CHAPTER 4

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.

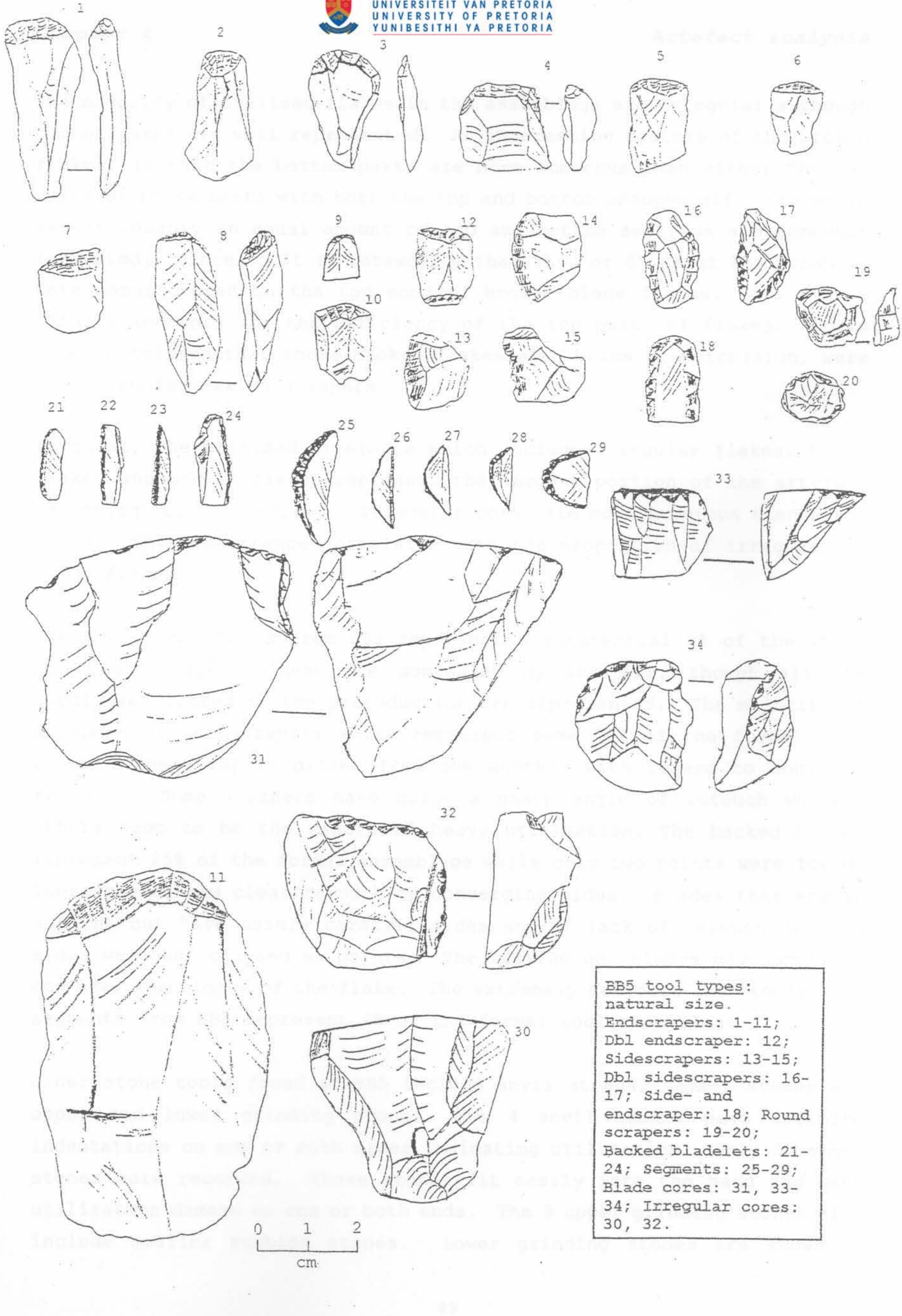
4.3. Results of typological analysis

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 bos.

SQUARE / ARTEFACT TYPE	D2	E6	F3	F4	H2	H3	H4	H5	H6	I1	I2	I3	I4	I5	I6	J1	J4	J6	BB5	FREQUENCY %	%
UTILISED FLAKES	27	219	177	185	634	469	353	332	145	141	371	355	355	246	118	20	267	314	4728		85.1
COMPLETE FLAKES	23	178	149	163	569	346	287	262	110	120	302	270	293	211	112	15	213	252	3875	69.8	
Irregulars	21	110	107	112	372	250	208	178	85	86	208	187	220	178	95	9	168	184	2778	50.0	
Blades	2	68	42	51	197	96	79	84	25	34	94	83	73	33	17	6	45	68	1097	19.7	
BROKEN FLAKES	4	41	28	22	65	123	66	70	35	21	69	85	62	35	6	5	54	62	853	15.4	
Top	3	20	8	8	22	27	9	20	9	5	5	16	15	7	2	2	10	16	204	3.7	
Middle		12	6	8	16	10	12	17	6	7	26	20	17	9	1	3	14	18	202	3.6	
Bottom	1	9	14	6	27	86	45	33	20	9	38	49	30	19	3		30	28	447	8.0	
FORMAL TOOLS	1	14	11	26	46	45	30	23	7	2	20	23	29	8	3	5	14	25	332		6.0
Scrapers																					
Endscrapers			2	1	24	25	25	22	4	2	12	9	18	5	2		6	8	165	3.0	
Side- and endscrapers		9	4	8	3				2							2			28	0.5	
Sidescrapers					9	3					3		6	3					24	0.4	
Dbl sidescrapers												1			1		2	1	5	0.1	
Dbl endscrapers						1						1							2	0.0	
Round scrapers				4												1	1	1	7	0.1	
Concave scrapers	1			2															3	0.1	
Backed pieces																					
Backed blades		5	5	9	9	15	5		1		3	8	5			1	4	13	83	1.5	
Segments				2	1	1					2	4					1	2	13	0.2	
Points								1								1			2	0.0	
CORES	3	9	10	15	41	57	43	57	16	14	20	27	44	30	29	2	28	34	479		8.6
Irregular cores	2	9	8	14	34	42	40	55	16	13	14	21	39	22	26	2	26	26	409	7.4	
Blade cores	1		2	1	7	15	3	2		1	6	6	5	8	3		2	8	70	1.3	
OTHER	1	1		3	1	2		2		1	1	1	1					2	16		0.3
Hammer stones		1			1													1	3	0.1	
Upper grinding stones	1			3		2					1		1					1	9	0.2	
Anvil stones								2		1		1							4	0.1	
TOTAL	32	243	198	229	722	573	426	414	168	158	412	406	429	284	150	27	309	375	5555		100
WASTE MATERIAL			37		309	277	410	474	132	135	513	484	404	244	84		282	306	4091		
MANUPORTS			38		211	115	75	117	75	46	80	103	153	55	24		82	58	1232		
GRAND TOTAL	32	243	273	229	1242	965	911	1005	375	339	1005	993	986	583	258	27	673	739	10878		



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).

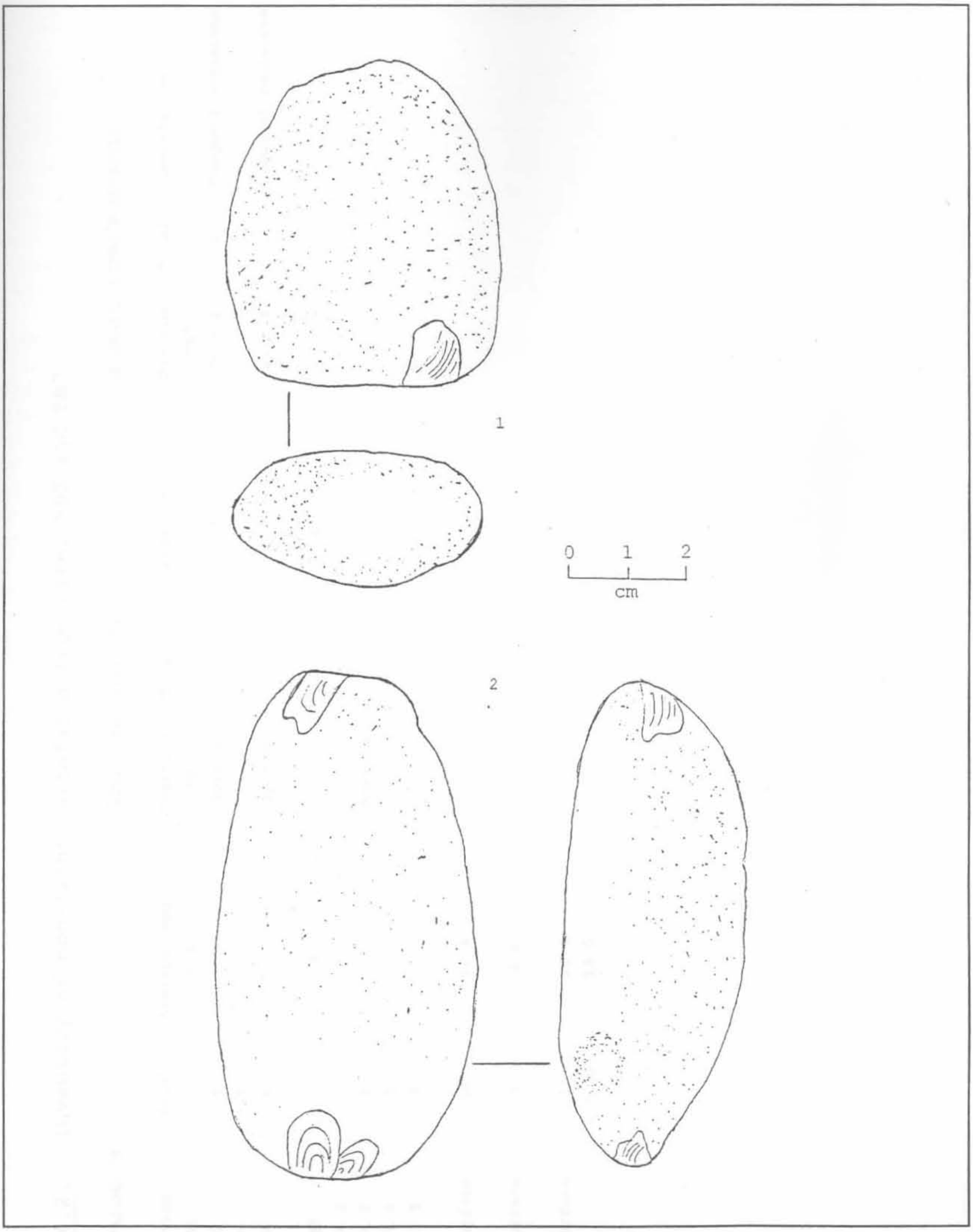
An extremely small sample of potsherds was collected from BB5. The 12 potsherds have a light reddish brown colour, fine texture and quartzite temper. All the sherds are slightly burnt. These sherds do not seem to belong to a single vessel. The non-lithic inventory is given in Table 4.2.

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.



<u>Figure 4.2</u>: **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

Position	Total	Average (mm)
BB5		5.6
D2	6	
F4	5	
H4	1	
BB7		6
Spit 1		
Spit 2	2	
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

OSTRICH EGGSHELL BEADS

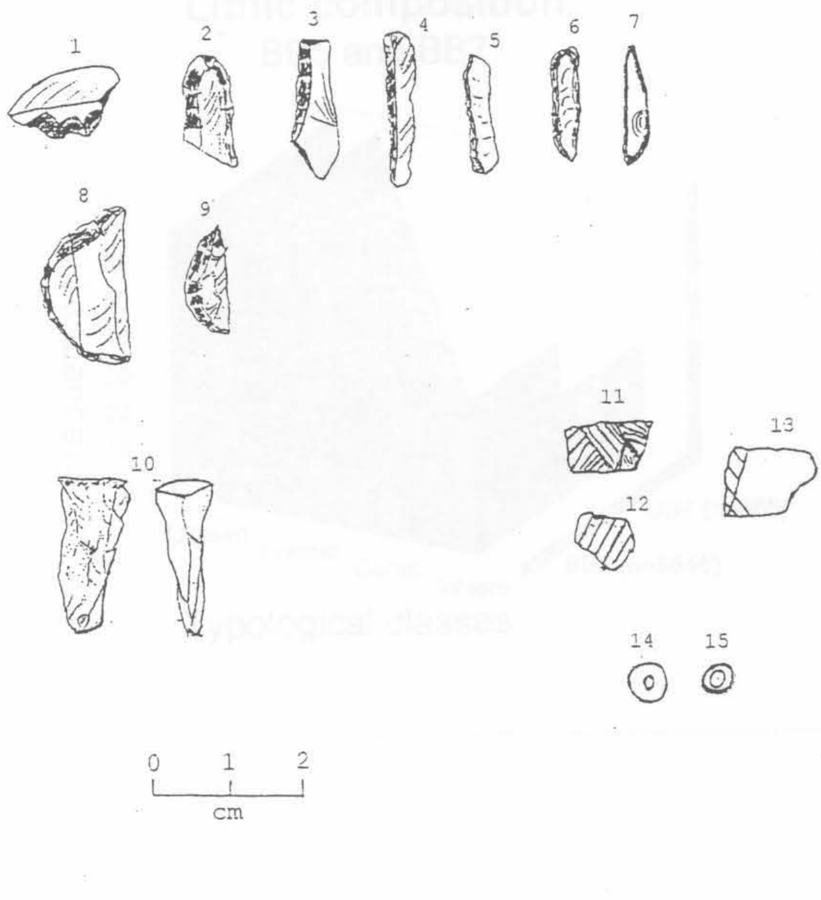
Position	Total	Diameter (mm)
BB7		
Spit 3	1	5.7
Spit 6	3	5.6
		4
		4
Average		5

DECORATED OSTRICH EGGSHELL

Position	Total	Description
BB7		
Spit 2	2	Diagonal incisions.
Spit 4	1	Diagonal incisions.

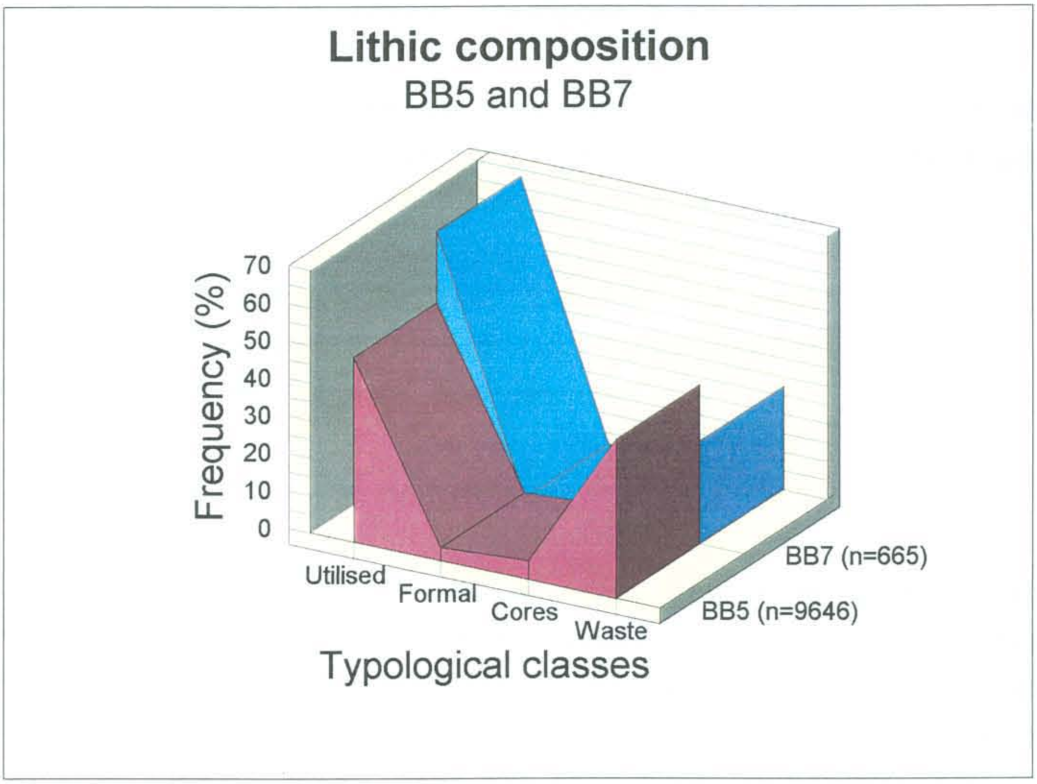
Table 4.3: Inventory of stone artefacts from site BB7 on Bloubos.

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		
MANUPORTS					
GRAND TOTAL	438	227	665		



<u>Figure 4.3</u>: BB7 stone tool types and non-lithic artefacts.

<u>BB7 tool types</u>: 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.



<u>Figure 4.4</u>: **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

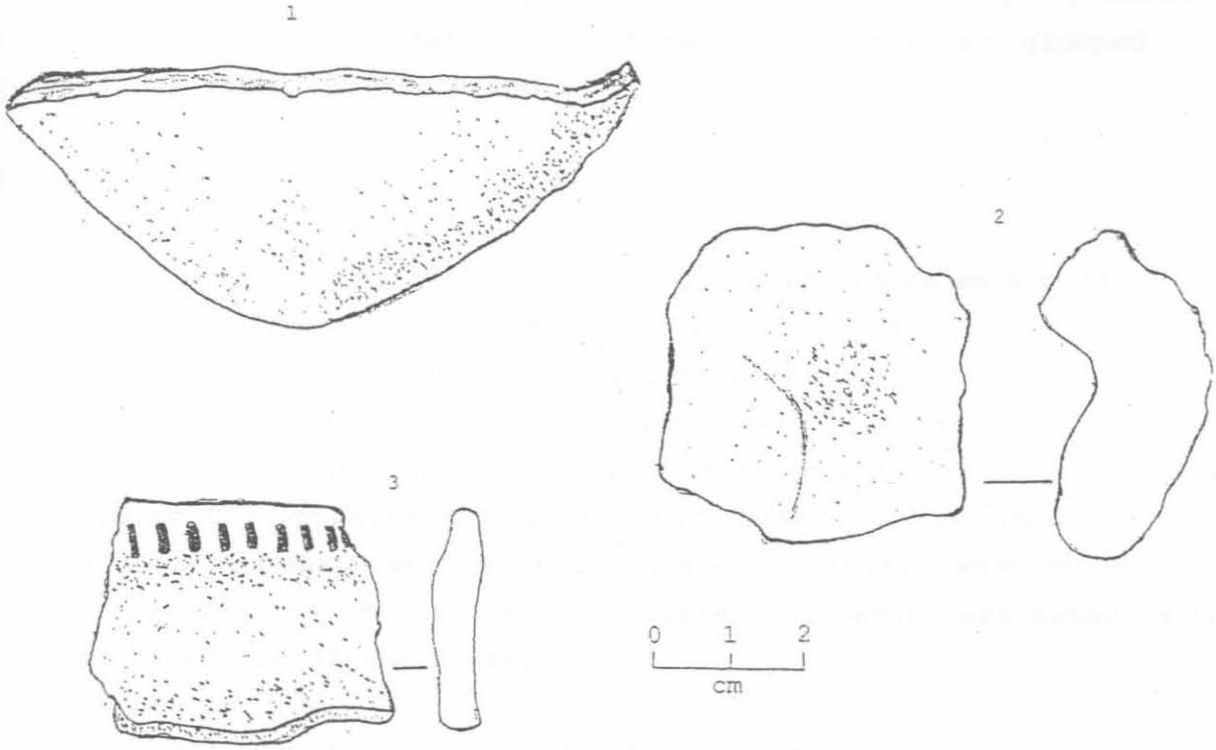


Figure 4.5: **Ceramic fragments.**

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
lxb	<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
l/b	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 $2cm^2$ while a 'microlithic index' is defined as the percentage of artefacts measuring less than $2cm^2$. 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 $<0,5cm^2$ to $128cm^2$ in size (see Table 4.4). Overall, the most preferred size however, is seen to be between 2 and $4cm^2$. 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 $128cm^2$ 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 $l/b < 2$.

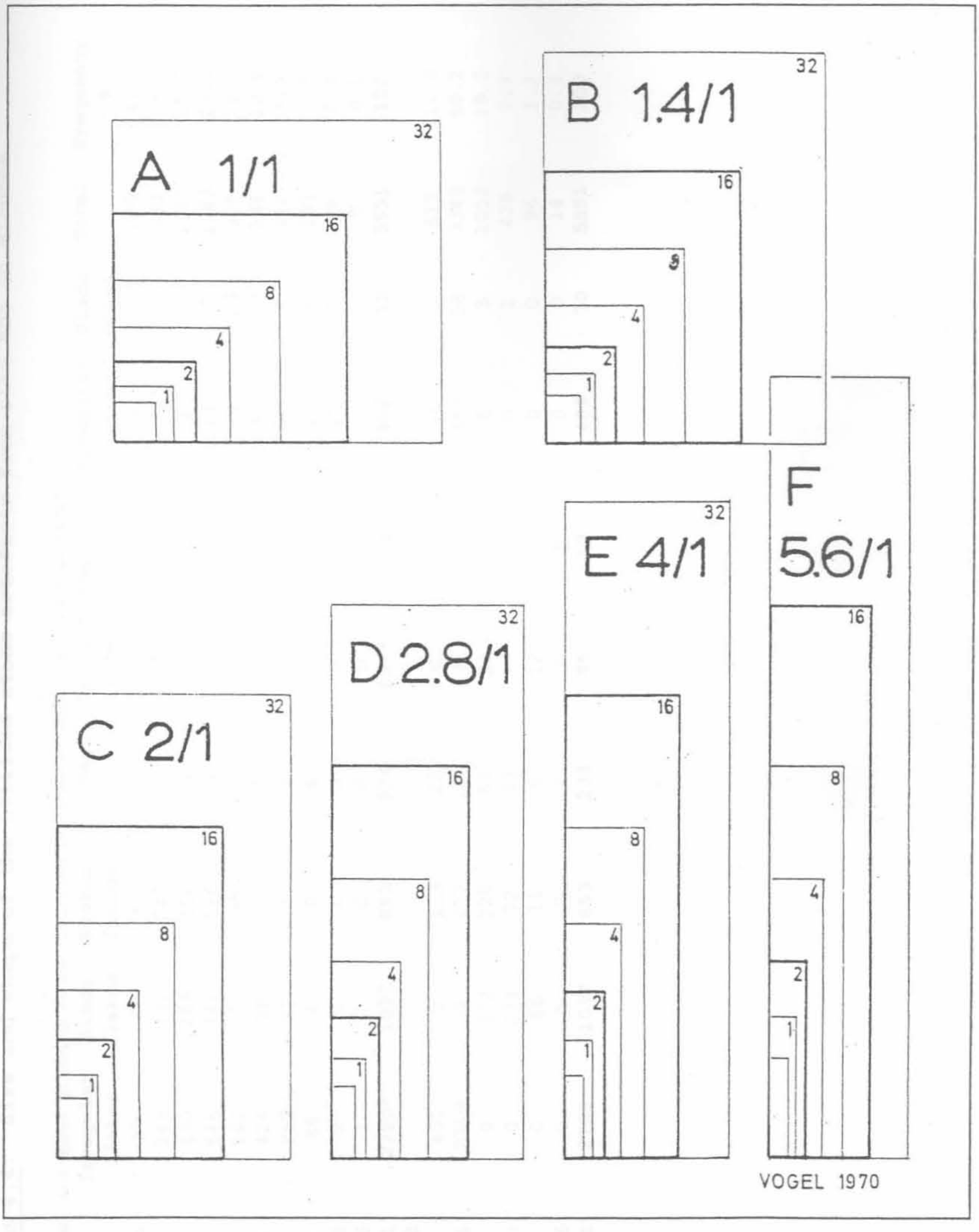


Figure 4.6: **Template of the Vogel scale.**

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 utili[illegible]facts from site BB5 on Bloubos.

* 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**

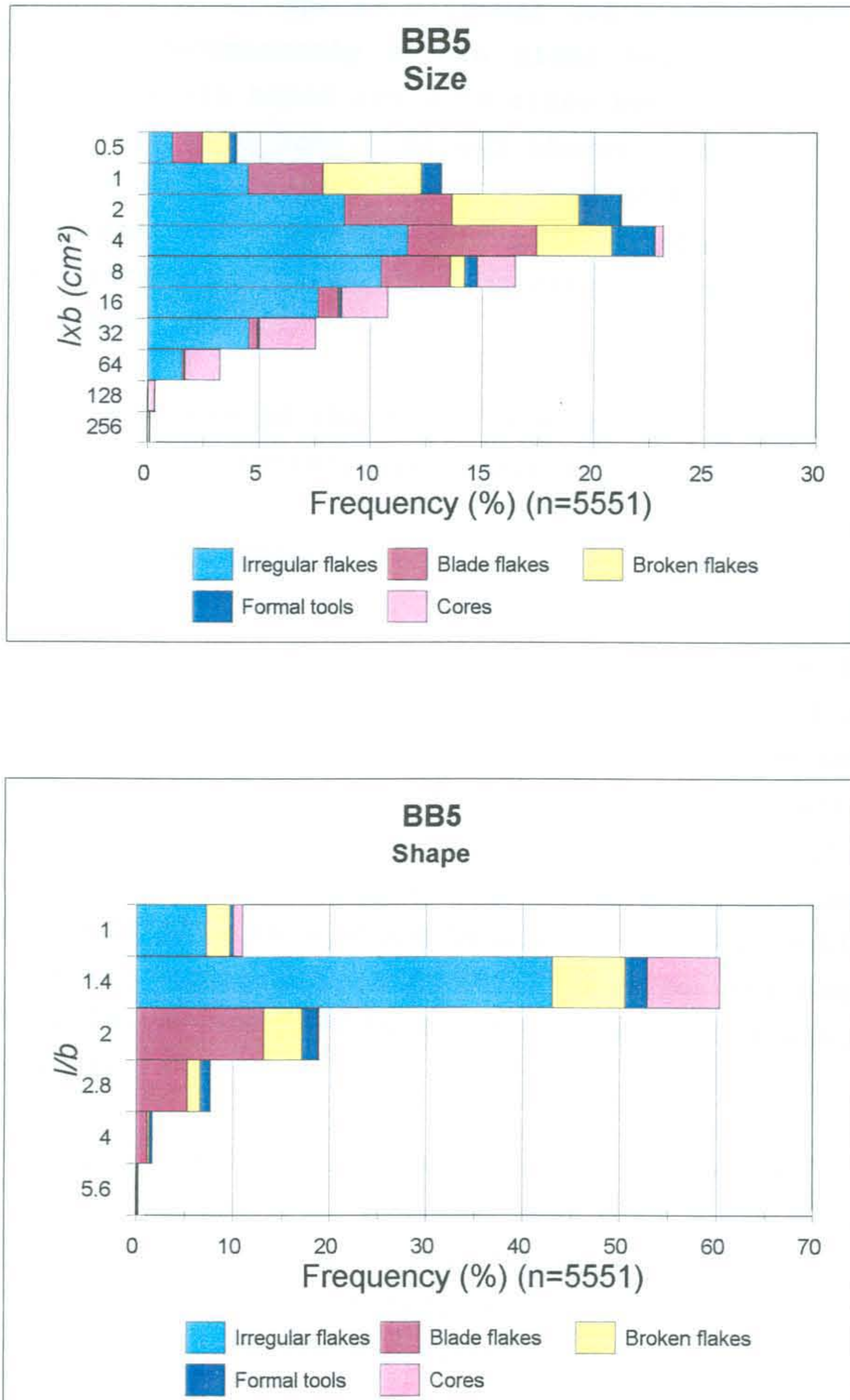


Figure 4.7: BB5 distribution histograms.

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 $4cm^2$, with the median value close to $2cm^2$. Backed blades peak in class D and their preferred size is $1cm^2$. 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.

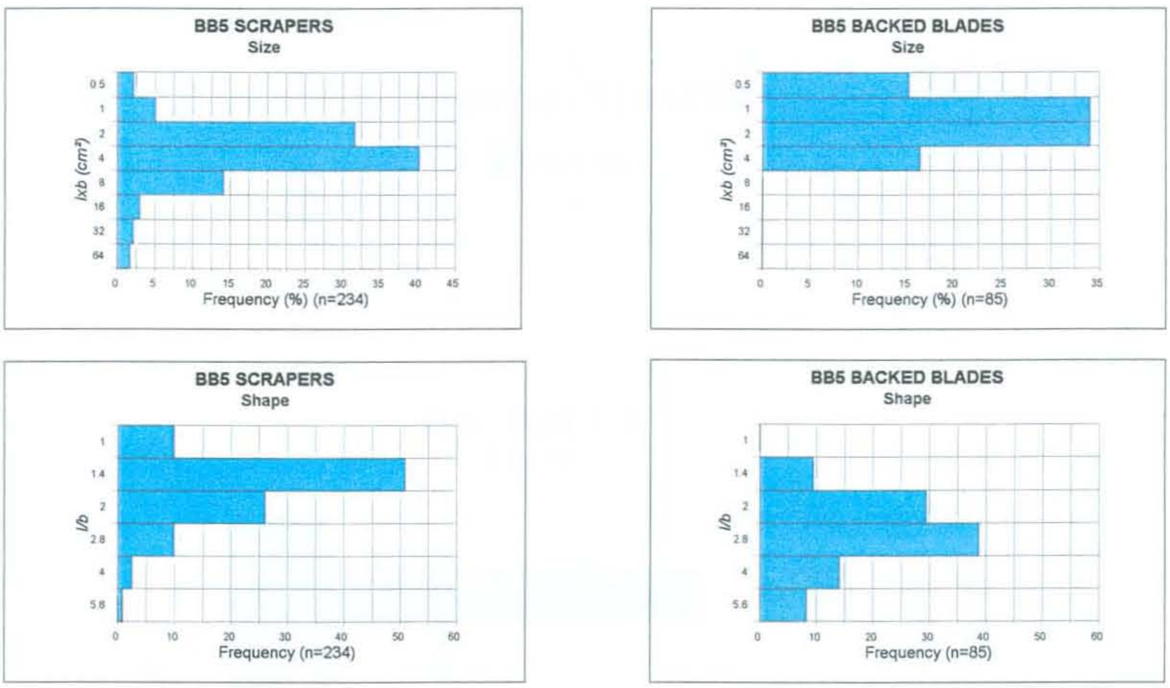
The average thickness of the BB5 potsherds is 5,6mm, which places them in the range of Khoi pottery (see Table 4.2) (Rudner 1979).

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 $2cm^2$. 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.

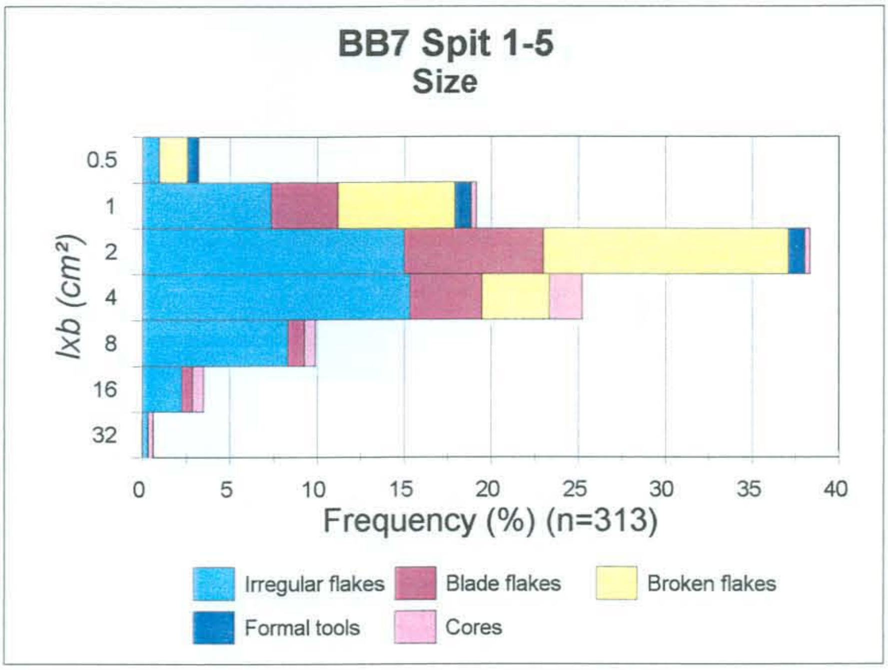
The distribution in the shape classes is similar to that at BB5 with 53% of the artefacts falling into class B, i.e. with a *l/b* ratio between 1.4 to 2. Since there are only 13 formal tools, statistical comparison with BB5 is not meaningful. It is noted, however, that only one of the formal tools does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



<u>Figure 4.8</u>: 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.



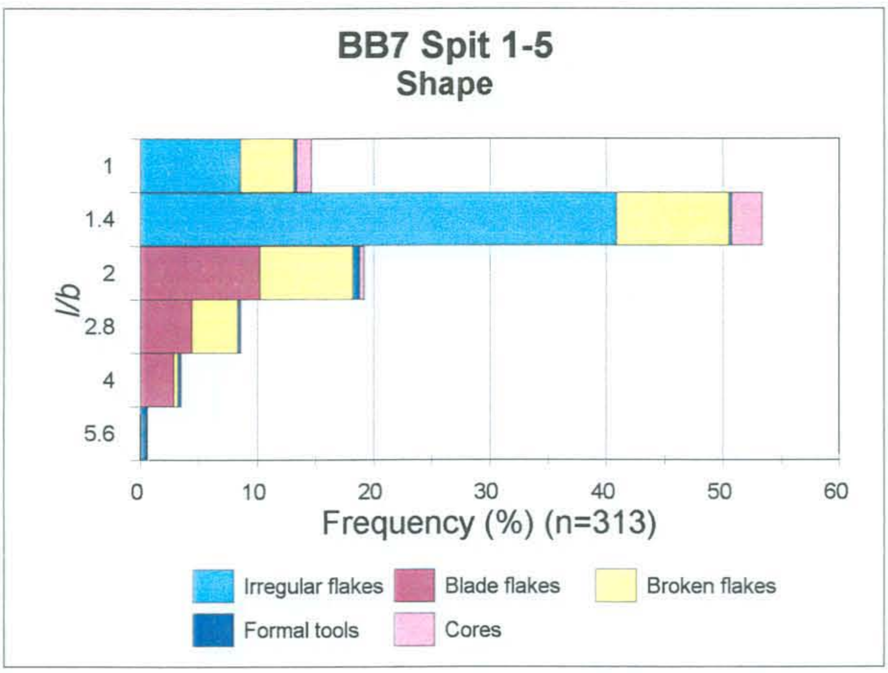
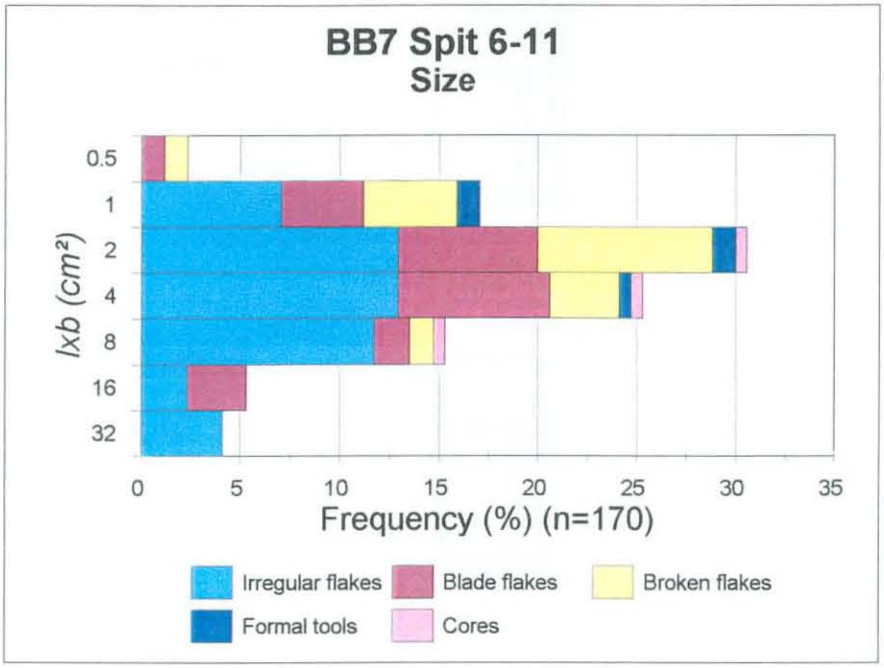
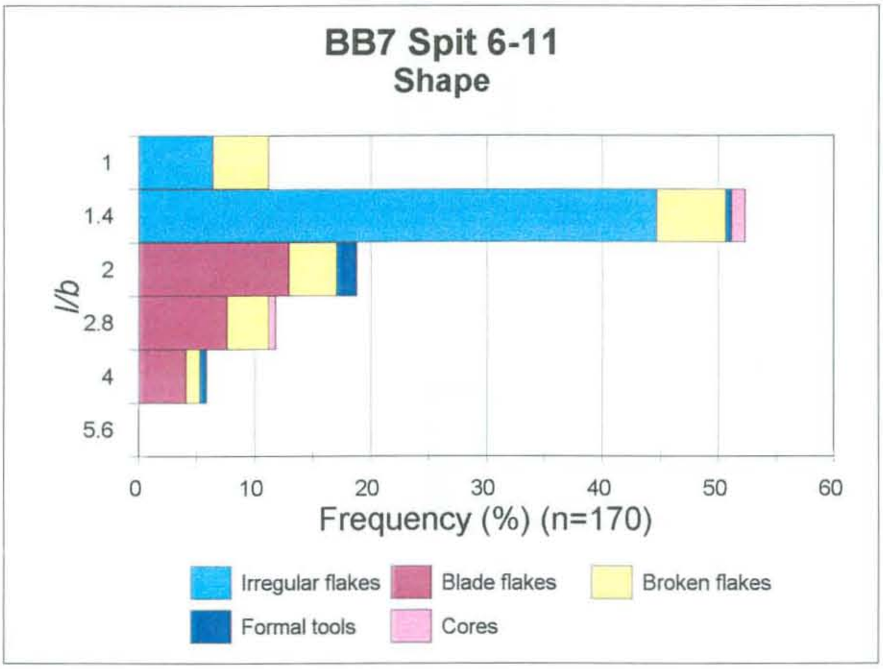


Figure 4.9: **Distribution histograms of stone tools from BB7 Spit 1-5.**

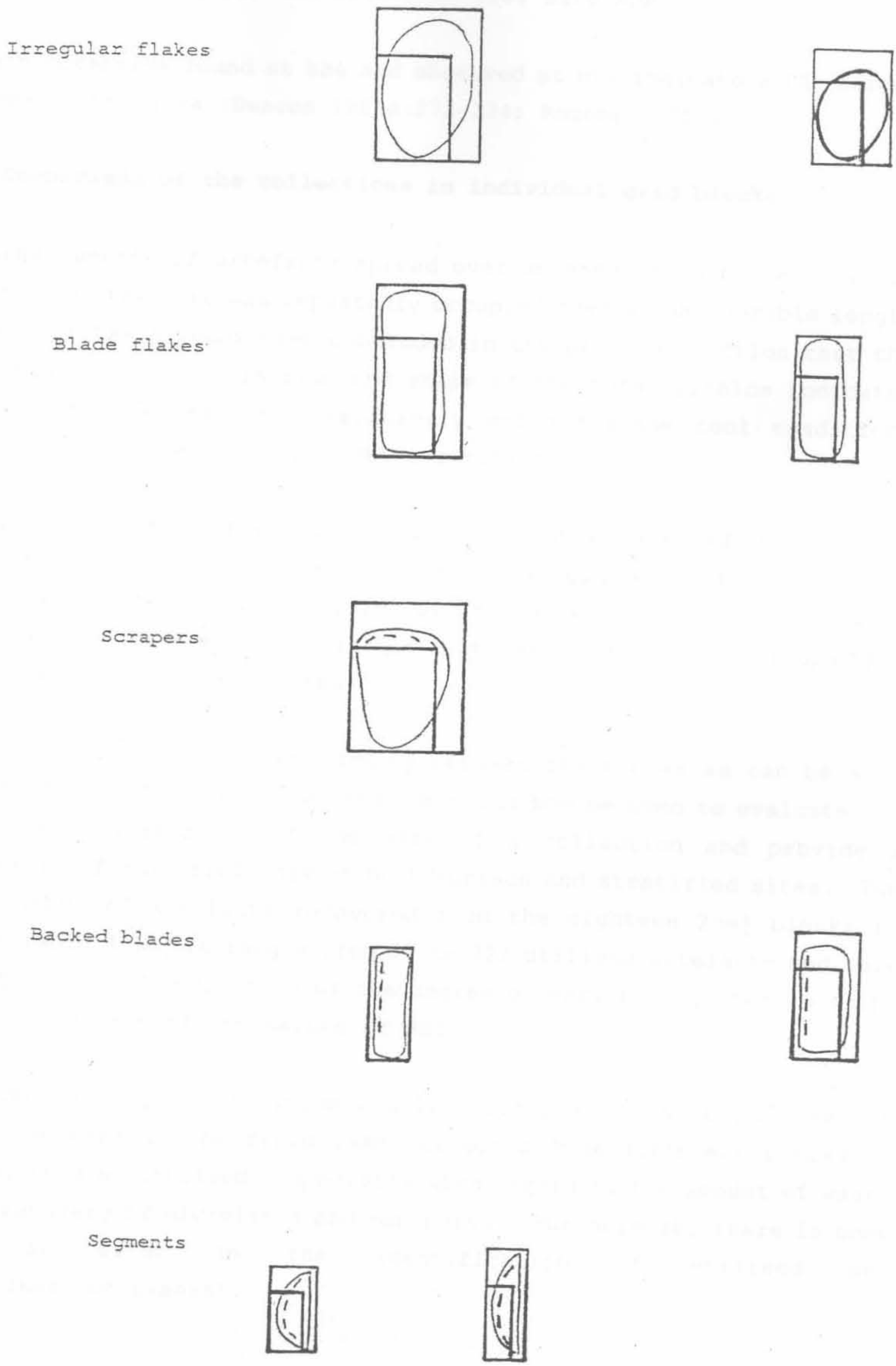
The distribution of BB7 stone artefacts between size and shape classes are much tighter than at BB5.





<u>Figure 4.10</u>: 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).

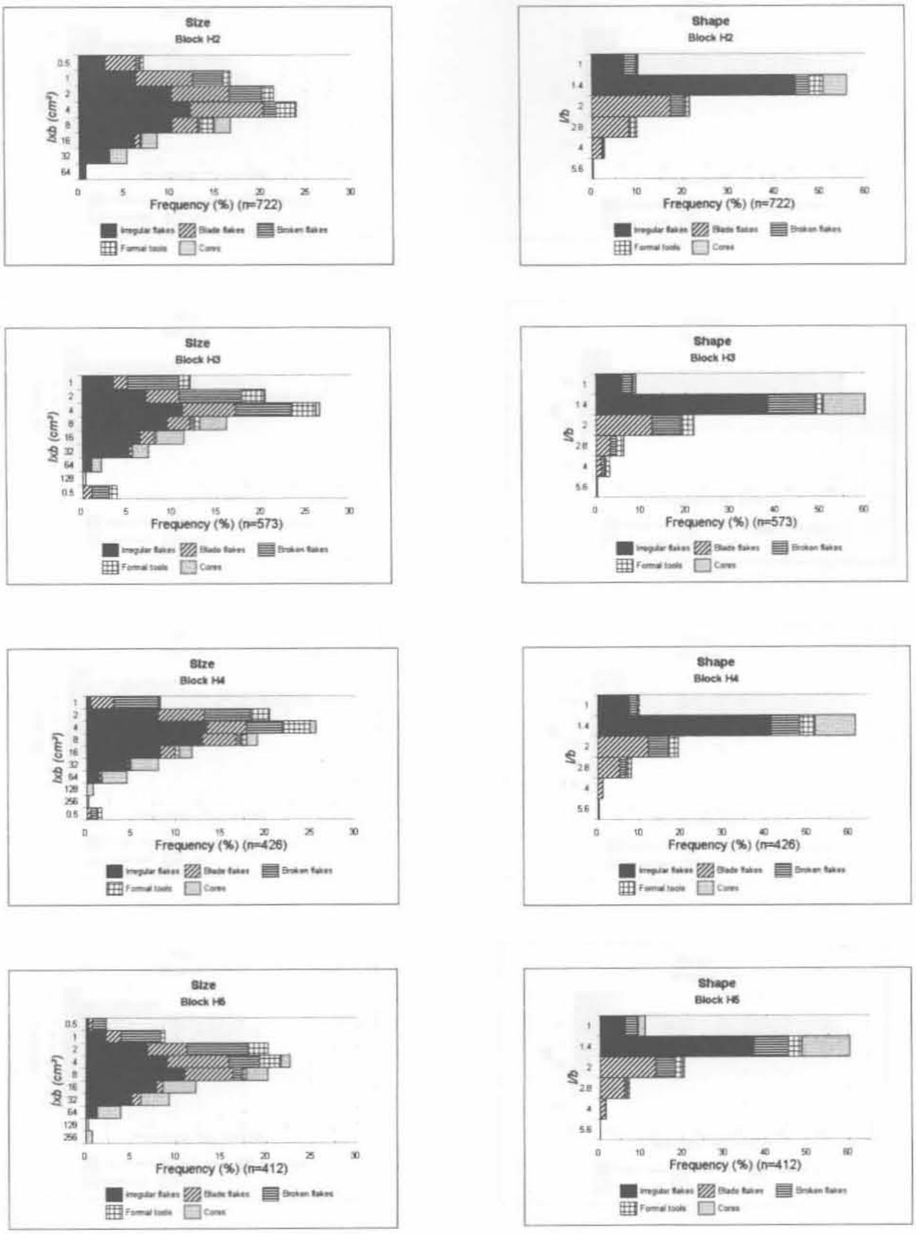


Figure 4.12: Distribution histograms of the size and shape of stone tools from different grid blocks on BB5.

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

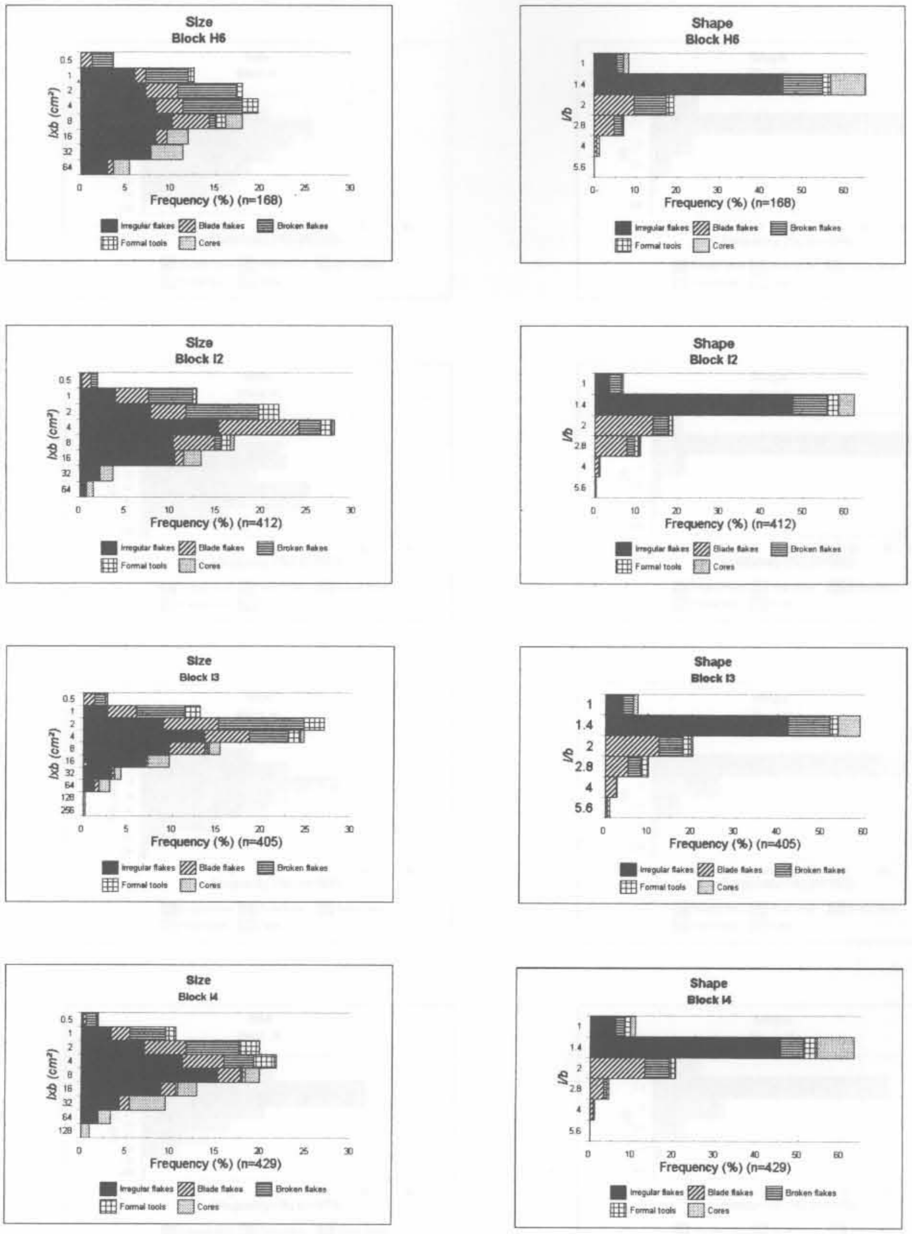


Figure 4.12: **(Continued).**

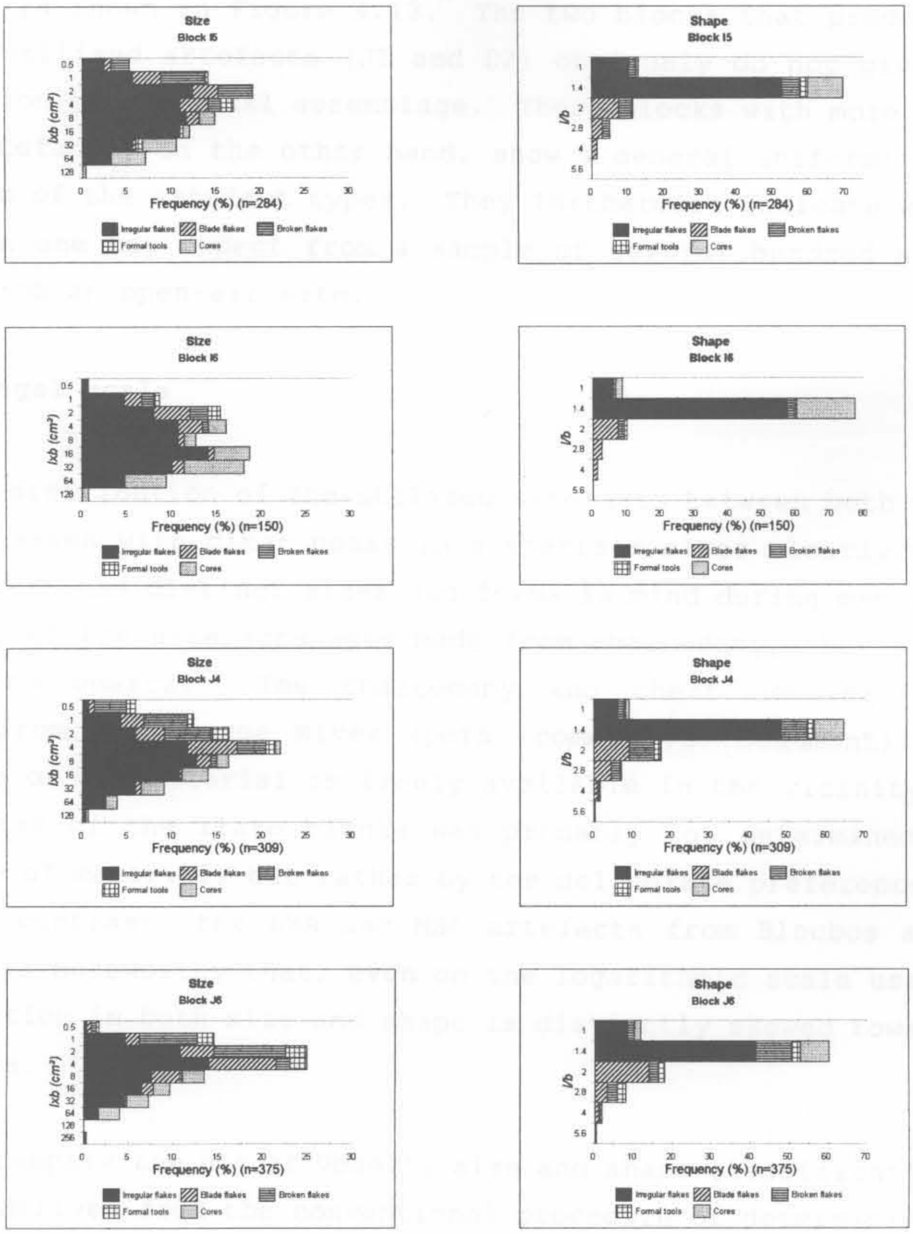


Figure 4.12: **(Continued).**

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

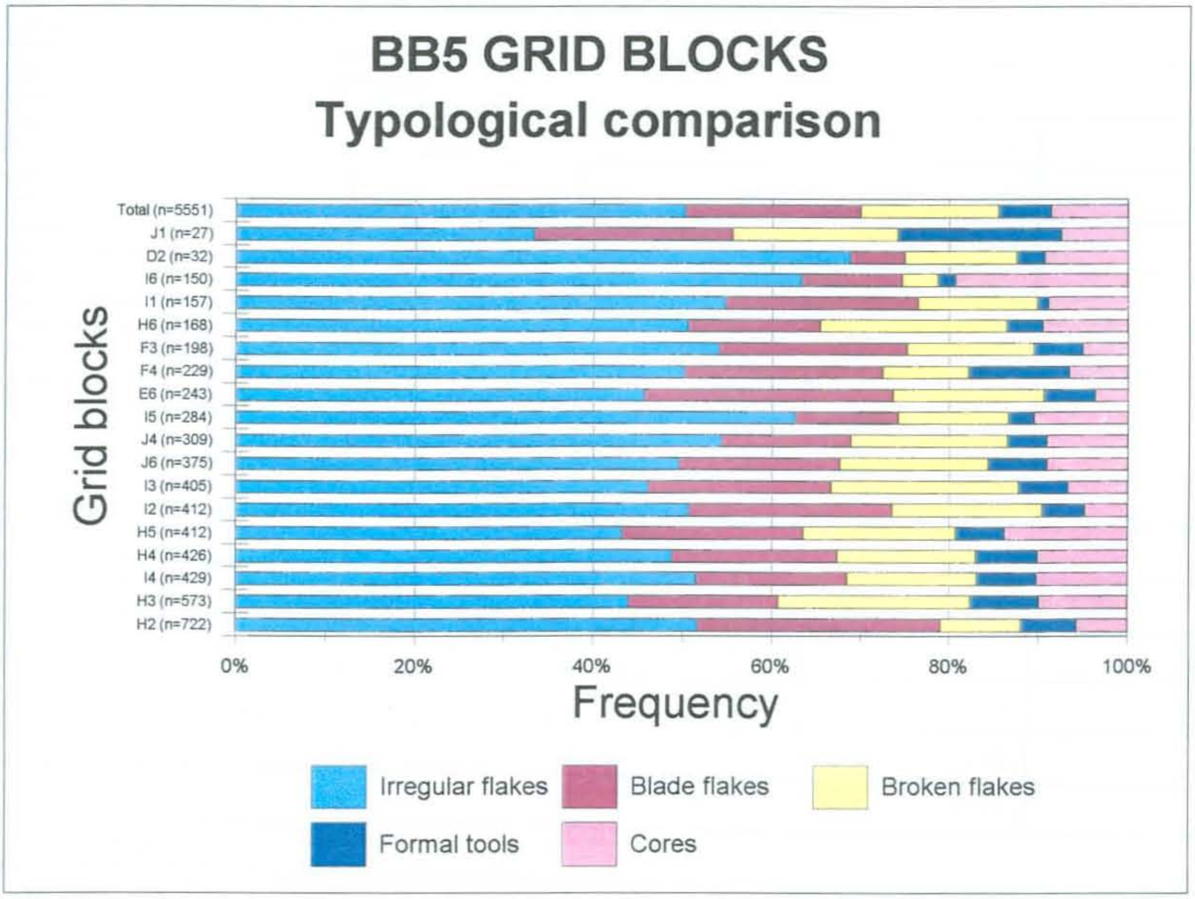


Figure 4.13: **Typological comparison between the BB5 grid blocks.**

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;

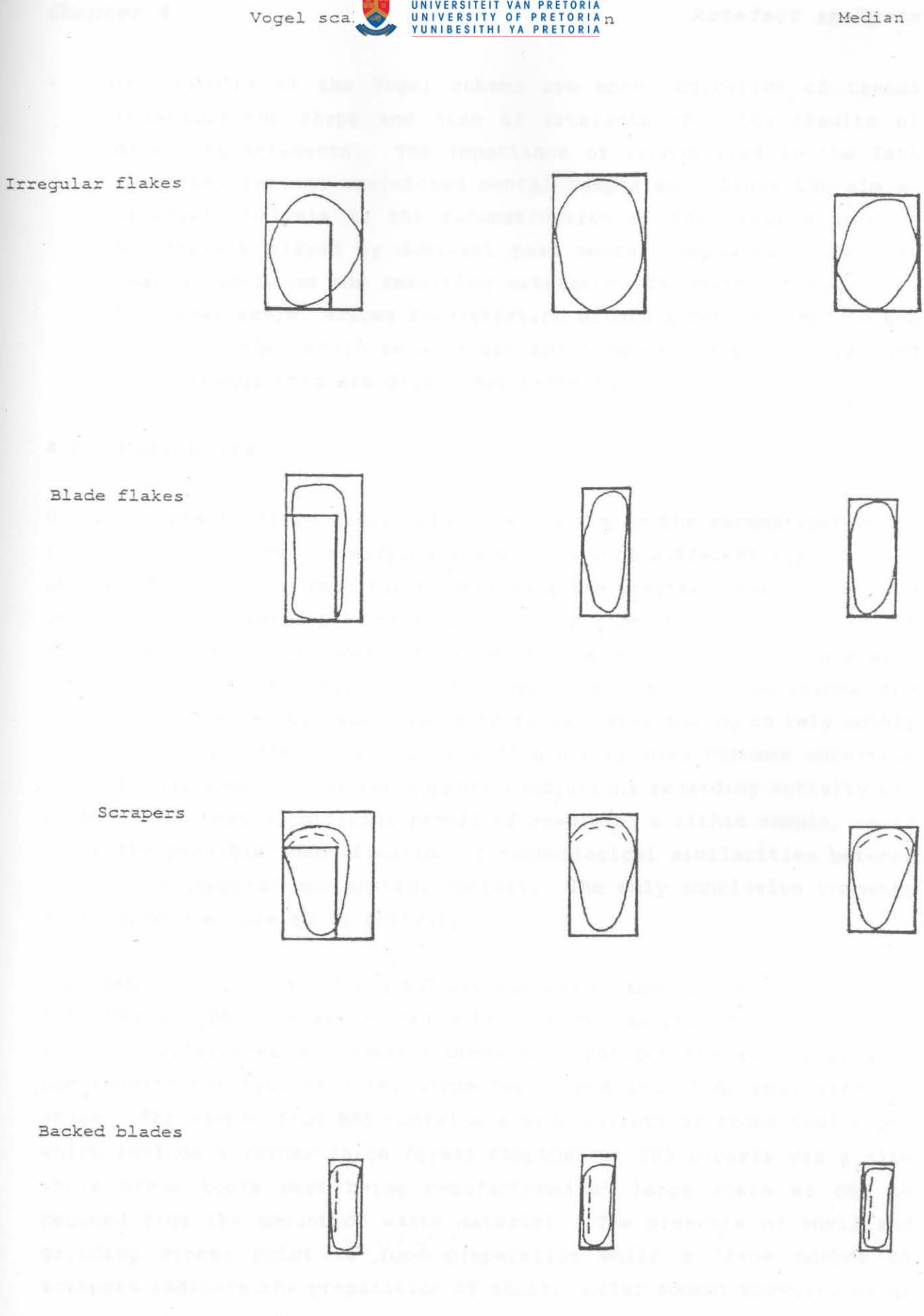

Vogel sca
n
Median
Irregular flakes
Blade flakes
Scrapers
Backed blades

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.