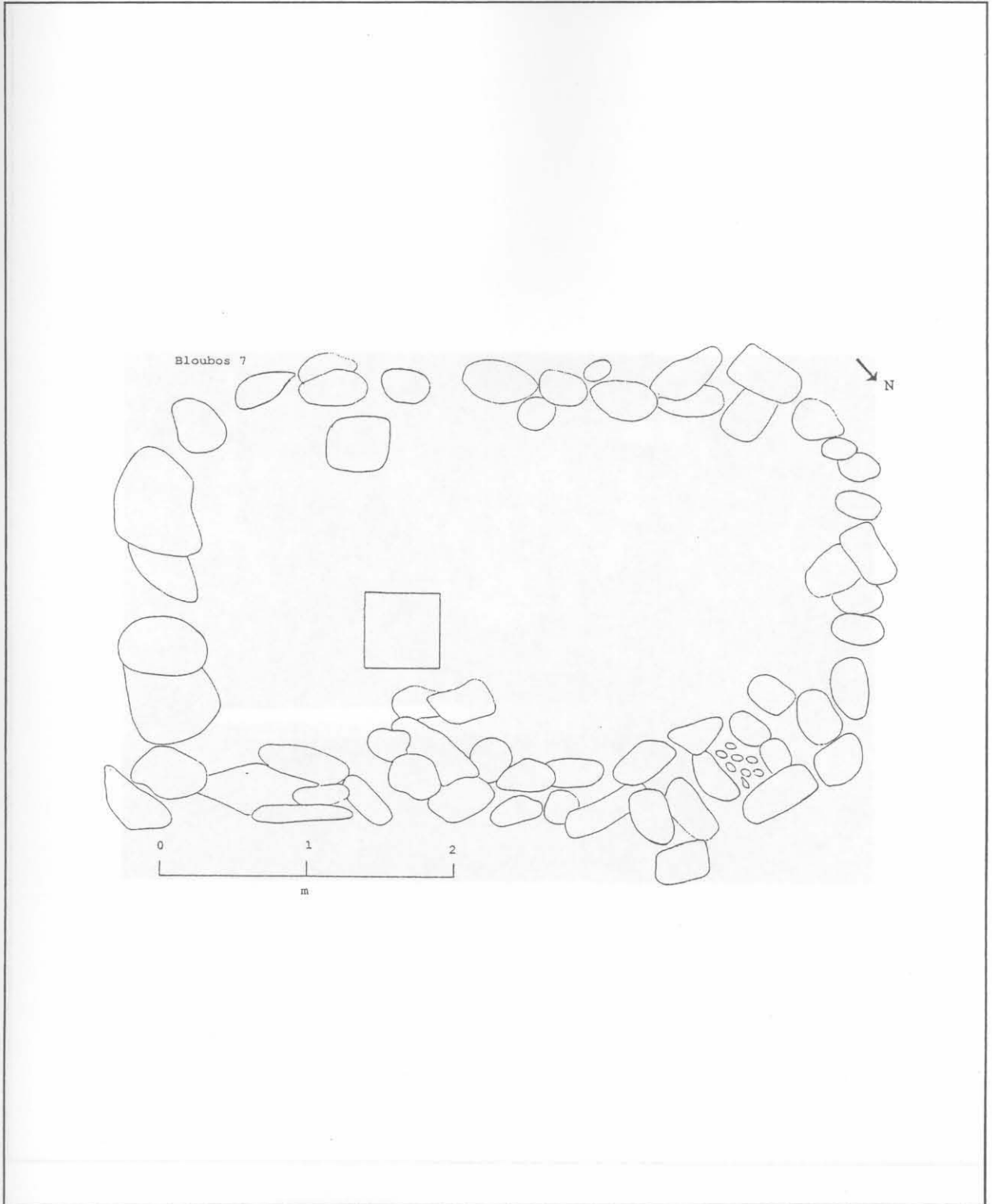


Figure 3.3: Survey plan of BB7. (Free-hand sketch).

The position of the test pit which was excavated at BB7 is indicated.



Photograph 3.5: Stone artefacts on BB6. (Scale = 40cm).

Cores and flakes that form part of the surface scatter are visible.



Photograph 3.6: Anvil stone on BB6.



3.5. Hakdooren Vlei 1

Amongst the dunes some 4,2 kilometres south of BB5, just within the borders of Hakdooren Vlei, two further sites were observed. The first, HD1 (28° 10.83' S; 20° 48.17' E), lies on the slope of a sand-dune. The site is a rather dense surface scatter, similar to BB5 and BB6 in typological character with utilised stone tools, waste material and anvil stones present on the surface. No European artefacts were identified.

A cache of empty but intact ostrich eggshells found buried in the shade of a kameeldoring on HD1 was pointed out to me by the owner. This cluster of probable prehistoric water containers, is a good example of one survival tactic of nomadic LSA hunters (Rudner 1953:82). Fragments of one shell which eventually broke after it was previously removed from the cache, were used for dating purposes with the following result:

Analysis no		Radiocarbon date (yrs BP)
Pta-7764	HD1, surface	1480± 50

3.6. Hakdooren Vlei 2

Hakdooren 2 (HD2) (28° 10.80' S; 20° 48.05' E) lies in a narrow depression on the northern side of the same line of dunes as HD1, and some 250 metres away (see Photograph 3.7). This surface scatter is smaller than that on HD1 but just as dense. Once more stone tools, waste material, upper grinding stones, ostrich eggshell fragments and anvil stones are ample. No European artefacts were present.

3.7. Bloubos LSA radiocarbon dates

In 1978 it was reported that OES tended to produce radiocarbon dates that were too 'old' (Horowitz, Sampson, Scott & Vogel 1987:145). A recent evaluation of the radiocarbon age determinations using ostrich eggshell has revealed that the reason for this is twofold (Vogel, Visser & Fuls in press). Firstly, ostrich eggshell tends to survive for long



Photograph 3.7: Site HD2.

This particularly dense surface scatter also lies on a dune next to a pan. The latter is visible in the top half of the photograph.



periods in the environment and can easily be incorporated into later deposits in the same way as pebbles are. Shell from an excavated level or from a surface scatter can thus be a mixture of fragments of different ages. The result is that a date is obtained that is older than the actual age of the stone age assemblage that is to be dated.

Secondly, it was found that ostriches incorporate 'dead' carbonate into the shell, causing the radiocarbon age to be, on average, 180 years too old. Dates produced with this material must therefore be adjusted by the subtraction of 180 years. The uncertainty coupled with this effect also increases the error of the dating.

The material used for the dating of the finds at Bloubos was, in all cases, OES fragments. The results must therefore be corrected for the 180 year offset. In addition to this, they need to be calibrated to the historical time-scale. This is done using the Pretoria Calibration Program (Talma & Vogel 1993). The data used in the present version of the program is the recently revised results for the northern hemisphere as published by Stuiver et al. (1998), but adjusted to account for the southern hemisphere offset and to best match the Pretoria equipment (Vogel in press). The results for Bloubos and HD1 are listed in Table 3.2.


Table 3.2: Dates calibrated to historical time-scale.

Site	Analysis no	Apparent age	Calibrated date
BB5	Pta-7381	1810± 45 BP	AD 416(438)536
BB6	Pta-7819	840± 80 BP	AD 1288(1312-1385)1412
BB7 surface	Pta-7367	440± 40 BP	AD 1775-1799
BB7 7 spit 2	Pta-7730	340± 50 BP	AD 1676(1692-1726)
BB7 spit 6	Pta-7755	2370± 45 BP	345-313, 210(186)146 BC
HD1	Pta-7764	1480± 50 BP	AD 685(766)793

Artefact analysis

4.1. Introduction

Stone age research relies on lithic, wooden and bone artefacts, faunal and floral remains, rare human bones, occasional structural features, and rock paintings or engravings for information (Sampson 1974:5-6). By analysing these remnants, the archaeologist endeavours to reconstruct segments of the way of life of prehistoric societies, their technology and their position in time. Part of the archaeological reconstruction of a past society is also to postulate social, political, economic and religious customs. In southern Africa, stone age studies are hampered by unfavourable conditions of preservation, with the result that analyses are often based only on stone artefacts (Sampson 1974:6).

The ultimate purpose of artefact analysis is to collect information about the manufacturers. Methods of lithic analysis include the use of experimental archaeology and ethnography, use-wear analysis, raw material analysis and the reconstruction of the manufacturing mode (Fagan 1988:323-326). The close investigation of one open-air surface site as prompted by the research objectives of this study, focusses on stone artefacts. The birth of processual archaeology during the 1960's triggered a more scientific approach to both archaeological practice and theory and although this movement was criticised by ensuing paradigms, scientific typological classification and metric analysis is still the accepted way in which LSA assemblages are investigated (Deacon & Deacon 1999:8, 112-113).

The primary analytical methods used in this study are typological classification and metric analysis. After collecting the artefacts from the different grid blocks on site BB5, they were kept separate so as to enable comparisons between blocks. The artefacts excavated at BB7 were grouped into two strata to obtain meaningful numbers for comparison with BB5. This was possible because the artefacts were typologically homogeneous throughout the deposit. The artefacts from spits 1 to 5 and from 6 to 11, respectively, were grouped together.

4.2. Typological analysis

4.2.1. Previous and current trends

The objectives of archaeological classification are to organise data so as to make it more manageable, to describe different types of artefacts, to identify relationships among types, and to enable comparisons between assemblages in time and space (Fagan 1988:296). In 1891, A. de Mortillet contributed to the science of archaeology by simplifying the existing and very imaginative classification schemes devised since the beginning of the eighteenth century in Europe. He created four tool categories into which lithic artefacts could be classed. These were cutting tools, perforating tools, crushing or breaking tools and grinding tools (Leroi-Gourhan, Bailloud, Chavaillon & Laming-Emperaire 1965:242-243). Today this terminology is still fixed in archaeological vocabulary, indicating the supposed usages of tools.

Previously, LSA research in South Africa was characterised by an abundance of definitions and terms for similar findings, largely due to the early influence of amateur archaeologists (Deacon 1990:52). Lithic assemblages belonging to the Later Stone Age in southern Africa are being progressively analysed in a uniform fashion. The 'chain of operation' method, aims to reconstruct the different stages of stone tool manufacture from the initial selection of the raw material, to the eventual discard of the utilised and/or retouched tool (Deacon & Deacon 1999:107-108). Elements taken into account include type of retouch, artefact size and morphology of the worked edge.

Deacon's system (1984b) classes lithics into five categories, each to be further subdivided. These classes are: manuports, waste, utilised pieces, formal tools and formal tools shaped by grinding or polishing. The manuport class refers to unused material brought to a site. The waste class refers to unretouched byproducts which form during tool manufacture. These pieces also have no utilisation traces visible to the naked eye. The utilised class refers to stone tools with visible utilisation damage and the formal tool class to those where definite



flaking retouch is evident and made to a repeated pattern (Deacon 1984b:370).

4.2.2. Classification scheme

The classification scheme for utilised artefacts used in this study consists of five classes. The **flake** class is divided into complete and broken flakes, with the former subclassed into parallel edged flakes or blades, convergent edged flakes or points and irregular flakes. Parallel flakes or blades are those flakes with a length of at least twice their breadth and with parallel sides. It is implied that a flake with a length twice that of the breadth, but with a thickness equalling the breadth, is not classed as a blade. Broken flakes are blade flakes with either the top or bottom end, or both ends, snapped off. Artefacts belonging to the flake class are necessarily utilised, i.e. utilisation damage is visible to the naked eye along the working edge of the artefact. Unutilised flakes are automatically classed as waste material. At this stage it is important to note the subjective nature of the classification concept, 'utilisation damage visible to the naked eye', and that its interpretation and application differs radically from one researcher to the next.

Artefacts belonging to the **core** class have three or more negative flaking scars as defined by Deacon (Deacon 1984b:371). Cores are subdivided into irregular cores and blade cores. Blade cores can either be conical or flat. Cores were further inspected for utilisation damage.

The **formal tool** class includes lithic artefacts with formal retouch. This class is subdivided into scrapers and backed pieces (segments, backed blades and points). The scraper class is subdivided into sidescrapers, endscrapers, side- and endscrapers, double side- or endscrapers, round scrapers and concave scrapers. Scraper angle of retouch was viewed from the dorsal side.

No distinction was made between scrapers and adzes in this study. Adzes have been defined as being made on flakes or pebbles, having one or more straight or convex working edges and as generally being larger than scrapers (Deacon 1984b:391). They are also said to be similar to hafted Australian woodworking tools (Clark 1959:233-234). Clark however does not distinguish between the functions of scrapers and adzes (1959:201). Furthermore it seems that the shape of adzes is dependent on the extent of use, and may vary significantly (Humphreys & Thackeray 1983:304).

Manuports refer to unutilised material brought to a site for tool manufacture. **Waste material** refers to the unretouched byproducts which forms during tool manufacture (Deacon 1984b:370). **Other lithic remains** refer to upper grinding stones, hammer stones and anvil stones. In other words, all unflaked, utilised lithics.

Other artefacts besides stone tools were found at both sites. These **non-lithic artefacts** include ceramic sherds, decorated ostrich eggshell (OES) fragments and some OES beads. OES fragments were collected at both sites for dating purposes. Charcoal as well as bone fragments were found at BB7. The fragmented bone was not diagnostic and extremely fragile.

4.3. Results of typological analysis

4.3.1. Bloubos site BB5

The results of the classification process of BB5 stone tools are given in Table 4.1 and types are illustrated in Figure 4.1. In total 10878 lithic pieces were collected from BB5. 51% of this total is classified as utilised stone artefacts (cores included), 38% as waste material, and 11% as manuports. Generally speaking, the amount of waste material present at BB5 is relatively small (Deacon & Deacon 1999:112-113). When determining relative frequencies, only the stone tools were taken into account.

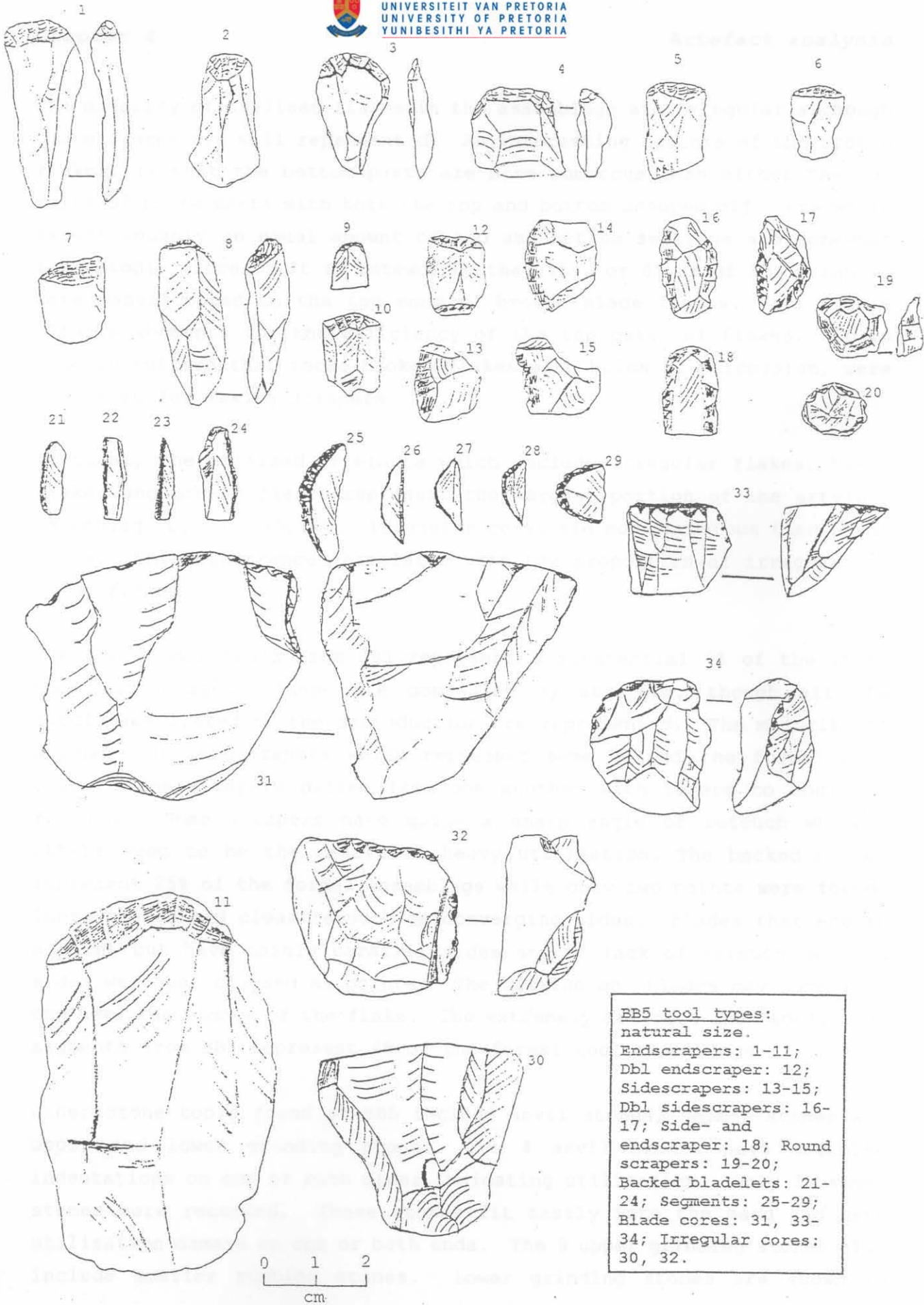
Table 4.1: Inventory of stone artefacts from s



ibos.

SQUARE	D2	E6	F3	F4	H2	H3	H4	H5	H6	I1	I2	I3	I4	I5	I6	J1	J4	J6	BB5	FREQUENCY		
																				%	%	
ARTEFACT TYPE																						
UTILISED FLAKES																					4728	85.1
COMPLETE FLAKES																					3875	69.8
Irregulars																					2778	50.0
Blades																					1097	19.7
BROKEN FLAKES																					853	15.4
Top																					204	3.7
Middle																					202	3.6
Bottom																					447	8.0
FORMAL TOOLS																					332	6.0
Scrapers																						
Endscrapers																					165	3.0
Side- and endscrapers																					28	0.5
Sidescrapers																					24	0.4
Dbl sidescrapers																					5	0.1
Dbl endscrapers																					2	0.0
Round scrapers																					7	0.1
Concave scrapers																					3	0.1
Backed pieces																						
Backed blades																					83	1.5
Segments																					13	0.2
Points																					2	0.0
CORES																					479	8.6
Irregular cores																					409	7.4
Blade cores																					70	1.3
OTHER																					16	0.3
Hammer stones																					3	0.1
Upper grinding stones																					9	0.2
Anvil stones																					4	0.1
TOTAL																					5555	100
WASTE MATERIAL																					4091	
MANUPOINTS																					1232	
GRAND TOTAL																					10878	

47



BB5 tool types:
 natural size.
 Endscrapers: 1-11;
 Dbl endscraper: 12;
 Sidescrapers: 13-15;
 Dbl sidescrapers: 16-17;
 Side- and endscraper: 18;
 Round scrapers: 19-20;
 Backed bladelets: 21-24;
 Segments: 25-29;
 Blade cores: 31, 33-34;
 Irregular cores: 30, 32.

The majority of utilised flakes in the assemblage are irregular although blade flakes are well represented. An interesting feature of the broken flakes, is that the bottom parts are more numerous than either the top parts or those parts with both the top and bottom snapped off. One would expect roughly an equal amount of top and bottom sections and somewhat less middle pieces. It is noteworthy that 154, or 65,8% of BB5 scrapers were manufactured on the top ends of broken blade flakes. This figure clearly accounts for the deficiency of the top parts of flakes. It is thus postulated that those broken flakes with bulbs of percussion, were preferred for making scrapers.

In total, the utilised artefacts which include irregular flakes, blade flakes and broken flakes represent the largest portion of the artefact assemblage by far (85,1%). Irregular cores are more numerous than blade cores. This occurrence correlates with the proportion of irregular to blade flakes.

The 332 formal tools from BB5 represent a substantial 6% of the stone tool assemblage. These are dominated by scrapers, though all the subclasses listed in the introduction are represented. The majority of scrapers are endscrapers which represent some 50% of the formal tool class. The scrapers differ from one another with regard to angle of retouch. Some scrapers have quite a sharp angle of retouch whereas others seem to be the result of heavy utilisation. The backed blades represent 25% of the formal assemblage while only two points were found. These points had clear retouch on converging sides. Blades that end in a point but have mainly parallel sides and/or lack of retouch on both sides were not classed as points. The backing on blades may sometimes end near the middle of the flake. The extremely delicate and finely made segments from BB5 represent 4% of the formal tool assemblage.

Other stone tools found at BB5 include anvil stones, hammer stones and upper and lower grinding stones. The 4 anvil stones have definite indentations on one or both sides indicating utilisation. Only 3 hammer stones were recorded. These stones fit easily into the hand and have utilisation damage on one or both ends. The 9 upper grinding stones also include smaller rubbing stones. Lower grinding stones are shown in

Photograph 4.1 and upper grinding tools in Figure 4.2. The presence of hammer and anvil stones along with waste material and manuports means that stone tools were manufactured on the site. Hammer, anvil and upper and lower grinding stones would also indicate that food was prepared there. It is perceivable that the indentations on anvil stones are caused by hammer stones crushing not only plant foods but also animal bones (Deacon 1984a:295; Inskeep 1978:43).

An extremely small sample of potsherds was collected from BB5. The 12 potsherds have a light reddish brown colour, fine texture and quartzite temper. All the sherds are slightly burnt. These sherds do not seem to belong to a single vessel. The non-lithic inventory is given in Table 4.2.

4.3.2. Bloubos site BB7

An inventory of the artefacts recovered from BB7 is given in Table 4.3 and examples of stone tools illustrated in Figure 4.3. The artefacts from the different spits are homogeneous and are for that reason discussed as a single unit. Interestingly, the test pit produced a lower percentage of waste material than BB5 (27% compared to 38%) and no manuports.

The distribution of the 483 utilised artefacts between the main artefact classes is shown in Figure 4.4 and compared with the values for BB5. The frequencies of the irregular and blade flakes are virtually identical to those of BB5, while there are relatively more broken flakes and less formal tools (only three scrapers were encountered) and cores. Furthermore, there is an almost equal number of top and bottom ends in the broken flake class. The abovementioned differences between the two sites are probably activity related; a matter that will be discussed in paragraph 4.8. below. The small number of formal tools (13) from BB7 makes any comparison of the frequencies within the categories with BB5 meaningless. Suffice to say that scrapers, backed blades and segments are present as in the BB5 assemblage. Spits 8 to 11 were devoid of any formal tools.



Photograph 4.1: BB5 lower grinding stone.

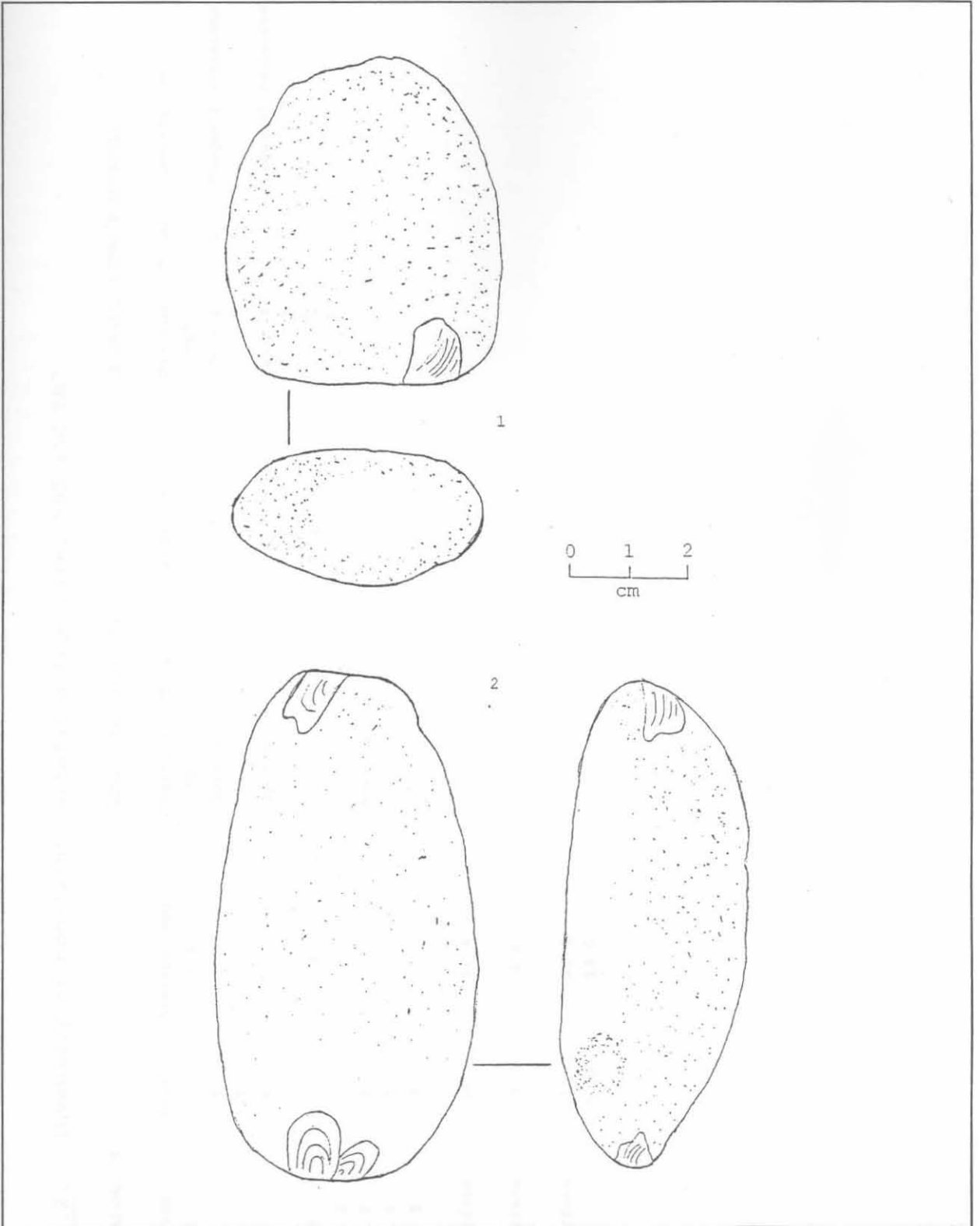


Figure 4.2: BB5 grinding tools.

Upper grinding stone: 1; Upper grinding and hammer stone: 2.

Table 4.2: Inventory of non-lithic artefacts from sites BB5 and BB7.

CERAMIC FRAGMENTS			OSTRICH EGGSHELL BEADS			DECORATED OSTRICH EGGSHELL		
Position	Total	Average (mm)	Position	Total	Diameter (mm)	Position	Total	Description
BB5		5.6	BB7			BB7		
D2	6		Spit 3	1	5.7	Spit 2	2	Diagonal incisions.
F4	5							
H4	1		Spit 6	3	5.6	Spit 4	1	Diagonal incisions.
					4			
BB7		6			4			
Spit 1								
Spit 2	2		Average		5			
Spit 4	2							
Spit 5	3							
BB7 Surface	14	10.4						
BB6 Surface	3	4.6						
HD2 Surface	1	10.4						
	1 (lug)	19.5						



Table 4.3: Inventory of stone artefacts from site BB7 on Bloubos.

SPIT	1 to 5	6 to 11	BB7	FREQUENCY	
ARTEFACT TYPE				%	%
UTILISED FLAKES	292	162	454		94.0
COMPLETE FLAKES	210	129	339	70.2	
Irregulars	155	87	242	50.1	
Blades	55	42	97	20.1	
BROKEN FLAKES	82	33	115	23.8	
Top	32	9	41	8.5	
Middle	17	11	28	5.8	
Bottom	33	13	46	9.5	
FORMAL TOOLS	8	5	13		2.7
Scrapers					
Endscrapers					
Side and endscrapers	1		1	0.2	
Sidescrapers	2		2	0.4	
Dbl sidescrapers					
Dbl endscrapers					
Round scrapers					
Concave scrapers					
Backed pieces					
Backed blades	4	3	7	1.4	
Segments		2	2	0.4	
Points	1		1	0.2	
CORES	13	3	16		3.3
Irregular cores	13	2	15	3.1	
Blade cores		1	1	0.2	
TOTAL	313	170	483		100
WASTE MATERIAL	125	57	182		
MANUPOINTS					
GRAND TOTAL	438	227	665		

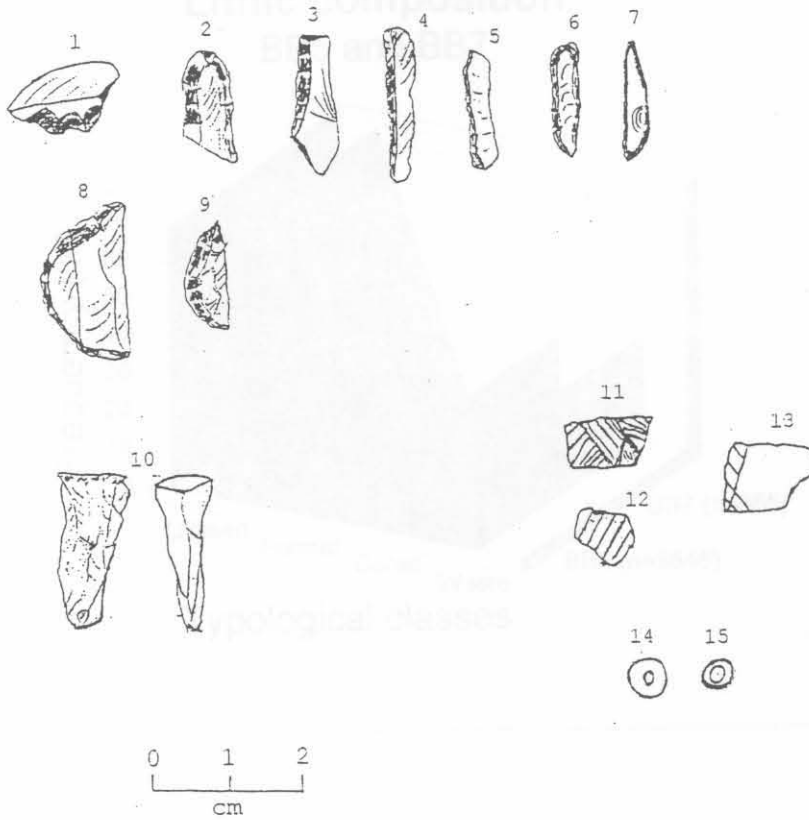


Figure 4.3: BB7 stone tool types and non-lithic artefacts.

BB7 tool types: natural size. Sidescraper: 1; Side- and endscraper: 2; Backed bladelets: 3-6; Point: 7; Segments: 8-9; Blade core: 10; Decorated OES fragments: 11-13; OES beads: 14-15.

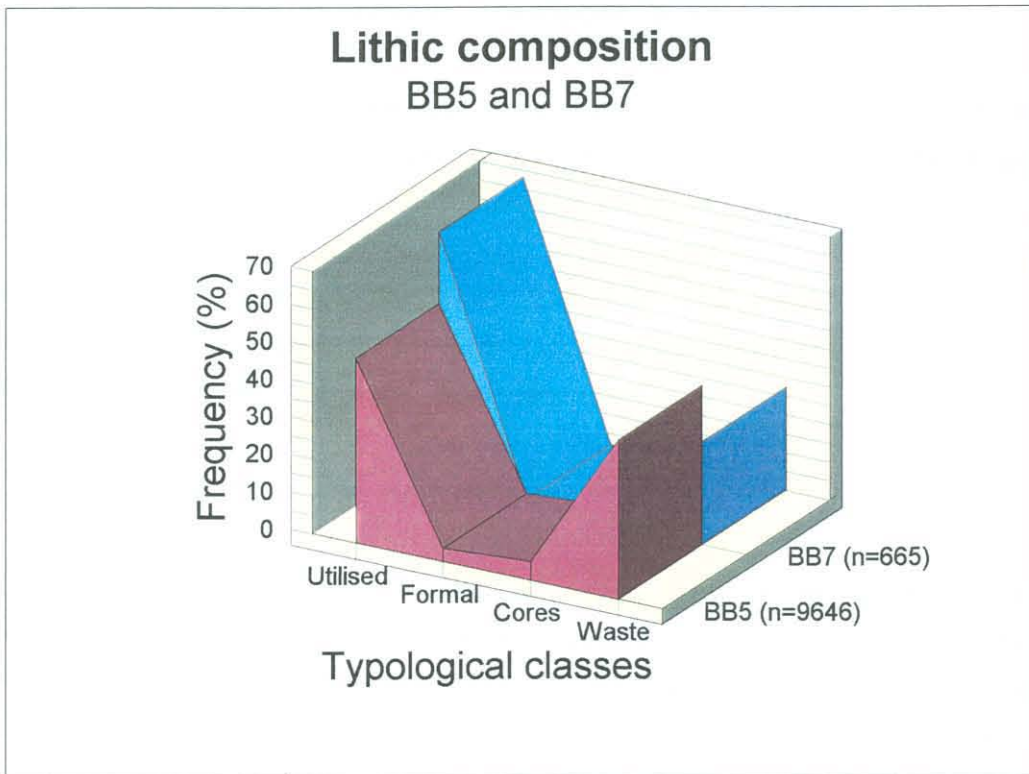


Figure 4.4: Comparison between BB5 and BB7 lithic composition.

The chart shows the relative similarity between the two assemblages in terms of main typological classes.

The non-lithic artefacts from BB7 are listed in Table 4.2 and depicted in Figure 4.3. Several potsherds were recovered from BB7. 14 potsherds were picked up from the surface. These sherds probably belonged to a single vessel since they all have a similar rough texture, reddish brown colour and thickness, and are all slightly burnt. Spits 1 to 5 contained 9 potsherds. These differ somewhat in colour but they all have grit temper and a fine texture. A single rim sherd was found. No potsherds were excavated from spits 6 to 11. Since spit 6 - dated to 2370 ± 45 - predates and/or coincides with the advent of pottery in the Northern Cape, this is to be expected (Beaumont & Vogel 1984:91).

Three ostrich eggshell beads were found in spits 3 and 6 while four decorated OES fragments were found in spits 2 and 4. The fragments are decorated with diagonal and cross-hatched incisions.

Despite the differences between BB5 and BB7 mentioned above, the two sites obviously represent the remains of groups with the same stone tool tradition and span the same time period.

4.3.3. *Bloubos site BB6 and Hakdooren Vlei site HD2*

A decorated potsherd was found at BB6 among some undecorated sherds. These sherds are of a light brown colour, they have a fine texture and they are tempered with quartzite. The decorated sherd has diagonally incised lines just below the rim. At HD2, a lug and conical base of a vessel were shown to me. These are both rough in texture with quartzite temper. The base is severely burnt while the lug has a reddish brown colour (Figure 4.5).

4.4. **Metric analysis**

Both the size and shape of lithic artefacts changed over time. Differences in the size and shape of stone tools are also recorded at different contemporaneous sites. These differences may be activity related or may be determined by the availability of raw material types. The possibility therefore exists that some information regarding the manufacturers and the demands of their societies can be obtained by

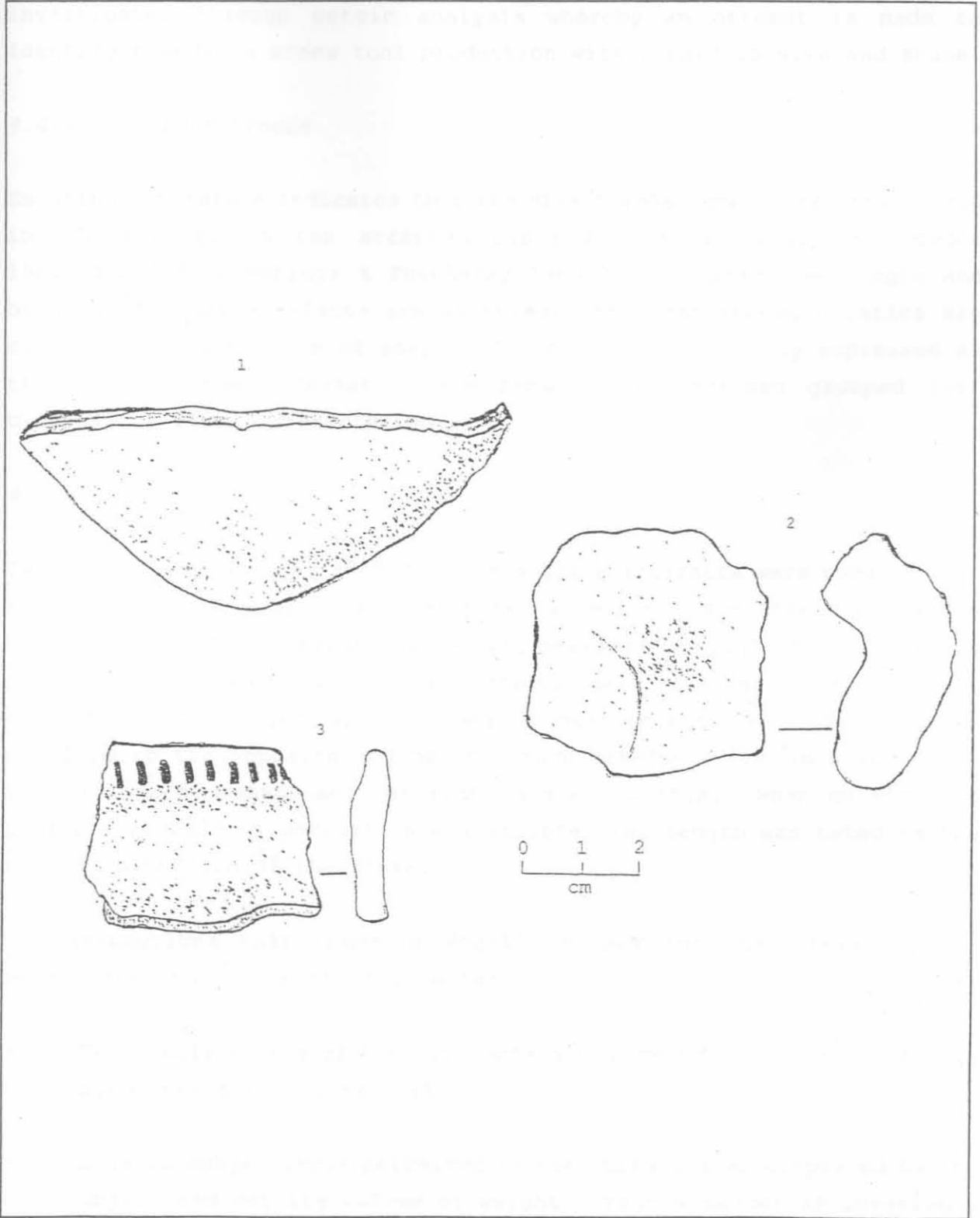


Figure 4.5: Ceramic fragments.

BB6: Decorated potsherd: 1. HD2: Ceramic lug: 2; Pointed base of ceramic vessel: 3.

defining these two attributes - size and shape. These attributes are investigated through metric analysis whereby an attempt is made to identify trends in stone tool production with regard to size and shape.

4.4.1. Current trends

Existing literature indicates that the direct measurements of stone tools in LSA studies is the accepted basis for metric analysis (Deacon 1984b:402-403; Humphreys & Thackeray 1983:306). After the length and breadth of stone artefacts are measured, the length/breadth ratios are calculated as a measure of shape. The results are usually expressed as the mean, standard deviation and range, and sometimes grouped into classes for visual presentation.

4.4.2. Metric scheme

Two different practical methods for measuring artefacts were used in this study. Size and shape were determined with the aid of the Vogel scale but direct length and breadth were also measured in millimetre, to enable a comparison between the results of the two methods (Vogel unpublished). The length was taken as the longest measurement from the striking platform to the opposite end of the stone artefact. Breadth was taken as the longest measurement at right angles to this. When no striking platform or bulb of percussion was visible, the length was taken as the longest dimension of the flake.

The assumptions that underlie Vogel's scheme for characterising the metric attributes are the following:

- The manufacturers of the artefacts had a specific size and shape in mind when they set to work.
- Size is subjectively perceived as the surface area displayed by the object and not its volume or weight. Thus a saucer is invariably placed in a larger category than an apple.

- A rough estimate of the size of an object is given by the length x breadth, and not by length, breadth or thickness separately.
- The perception of size is basically logarithmic. Thus in defining size, the observer asks whether the next artefact is twice the size or half the size of the first. Size classes are therefore based on a logarithmic scale.
- In terms of the shape of an artefact the first criterion subjectively applied, is whether it is long and thin, or short and squat. The length/breadth ratio provides a measure for this.
- Other concepts of shape may be added to the length/breadth criterion, such as round, oblong, rectangular, pointed or irregular.
- The concept of shape in terms of the length/breadth ratio is also governed by a logarithmic scale. The shape is judged as to whether it is as long as it is wide, or twice as long, or four times as long, etc.
- The choice of size and shape classes is based on what subjectively can be distinguished clearly. With this in mind and using a logarithmic scale, the following size classes are defined:

class	1	2	4	8	16
<i>lxb</i>	<1	1-2	2-4	4-8	8-16cm ² etc.

For the length/breadth classes the appropriate logarithmic subdivision is taken as:

class	A	B	C	D
<i>l/b</i>	1-1.4	1.4-2	2-2.8	2.8-4 etc.

- Such a classification system is applicable to any collection of objects. It can be used to define the size and shape of Acheulian

hand axes as well as that of a microlithic assemblage or even ceramic ware if need be.

The artefacts are not individually measured, but directly grouped into the different classes, using the template shown in Figure 4.6. In this study the term 'microlithic' is used to describe stone tools which measure less than 2cm² while a 'microlithic index' is defined as the percentage of artefacts measuring less than 2cm². Similarly, the 'blade index' is defined as the percentage of stone tools with a length greater than twice the breadth, i.e. $l/b > 2$.

4.5. Results of metric analysis

4.5.1. Bloubos site BB5

The utilised stone artefacts from BB5 have a wide range of sizes and shapes. Using the Vogel scale, the stone artefacts vary from being <0,5cm² to 128cm² in size (see Table 4.4). Overall, the most preferred size however, is seen to be between 2 and 4cm². Formal tools show a more limited distribution on the scale than the irregular flakes, blade flakes and cores. For obvious reasons the broken flakes tend to be smaller and the cores tend to be larger than the median. The irregular cores vary between 4 to 128cm² while blade cores tend to be somewhat smaller. A considerable proportion of the artefacts fall into the microlithic classes, with the overall microlithic index being 36%.

The overwhelming majority (approximately 60%) of the stone tools fall within the shape class B ($l/b = 1.4$ to 2) and the overall distribution is relatively tight (see Figure 4.7). Blade flakes are by definition limited to classes C to E, i.e. $l/b > 2$, while irregular flakes fall into classes A and B with $l/b < 2$.

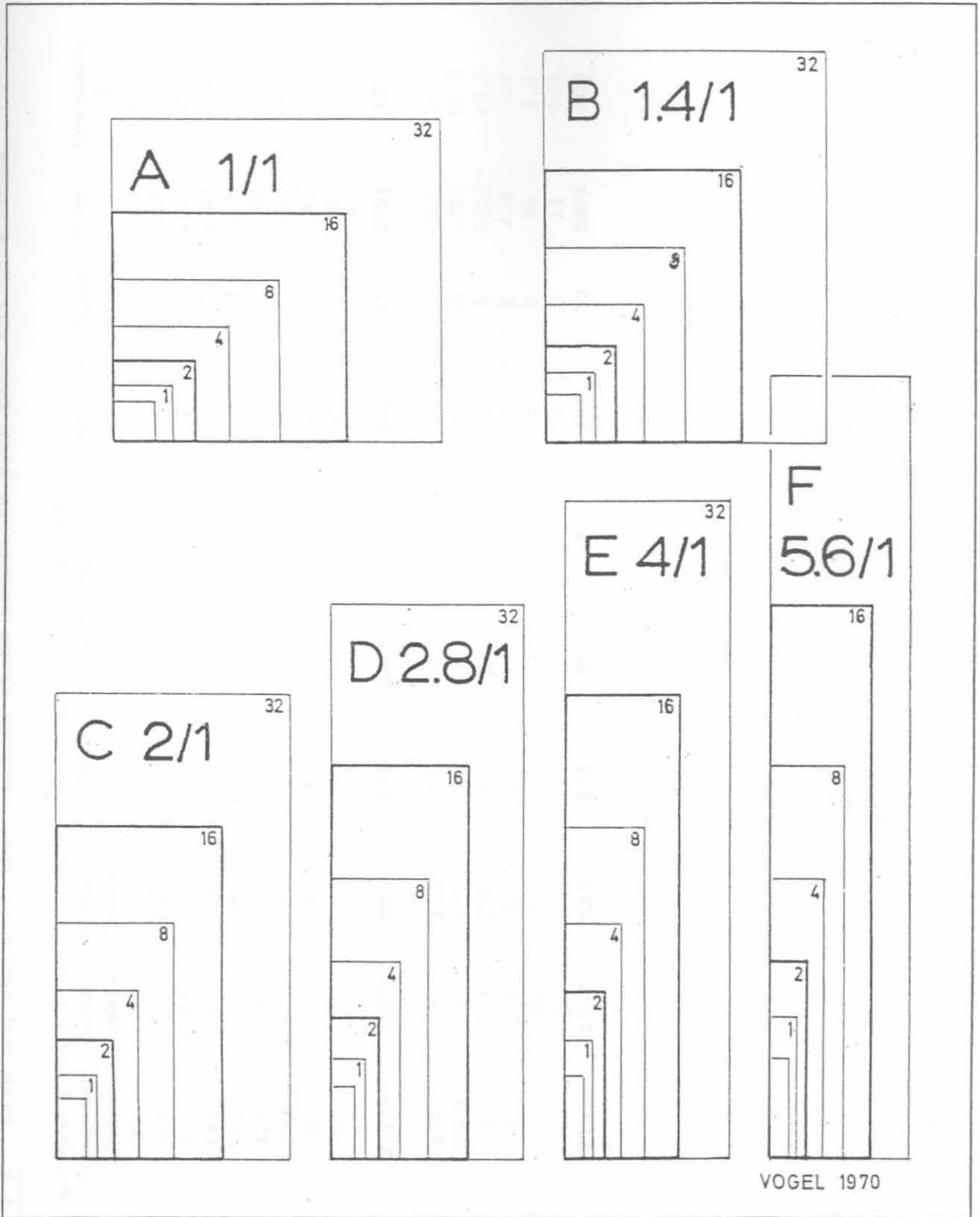


Figure 4.6: Template of the Vogel scale.

This logarithmic scale was used to determine the size and shape of artefacts from the Bloubos sites.

Table 4.4: Size and shape of the utilitarian artefacts from site BB5 on Blouboos.



* Hammer and upper grinding stones included in total ** Points included in total

SIZE	Irregular flakes	Blade flakes	Broken flakes	Scrapers	Backed blades	Segments	Irregular cores	Blade cores	Total	Frequency %
0.5	59	76	67	5	13	0	0	0	220	4.0
1	249	186	245	12	29	9	0	0	730	13.2
2	490	266	316	74	29	3	0	2	1180	21.3
4	646	322	186	94	14	1	13	7	1283	23.1
8	581	172	35	33	0	0	65	29	915	16.5
16	424	50	3	7	0	0	97	17	598	10.8
32	252	21	1	5	0	0	131	8	418	7.5
64	86	4	0	4	0	0	81	6	181	3.3
128	2	0	0	0	0	0	17	0	19	0.3
256	1	0	0	0	0	0	5	1	7	0.1
Total	2790*	1097	853	234	85**	13	409	70	5551	100
SHAPE										
1	401	0	133	23	0	1	46	8	612	11.0
1.4	2389	0	417	119	8	1	357	58	3349	60.2
2	0	732	220	61	25	5	6	3	1052	19.1
2.8	0	294	72	23	33	5	0	1	428	7.7
4	0	66	11	6	12	1	0	0	96	1.7
5.6	0	5	0	2	7	0	0	0	14	0.3
Total	2790	1097	853	234	85	13	409	70	5551	100

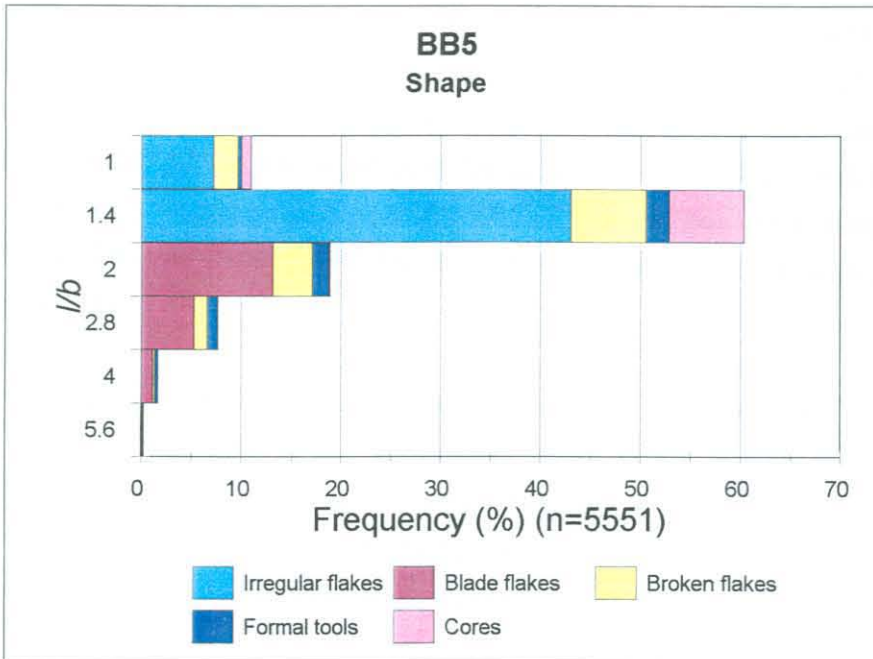
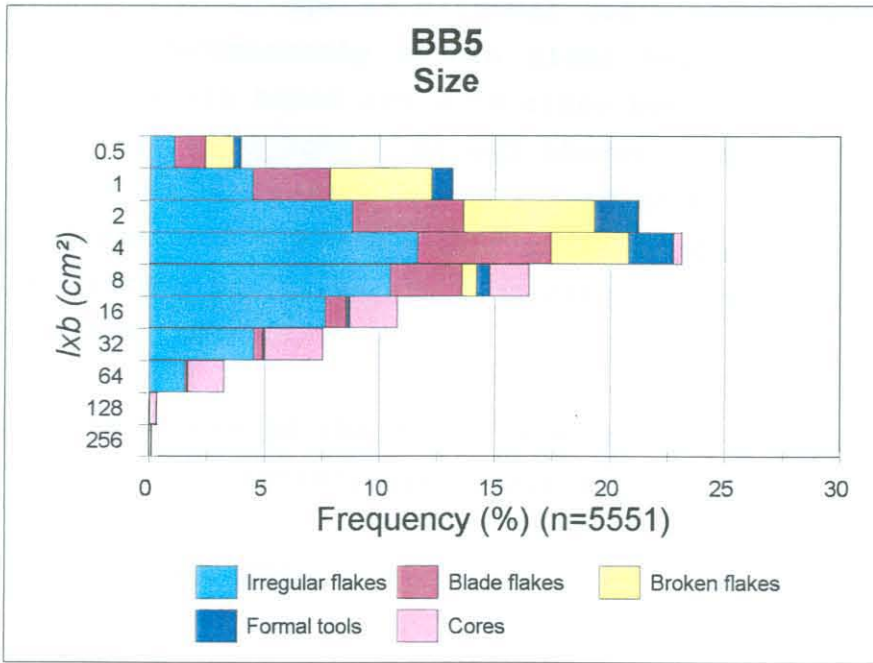


Figure 4.7: BB5 distribution histograms.

The tight distribution of BB5 stone tools between classes indicate that they were manufactured according to specific size and shape requirements.

The size and shape of specific formal tools are shown in Figure 4.8. Scrapers fall predominantly within class B4, tending to be slightly longer than they are broad and with sizes between 2 and 4cm², with the median value close to 2cm². Backed blades peak in class D and their preferred size is 1cm². The segments tend to be either C1 or D1. Both the backed pieces and segments are, therefore, bladelike and microlithic. Unretouched irregular flakes are best represented in class B4 and blade flakes in class C2.

The average thickness of the BB5 potsherds is 5,6mm, which places them in the range of Khoi pottery (see Table 4.2) (Rudner 1979).

4.5.2. Bloubos site BB7

Due to its typological homogeneity BB7 will again be discussed as a single unit. This homogeneity is shown in Figures 4.9 and 4.10. The sizes of the utilised artefacts from the site tend to be somewhat smaller than at BB5, peaking between 1 and 2cm². This is partly due to the smaller proportion of cores and the larger proportion of broken flakes but the blade flakes are, on average, also slightly smaller. As a result, the artefacts as a whole tend to be more microlithic, with an index of 57% as compared to 36% at BB5. The sizes and shapes of BB7 and BB5 stone tools, as measured by means of the Vogel scale, are compared in Figure 4.11.

The distribution in the shape classes is similar to that at BB5 with 53% of the artefacts falling into class B, i.e. with a *l/b* ratio between 1.4 to 2. Since there are only 13 formal tools, statistical comparison with BB5 is not meaningful. It is noted, however, that only one of the formal tools does not fall into the microlithic category.

The average thickness of the sherds retrieved from BB7 is 6mm while the potsherds collected from the surface have an average thickness of 10,4mm. The thicker ones probably represent San ceramics while the excavated thinner ones belong to the Khoi ceramic tradition (Deacon 1984a:273-274; Rudner 1979).

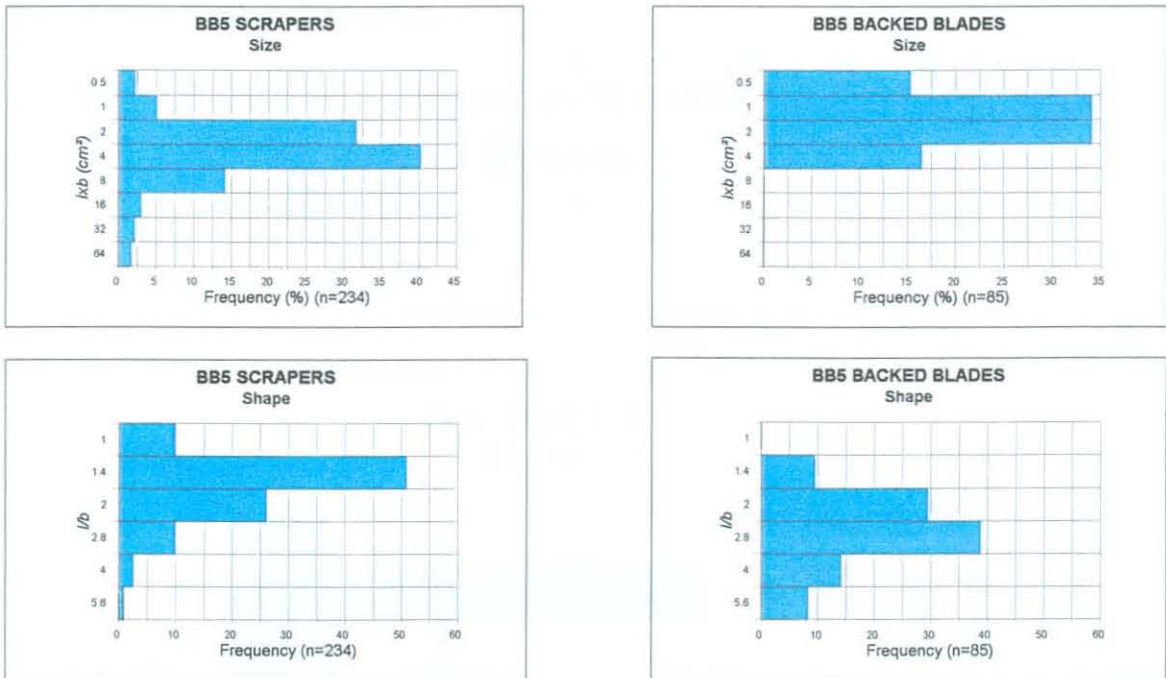


Figure 4.8: Distribution histograms of BB5 scrapers and backed blades.

A tighter distribution exists between the size classes for BB5 formal tools than for the complete assemblage.

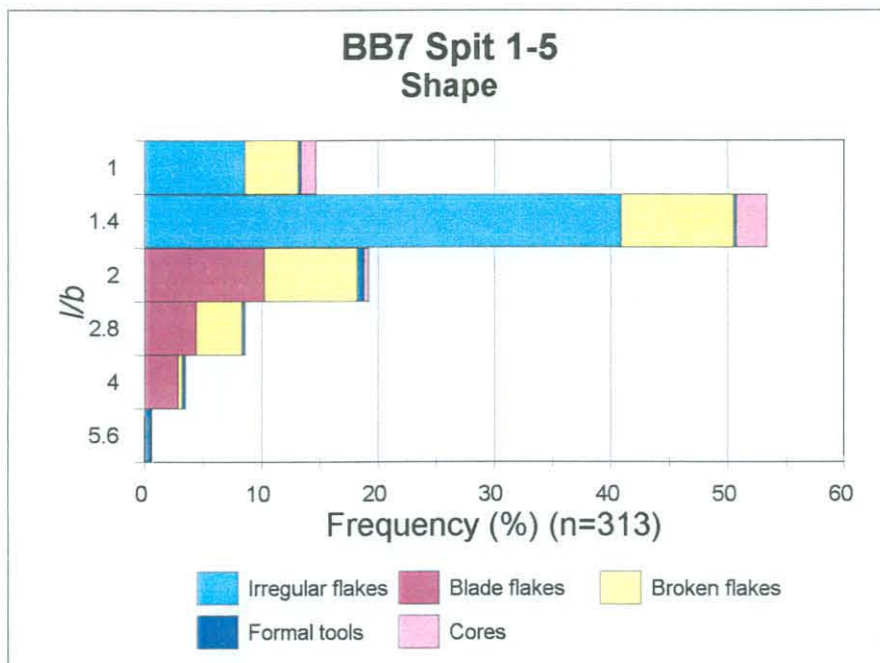
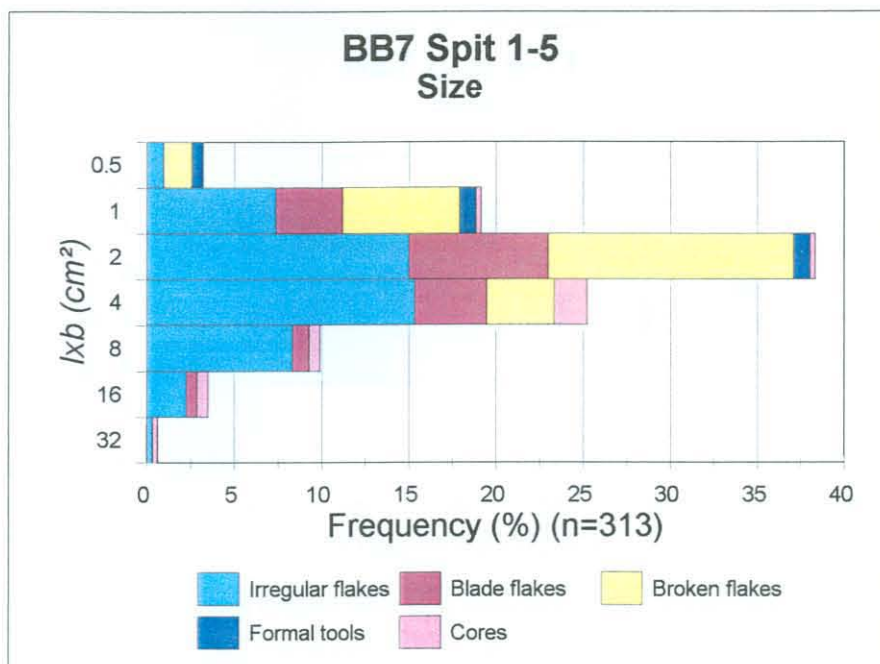


Figure 4.9: Distribution histograms of stone tools from BB7 Spit 1-5.

The distribution of BB7 stone artefacts between size and shape classes are much tighter than at BB5.

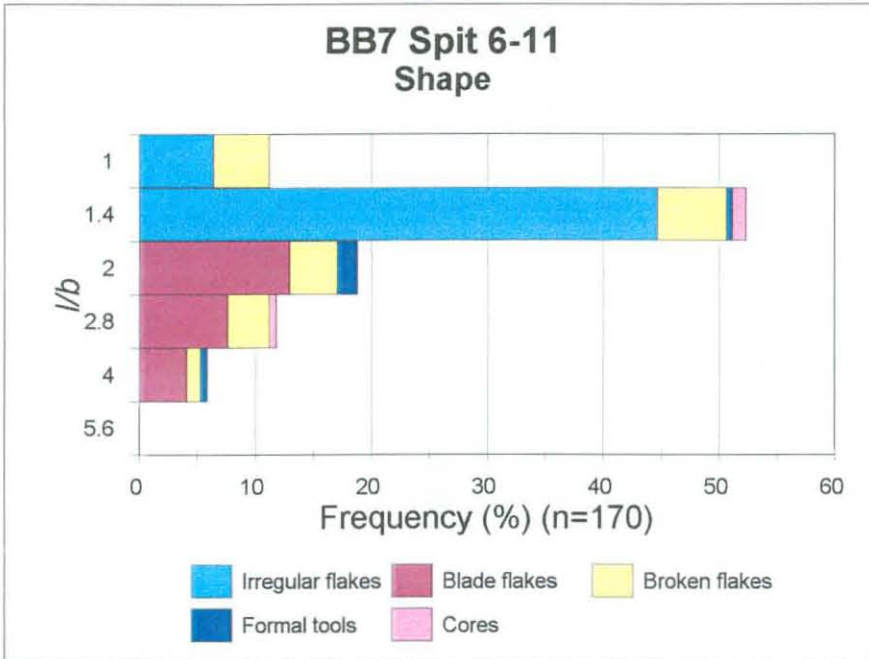
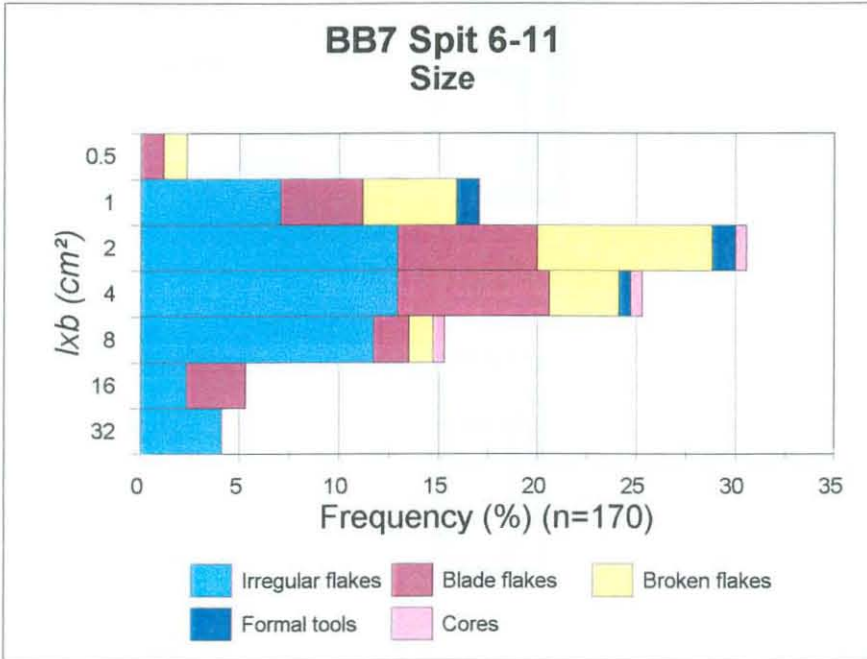
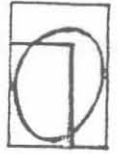
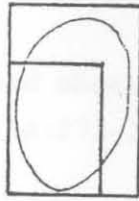


Figure 4.10: Distribution histograms of stone tools from BB7 Spit 6-11.

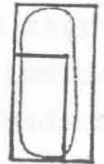
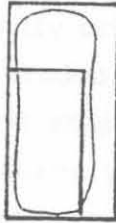
The distribution in these two charts is similar to that of BB7 Spit 1 to 5 and indicates a homogeneity in terms of stone tool size and shape throughout the deposit.



Irregular flakes



Blade flakes



Scrapers



Backed blades



Segments



4.5.3. *Bloubos site BB6 and Hakdooren Vlei site HD2*

The thin potsherds found at BB6 and observed at HD2 indicate a LSA herder presence in the area (Deacon 1984a:273-274; Rudner 1979).

4.6. **Comparison of the collections in individual grid blocks**

The large numbers of artefacts spread over an area of more than 96m² at BB5 show that the site was repeatedly occupied over a considerable length of time. It has already been concluded in the previous section that the rather tight variation in size and shape of the total lithics indicates that the site represents a relatively uniform stone tool tradition, probably covering much of the last two millennia.

Comparing the mostly dense collections from the selected grid blocks representing some 20% of the total area, should make it possible to further substantiate this claim by revealing whether there were significant differences in the lithic cultures of the various groups that camped there at different times.

There exists an essential uniformity between the blocks as can be seen in Figure 4.12. The variations that do occur may be used to evaluate the statistical significance of the size of a collection and provide a guideline for future fieldwork at both surface and stratified sites. The actual number of artefacts recovered from the eighteen 25m² blocks is given in Table 4.1. It ranges from 27 to 722 utilised artefacts and this should give a good indication of the degree of variability that is to be expected on a site of the nature of BB5.

Before considering the individual collections, it must be pointed out that the members of the field team collected from different blocks so there may be bias involved, especially with regard to the amount of waste and the recovery of microliths and manuports. Furthermore, there is some margin of error in the identification of utilised and waste flakes (or blanks).

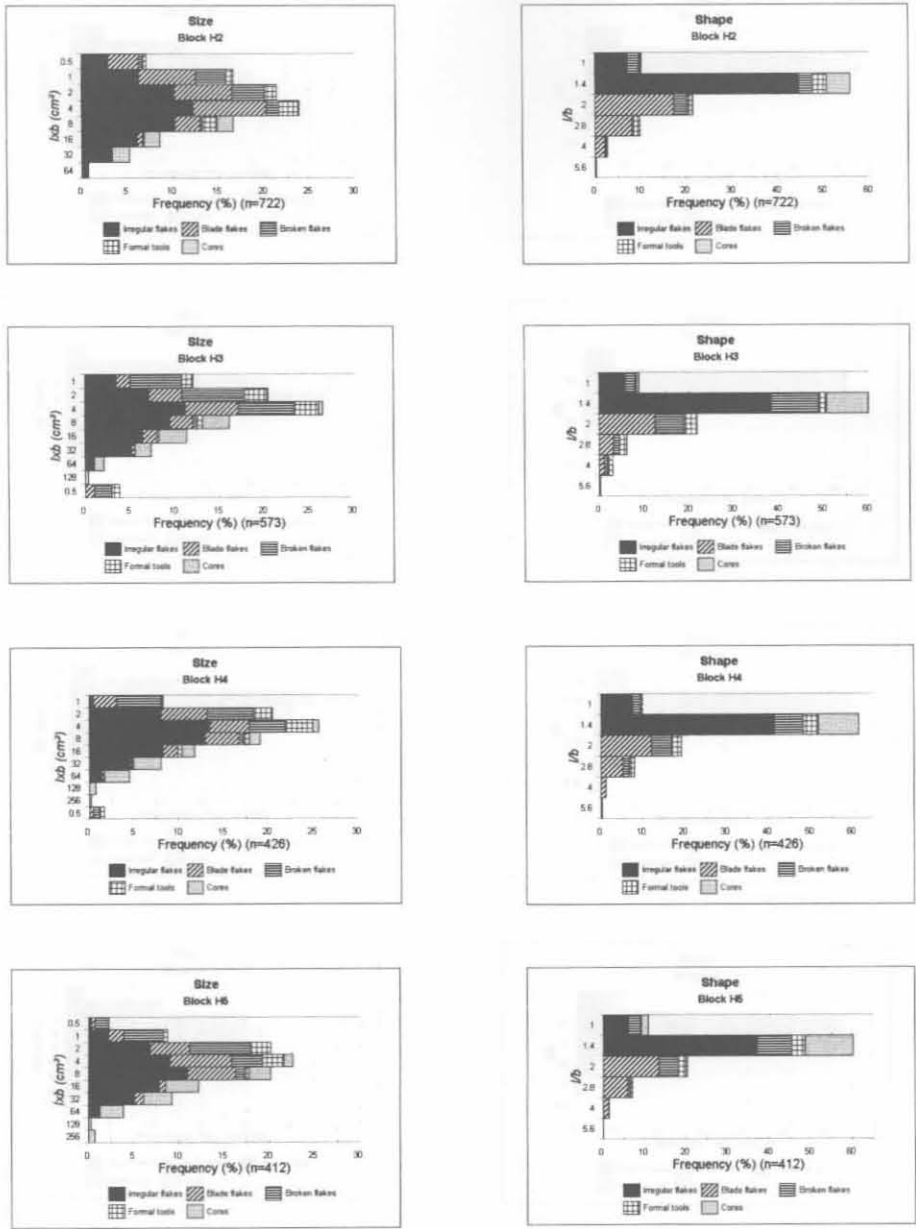


Figure 4.12: Distribution histograms of the size and shape of stone tools from different grid blocks on BB5.

The similarity in the distribution of grid blocks containing 200 to 250 and more stone tools is noteworthy.

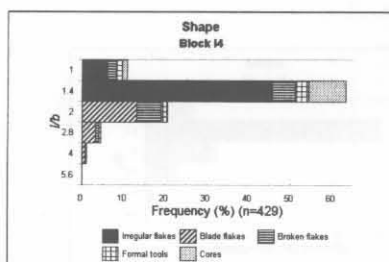
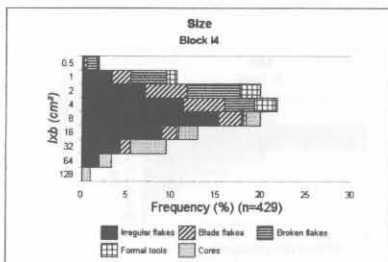
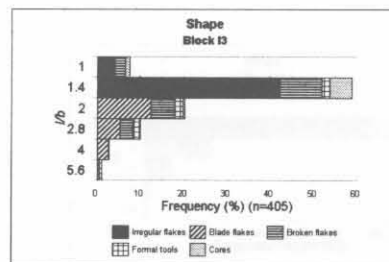
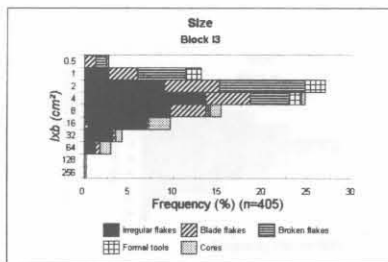
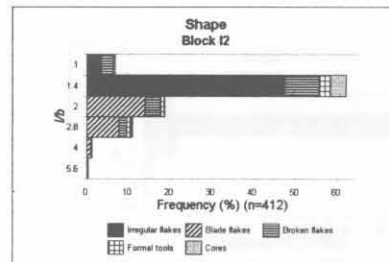
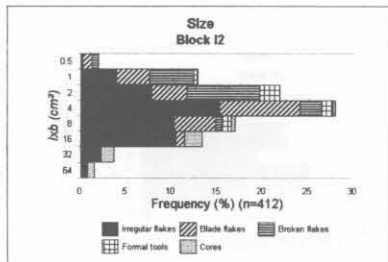
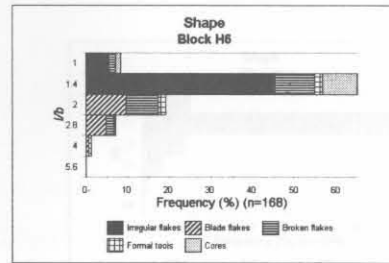
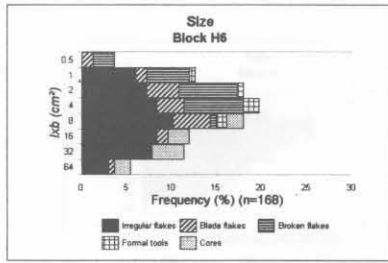


Figure 4.12: (Continued).

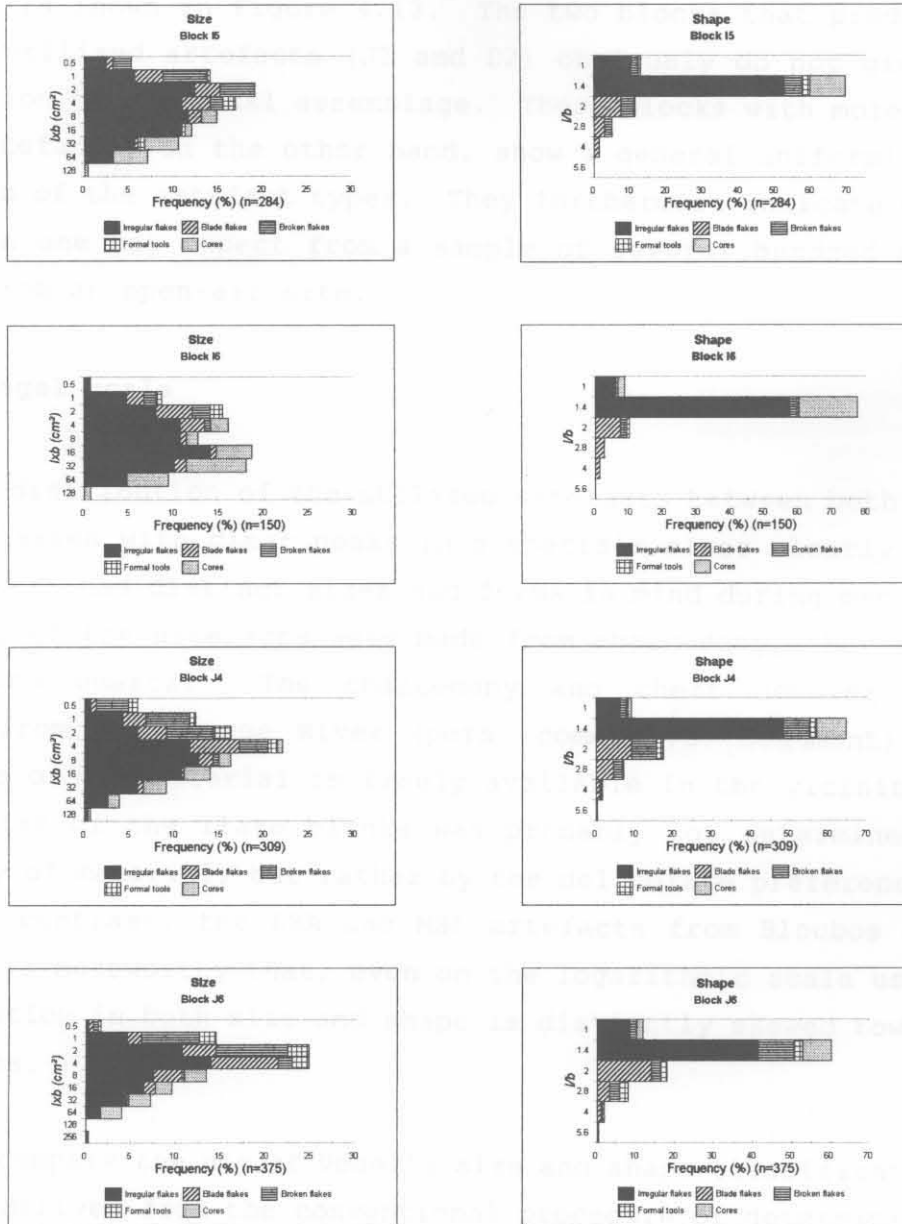


Figure 4.12: (Continued).

4.6.1. *Artefact classes*

The relative frequency of the five main artefact classes in the different grid blocks is shown in Figure 4.13. The two blocks that produced less than fifty utilised artefacts (J1 and D2) obviously do not give a good representation of the total assemblage. Those blocks with more than 250 utilised artefacts, on the other hand, show a general uniformity in the distribution of the artefact types. They furthermore indicate what sort of variation one may expect from a sample of several hundred artefacts collected from an open-air site.

4.7. **The Vogel scale**

The regular distribution of the utilised artefacts between both the size and shape classes with clear peaks in a specific class clearly suggests that the makers had distinct sizes and forms in mind during manufacture. The majority of the artefacts were made from chalcedony, chert, jasper, quartzite and quartz. The chalcedony and chert nodules probably originated from the Orange River (pers. comm. P.B. Beaumont). Since large pieces of raw material is freely available in the vicinity of the sites the size of the flake blanks was probably not determined by the availability of material, but rather by the deliberate preference of the makers. In contrast, the ESA and MSA artefacts from Bloubos are much larger. It is noteworthy that, even on the logarithmic scale used here, the distribution in both size and shape is distinctly skewed towards the higher values.

In order to compare the use of Vogel's size and shape classification with the results derived from the conventional procedure of determining these attributes, the length and breadth of each artefact from BB5 and BB7 were measured. The averages obtained for the BB5 artefacts are listed in Table 4.5 along with the standard deviation and range. Due to the fact that the distribution is significantly skewed towards the positive side, the mean values do not reflect 'the most common value'. In such cases, the median (which is the point where as many measurements fall above the value as below) should be used. With a skewed distribution the standard

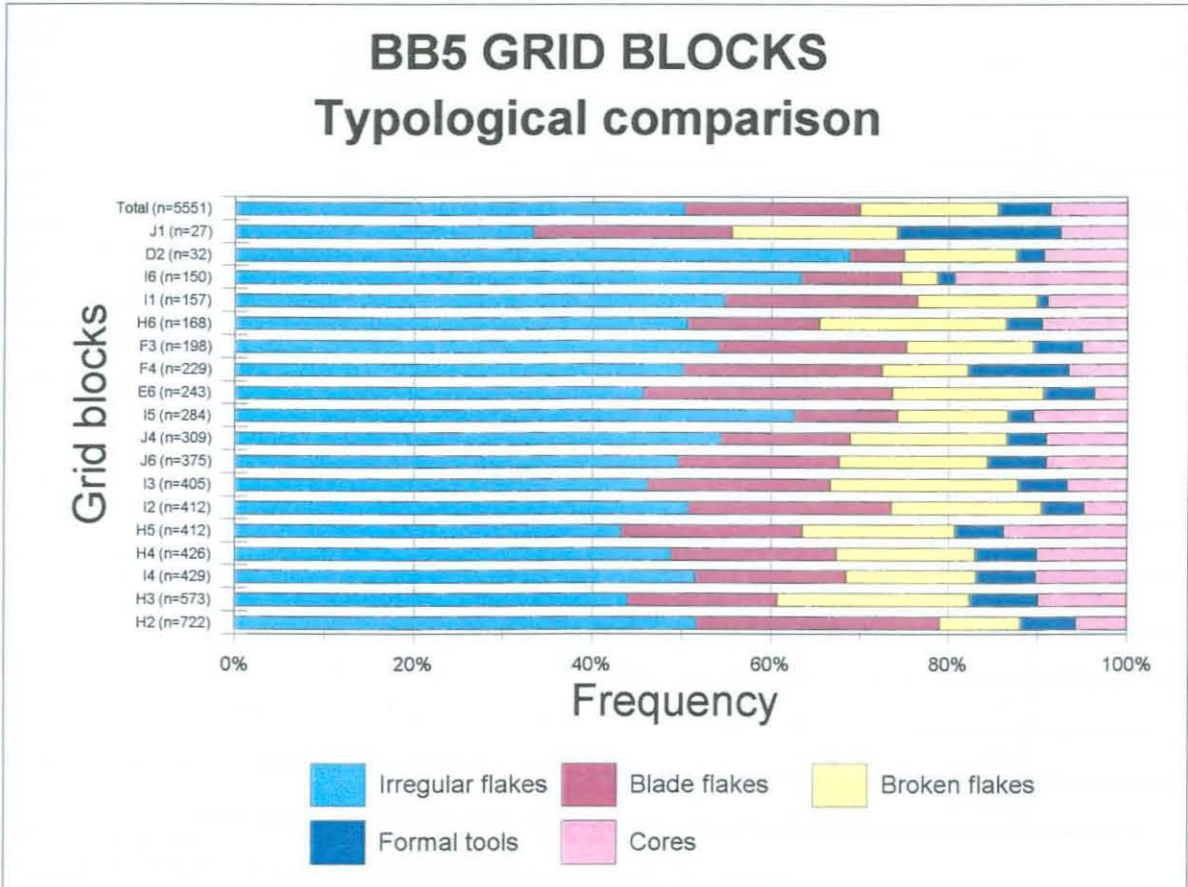


Figure 4.13: Typological comparison between the BB5 grid blocks.

This chart indicates the homogeneity of the BB5 assemblage by demonstrating similar typological compositions for the grid blocks on the site.



Table 4.5: BB5 metric data of utilised stone artefacts (mm).

Artefact type	Mean	St. Dev.	Median	Range
IRREGULAR FLAKES (n=2778)				
Length	26.2	15.4	22	5-119
Breadth	18.3	11.5	15	1-80
lxb	479.46		330	
l/b	1.43		1.47	
BLADE FLAKES (n=1097)				
Length	23.6	10.3	22	7-106
Breadth	9.3	4.8	9	2-47
lxb	219.48		198	
l/b	2.54		2.45	
BROKEN FLAKES (n=853)				
Length	15.1	5.5	14	4-52
Breadth	8.8	3.5	8	2-31
lxb	132.88		112	
l/b	1.72		1.75	
SCRAPERS (n=234)				
Length	23	12.1	20	7-90
Breadth	13.5	8.8	12	3-71
lxb	310.5		240	
l/b	1.7		1.67	
BACKED BLADES (n=83)				
Length	16.8	5.3	16	8-31
Breadth	5.9	2.7	5	2-15
lxb	99.12		80	
l/b	2.85		3.2	
SEGMENTS (n=13)				
Length	14.4	3.2	13	10-20
Breadth	5.8	2.3	5	4-10
lxb	83.52		65	
l/b	2.48		2.6	

deviation is also not appropriate since it implies equal deviation to both sides of the mean, which is not the case.

The median sizes of the main artefact categories at BB5 are shown in Figure 4.14, along with the mean values as well as the most common size and shape according to the Vogel classification. The correspondence of the two measuring methods is noteworthy. Needless to say, the use of the mean values would suggest that the preferred sizes were larger.

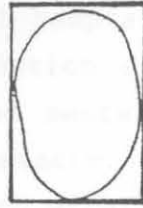
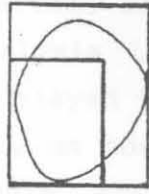
The spread in size and shape is adequately illustrated in the distribution histograms. As an example the scrapers and backed blades from BB5 were shown separately in Figure 4.8. From these figures it is clear that the makers had a specific size and shape in mind. If the tools were manufactured for two different tasks that required different sized artefacts, one would expect a bi-modal distribution peak, or at least a much broader spread.

It is suggested that the Vogel scale may represent an effective substitute for direct artefact measurements. Several advantages of the Vogel scheme have been identified:

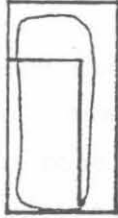
- placing the artefacts directly into size and shape classes with the aid of the Vogel scheme is much less time-consuming than the traditional method;
- the shape and size of objects are visually depicted, one is thus not confronted with an abstract set of statistics;
- the resulting diagrams of shape and size trends within a sample, eliminates the use of diagrams depicting means;
- the Vogel scheme is a precise, standardised measuring method applicable to any collection of artefacts. Simultaneously, some leeway within size and shape classes is provided for. This minimizes the influence of unique large and/or small artefacts within a sample;



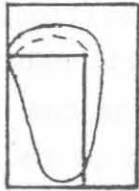
Irregular flakes



Blade flakes



Scrapers



Backed blades





Figure 4.14: Comparison between the mean, median and Vogel scale figures obtained for BB5 stone tool types. (Scale 1:1).

A striking similarity is illustrated between the Vogel scale figures and the median.



- the results of the Vogel scheme are more indicative of trends regarding the shape and size of artefacts than the results of direct measurements. The importance of trends lies in the fact that they reflect envisioned mental templates. Since the aim of artefact analysis is the reconstruction of the past, a role is necessarily played by dominant past mental templates since they bear directly on the resulting artefacts. The margin provided by the Vogel scale, allows for variation within a mental template and therefore the metric results are more representative of size and shape trends than are direct measurements.

4.8. Conclusions

Having access to stone tools only, clearly limits the reconstruction of past lifestyles. By classifying stone tools into different type classes and subclasses, it is possible to determine the preferred technology used at a site. By interpreting stone tool collections, the archaeologist can also to some extent suggest activities that might have taken place at a site. It is however difficult to reconstruct social, religious and political practices by examining stone tools. When having to rely solely on lithics, even the reconstruction of LSA economies becomes uncertain since faunal remains that can support conclusions regarding activity are absent. The most significant result of examining a lithic sample, seems to be the possible identification of technological similarities between sites in a temporal and spatial context. The only conclusive comments to be made are related to activity.

The samples from both BB5 and BB7 are typical of the LSA in South Africa. Both BB5 and BB7 are associated with pottery, dating to the last 2000 years. Differences are however observable between the two sites when considering the type of site, stone tool types and stone tool size and shape. The sample from **BB5** contains a wide variety of stone tool types which include a rather large formal component. BB5 clearly was a site where stone tools were being manufactured on large scale as can be deduced from the amount of waste material. The presence of anvil and grinding stones point to food preparation while a large number of scrapers indicate the preparation of skins. After summer showers, water



and food would have been plentiful around the pan adjacent to BB5, and it would have represented a suitable area to inhabit at such times. All this suggests that BB5 was primarily a factory/manufacturing site which was inhabited from time to time during the final LSA.

BB7, on the other hand, represents a more sheltered site. It is relatively well protected against the wind and it is located in the vicinity of water. It is noteworthy that there are nearly equal numbers of bottom and top ends in the broken flake class, in contrast to BB5. This may indicate that scrapers were not made at the site. They were possibly not even used there because only 3 scrapers were recovered. The absence of hammer and anvil stones and manuports at BB7 as well as the small amount of waste material also suggest that the site was not primarily a factory/manufacturing site but probably only a living area.

Ostrich eggshell beads were present, but since no unfinished beads or grooved stones were found, it is, on present evidence, unlikely that beads were manufactured on the Bloubos sites (Humphreys & Thackeray 1983:301). The presence of burnt ostrich eggshell fragments indicates that ostrich eggshells were in use at BB7, again suggesting that BB7 was a living area. Other factors confirming this assumption is the ashy sand excavated at BB7. Extremely fragmented bone and charcoal along with a very small amount of waste material excavated from BB7 also support the belief that BB7 was not a locality where stone tools were manufactured on a large scale. The BB7 sample is interpreted as indicative of a living site.

It is conceivable that the groups of people occupying both BB5 and BB7 were nomadic bands exploiting the wildlife and temporary water sources on Bloubos. The stone tool types characteristic of the sites lead one to deduce that the hunting of wild animals, the preparation of food, the preparation of animal skins and the manufacturing of appropriate tool kits, were activities practised on the sites. The location of BB5 is troublesome when considering that the presence of people in close proximity to a water source would make wild animals wary. However, the pan which BB5 overlooks is so large that this would probably not have



been a problem and could have made the location of the site ideal for spotting and approaching game unnoticed.

Site comparisons

5.1. Introduction

By comparing sets of data retrieved from various archaeological sites, the archaeologist aims to identify significant similarities and differences between them. Similarities would indicate relationships in time and space between sites, although differences may also be activity related. The artefacts of several sites in the Northern Cape are to be compared to the BB5 and BB7 results. These sites were selected predominantly because they fall within the same time range as those on Bloubos as can be seen in Appendix C. Thus in case of artefactual similarities, it would be possible to place the Bloubos results within a broader geographical context. The sites selected for comparison are the following:

Wonderwerk cave situated some 50 kilometres south of the town of Kuruman in the Kuruman hills. The cave that was inhabited during much of the stone age, is rich in archaeological deposit dating from long before the advent of the LSA in South Africa. This site was chosen for comparison because of its prominence in LSA research in the Northern Cape.

Klein Witkrans shelter just outside the village of Buxton. The shelter was chosen for comparison because its lithic artefacts seemingly belong to a single industry, namely the Wilton Industry (Humphreys & Thackeray 1983:173, 189).

Limerock I and II shelters on the farm Lime Rock north-west of Schmidtsdrift in the Northern Cape. A stone circle located not far from the two shelters is a third archaeological feature of interest to this study on Lime Rock. Limerock II was chosen because of its association with a stone circle, because of the nature of the water sources on the farm that remind of those on Bloubos, and because of its relatively large artefact sample. The shelters - Limerock II being the larger of the two - overlook a riverbed while the stone circle is situated close to one of several water pools on the farm. In contrast to the riverbed, these

pools hold water for some time after heavy rainfall (Humphreys & Thackeray 1983:197).

The type site **Swartkop I**, located in Bushmanland almost halfway between Brandvlei and Vanwyksvlei. The excavated stone circle yielded material belonging to one of the two contemporary Ceramic LSA industries defined by Beaumont (Beaumont & Vogel 1989; Beaumont, Smith & Vogel 1995). The Swartkop Industry is concurrent with the Doornfontein Industry. The latter has been found at **Biesje Poort II** - the only excavated site geographically close to Bloubos. It is a large site located north-west of Kakamas (Beaumont, Smith & Vogel 1995:239). Both these sites were chosen for comparison because, along with the other sites, they may shed light on the identity of the industry[s] found at BB5 and BB7. Both Swartkop and Biesje Poort II were excavated by Peter Beaumont between 1985 and 1990, who kindly gave me permission to examine the material for the purpose of comparison.

The methods of typological classification and metric analysis used by Humphreys and Thackeray to examine the assemblages from the first three sites, differ from those used in this study. Adjustments were made to provide for the differing methodologies when these results were compared. Another consideration is the subjective perception of the term 'utilised' artefacts. The definition of what is understood by the term 'utilised' has already been given in Chapter 4. However, it is obvious that the identification of the trait, 'utilisation damage visible to the naked eye', greatly depends on the person performing the analysis. The validity of the distinction between utilised and unutilised stone artefacts is therefore questionable.

A further possibly subjective perception relevant to the analysis of artefacts and subsequently to comparisons, is that of size. This perception specifically relates to what is understood by the terms 'microlithic' and 'macrolithic'. Whenever reference is made to the term microlithic in this study, it refers to stone artefacts with length x breadth smaller than 2cm², while macrolithic artefacts are larger than 2cm². Artefacts from other sites are described in terms of the same parameter. When comparing results obtained by means of direct



measurements, similarly obtained statistics for BB5 and not the results obtained with the Vogel scale are used. The three sites analysed by Humphreys and Thackeray will be discussed first in this chapter and then the two analysed by myself. The conclusions will follow thereafter.

The relevant results on which the following discussion is based, are given in Figures 5.1 to 5.9 and a list of relevant dates and additional information regarding them is given in Appendix C.

5.2. Wonderwerk cave

The stone artefact analysis conducted by A.I. Thackeray (1982) was based on material that she and J.F. Thackeray excavated at Wonderwerk cave. The formal tools recovered by Beaumont from adjacent squares were added in order to enlarge the available sample for the original analysis (Humphreys & Thackeray 1983:48). To enable a meaningful comparison, the results of layers 2B, 3A and 3B are used since these layers date to approximately the same time range as BB5 and BB7. The dates obtained for the three layers range from 1210 ± 50 years BP to 3990 ± 60 years BP. The stone tool classification used by Thackeray is adjusted to enable comparisons. The non-retouched and unutilised chunks, chips and flakes are all considered waste material. Thackeray and Humphreys include this material in the calculation of their relative frequencies while I exclude the waste. This makes a considerable difference to the composition of the classes within the three layers.

The following observations are based on the lithic artefact inventory of the Thackeray excavation, and where applicable, also on the formal tool inventory of the Beaumont excavation (Thackeray 1982:109-110). It is clear from Figure 5.1 that Wonderwerk cave has a higher frequency of formal tools than BB5. Cores also seem to be more abundant. Figure 5.2 indicates that broken flakes were not classed separately at Wonderwerk cave. Taking this into account, the proportion of blade flakes to irregular flakes become increasingly similar at the two sites through time with layer 2B from Wonderwerk Cave almost mirroring BB5. The general shape of flakes at Wonderwerk was shifting from being bladelike

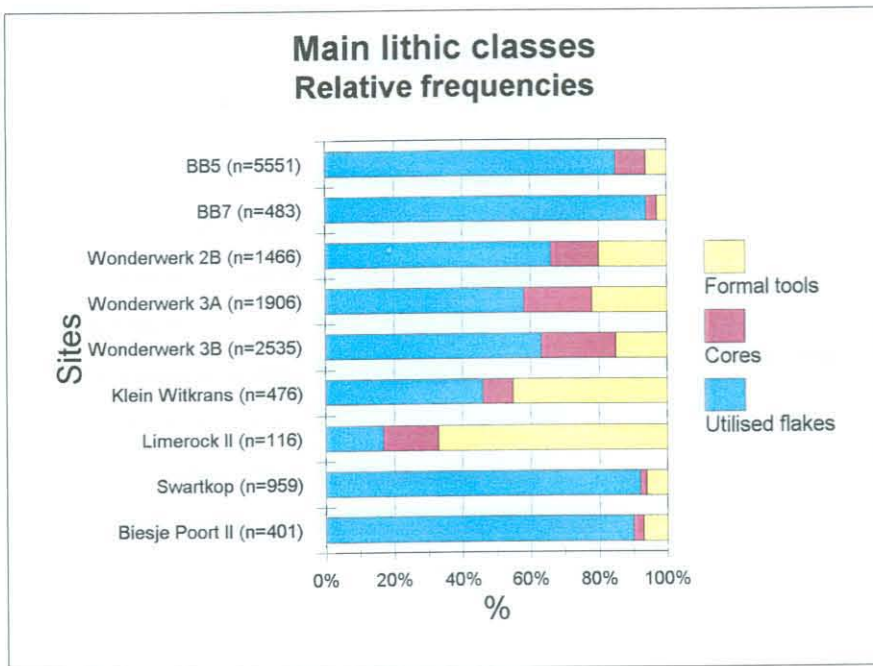


Figure 5.1: Relative frequencies of the main lithic classes of LSA sites in the Northern Cape.

The comparison between the frequencies indicates remarkable similarities between the assemblages from BB5, BB7, Swartkop Excavation I and Biesje Poort II.

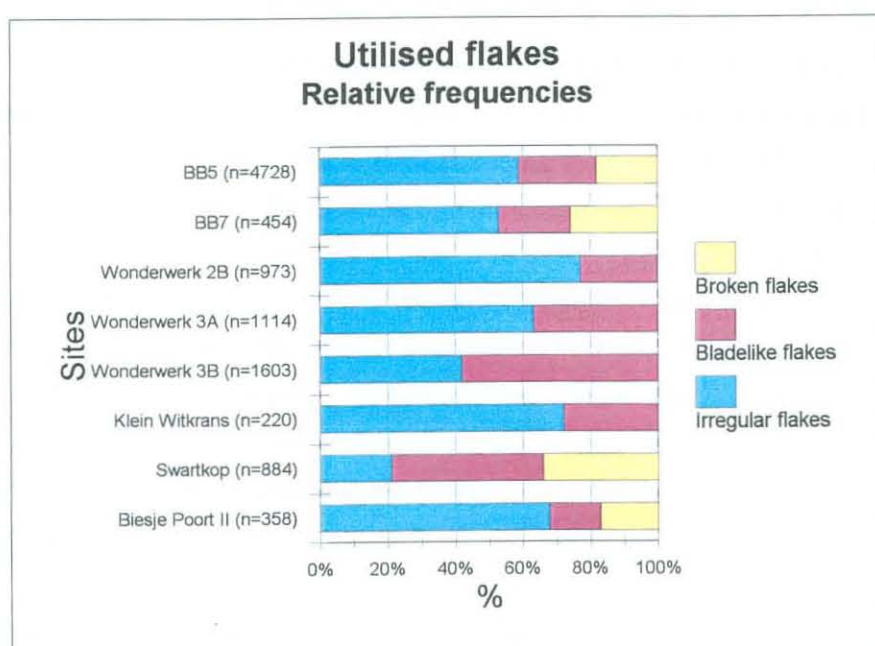


Figure 5.2: Relative frequencies of the utilised flake classes of LSA sites in the Northern Cape.

The comparison between the frequencies indicates remarkable similarities between the assemblages from BB5, BB7, Swartkop Excavation I and Biesje Poort II.



to being irregular between the fourth and second millennium BP. The relation of blade cores to irregular cores as shown in Figure 5.3 is approximately similar at Wonderwerk and BB5 with practically no radial cores represented. Figure 5.4 surprisingly shows that the formal tool frequency of layer 3A and not 2B is most similar to BB5. Both samples contain some segments while scrapers largely predominate over backed blades at both sites. Generally speaking, the composition of the formal tool assemblages from the two sites is similar.

Figure 5.5 compares the mean size and shape of the different stone artefacts from BB5 and Wonderwerk cave analysed by A.I. Thackeray. The utilised flakes from Wonderwerk cave are predominantly macrolithic. This is attributed to the intensive use of larger raw material nodules like banded ironstone and dolomite (Thackeray 1982:343, 373). Similar large flakes made from sandstone are also present at BB5. No definite changes are discernable with regard to the size of the utilised blade flakes on all raw materials through time at Wonderwerk cave (Thackeray 1982:377). This implies that one envisaged size for blade flakes remained the norm through time. It is however interesting that the backed blades from all three layers are microlithic while the unretouched blade flakes have a macrolithic character (Thackeray 1982:333, 391-396). A similar trend is identifiable at BB5.

The unbroken chert scrapers from the Wonderwerk layers are macrolithic and slightly oblong in shape (Thackeray 1982:383). Banded ironstone and dolomite scrapers from the same layers (not depicted in Figure 5.5) are as expected much larger than the chert tools and vary between being square and oblong in shape. The quartz scrapers are, like the chert scrapers, macrolithic, but also smaller than the banded ironstone and dolomite scrapers (Thackeray 1982:379, 387, 389). It is possible that the scraper shape based on mean length and breadth, may have been distorted by the method used for measuring scrapers (Thackeray 1982:69-71). This is especially seen in tools where the breadth exceeds the length. The BB5 scrapers are similar in size to the chert and quartz scrapers from Wonderwerk cave.

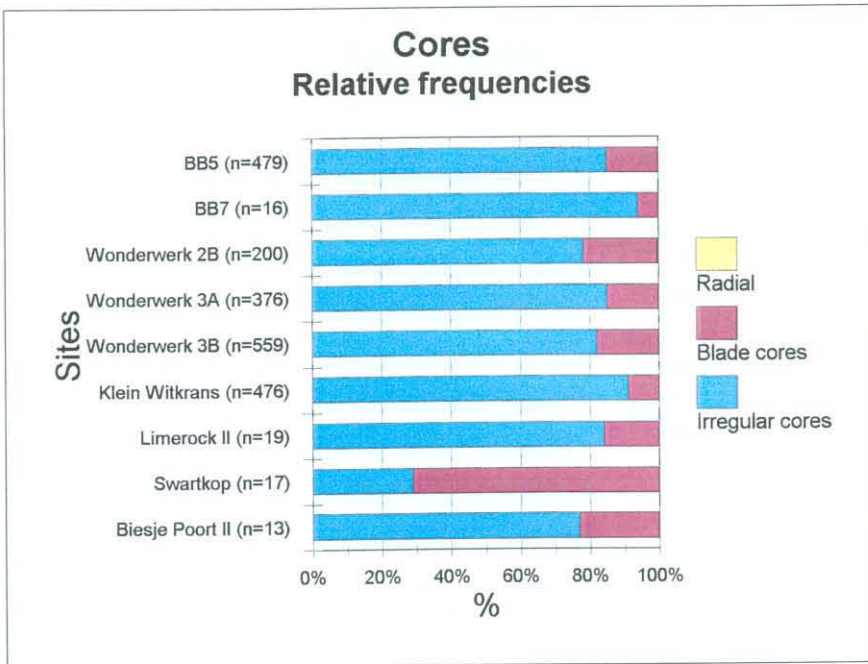


Figure 5.3: Relative frequencies of the core classes of LSA sites in the Northern Cape.

The comparison between the frequencies indicates remarkable similarities between the assemblages from BB5, BB7 and Biesje Poort II.

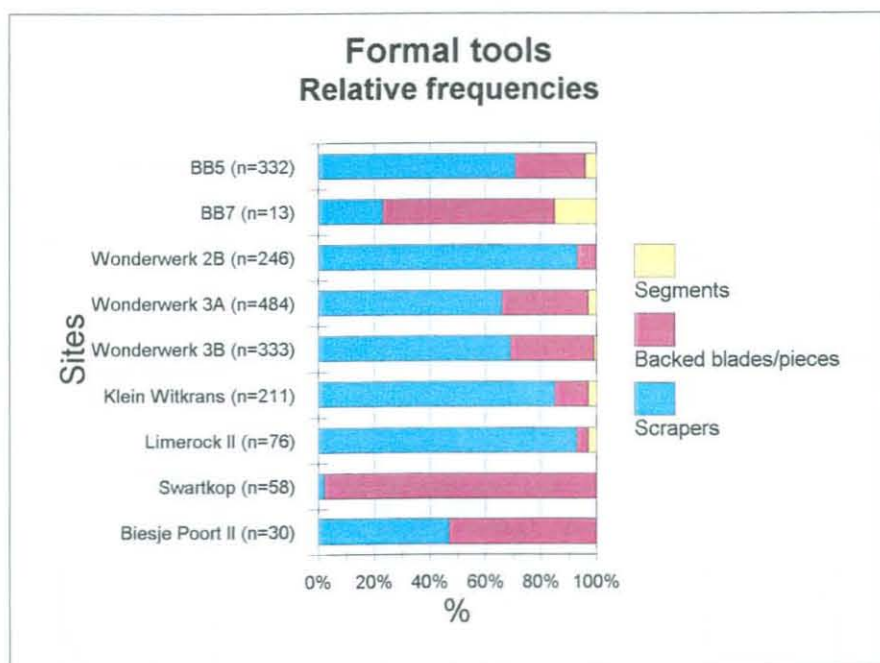
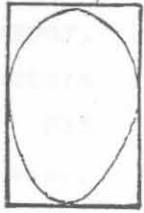
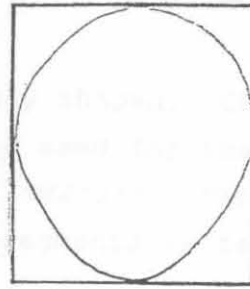
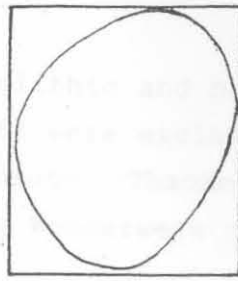
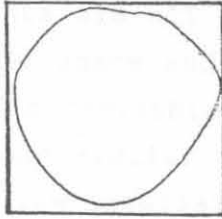


Figure 5.4: Relative frequencies of the formal tool classes of LSA sites in the Northern Cape.

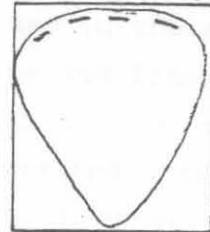
The comparison between the frequencies indicates a remarkable difference between the assemblages from BB5, BB7 and Swartkop Excavation I. Both the Biesje Poort II and the Swartkop Excavation I assemblages lack segments.



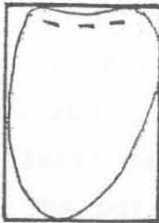
Regular flakes



Blade flakes



Chert scrapers



Quartz scrapers



Backed blades



Segments



Figure 5.5: Comparison between the mean size and shape of stone tools from BB5 and Wonderwerk cave. (Scale 1:1).

These diagrams indicate a general correspondence in artefact shape although artefact size differs in several instances.

The segments are all microlithic and narrowly shaped. Chert, jasper, chalcedony, agate and quartz were exclusively used for the manufacture of these microlithic elements (Thackeray 1982:347, 398-400). BB5 segments are similar to the Wonderwerk cave segments in terms of size, shape and raw material.

Upper and lower grinding stones as well as hammer stones were found throughout the three Wonderwerk layers, supporting the notion that this was also a manufacturing site. All of these tools are present at BB5.

The following observations with regard to the non-lithic artefacts found in layers 2B, 3A and 3B, are based on the inventory of the Thackeray excavation (Humphreys & Thackeray 1983:130). Several bone points and some miscellaneous fragments of bone are included in the assemblages of the selected layers. A large number of complete and fragmented ostrich eggshell beads was found along with some plain OES fragments. Metal objects were retrieved from the two upper layers and a few undecorated grit-tempered potsherds from all three layers (Humphreys & Thackeray 1983:92-93).

In contrast, no European artefacts, iron objects or bone points were found at the Bloubos sites. The lack of bone points is attributed to poor preservation conditions while the absence of iron objects and European artefacts may be attributed to the relatively isolated location of Bloubos. The potsherds excavated from the selected Wonderwerk cave layers seem to be similar to those from BB5 and the BB7 spits.

5.3. Klein Witkrans shelter

The dates obtained from the top seven spits of Klein Witkrans shelter range from 1490 ± 40 to 3910 ± 60 BP (see Appendix C). Klein Witkrans shelter is characterised by a single industry which falls well within the BB5/BB7 time range (Thackeray 1982:186). I lumped the results from these spits together to obtain a larger sample. The following observations are based on the inventory of the Beaumont excavation of Klein Witkrans shelter (Thackeray 1982:187). For the purpose of comparison, the waste

material as defined in this study is again subtracted from the artefact total.

As shown in Figure 5.1 the most arresting feature of the Klein Witkrans sample is the high frequency of formal tools that equals the frequency of utilised flakes. This distribution of formal tools may be attributed to the rather small sample retrieved or to a different definition of 'utilised' flakes. The frequency of cores is more similar to that of BB5.

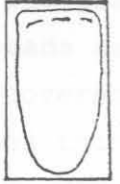
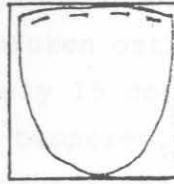
As shown in Figure 5.2 broken flakes are again not distinguished at this site. Nonetheless, the relationship of blade flakes to irregular flakes is roughly similar to that of BB5. The frequency of blade cores is slightly less at Klein Witkrans than at BB5 but not significantly so (see Figure 5.3). Figure 5.4 indicates that the breakdown of formal tool types at Klein Witkrans is very similar to that at BB5 except for a somewhat higher frequency of scrapers and a lower frequency of backed blades.

No measurements of utilised irregular and blade flakes are documented as they represent such a small sample. It is however accepted that no obvious changes in the length or breadth of flakes are discernable through time at Klein Witkrans shelter and that differences that do occur are directly related to the chosen raw material (Thackeray 1982:200). Lidianite and quartzite artefacts are necessarily larger than chert, quartz or chalcedony artefacts (Thackeray 1982:207).

Figure 5.6 shows that, similar to Wonderwerk cave, the chert and chalcedony scrapers in the first seven spits at Klein Witkrans are macrolithic in size (Thackeray 1982:428). They are however somewhat smaller than the Wonderwerk Cave scrapers (Thackeray 1982:257-258). The backed blades and segments from Klein Witkrans are also microlithic, as at Wonderwerk and Bloubos (Thackeray 1982:434-435). These differences imply that larger scrapers were purposefully manufactured at Wonderwerk cave, Klein Witkrans and BB5.



Scrapers*



Scrapers**



Backed blades***



Segments****



Segments*****





Figure 5.6: Comparison between the mean size and shape of stone tools from BB5, Klein Witkrans shelter and Limerock II. (Scale 1:1).

* All material, ** chert & chalcedony, *** chert & hornfels, **** all material, ***** chert, chalcedony & quartz

A single upper grinding stone indicates food preparation at Klein Witkrans. The non-lithic artefacts excavated from the spits include eight bone points, several complete and broken ostrich eggshell beads as well as some decorated OES fragments. Only 15 potsherds were recovered from these spits and these are all grit-tempered, undecorated and thin walled (between 4 and 8mm thick) (Humphreys & Thackeray 1983:187, 250, 252). The non-lithic artefacts from the selected spits from Klein Witkrans shelter seem, with the exception of bone points, to be very similar to those from the selected Wonderwerk cave layers and the BB5 and BB7 assemblages.

5.4. Limerock II

Limerock II is a 12m x 5m shelter, excavated to bedrock in four units. The dates obtained for this deposit range from 1760± 50 to 1430± 50 years BP (see Appendix C for the whole range of dates for the site). Although slight changes in artefact size are observable, the deposit was only 60cm deep and the results of spits I to V are therefore lumped together to enable a meaningful comparison (Humphreys & Thackeray 1983:201, 205).

The following is a summary of results based on Humphreys' excavation (Humphreys & Thackeray 1983:254). Subtracting the waste material from the total, again left a very small sample of only 116 stone artefacts. A very high incidence of formally retouched tools which totally contrasts with BB5, is seen in Figure 5.1, utilised irregular and blade flakes are abnormally scarce and no broken flakes were documented. This discrepancy may again be due to the excavator's definition of 'utilised'. Cores, on the other hand, are comparatively well represented. It is notable that almost all the flakes produced at this site were retouched. Since no distinction was originally made between irregular and blade flakes, the utilised class of the site is not represented in Figure 5.2. Despite the low frequency of cores, the proportion of irregular to blade cores shown in Figure 5.3 is almost exactly similar to that of BB5. Figure 5.4 shows that the formal tool class consists of scrapers, backed blades and

segments as at BB5. However, scrapers are much more prominent than at BB5 while backed blades are less well represented.

Due to the small sample, no dimensions are given for utilised flakes. Scrapers are macrolithic in size, as is the case for BB5 (see Figure 5.6). They are however squarely shaped. The segments are microlithic as are those from the other considered sites. Only three backed blades were excavated from the site making mean length and breadth dimensions meaningless (Humphreys & Thackeray 1983:205-206). The majority of retouched and utilised tools were made from chert at Limerock II (Humphreys & Thackeray 1983:256). It is noteworthy that the Limerock II scrapers are macrolithic despite the smaller sized raw material used. This trend is similar to the one identified at Wonderwerk cave, Klein Witkrans and BB5.

The presence of three grinding stones points to Limerock II being a living site. The large number and variation of non-lithic artefacts from the site is noteworthy. The deposit contained several fragmented bone points, broken and complete ostrich eggshell beads throughout, decorated OES fragments and some OES flask mouth fragments (Humphreys & Thackeray 1983:263). Iron, glass and porcelain of European origins were found in the top spits with potsherds throughout the deposit. The majority of these potsherds are thin walled while the few thicker ones from the surface probably belonged to the base of a single vessel (Humphreys & Thackeray 1983:121). The two sherds were respectively decorated with cross-hatching on the vessel's rim and wide, shallow impressions on the body (Humphreys & Thackeray 1983:212). Similar thicker sherds, probably belonging to a single vessel, were found on the surface at BB7.

It is a pity that the Limerock stone circle could not be excavated. Especially since its dimensions are very similar to those of the BB7 circle and it might have been informative with reference to the nature of these structures.



5.5. Swartkop Excavation I

The OES date obtained for Swartkop is 670 ± 50 years BP, as shown in Appendix C. Comparing the Bloubos and Swartkop samples was a comparatively easy task as the same classification was used to analyse the two. It was originally hoped that similarities would exist between the BB5 and Swartkop results but it soon became apparent that the samples differed in several ways. At Swartkop, the whole surface within a stone circle was excavated in three blocks, in 5cm spits down to 10cm. The artefacts were lumped together because no obvious size differences were identified during the classification process. A total of 959 stone artefacts was excavated.

As can be seen in Figure 5.1 the basic class composition of the Swartkop sample is not that different from the Bloubos sample. However, Figure 5.2 sheds a different light on the Swartkop sample. This is the only site analysed with a constant lower frequency of irregular flakes than blade flakes. In addition, a much higher frequency of broken flakes is present. It is however noteworthy that the Wonderwerk cave layers 3A and 3B also contain rather high frequencies of blade flakes. The core frequencies shown in Figure 5.3 correspond to the frequencies of irregular and blade flakes. In contrast with BB5, the majority of cores at Swartkop are blade cores, not irregular cores. The subsequent breakdown of formal tools (Figure 5.4) is not surprising as almost 90% of these are backed blades with the remaining formal tools being scrapers. No segments were retrieved. Taken together, the assemblage from Swartkop differs markedly from those at Bloubos and must represent a totally different activity.

The Vogel scale was used to determine shape and size tendencies within the Swartkop sample (see Figure 5.7). As shown in Figure 5.8, the majority of irregular and blade flakes vary between 4cm^2 and 8cm^2 in size. Similarly to the Bloubos artefacts, the Swartkop unretouched flakes thus possess an overall macrolithic character. This is however to be expected since the majority of Swartkop artefacts are made of indurated shale. Backed blades on the other hand are completely microlithic with their sizes varying between 0.5cm^2 and 2cm^2 . Thus it

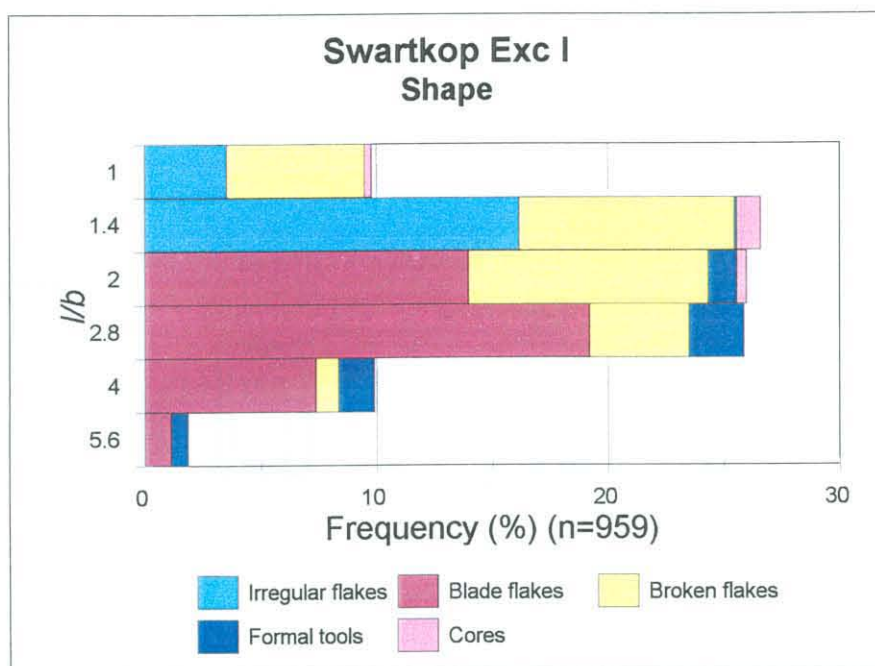
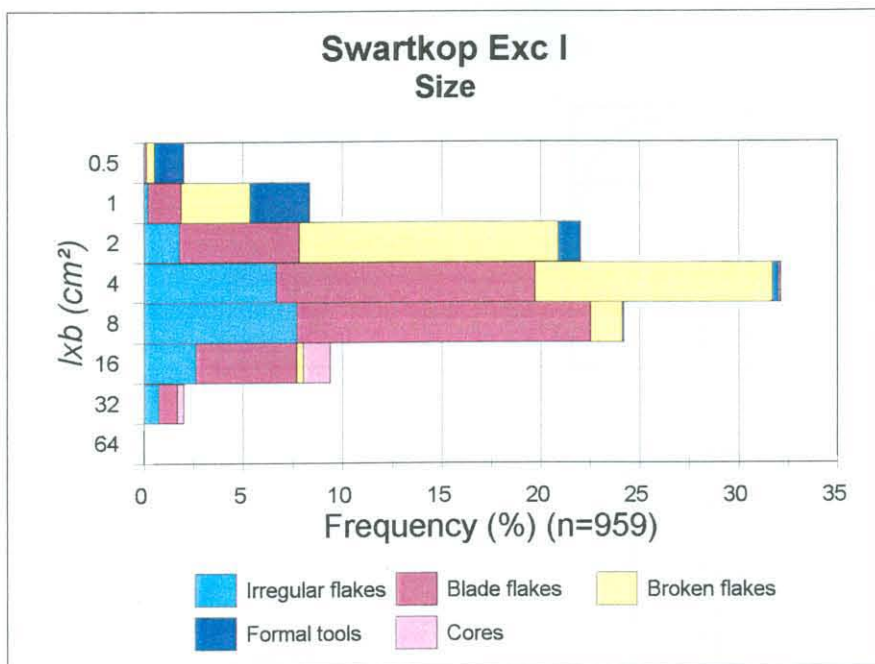
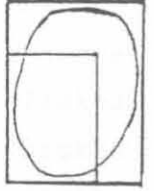
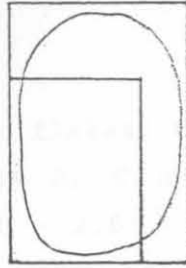


Figure 5.7: Distribution histograms of the size and shape of stone tools from Swartkop Excavation I.

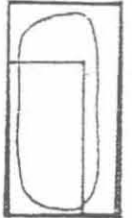
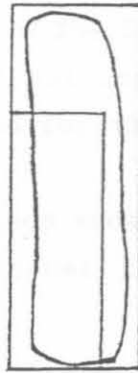
The distribution between size and shape classes for this assemblage clearly differs from that of BB5.



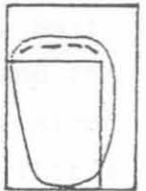
Irregular flakes



Blade flakes



Scrapers



Backed blades





Figure 5.8: Comparison between the Vogel scale size and shape of stone tools from BB5, Swartkop Excavation I and Biesje Poort II (scale 1:1).

Although slightly smaller, the Biesje Poort II artefacts correspond very well to those from BB5.

seems that as soon as stone tools were being retouched, the desired size tended to be smaller, regardless of the type of raw material used. This might also be the case at BB5 as well as at the other sites considered in this chapter.

Due to the high incidence of blade shaped flakes, the majority of stone tools from Swartkop fall within classes B, C and D. Blade flakes predominantly fall in class D, i.e. $l/b = 2.8 - 4$. Even the broken flakes seem to be 'more bladelike' in character with the majority belonging to class C, i.e. $l/b = 2 - 2.8$. This is quite different from BB5 where the most desired shape is class B. The Swartkop backed blades are all rather narrow, with the majority falling into class D. No definite shape patterns could be identified for the BB5 backed blades.

The only non-lithic artefacts from the Swartkop excavation are potsherds. All these sherds are fibre-tempered and rather thick in diameter and therefore unlike the Bloubos fragments.

5.6. Biesje Poort II

According to Beaumont, Biesje Poort II represents an early Doornfontein site with two surface dates (pers. comm.). The first date, obtained from OES organics, is 1390 ± 70 years BP, while the second, obtained from sherd organics, is 1870 ± 50 years BP (see Appendix C) (Beaumont, Smith & Vogel 1995:247). Three of four blocks were excavated to 50cm and the remaining one to 55cm in 5cm spits. The sample contained 401 stone artefacts in total which were all lumped together because little variation between them was identified during classification.

At first glance the samples from Biesje Poort II and Swartkop seem very similar. Figure 5.1 shows a lower frequency of cores at Biesje Poort than at BB5. However, Figure 5.2 indicates that the relative frequency of utilised flakes is similar to that at BB5. Figure 5.3 shows that a slightly higher frequency of blade cores is present at Biesje Poort than at BB5. The largest difference between BB5 and Biesje Poort can however be seen in Figure 5.4. The latter clearly has a higher frequency of backed blades and less scrapers than BB5 while no segments

are present at Biesje Poort. The small size of the formal tool category may, however, be the reason for this difference.

As can be seen in Figures 5.8 and 5.9, the Biesje Poort II assemblage is predominantly microlithic with utilised irregular, bladelike and broken flakes, and scrapers measuring from 1cm² to 2cm² on the Vogel scale. The majority of backed blades measure from 0,5cm² to 1cm². With regard to size, the BB5 irregular and blade flakes and scrapers are on average slightly larger than their Biesje Poort II counterparts.

Obvious characteristics with regard to stone tool shape, include that Biesje Poort II scrapers mainly fall within class B, thus being slightly oblong. The same trend can be seen with the utilised irregular and broken flakes. The majority of backed blades fall within class C. These results correspond to the BB5 results.

The non-lithic sample retrieved from Biesje Poort II consists of the following artefacts. Complete and broken or uncompleted ostrich eggshell beads were found throughout much of the deposit. Towards the middle of the deposit, one decorated OES fragment was found as well as one bone point. Several potsherds were also present throughout the deposit. They are all thin, grit-tempered and of a light reddish brown colour. Four sherds are decorated with parallel incisions on the rim, and two sherds with diagonal incisions on the rim. One ceramic fragment found may belong to a lug and one seems to have a slight shoulder. The bone point and the relatively many decorated potsherds are absent from BB5.

5.7. Conclusions

5.7.1. Preliminary remarks

Some comments with regard to the importance attached to raw material analysis in LSA studies should be made. The importance attached to the

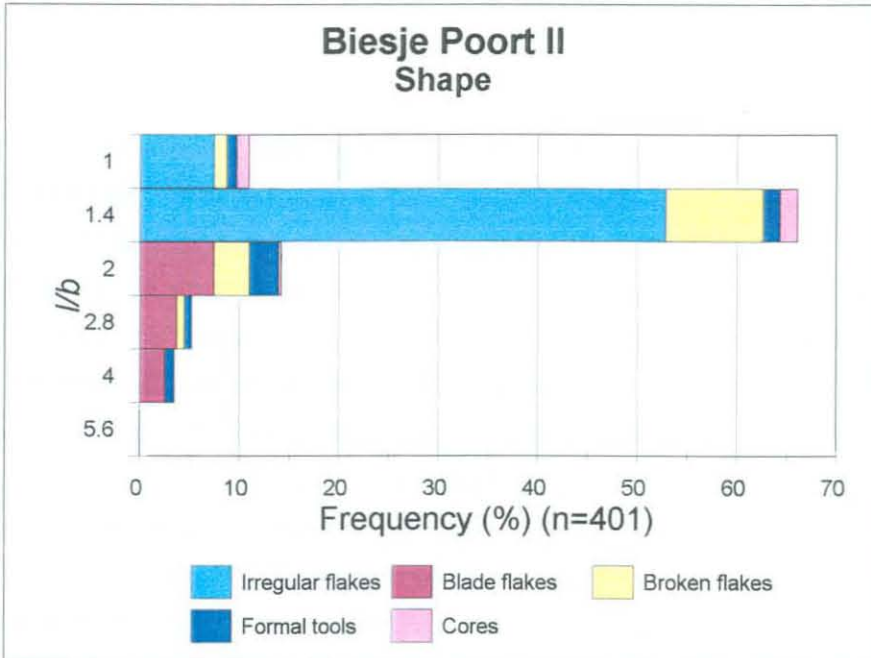
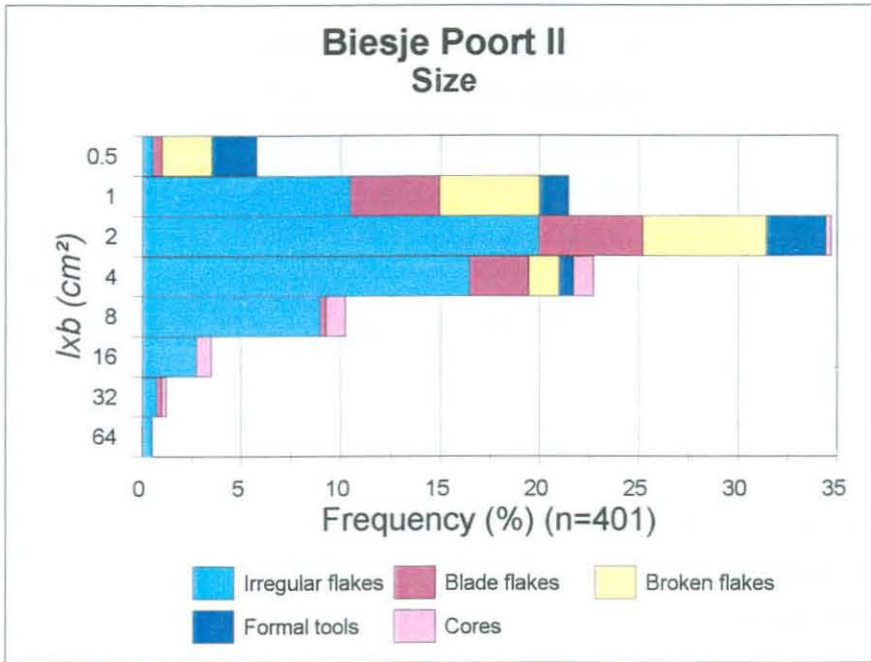


Figure 5.9: Distribution histograms of the size and shape of stone tools from Biesje Poort II.

The distribution curve between the size and shape classes for this assemblage is similar to that of BB5 although the position of the size peak differs slightly.

role played by raw material was indicated in the archaeological review of this study and throughout this chapter. Raw material size obviously played a role, as did its availability and its suitability when specific tool types were being manufactured during the LSA. The fact that instances do occur where different sized stone tools were produced on similar raw materials within one spatial and temporal framework, even at one site, goes to show that raw materials alone cannot account for every change in stone tool size and shape through time. It is clear from these instances, that mental templates existed in the LSA, and that they were probably just as much a deciding factor during the manufacturing process of stone tools, as were the available raw materials, personal skill and stylistic preferences. Therefore, raw material based divisions of stone tools sometimes seem excessive, if not always irrelevant. A case in point are the similarities identified in scraper size at Wonderwerk Cave, Klein Witkrans, Limerock II and BB5. The contemporaneous scrapers from these sites are all macrolithic, while the rest of the formal assemblages, made from the same types of raw material, are microlithic. Thus despite the use of raw materials characterised by smaller nodules, the resulting formal implements were not necessarily all microlithic.

A drawback experienced while trying to compare the abovementioned sites was the different definitions of length and breadth. Obviously these affect mean length and breadth measurements and may lead to the mistaken impression that flakes are generally square when in fact they are oblong in shape. This is especially true for sidestruck flakes, if the length is taken as the maximum distance between the striking platform and the opposing end of the flake. Often in such cases the breadth then exceeds the length, thus influencing the mean figures. Obviously this is not a problem when one is predominantly dealing with endstruck flakes as is the case at BB5, or when length/breadth ratios are used for analysis. Deacon's definition of the length of a scraper as being the distance perpendicular to the retouched surface can also lead to distorted mean values (1984b:404). For instance, a collection of elongated end- and sidescrapers together will result in equal average lengths and breadths, suggesting that the mean shape is more or less square.

The stone circles present at three of the considered sites are of special interest in this study. BB7 is one of several stone circles on Bloubos located within close proximity of a dry watercourse which might have held water in previous times. It is a pity that only a very small sample was excavated at the site, especially since the combination of artefacts recovered which included bone fragments, was rather unique considering the environmental conditions on Bloubos. It is possible that BB7, like the stone circle on Lime Rock and Swartkop, represents the base of a LSA dwelling. Additionally, the Lime Rock and Swartkop circles are both located close to water sources. Swartkop is situated close to a pan, although it was observed that it seldom carries water (pers. comm. P.B. Beaumont). All three examples are indirectly related to potential sources of protein in the shape of wildlife drawn to the water. A thorough investigation might provide detailed information on hunting exploitation strategies.

5.7.2. Concluding remarks

When examining the results of the comparisons made, it is undeniable that the four samples classified by me, have significantly more utilised flakes, less formal tools, and a wider range of utilised flakes, than the Humphreys and Thackeray material. This is attributed to the subjective nature of the classification process of stone tools, the fact that different systems were used and possibly to the geographic location of the sites.

After comparing BB5 to the chosen sites, it is clear that the site has several elements in common with others in the Northern Cape. An important aspect of the classification scheme used in this study, is that utilised broken flakes are classified as a separate category, the reason being that they often do not classify as either irregular or blade flakes. Broken flakes are not noted as a separate class by either Humphreys or Thackeray and this influences the relative proportions of utilised flake subclasses identified by them. The samples analysed by me all contained broken, bladelike and irregular flakes, even if the relative proportions differed somewhat.

The majority of cores on all the mentioned sites except Swartkop, are irregular. The presence of blade cores at Swartkop is related to the high frequency of blade flakes and backed blades. Evidently, the Swartkop type site has little relation to the Bloubos sites, even though the dates of Swartkop sites - until now mainly found in Bushmanland - cover at least the last 2000 years (Beaumont, Smith & Vogel 1995:242). Swartkop itself, however, has a relatively late date.

It is clear that scrapers, backed blades and segments were the most popular formal tools produced at the mentioned sites. Even the Wonderwerk cave layers held some segments despite the fact that all three formal types are not present in all three layers. It is therefore significant that the youngest layer (2B), Swartkop, and Biesje Poort II lack any segments as these assemblages belong to the final phase of the LSA in the region. It has been observed that the frequency of backed microliths and particularly segments, decreases after the appearance of LSA pottery in some parts of South Africa (Deacon 1984b:345). It might thus be suggested that BB5 - a site where both backed microliths and segments are well represented - characterises a LSA site associated with some ceramics but falling on the borderline between pre-pottery and pottery late Holocene assemblages, while layer 2B of Wonderwerk cave, Swartkop and Biesje Poort II are more representative of the Ceramic LSA.

The extremely high frequency of scrapers at Limerock II that accounts for the majority of the stone tools, is striking. The fact that more scrapers than utilised flakes or blades were excavated, suggests that the manufacturing of stone tool was a very specialized task at the site. Simultaneously, the site contained strong evidence of having been a living area. A similar, though maybe not as pronounced, high frequency of scrapers is observable at Klein Witkrans, Wonderwerk cave Layer 2B and BB5. It is interesting to note however, that the younger Swartkop site as well as the Doornfontein site, Biesje Poort II, are not characterised by such a decrease in backed tools at this time. These two sites are both far removed from Wonderwerk cave, Klein Witkrans and Limerock II, lying closer to Bloubos.

It is accepted that the Bloubos LSA material shares several characteristics with that of Biesje Poort II as well as with the other sites considered in this chapter with the exception of Swartkop. Contact did probably take place between different LSA groupings during the last 2000 or more years in the Northern Cape. This would account for similarities between the Bloubos, Kuruman hills and Ghaap sites considered in this chapter, all of whom were more or less contemporaneously occupied. Differences that do occur, may be attributed to radically different environmental conditions.

The assemblage from BB5 contains several traditional Wilton characteristics. The most obvious is the inclusion of scrapers, backed blades and segments in the formal lithic sample. These types continue to indicate the Wilton Complex, as understood in LSA studies in southern Africa (Deacon 1972:38; Wadley 1986:54). It is at approximately 2000 years BP, that ceramic ware first appears on the LSA scene in southern Africa. The Bloubos sites contained some pottery as do the other sites considered. It does however become clear that while Biesje Poort II and Swartkop are both relatively rich in ceramic fragments, BB5 and BB7, like some of the Kuruman hills and Ghaap sites, lack large numbers of ceramics. This is especially surprising for BB5, considering the large lithic sample collected there. The ceramic fragments found at BB5 and BB7 are similar to the Biesje Poort II and sites classed as Wilton while they differ completely from the Swartkop pottery. The Swartkop assemblage also clearly challenges the notion that LSA assemblages associated with ceramics after 2000 years are dominated by scrapers. This trend may not be applicable to Bushmanland and some other parts of the Northern Cape.

Considering these elements, I suggest that the BB5 artefacts belong to a transitional period between the non-ceramic Wilton in the Northern Cape, and LSA assemblages associated with pottery after 2000 years BP, be they named Doornfontein, Ceramic Wilton, or Ceramic LSA assemblages (Beaumont & Vogel 1989:79; Beaumont & Vogel 1984:82; Beaumont, Smith & Vogel 1995:242-247). It is clear that the BB5 tool frequencies are on more than one level very similar to that of the Biesje Poort II, while it is simultaneously also similar to the other investigated assemblages.

Differences that occur may be attributed to variations in geographical setting, age and limited contact between the makers of these artefacts. Differences may also be attributed to differing site types. The sites analysed by Humphreys and Thackeray, as well as BB5 and BB7, contain evidence of having been living sites while the Beaumont samples do not. Whatever the case may be, sufficient evidence that includes similar stone artefact types, sizes, raw materials and ceramic ware, exists to conclude that the BB5 artefacts are in fact, very similar to other analysed LSA assemblages in the Northern Cape and that it may be incorporated into the accepted archaeological framework for the region.

As discussed in Chapter 1, Beaumont identifies the presence of two distinct but contemporaneous industries belonging to the Ceramic LSA Complex of the Northern Cape. Without hesitation he associates hunter groups with the Swartkop Industry, while pastoralists are associated with the Doornfontein (Biesje Poort II) Industry. In view of the evidence examined in this chapter, it is believed that the Bloubos material would belong to the pastoralist Doornfontein Industry.



CHAPTER 6

Conclusions

6.1. Introduction

The results of this study provide insight into the potential contribution of surface assemblages. The following conclusions were drawn from the artefact analyses and site comparisons conducted during this study project. They reflect the substantial amount of information gained from studying one open-air site in the environment and argue for the consideration of surface assemblages in the reconstruction of prehistoric subsistence strategies.

6.2. Value of a surface site

A very large sample of stone artefacts was recovered from the site BB5, while only a small number of ceramic fragments was found. No OES beads or faunal remains were encountered. However, despite these 'deficiencies', it was possible to retrieve valuable information from the lithic artefacts at the site. Their interpretation was supported by results from the deposits at the BB7 site.

The most important result of this project is the conclusion that BB5 represents a homogeneous sample without evidence of cultural mixing, thus representing a valid research sample. Furthermore, the artefact analysis shows that both in terms of artefact typology and artefact size and shape, the samples from the individual grid blocks do not differ significantly from one another. It is therefore concluded that a single occupation phase is being dealt with.

The artefact analysis revealed that when samples of 250 or more utilised artefacts are analysed, the results are much more similar for the individual grid blocks than when smaller samples are analysed. The conclusion is that one needs at least 200 to 250 utilised artefacts to obtain a representative sample, collecting more than that number does not significantly improve results. Since the samples from the grid

blocks are more or less homogeneous, a smaller sample would have been adequate.

The artefact analysis made it possible to establish which artefact types are present on the site and what they look like. An interesting observation is the high frequency of scrapers manufactured on broken flakes with the bulb of percussion still visible. This indicates that these flakes were selected when manufacturing scrapers.

The metric analysis showed that the use of the Vogel method to determine size and shape of artefacts is much less time-consuming than measuring each artefact individually. It was subsequently shown that the results of the two methods do not significantly differ and suggested that the former method may substitute the latter. The importance of considering the median in metric analysis was also pointed out. The median value reflects the 'most common value' which is more significant than the mean value when the distribution is skewed.

The results from BB5 were also compared to those from BB7. Some differences were observed between the two sets of data, but it was concluded that they are ultimately similar. Obvious differences are either activity related or have to do with the small sample from BB7. BB5 primarily represents a factory/manufacturing site, which was also a living site. On present evidence BB7 represents a living site with little evidence of stone tool manufacture or the preparation of animal skins.

The site comparisons established that BB5 represents a true terminal Later Stone Age site. Neither the artefact types nor the artefact sizes and shapes differed to such an extent for one to conclude that BB5 is not an LSA site. The implication is that artefact analysis, especially stone tool analysis, must form the basis of any attempted inter-site comparison. The importance of a uniform method of analysis in LSA research, be it typological or metric analysis, was also shown. There is a need for a more precise standardisation of terms and definitions which may be used to describe LSA assemblages. Such uniformity will simplify regional and other comparisons.

Other, less obvious conclusions regarding prehistoric lifestyle and subsistence strategies may also be drawn from the research results. The natural environment and location of the site alone imply that hunting was an important economic activity of the people who occupied BB5. The formal tool kit which includes segments and backed blades also points to hunting as an activity, while the presence of grinding stones may be linked to the preparation of plant foods. The similarities between the BB5 sample and that of Biesje Poort II (Doornfontein Industry) indicate that BB5 may also be associated with herding. The natural environment once again lends itself to this type of economy since water is often available during the rainy season. Despite the fact that no faunal evidence of herding was found, it is possible to connect both the lithic and ceramic samples found at BB5 and BB7, to those manufactured by herders during the final LSA in the Northern Cape.

From the amount of waste material and the number of cores and hammer stones at BB5, it is possible to conclude that stone tools were manufactured on the site. No traces of settlement features could be identified at BB5. The presence of grinding stones however indicate some form of settlement. The possibility of seasonal occupation of the site may even be postulated, based on the relatively short distance between the farm and the Orange River, as well as on the annual availability of water and food during the rainy season on Bloubos.

6.3. Evaluation

The **research approach** as outlined in Chapter 1 contained two components - methodology and presentation. These frameworks were used to attain the research objectives of this study. Several contributions that can be expected from the investigation of a surface site were also proposed in Chapter 1.

The question as to whether the **research objectives** were reached, will be addressed first. The value of a surface site in terms of a regional reconstruction of prehistoric subsistence strategies is indicated by the successful placing of the site BB5 within the larger LSA context. Contributing to the completion of this research aim was the artefact

analysis conducted, the description of the results thereof and the subsequent comparison of these results with other stratified sites in the area. Without the initial typological and metric analysis, no such comparisons could have been made. The answer to whether any 'new, relevant information' was added to the existing chronological and spatial LSA framework is also affirmative. BB5 may safely be ascribed to the early phase of the Doornfontein Industry (Wilton Complex) of the Northern Cape. The site therefore broadens both the spatial and temporal scope of the LSA database in the research area.

Contributions that can be made by investigating surface sites may be summarized as follows:

BB5 represents an open-air living site where food, animal skins and stone tools were prepared. It is therefore probable that similar activities were practised on other open living sites. This shows that LSA people not only sheltered in caves. The size of the site and artefact assemblage, furthermore suggests that the communities actually spent more of their time camping in the open and occupied cave sites only to a lesser extent. We thus have an improved perception of the utilisation of the area. Furthermore, investigations similar to the one conducted on BB5 will ultimately lead to a more complete reconstruction of subsistence strategies and terrain utilisation in the Northern Cape.

By comparing the results from BB5 and BB7, it seems as if several different activities took place at the surface site while the other was only a living site. The comparison between surface and stratified sites may therefore add to our understanding of site utilisation.

With regard to practical implications, surface accumulations of artefacts often indicate the location of a deposit. This was the case at BB7 where a surface scatter of potsherds indicated the presence of a cultural deposit. Also, the extent of the utilised area of a site is clearly visible on open-air surface sites while this is not the case from excavations in stratified caves. In terms of field work this influences the collection strategy. Lastly, a group consisting of several people

could participate in the field work and so gain experience in the collection and handling of stone artefacts.

In terms of cultural resource management this project did not harm the site in any way. Only a limited proportion of the artefacts were collected while the rest were left for future research. It also documented the locality of a living site that is worthy of preservation.

6.4. Concluding remarks

All evidence shows that the lithic material from the Bloubos samples represents a relatively uniform assemblage covering a restricted time period in the Late Holocene. Firstly, there are no artefacts belonging to an obviously earlier period at BB5 or BB7 - an absence which might be attributed to a more recent age of dunes on the farm. Secondly, there is an undeniable similarity between the collection and other stratified sites in the research area. The Bloubos sites therefore can be used to compliment the reconstruction of the final Stone Age human habitation of the region.

For a comprehensive reconstruction of LSA activities and lifestyle, focus must be placed on the following three aspects of utilisation of the natural environment or landscape:

- investigation of stratified cave sites to provide the chronological sequence;
- investigation of surface assemblages to identify the living sites;
- recording of the distribution of both shelters and open-air sites in the environment to reconstruct the extent of the habitation.

Only such a complete investigation of an area might lead to a true reconstruction of subsistence strategies and land use patterns. Sampson (1985; 1986) has started to explore the possibilities of LSA surface sites, especially with regard to the identification of so-called contact zones between hunters and herders in the Seekoei River valley.

Local researchers also have much to gain by taking note of European archaeological trends. Reconstructions in France have become so sophisticated that it is currently possible to link Mesolithic sites to specific groups that were in frequent contact. They have reached the stage where different tribal territories may be identified (Rozoy 1998). It is emphasized that such reconstructions are based on investigations which include all types of sites and their distribution in the environment.

It is conceivable that similar patterns may be identified in the Northern Cape, but such regional research will only become possible once all aspects of land use are taken into account. Regional research on this scale may in turn just indicate related or associated LSA groups or communities and regional boundaries between them.

The high frequency of open-air sites in the Northern Cape implies that they were regularly occupied. Both hunters and herders probably spent more time on open sites than in caves where stratified deposits accumulated. This observation sheds light on the general land use pattern. The extremely large surface scatter at BB5 indicates that it was a regular camp site within a restricted time period. Cave sites on the other hand may only have been visited by a limited part of the population or only for short periods, thus leading to distorted reconstructions of prehistoric lifestyles. Information retrieved from both cave and open sites may therefore only complement one another.

The research conducted at BB5 contributes to our expanding understanding of the final LSA in the Northern Cape. The possibility exists that other such sites may also add to the existing body of knowledge with regard to this period in prehistory. They may do so in terms of the geographical distribution of industries, their age, their composition and their cultural affinities. In addition, every individual within a group may be represented on an open site. This implies interesting possibilities for future research. Surface assemblages have up to now often been neglected, resulting in the destruction and loss of potentially important archaeological evidence. It is only through the comprehensive



investigation of all the sites in the landscape that truly holistic reconstructions of the past can be made.



APPENDICES



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APPENDIX A: Mammal species on Bloubos.

Order Artiodactyla

<i>Oryx gazella</i>	Gemsbok
<i>Tragelaphus strepsiceros</i>	Kudu
<i>Antidorcas marsupialis</i>	Springbok
<i>Sylvicapra grimmia</i>	Common duiker
<i>Raphicerus campestris</i>	Steenbok (Skinner & Smithers 1990:638, 642, 655, 678, 686).

Order Insectivora

<i>Atelerix frontalis</i>	South African hedgehog
<i>Crocidura cyanea</i>	Reddish-grey musk shrew
<i>Crocidura hirta</i>	Lesser red musk shrew (Skinner & Smithers 1990:15, 19, 21).

Order Carnivora

<i>Suricata suricatta</i>	Suricate
<i>Otocyon megalotis</i>	Bat-eared fox
<i>Vulpes chama</i>	Cape fox
<i>Hyanea brunnea</i>	Brown hyaena
<i>Felis caracal</i>	Caracal
<i>Genetta genetta</i>	Small-spotted genet
<i>Ictonyx striatus</i>	Striped polecat
<i>Cynictis penicillata</i>	Yellow mongoose (Skinner & Smithers 1990:378, 408, 424, 433, 461, 472, 481, 490).

Order Rodentia

<i>Xerus inauris</i>	Cape ground squirrel
<i>Gerbillurus vallinus</i>	Brush-tailed hairy-footed gerbil
<i>Gerbillurus paeba</i>	Hairy-footed gerbil
<i>Gerbillurus tytonis</i>	Dune hairy-footed gerbil
<i>Tatera leucogaster</i>	Bushveld gerbil
<i>Tatera brantsii</i>	Highveld gerbil
<i>Desmodillus auricularis</i>	Short-tailed gerbil (Skinner & Smithers 1990:211, 284, 285, 287, 288, 290, 292).

(List compiled by Mr. F. Liebenberg)





APPENDIX B: Mammal species in the Kalahari Gemsbok National Park.

ORDER ARTIODACTYLA

<i>Phachochoerus aethiopicus</i>	Warthog
<i>Connochaetes taurinus</i>	Blue wildebeest
<i>Alcelaphus buselaphus caama</i>	Red hartebeest
<i>Sylvicapra gimmia</i>	Common duiker
<i>Antidorcas marsupialis</i>	Springbok
<i>Raphicerus campestris</i>	Steenbok
<i>Aepyceros melampus</i>	Impala
<i>Tragelaphus strepsiceros</i>	Kudu
<i>Oryx gazella</i>	Gemsbok
<i>Traurotragus oryx</i>	Eland

ORDER INSECTIVORA

<i>Crocidura hirta deserti</i>	Desert musk shrew
<i>Erinaceus frontalis</i>	Hedgehog
<i>Chrysochloris asiatica</i>	Cape golden mole
<i>Macroscelides proboscideus</i>	Round-eared elephant-shrew
<i>Elephantulus intuffi</i>	Bushveld elephant-shrew

ORDER CARNIVORA

Family Hyaenidae

<i>Proteles cristatus</i>	Aardwolf
<i>Hyaena brunnea</i>	Brown hyaena
<i>Crocuta crocuta</i>	Spotted hyaena

Family Felidae

<i>Acinonyx jubatus</i>	Cheetah
<i>Panthera pardus</i>	Leopard
<i>Panthera leo</i>	Lion
<i>Felis caracal</i>	Caracal
<i>Felis lybica</i>	African wild cat
<i>Felis nigripes</i>	Small spotted/black-footed cat



Family Canidae

<i>Otocyon megalotis</i>	Bat-eared fox
<i>Lycaon pictus</i>	Wild dog
<i>Vulpes chama</i>	Cape fox
<i>Canis mesomelas</i>	Black-backed jackal

Family Mustelidae

<i>Mellivora capensis</i>	Honey badger
<i>Ictonyx striatus</i>	Striped polecat

Family Viverridae

<i>Genetta genetta</i>	Small-spotted genet
<i>Suricata suricatta</i>	Suricate
<i>Cynictis penicillata</i>	Yellow mongoose
<i>Galerella sanguinea</i>	Slender mongoose
<i>Mungos mungo</i>	Banded mongoose

ORDER RODENTIA

<i>Cryptomys hottentotus damarensis</i>	Damara molerat
<i>Hystrix africaeaustralis</i>	Porcupine
<i>Pedetes capensis</i>	Springhare
<i>Xerus inauris</i>	Ground squirrel
<i>Parotomys brantsii</i>	Brants' whistling rat
<i>Rhabdomys pumilio</i>	Striped mouse
<i>Zelotomys woosnami</i>	Woosnam's desert rat / tree rat
<i>Mus minutoides</i>	Pygmy mouse
<i>Thallomys paedulcus</i>	Tree mouse
<i>Aethomys namaquensis</i>	Namaqua rock mouse
<i>Saccostomus campestris</i>	Pouched mouse
<i>Malacothrix typica</i>	Large-eared mouse
<i>Dendromus melanotis</i>	Grey climbing mouse
<i>Desmodillus auricularis</i>	Namaqualand / short-tailed gerbil
<i>Gerbillurus paebe</i>	Hairy-footed / pygmy gerbil
<i>Tatera brantsii</i>	Highveld / Brants' gerbil



ORDER TUBULIDENTATA

Orycteropus afer Aardvark

ORDER CHIROPTERA

Tadarida aegyptiaca bocagei Egyptian free-tailed bat

Eptesicus capensis Cape serotine bat

Scotophilus dinganii Yellow house bat

Nycteris thebaica Common slit-faced bat

ORDER PRIMATES

Papio ursinus Chacma baboon

ORDER PHOLIDOTA

Manis temminckii Pangolin

ORDER LAGOMORPHA

Lepus capensis Cape hare

Lepus saxatilis Scrub hare

(List from Mills & Haagner 1989:94-95)



APPENDIX C: Table of radiocarbon dates for sites referred to in Chapter 5. (Also see paragraph 3.7).

Analysis no	Level	Material	Radiocarbon Age	Calibrated date
Wonderwerk cave Excavation I				
Pta-2779	Stratum 2B	Charcoal	1210± 50 BP	AD 785 (881) 954
Pta-2542	Stratum 3 top	Charcoal	1890± 50 BP	AD 94 (141) 234
Pta-6873	Stratum 3A	Charcoal	2120± 80 BP	192 (84 BC) AD 5
Pta-2543	Stratum 3 base	Charcoal	2910± 60 BP	1123 (1018) 941 BC
Pta-2785	Stratum 3A/B	Charcoal	3990± 60 BP	2555 (2466) 2356 BC
Klein Witkrans shelter				
Pta-2447	Spit 3	Charcoal	1490± 40 BP	AD 583 (624) 646
Pta-4499	Spit 3	OES	2350± 45 BP	400 (389) 375 BC
Pta-4453	Spit 4	Charcoal	2029± 45 BP	107 (49) 1 BC
Pta-4444	Spit 4	OES	1860± 50 BP	AD 128 (222) 248
Pta-3418	Spit 5	Charcoal	1830± 50 BP	AD 151 (238) 322
Pta-4497	Spit 5	OES	3910± 60 BP	2458 (2331) 2220 BC
Pta-4324	Spit 6	Charcoal	1860± 60 BP	AD 122 (222) 252
Pta-4323	Spit 7	Charcoal	2130± 60 BP	186 (101) 39 BC
Pta-2095	Level IV	Charcoal	1720± 40 BP	AD 339 (390) 414



Limerock II				
Pta-4502	Level IV	OES	1760± 50 BP	AD 248 (339) 397
Pta-1759	Level V	Charcoal	1430± 50 BP	AD 631 (653) 672
Pta-4435	Level V	OES	1750± 50 BP	AD 252 (348) 403
Biesje Poort II				
Pta-4772	Surface	OES org frac	1390± 70 BP	AD 641 (668) 706
Pta-4764	Surface	OES carb frac	1890± 50 BP	AD 122 (214) 243
Swartkop Excavation I				
Pta-4106	Exc Spits 1-2	OES carb frac	670 50 BP	AD 1424 (1440) 1462



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PERSONAL COMMUNICATION

- Beaumont, P.B. *August 1999*
- Liebenberg, F. *July 1998 - August 1998*
- Vogel, J.C. *June 1999 - August 2000*

