9/2/066/34

EXCAVATIONS AT SIX ARCHAEOLOGICAL SITES IN THE NEAR SHORE DIAMOND MINING AREA, BRANDSEBAAI, NAMAQUALAND

Prepared for
De Beers Namaqualand Mines Division

July 1993

Prepared by
Archaeology Contracts Office
Department of Archaeology
University of Cape Town
Rondebosch
7700

Tel (021) 650 2357
Fax (021) 650 2352

CONTENTS

ABSTRACT

The six archaeological sites documented in this report were excavated by the Archaeology Contracts Office of the University of Cape Town. The study was commissioned by De Beers Namaqualand Mines Division to mitigate the potential destruction of these sites as a result of the Brandsebaai near shore diamond mining operation.

The archaeological sites include a Pleistocene Middle Stone Age (MSA) deposit (120000 years ago) and a series of 5 Late Stone Age (LSA) sites that span the mid-Holocene period (4000 years ago) to just before historic times. A lengthy analysis of the finds from the five LSA sites show that Late Stone Age people have been living on the Namaqualand coast for at least 4000 years. Their subsistence strategy involved snaring/hunting of small terrestrial mammals and sea birds. They also exploited large amounts of marine foods such as shellfish and rock lobsters but apparently did not hunt seals which are common in the area today. Evidence from a ceramic period site of 1700 years ago shows that people collected the deepest and most inaccessible of shellfish when conditions were suitable. The stone tool assemblages from these sites hint at changes in technology that may have involved a transition from a microlithic to a more informal assemblage after 3000 years ago.

Namaqualand is considered an important area in terms of its potential to yield evidence about important events that have shaped southern Africa's past. The most debated of these is the introduction of pastoralism that may have taken place via Namaqualand just after 2000 years ago. It is only in recent years that the archaeology of the area has begun to be explored. The rescue of these sites has resulted in not only new knowledge about a little known area, but also provided a framework of findings that may be utilised by future scientists and historians. Specific recommendations are made in this report for the protection of important sites, and furthermore, that long term measures be taken to conserve Namaqualand's cultural resources.

1. INTRODUCTION

The Archaeology Contracts Office of the University of Cape Town has been commissioned by De Beers Namaqualand Mines to conduct archaeological rescue excavations on coastal shell middens that are threatened by near shore diamond mining operations on the coastal foreshore at Brandsebaai, Namaqualand district, Cape Province (Figure 1). Six sites have been identified as representative of the different kinds of sites that exist locally and are endangered by the mining operation. These we have labelled BSB 1-6. Our strategy has been to excavate a sufficient volume from these shell middens so that we can date them, assess their shellfish and faunal composition, recover enough artefactual material to place them in local context and look for any signs of spatial patterning among the archaeological remains.

2. BACKGROUND

The Namaqualand coast is one of the least documented parts of South Africa in archaeological terms. Until recently, no archaeological sites had been excavated nor had any systematic surveys been undertaken. This despite the fact that a number of archaeologists and historians had identified Namaqualand as a key research area in terms of understanding the earliest appearance of domestic stock (sheep, goats and cattle), and ceramic technology in the Cape shortly after 2000 years ago. This critical series of events helped shape later pre-colonial South African history, and determined, in large part, the social arrangements among hunters and herders encountered by European colonists. Pre-colonial hunter gatherers are known as bushmen or San, whilst the herders referred to themselves as Khoi or Khoi khoi.

The route by which herding was introduced into a region previously occupied exclusively by people with a hunting and gathering economy has been the focus of debate among linguists, historians and archaeologists since early this century. The debate has been summarised by Richard Elphick (1977, 1985), who notes two schools of thought. Robertshaw (1978) and Deacon and colleagues (1978) support the hypothesis that the herding economy had its origin in Botswana whence it entered the Cape via the west coasts of Namibia and Namaqualand. The alternative, supported by Elphick himself (1985), is that the Khoi entered southern Africa via the Orange River and through the interior of the country, spreading only later around the coastlines. By 1990 the balance of archaeological evidence favoured the west coast as the route of introduction. Excavation of sites on Elphick's proposed central route (Hart 1989, Sampson et al 1989) showed that the advent of herding was far later than expected here, in contrast to early dates (about 2000 years ago) in Namibia (Kinahan 1989).

Curiously, in the face of years of theoretical debate, no archaeological sequences had ever been excavated on the Namaqualand coast until Webley (1992) tested the west coast model with her excavations at Spoeg River Mouth. Not only did she recover the remains of early domestic sheep and ceramics, but she also dated the bones (albeit present in small numbers) to as early as 1920 years ago, about the beginning of the fist millennium AD. Webley concluded that the introduction of herding took place gradually, with stock rearing reaching a peak and then declining after 500 AD as a result of increasing aridity. Webley went on to hypothesise that the bulk of recent human occupation of the Namaqualand coast took place after the appearance of domestic stock. This, she felt, was coincident with a gradual change in stone tool technology involving a departure from the manufacture of carefully retouched tools in the direction of expediently produced artefacts. Although Webley pioneered the description of the archaeological sequence of the last 2000 years in the region, many questions remain unanswered. Apart from the fact that her findings need to be replicated on other archaeological sites, little is known of the distribution of

archaeological sites across the landscape, the time depth of particular sites or the details of human activities on them.

Recently, two further studies in Namaqualand, undertaken by archaeologists from the University of Cape Town, have provided more information about the time depth of human occupation. Members of the Archaeology Contracts Office (ACO) were commissioned by De Beers Namaqualand Mines to undertake a survey of De Beers-owned properties on the Namaqualand coast to produce an inventory of sites for cultural resource management purposes. The survey, which has been completed from Oubeep (just south of Port Nolloth) to Mitchells Bay (after which it had to be adjourned until further funding can be raised), resulted in the recording of over eight hundred archaeological sites, many of which were excellently preserved and should be considered a cultural resource of national importance. The observations from this survey support a number of hypotheses about the nature of human occupation of the Namaqualand coast, supplementing and expanding on those from Spoeg River Mouth cave. Perhaps the most significant observation has been that many of the shell middens are associated with retouched artefacts including microlithic ones that, in the south west Cape, usually pre-date the appearance of herding some 2000 years ago. Although none of these open sites had been dated at this time, this implied that the later Stone Age occupation of Namaqualand was older than suggested by Webley (1992).

Corroborating evidence for this has come in the form of a study undertaken by Jerardino, Yates, Morris and Sealy (1992), which involved the analysis of a human burial excavated at Groen River Mouth. The results of the study showed that the individual buried was an adult female who had included a number of small rodents in her last meal. Stable carbon isotope analysis of one of the bones showed that the woman had consumed a mixed marine and terrestrial diet. The ribs gave a radiocarbon date of 2720 ± 60 BP (lab number Pta-5617) which is a clear indicator that there were at least some people living on the Namaqualand coast before 2000 years ago. A further burial excavated by colleagues from the South African Museum near Kleinsee has been dated to 3750 ± 60 BP (lab number Pta-2267), establishing without doubt that human occupation extended to the mid-late Holocene. The form of the cultural sequence for this area remained unknown as no one had excavated or dated enough archaeological sites to establish patterning. Apart from the little that is known about the Late Stone Age (LSA), the Middle (MSA) and Early Stone Age (ESA) periods remain entirely un-investigated, although isolated finds are known.

It should be clear from this that the six excavations which are discussed in this report have provided archaeologists with an opportunity to add significantly to what is known about the regional sequence for Namaqualand. The series of radiocarbon dates from the Brandsebaai diamond mining area show that four of the six excavated sites may be fitted into a tentative sequence that spans the period from just prior to 4000 years ago to historic times. Not only that, but some of the technological and subsistence changes of the period are beginning to emerge, allowing us to embark on the writing of a regional history for pre-colonial times.

3. ARCHAEOLOGICAL METHOD

Excavations at Brandsebaai and subsequent analyses were conducted according to standard archaeological procedures. A meter square grid system imposed on the surface of the sites was used to record the horizontal provenance of artefacts and features. Excavations then proceeded by the removal of natural stratigraphic units. Recognisable occupation layers, made up of variable concentrations of ash, artefacts, shell and other food debris, were assigned names, removed separately, sieved through a 1.5mm mesh and bagged according to provenance. Detailed section drawings were made to enable the process of site formation to be reconstructed.

The excavation of an archaeological site is followed by a lengthy period of laboratory analysis. In the case of the Brandsebaai sites, material was sorted into a series of separate components, namely stone artefacts, ceramics, special artefact finds, bone, ostrich egg shell, rock lobster mandibles and shellfish. The stone artefacts have been analysed in terms of raw material, tool or waste type and then compared with assemblages from other dated sites. Ceramics have been examined for clues to their cultural associations. Bones have been sorted by species and body part (when preservation allows) so as to obtain the minimum number of individuals represented per excavated unit. Likewise, shellfish have been sorted by species, measured and counted. The accumulated measurements and observations have been analysed for their spatial and chronological patterning as a basis for the reconstruction of the behaviour of pre-colonial people and the environment in which they lived. These observations, besides being the basis for our report, form the body of regional information available to archaeologists for future research.

4. ARCHAEOLOGICAL EXCAVATIONS

4.1 BSB 1

The site BSB 1 was originally exposed when a prospecting trench penetrated the raised beach left behind by a formerly higher sea level immediately landward of the present shoreline (Figure 1). The archaeological occurrence is a shell midden which caps the underlying raised beach sequence. After we had cut away the slumped beach and midden that had eroded off the section, it became clear that, although a large portion of the midden had been destroyed by prospecting, there was still stratified material of potential interest visible in the section (Plate 1). We initiated a formal excavation on the top of the raised beach.

The first of five excavated squares (B10) was set 1m back from the section exposed by the prospecting trench. We expected the sequence in this square to replicate that which we could see in the prospecting trench section. This consisted of a dense layer of shell midden directly below the surface and visibly dominated by limpets *(Patella sp.)*, underlain by a less dense, sandier lens containing both limpets and black mussels *(Choromytilus meridionalis)*. The lower of these was only partially sampled as it had become mixed with the upper unit of the underlying raised beach sequence.

A second excavation in square (B14), 4m to the west of B10, exposed a dense lens of shell dominated by limpets. A field examination of the material excavated from this unit revealed that, although it contained remnants of stone artefact manufacture and fragments of bone of archaeological origin, many of the shells were waterworn. In addition, species normally not eaten by prehistoric people were included in the sample. We concluded that this particular excavation had intercepted a part of the midden that at some time in the past had been mixed with a storm beach. Because the archaeological material had lost its integrity we concentrated our efforts further east in squares C10 and G3, where there was less chance that the midden had been disturbed.

Excavation in C10 located the interface between undisturbed midden material and that which had been disturbed by storm events, providing some degree of confidence in the results that we were able to obtain from excavations in G3 and B10. The compounded results from all 4 excavations show that the deposition of archaeological material at this site is best visualised as two stratigraphic events (Figure 2). Unit LPCH was deposited first and consists of a mixed mussel (probably raised beach) and limpet midden followed by unit LL1, a dense layer of limpets together with stone artefacts and bone. The detailed analysis of these two units is discussed below.

4.1.1 Dating

The fact that parts of the site had been mixed with storm beach marine shell means that there is a possibility that any shell sample submitted for radio-carbon dating will give misleading results. The contents of the site, however, do allow us to suggest a possible date range. Because sorting failed to reveal any ceramics or domestic animal bones in the assemblage, we suggest that the site is likely to be older than 1800 years ago. The artefactual analysis has also shown that the assemblage does not contain any microlithic stone tools, which, based on other observations from Brandsebaai and elsewhere, argues for a date after 3000 years ago. A suggested date for the occupation of BSB 1 is therefore somewhere between 2000 and 3000 BP.

4.1.2 Artefacts

The stone artefact assemblage consists of informally produced quartz chips, chunks and flakes, together with irregular cores (Table 1). No ceramics or ostrich eggshell

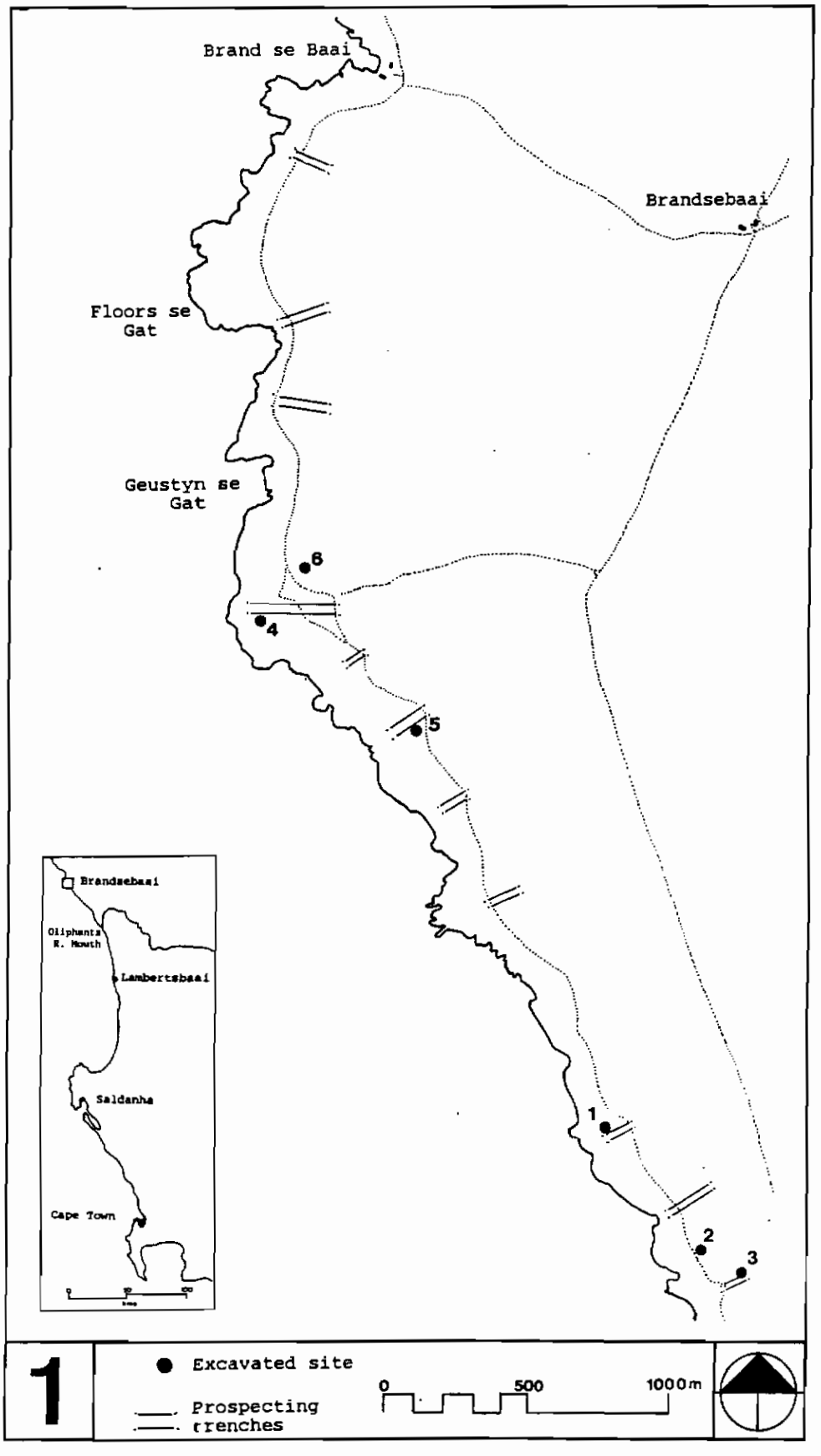

Brand se Baai
Brandsebaai
Floors se Gat
Geustyn se Gat
6
4
5
1
2
3
Brandsebaai
Oliphants R. Mouth
Lambertsbaai
Saldanha
Cape Town
1
Excavated site
Prospecting trenches
0
500
1000m

Plate 1

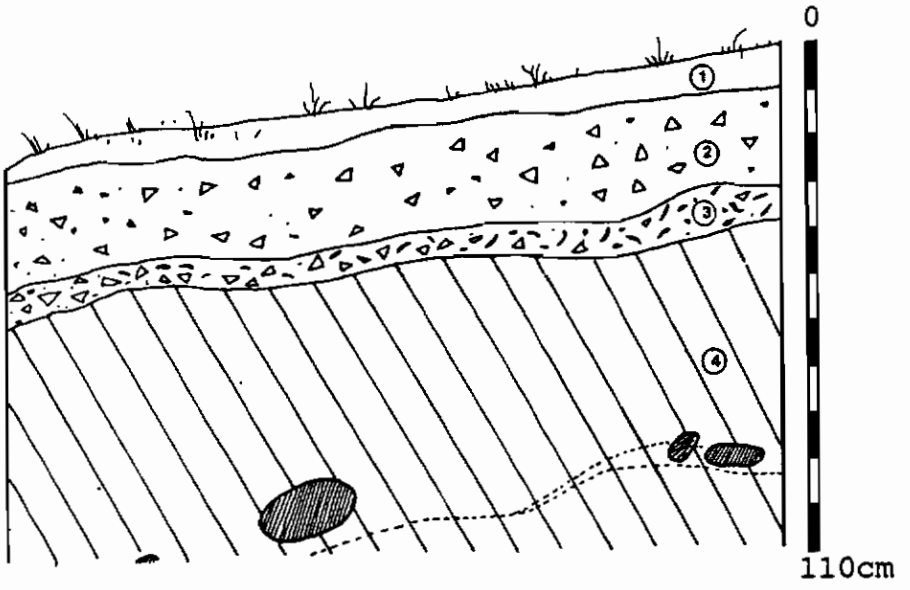
Stone artefact frequencies

SITE	SURF		LL1		LPCO		BLPCO		TOTAL
BSB 1	n	%	n	%	n	%	n	%	
CHIPS	4	18.18	101	36.73	1	14.29			106
CHUNKS	7	31.82	49	17.82	6	85.71			62
FLAKES	11	50	124	45.09			1	100	136
BLADES			1						1
BLADELETS									
sub-total	22	100	275	99.64	7	100	1	100	305
%	100		98.92		100		100		
BP-CORE			1	33.33					1
IRR-CORE			2	66.67					2
SP-CORE									
sub-total			3						3
%									
BKD SCRAPER									
SCRAPER									
SEGMENT									
MRP									
MBP									
sub-total									
%									
HS									
US									
LGS									
HS/GS									
sub-total									
%									
TOTAL	22	100	278	100	7	100	1	100	308
%	7.143		90.26		2.273		0.325		

Raw materials

	SURF		LL1		LPCO		BLPCO		TOTAL
	n	%	n	%	n	%	n	%	
QTZ	22	100	278	100	7	100	1	100	308
QTZITE									
CCS									
SIL									
TOTAL	22	100	278	100	7	100	1	100	308
%	7.1		90		2.3		0.3		

Table 1



1. SURFACE
2. LL1
3. LPCO
4. RAISED BEACH SEQUENCE

2 BSB 1 North section

beads were found. This is a feature shared with sites BSB 3 and BSB 4, which have been radiocarbon dated to between 2000 and 3000 years ago.

4.1.3 Animal bone

Although all the excavated units in BSB 1 contain some bone, the analysis indicates that the main human occupation occurred in layer LL1. Fragments of tortoise bone were found in all the excavated layers, but have not been identified to species, a procedure made difficult because the bulk of bone is fragmented during consumption or deteriorates over time. Appendix A contains details of the faunal analysis.

The bones of at least one striped polecat (*Ictonyx striatus*), a steenbok (*Raphicerus campestris*) and a grysbok (*Raphicerus melanotis*), as well as a single Jackass penguin (*Spheniscus demersus*), were identified from the sample of bone fragments recovered from LL1. Although the identified species are present in the study area, the faunal collection is unusual in that it does not contain any bones of marine mammals such as the Cape fur seal (*Arctocephalus pusillus*)which is common in the area today. The majority of coastal sites studied by archaeologists south of Lamberts Bay contain high frequencies of marine mammal bones.

4.1.4 Shellfish

The presence of large quantities of water worn shell in most of the sampled squares prompted us to exclude this aspect of the site from the analysis. Our observations of the sample indicate that the artefact-rich lens LL1 is dominated by limpets, of which *P. granatina, P. granularis* and *P. argenvillei* are prominent. The presence, however, of large quantities of *P argenvillei* in the storm beach material nearby prohibits our drawing further conclusions.

The underlying stratigraphic unit (LPCO) consists of a coarse beach sand and shingle, with many fragments of *Choromytilus meridionalis* (black mussel). Although artefacts in this layer suggest a human presence, an abundance of water worn shell indicates that the shell sample may have been contaminated.

Large numbers of mandibles, the only portion of this animal which survives on archaeological sites, of the Cape Rock Lobster (*Jasus lalandii*) were found in both layers. These have been divided into left and right mandibles, so as to produce an MNI, and measured to establish the size profiles of the lobsters collected by prehistoric people. The results (Appendix B) indicate that lobsters were heavily exploited at this and other sites in the Brandsebaai area. Some extremely large lobster mandibles were so fractured that measurements could not be obtained.

4.1.5 Conclusion

BSB 1 is likely to be a pre-ceramic site dating to between 2000 and 3000 years ago. This is demonstrated by the informal stone artefact assemblage, the lack of potsherds or domestic animal bones and comparisons with other dated sites at Brandsebaai. The fact that the main occupation layers of the site have been mixed with storm beach material means that the site is compromised, and probably not worthy of further investigation. Further mitigatory measures are not required.

4.2 BSB 2

At the time of excavation BSB 2 consisted of a small patch of shell midden of mixed mussel and limpet composition lying on the lower slopes of the seaward side of the coastal bluff (Figure 1; Plate 2). We thought initially that this site represented a single, short term occupation by prehistoric people. If so, the site would afford us the ideal research opportunity to take an archaeological `snapshot' of a single event in the past, to obtain an image of a single campsite abandoned after use . As the excavation progressed, however, it became clear that at least two more occupation layers existed below the one that we could see on the surface.

All material exposed on the surface was removed and sieved. Thereafter a single square meter (K50) was excavated further to reveal a fairly dense lens of shell (LBS) below the surface. Additional excavations were then diagonally staggered across the site in order to gauge the spread of the deposit below the surface (Plate 3). As the excavation progressed it became evident that this site contained good stratigraphic information in that six separate occupation units existed below the surface layer (Figure 3).

4.2.1 Dating

Two samples of limpet shell *(Patella granatina)* were submitted to the Quaternary Dating Research Unit of the CSIR for radiocarbon dating. The samples were selected from unit LBS and unit BBRL, the latter of the two representing the deeper and older part of the sequence. Before interpreting the dates it should be recognised that all shell dates are systematically a few hundred years "too old" because of the apparent age of modern sea water. At the times reflected in these Brandsebaai dates some 400-500 years should be subtracted from the shell radiocarbon dates to make them approximate calendar years. The dates are as follows:

Unit LBS	Pta-6050	860 ± 50 $\delta^{13}C$ = -0.8‰
Calibrated age		AD 1515(1566)1648
Unit BBRL	Pta-6053	4510 ± 30 $\delta^{13}C$ = -0.6‰
Calibrated age		2608(2578)2552 BC

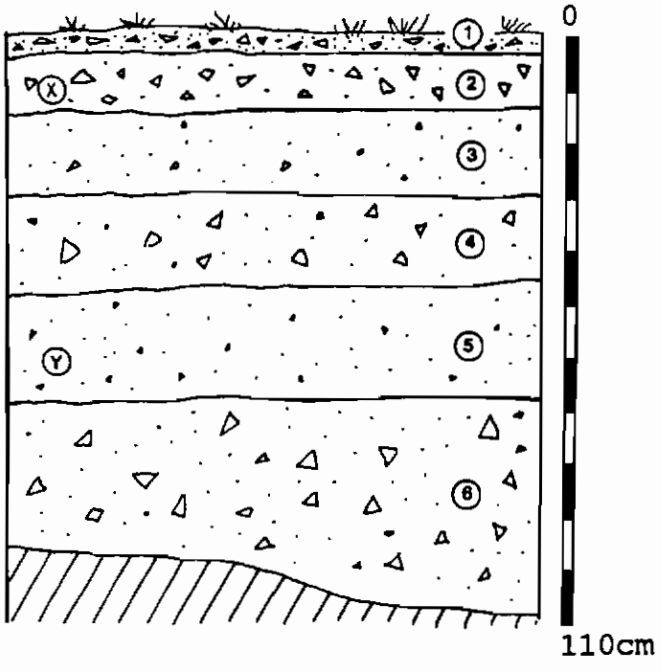
The dates indicate that BSB 2 has been occupied a number of times in the past. The latest occupation took place about 400 years ago while the earliest was a little more than 4000 years ago. The earlier date is associated with a relatively dense artefact assemblage which includes formally retouched elements such as small scrapers and backed tools. Studies of equivalent assemblages in the south western Cape lead us to expect a date older than 3000 years for this unit, corroborated by the surprisingly early date of about 4000 years for unit BBRL which contains the first evidence of microlithic stone artefacts. This may suggest that the archaeological sequences in the southern and northern parts of the Atlantic coast are in phase with one another. Furthermore, it is assured that DLP, lying below BBRL, is even older, although perhaps only marginally.

4.2.2 Artefacts

The stone artefact assemblage (Table 2) has provided a key to the interpretation of the sequence at BSB 2. An examination of the types of stone artefacts and the raw materials used has enabled us to hypothesise a preliminary cultural sequence. In the recent occupation layers SSC and LLBS the stone artefact assemblage consists almost entirely of quartz flakes chips, chunks and cores, with some informal artefacts being

Plate 2

Plate 3



1. SSC
2. LLBS
3. BSBL
4. BRL
5. BBRL
6. DLP

X. Pta - 6050 860±50

y. Pta - 6053 4510±30

3 BSB 2 Section (typical)

Stone artefact frequencies

SITE	SSC		LLBS		BSBL		BRL		BBRL		DLP		TOTAL
BSB 2	n	%	n	%	n	%	n	%	n	%	n	%	
CHIPS	22	50	33	54.1	77	67.54	249	41.09	24	26.37	58	35.15	463
CHUNKS	3	6.81	5	8.19	4	3.50	43	7.09	13	14.29	10	6.06	78
FLAKES	16	36.36	23	37.7	30	26.32	304	50.17	52	57.14	83	50.3	508
BLADES	2	4.54			2	1.75	7	1.15	2	2.19	12	7.27	25
BLADELETS	1	2.27			1	0.87	3	0.49			2	1.21	7
sub-total	44	100	61	100	114	100	606	100	91	100	165	100	1081
%	95.65		98.39		98.28		96.96		94.79		98.21		
BP-CORE							3	30			2	66.67	5
IRR-CORE	1	100					6	60	2	100	1	33.33	10
SP-CORE							1	10					1
sub-total	1	100					10	100	2	100	3	100	16
%	2.17						1.6		2.083		1.78		
BKD SCRAPER							2	28.57	1	50			3
SCRAPER			1	100			2	28.57	1	50			4
SEGMENT					1	50	1	14.29					2
MRP					1	50	2	28.57					3
MBP													
sub-total			1	100	2	100	7	100	2	100			12
%			1.61		1.72		1.12		2.08				
HS	1	100					1	50					2
US							1	50	1	100			2
LGS													
HS/GS													
sub-total	1	100					2	100	1	100			4
%	2.17						0.32		1.04				
TOTAL	46	100	62	100	116	100	625	100	96	100	168	100	1113
%	4.13		5.57		10.42		56.15		8.62		15.09		100

Raw materials

	SSC		LLBS		BSBL		BRL		BBRL		DLP		TOTAL
	n	%	n	%	n	%	n	%	n	%	n	%	
QTZ	36	78.26	61	98.39	105	90.52	598	95.68	86	89.58	160	95.24	1046
QTZITE	1	2.17		0	4	3.44	5	0.8	1	1.04	2	1.19	13
CCS	9	19.57	1	1.61	7	6.03	21	3.36	9	9.37	6	3.57	53
SIL		0		0		0	1	0.16		0		0	1
TOTAL	46	100	62	100	116	100	625	100	96	100	168	100	1113
%	4.13		5.57		10.42		56.15		8.62		15.09		

Table 2

made from exotic raw materials such as silcrete and crypto-crystalline silicates (CCS). Exotic is used in the sense that, whereas quartz is entirely local, silcrete and CCS are found in more distant locations. Although no formal tools were found in these layers, flakes of quartz were probably expediently used as cutting and scraping tools.

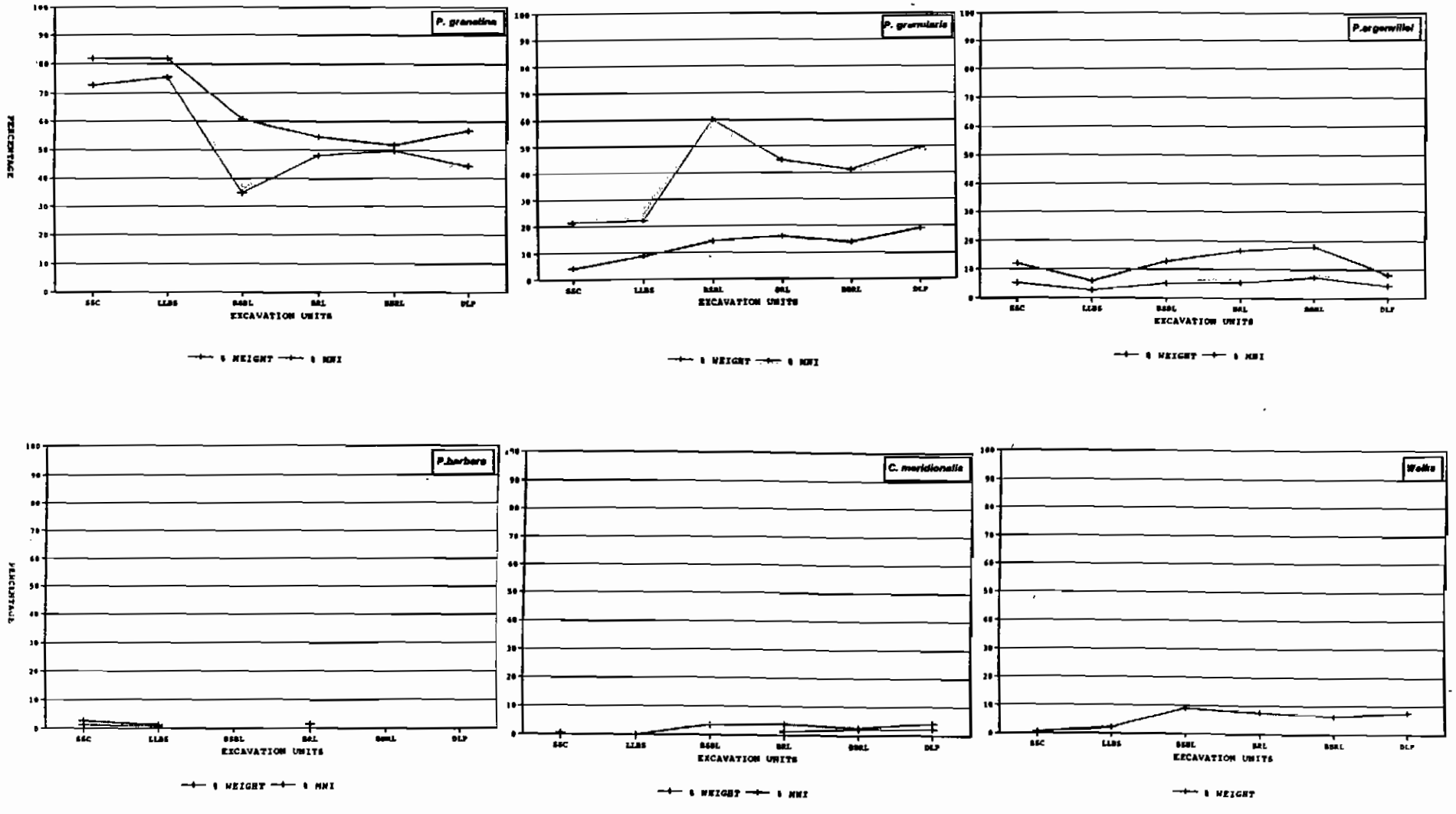
These quartz dominated assemblages are similar to that described by Webley (1992) as being characteristic of the last 1800 years at the Spoeg River Mouth cave. The earlier portions of the BSB 2 sequence, layers BSBL to DLP, of which layer BBRL has been dated to approximately 4000 years ago, contains high densities of stone artefacts when compared with other units. Although stone artefact sample sizes are small at all the Brandsebaai excavations, initial indications are that in earlier times people were making more formalised stone artefacts. Although quartz continued to be the favoured raw material, exotic stones such as CCS were being collected for the manufacture of formal tools. These tools include segments, double backed scrapers and convex scrapers, all of which are small tools mounted, presumably, in handles. The comparatively small sample sizes prohibits us from making definitive statements at this stage, but the evidence allows us to hypothesise that a there is a tendency towards a formalised tradition of artefact manufacture during the mid-later Holocene, when compared to the expediency and informality of the later assemblages. This implies some change in toolmaking tradition over four millennia. It may be suggested at some time between 400 and 4000 years ago, and probably after 3000 years ago, some rather strict norms of artefact manufacture gave way to a more expedient attitude, involving greater use of immediately available quartz to fashion unretouched flake tools.

4.2.3 Animal bone

All stratigraphic units produced diagnostic fragments of bone, including tortoise bone. Details of the faunal analysis are presented in Appendix A. The sample is once again unusual for a Cape coastal site in that there is little evidence for the exploitation of marine mammals such as the Cape fur seal. Instead, a variety of bovids, including springbok (*Antidorcas marsupialis*) or grey rhebok (*Pelea capreolus*), steenbok and/or grysbok (*Raphicerus sp.*) and duiker (*Sylvicapra grimmia*) combine to give a marked terrestrial bias to the animals snared or hunted. In addition the assemblage contains the remains of small carnivores such as the African wild cat (*Felis lybica*) and black backed jackal (*Canis mesomelas*). Sea birds, including the Cape cormorant (*Phalacrocorax capensis*), jackass penguin (*Spheniscus demersus*) and shy albatross (*Diomedia exulans*), were eaten.

4.2.2 Shellfish

Two species of shellfish, the two limpets *Patella granatina* and *Patella granularis*, feature prominently in the excavated assemblages (Figure 4). Other shellfish species that were exploited to a lesser extent were *Patella argenvillei*, which lives low down on the infratidal fringe, another species of limpet, *Patella barbara*, the black mussel, *Choromytilus meridionalis* and various species of whelks. In the upper units SSC and LBS *P. granatina* dominates the assemblage in terms of both weight and minimum numbers of individuals. This probably means that during the most recent occupation of the site people were exploiting shellfish that could easily be obtained in the upper balanoid zones closer to the high water mark. The MNI and weights of *P. granularis* increase below layer BSBL as do, less markedly, those of *P. argenvillei*, *Choromytilus meridionalis* and welks. Thus the earlier levels of the site are characterised by a greater diversity of shellfish, some of which were only available at low tide. Mean sizes of shellfish show little variation over time. Of note is the presence of small quantities of water worn shell in units predating BSBL.



4 BSB 2 Shellfish analysis - percentage frequencies

4.2.5 Conclusion

BSB 2 is an interesting site, the excavation of which has produced the first dated later mid-Holocene sequence on the Namaqualand coast and one of only a few on the west coast of southern Africa. The general scarcity of stone tools in the excavated samples makes it difficult to make secure observations at present. An initial indication is that the stone artefact assemblage includes some carefully worked microliths made of exotic raw materials. These are not present in the artefact repertoire at sites between 2000 and 3000 years ago. It is recommended that the site BSB 2 and its immediate surrounds is protected and preserved until other sites in the Brandsebaai area can be shown to produce a replicate sequence.

4.3 BSB 3

An exposure of *Patella argenvillei*, as well as stone artefacts, indicated that a buried lens existed towards the upper end of the prospecting trench just south of beacon SEA 1009 (Figure 1). We decided to clear the slumped material away from the edge of the prospecting trench and, in doing so, showed that part of an intact archaeological site lay buried under 20cm of red aeolian sands. Dumpings in the vicinity of the prospecting trench contain large quantities of shell as well as grinding surfaces and stone artefacts not only of quartz but also of raw materials exotic to the area. This section showed that, although much of the site had been destroyed, enough remained to provide an adequate archaeological sample. Little shell was present on the surface except where it had been brought up by prospecting and burrowing.The bulk of the occupation layers were buried below a capping of aeoloian soil. A hard calcretized layer was exposed at a depth of approximately 1m (Plate 4).

Our grid system was aligned along the north side of the prospecting trench. The archaeological excavation resulted in the removal of $6m^2$ of deposit (2 x 3m trench). Some of this had been disturbed by meerkat activity after the midden had accumulated. Altogether thirteen stratigraphic units were recognised and isolated during the excavation (Figure 5). All of these contained archaeological material with the main bulk of the finds occurring in units THL, ARG, LBEE and BEE. Although some of these units had been disturbed by burrowing animals, it was possible to separate out the disturbed material and obtain a sample for analysis.

4.3.1 Dating

A single sample of *Choromytilus meridionalis* was submitted to QUADRU at the CSIR for radiocarbon dating. The sample was selected from the main occupation layer in square B10 at a depth of 26 cm below surface. The date is as follows:

Unit THL, square B10	Pta-6051	2930 ± 50 $\delta^{13}C$ = - 0.1‰ 723(595)505 BC

This date, which can be read as about 2500 calendar years ago, combined with the fact that the faunal analysis produced no evidence of domestic animals in the main occupation layer shows that the bulk of occupation of the site preceded the advent of pastoralism locally. A fragment of pottery (Appendix C) excavated in the upper layers and a further fragment located in the slope wash in the prospecting trench indicates that at least a portion of this site post-dates that event and may be younger than 2000 years of age. The main occupation lense, however, predates this period by at least 500 years. The presence of a small formal tool component in the lowest excavated units may indicate that the bottom of the sequence was deposited about 3000 years ago.

4.3.2 Artefacts

The stone artefact assemblage from BSB 3 is a quartz dominated assemblage (Table 3). Throughout the upper (post-ceramic) and main occupation layers (units THL, ARG and LARG), few formally retouched stone tools were found. The assemblage consisted mainly of quartz flakes, chips, chunks as well as bipolar and irregular cores. Other artefacts include fragments of quartzite and a hammerstone. Upper units SURF, CB, and HSL contained two scrapers and small quantities of exotic raw materials. The main occupation layers, which date to 2500 years ago and contain the bulk of the shellfish excavated, have no formal stone artefacts nor any exotic raw materials. The presence of further formal tools (scrapers and a 'backed' piece, that is a flake with abrupt retouch) below the main occupation layers is consistent with our observations of earlier material from BSB 2.

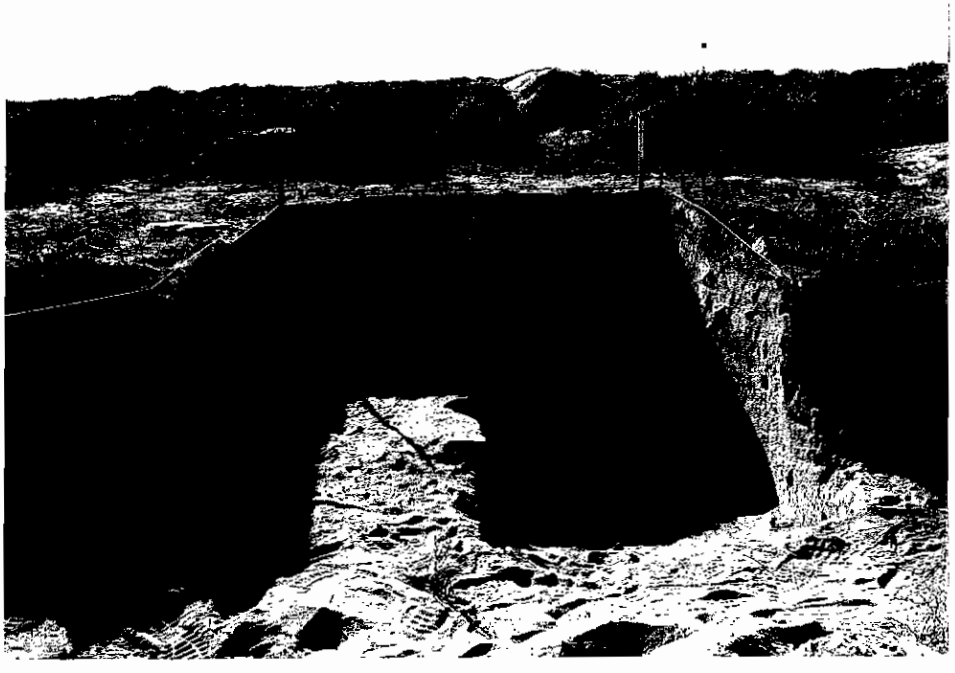
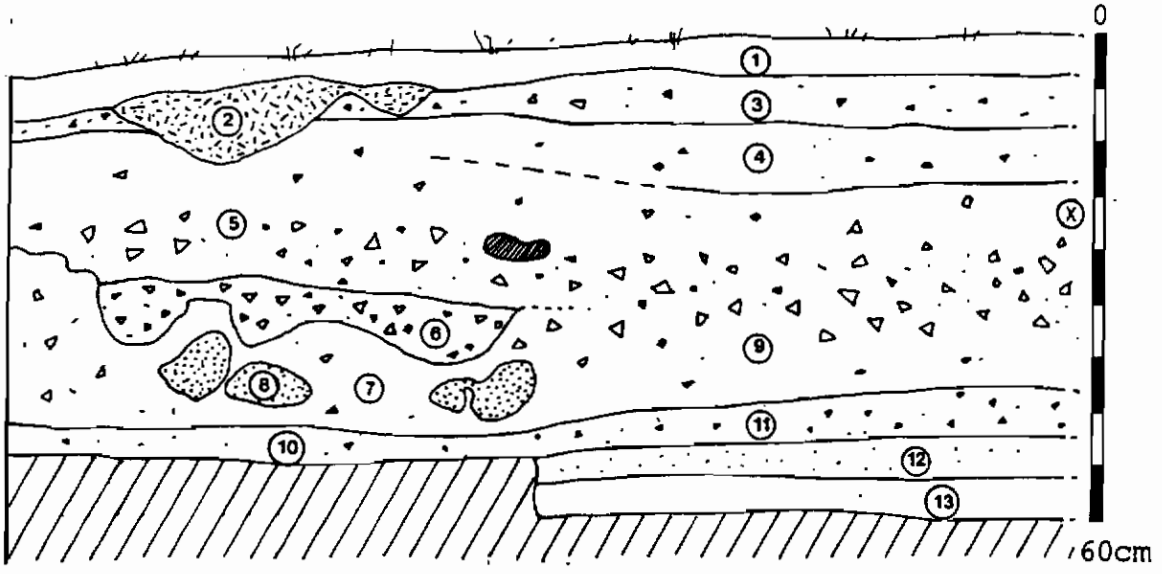


Plate 4



1. SURF
2. TERMITE
3. CB
4. HSL
5. ARG
6. LARG
7. BEE
8. LBEE
9. THL
10. CIT
11. SBTL
12 LIM2
13. BL2
X. Pta - 6051 2930±50 BP

5 BSB 3 North section

Stone artefact frequencies

SITE	SURF		CB		HSL		THL		GPTL		ARG		LARG		LBEE		BEE		SBTL		CIT		LIM2		BL2		TOTAL
BSB 3	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
CHIPS	19	47.5	46	45.54	29	40.28	9	13.85	4	36.36	8	34.78	11	26.83	25	56.82	27	48.21	52	58.43	10	27.78			3	30	243
CHUNKS	1	2.5	12	11.88	5	6.94	12	18.46			5	21.74	8	19.51	2	4.54	2	3.57	6	6.74	7	19.44			2	20	62
FLAKES	20	50	43	42.57	38	52.78	43	66.15	7	63.64	10	43.48	22	53.66	17	38.64	25	44.64	30	33.71	17	47.22	10	27.78	5	50	287
BLADES							1	1.53									2	3.57	1	1.124	2	5.55	2	5.55			8
BLADELETS																							24	66.67			24
sub-total	40	100	101	100	72	100	65	100	11	100	23	100	41	100	44	100	56	100	89	100	36	100	36	100	10	100	624
%	95.24		98.06		97.3		94.2		91.67		100		97.62		100				96.74		100		100				
BP-CORE	1	100			1	100			1	100							2	66.67									5
IRR-CORE			1	100			4	100					1	100			1	33.33	2	100					1	100	8
SP-CORE																											
sub-total	1	100	1	100	1	100	4	100	1	100			1	100			3	100	2	100					1	100	15
%	2.38		0.97		1.35		5.79		8.33				2.38						2.17						8.33		
BKD SCRAPER																											
SCRAPER	1	100	1	100																					1	100	3
SEGMENT																											
MRP																											
MBP																			1	100							1
sub-total	1	100	1	100															1	100					1	100	4
%	2.38		0.97																1.08								
HS					1	100											1	100									2
US																											
LGS																											
HS/GS																											
sub-total					1	100											1	100									2
%					1.35																						1.35
TOTAL	42	100	103	100	74	100	69	100	12	100	23	100	42	100	44	100	60	100	92	100	36	100	36	100	12	100	645
%	6.51		15.97		11.47		10.7		1.86		3.56		6.51		6.82		9.30		14.26		5.58		5.58		1.86		

Raw materials

	SURF		CB		HSL		THL		GPTL		ARG		LARG		LBEE		BEE		SBTL		CIT		LIM2		BL2		TOTAL
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
QTZ	39	92.86	102	99.03	69	93.24	69	100	12	100	23	100	42	100	44	100	58	96.67	85	92.39	36	100	34	94.44	12	100	625
QTZITE		0		0	3	4.05		0		0		0		0		0	1	1.667	2	2.174		0	1	2.77		0	7
CCS	3	7.14		0	2	2.70		0		0		0		0		0		0	3	3.261		0		0		0	8
SIL		0	1	0.97		0		0		0		0		0		0	1	1.667	2	2.174		0	1	2.77		0	5
TOTAL	42	100	103	100	74	100	69	100	12	100	23	100	42	100	44	100	60	100	92	100	36	100	36	100	12	100	645
%	6.51		15.97		11.47		10.7		1.86		3.56		6.51		6.82		9.30		14.26		5.58		5.58		1.86		

Table 3

Of particular interest is that the main occupation layers, which predate the introduction of domestic stock and ceramics, are characterised by an informal artefact assemblage. It had been suggested previously that the disappearance of assemblages of formal stone artefacts in the south western Cape might be related to changes in circumstances brought about by the introduction of domestic stock and ceramics soon after 2000 years ago. Evidence reported here from BSB 3 indicates that an informal artefact assemblage existed well before the introduction of ceramics and therefore requires a different explanation.

4.3.3 Animal bone

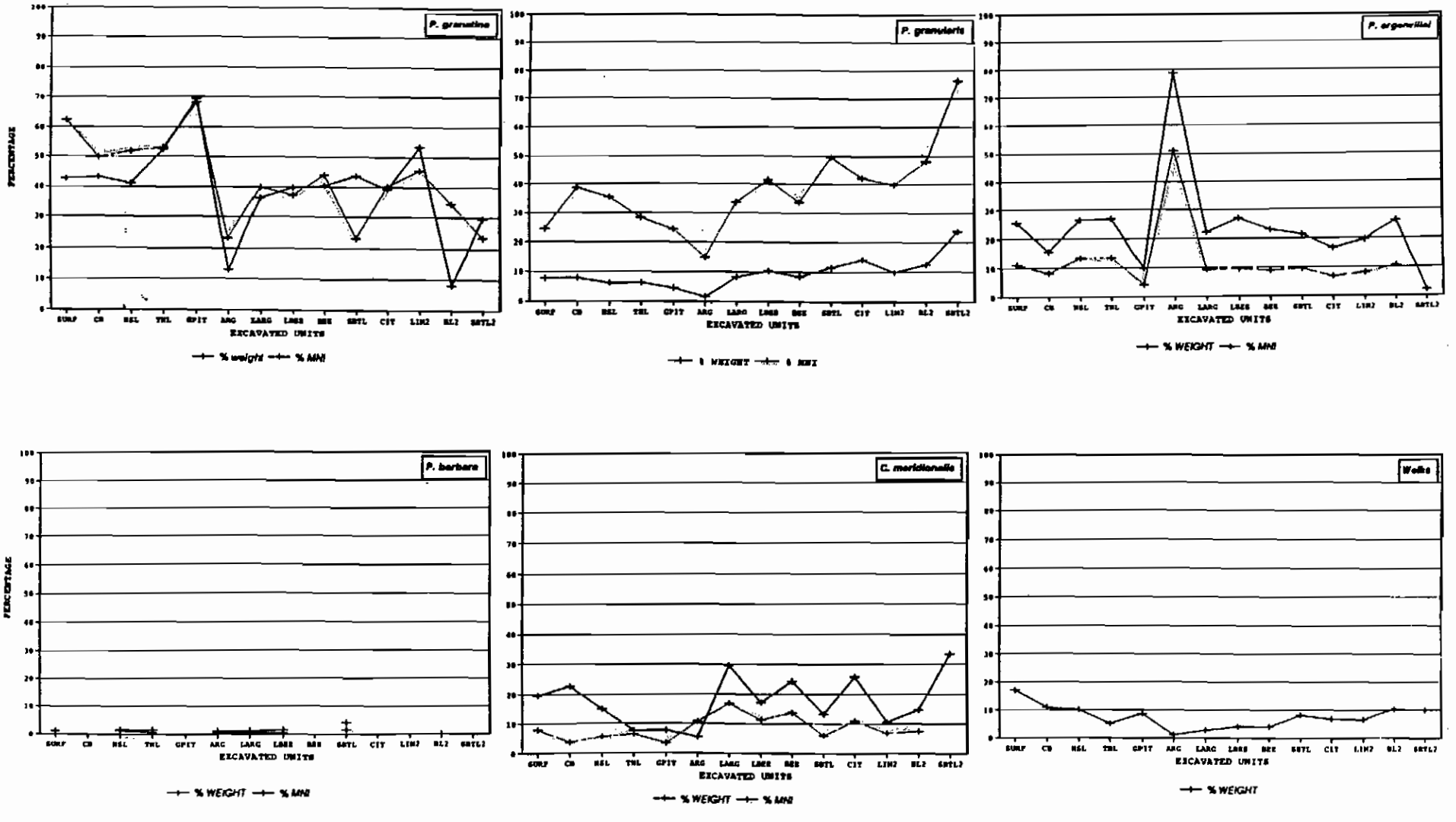
A detailed analysis of the faunal remains is presented in Appendix A. In general the assemblage shares many elements with sites BSB 1 and BSB 2, in that the bulk of the faunal remains are terrestrial. The bones of small bovids such as steenbok or grysbok (*Raphicerus sp*) and duiker (*Sylvicapra grimmia*) were found in most of the stratigraphic units. A single bone of a Cape fur seal (*Arctocephalus pusillus*) was found in unit SBTL. The ARG/BEE complex contained the greatest diversity of species with jackass penguins (*Spheniscus demersus*) and a wild cat (*Felis lybica*) being present. Tortoise bones were ubiquitous throughout the sequence.

4.3.4 Shellfish

As in other Brandsebaai sites, shellfish formed the most abundant component of the diet. *P. granatina* and *P. granularis* were utilised to varying degrees throughout the sequence. Also noticeable is the presence of *Choromytilus meridionalis* (10-30% by weight) and *P. argenvillei* which played a relatively important role in the diet (Figure 6).
Prominent is the fact that, in the main occupation layers, people were exploiting large sized shellfish, particularly the limpets *P. granatina* and *P. argenvillei*. In units THL and ARG, whelks, *C. meridionalis* and *P. granularis* are notably less frequent than large species of limpets. In unit ARG, for example, *P. argenvillei*, a species found only in the lowest part of the inter-tidal zone, makes up 80% of the shellfish assemblage by weight and 50% by minimum number of individuals. *P. barbara*, also a large limpet but one which lives more generally in the lower intertidal, is not present in large numbers.

In terms of our experience on archaeological sites south of the Olifants River mouth, where *P. argenvillei* seldom makes up more than 10% of any archaeological sample, this is an unusually high occurrence of a limpet that is difficult to collect except at times of low spring tide. Although almost exclusively *P. argenvillei* "piles" have been noted on middens along the Namaqualand coast, this is the first to have been sampled. It seems apparent that, in our excavation of BSB 3, we encountered a *P. argenvillei* "pile", perhaps even an individual meal. When sea conditions were suitable, prehistoric people exercised a preference for the collection of *P. argenvillei*, a favoured food which was seldom available.

The comparatively high frequency of *C. meridionalis*, compared with younger sites excavated at Brandsebaai, is consistent with Webley's (1992) observations at Spoeg River mouth cave, where she showed that increased frequencies of *C. meridionalis* characterised layers older than 1800 years ago. Further south, between the Olifants and Berg river mouths, massive *C. meridionalis* middens have been dated to between 2000-3000 BP. It is thought that marine regressions at this time exposed greater expanses of flat reef which brought mussel colonies into exploitable range (Yates et al 1986). This change in exploitation strategy is currently the focus of continuing research. Our observations at BSB 3, and elsewhere at Brandsebaai, seem to point to patterning in roughly contemporary events along a very substantial length of the Atlantic coast.



6

BSB 3 Shellfish analysis - percentage frequencies

4.3.5 Conclusion

Along with BSB 4 and BSB 1, BSB 3 provides good evidence for occupation of the Namaqualand coast before the introduction of domestic stock and ceramics. In addition, these sites demonstrate that the transition from a formal stone artefact assemblage (about 4000 years ago) to an informal assemblage took place well before the introduction of pastoralism. BSB 3 has been sampled, but far larger samples of bones and stone artefacts are needed if robust patterns of pre-colonial behaviour are to be detected.

4.4 BSB 4

The fact that recent diamond mining operations in the area of Geustyn se Gat have resulted in the disturbance of archaeological material is well demonstrated by the presence of shell fragments and stone artefacts scattered along the bottom of a prospecting trench nearby. We noted that more material was eroding out of the side of a small dune that had been partially bulldozed away on the south side of the trench (Figure 1, Plate 5). As erosional processes would eventually cause the dune to slump, resulting in the destruction of any in-situ material, we decided to initiate an exploratory excavation.

The removal of a 3m strip immediately parallel to the prospecting trench produced evidence of a lens of material that had been all but destroyed when the dune was bulldozed. The excavation was extended into the face of the dune. Lenses of dense shell, hearth ashes, as well as fragments of bone, indicated the survival of an archaeological horizon which was still in place within the remainder of the dune body (Plate 6). A $4m^2$ trench was excavated into the dune after sterile red aeolian sand had been cleared off the top. Some 16 individual stratigraphic units were discerned and excavated separately (Figure 7). The most significant of these is what we have termed the "Dodge" complex - three related stratigraphic units (BDO, GDO, WDO) consisting of hearths and associated foodwaste dumps. Excavation of these units has generated assemblages of bone fragments, shellfish and stone artefacts which are described in the following pages.

4.4.1 Dating

A sample of *Choromytilus meridionalis* shell from dense occupation lense BDO was submitted to QUADRU at the CSIR for radiocarbon dating. The date obtained is:

Unit BDO, square F22	Pta-6049	2430 ± 40 $\delta^{13}C$ = +0 2‰ 10 BC(39 AD)84 AD

This date, approximately 1900 years ago in calendar years, indicates that the main occupation of BSB 4 took place a short time before the introduction of ceramics and domestic stock into the region. This is consistent with the results of the sorting and analyses, which produced neither of these items.

4.4.2 Artefacts

The majority of the stone artefacts were found in the denser occupation lense which comprised units WES, BES, BDO, GDO and DOD (Table 4). The assemblage is similar to BSB 3 except that, in this case, absolutely no formal tools (apart from an upper grindstone) were found. The raw materials used were those that were immediately available - quartz and a little quartzite. The artefacts comprise only those that characteristically result from a quartz based technology, that is unretouched flakes, chips and chunks, along with irregular and bipolar cores. Blades and bladelets are quite rare. The analysis of the stone artefacts corroborates the pattern that has emerged from that of sites BSB 2 and BSB 3 - an expedient stone tool industry based upon the use of immediately available raw materials, notably quartz.

4.4.3 Animal bone

BSB 4 did not produce much bone that was well enough preserved to be identified to species (Appendix A), although tortoise and adiagnostic mammal bone occurred in all excavated units. Various sea birds including albatross (*Diomedea sp*), kelp gull (*Larus dominicanus)* were also exploited. In general, the assemblage is similar to that of the

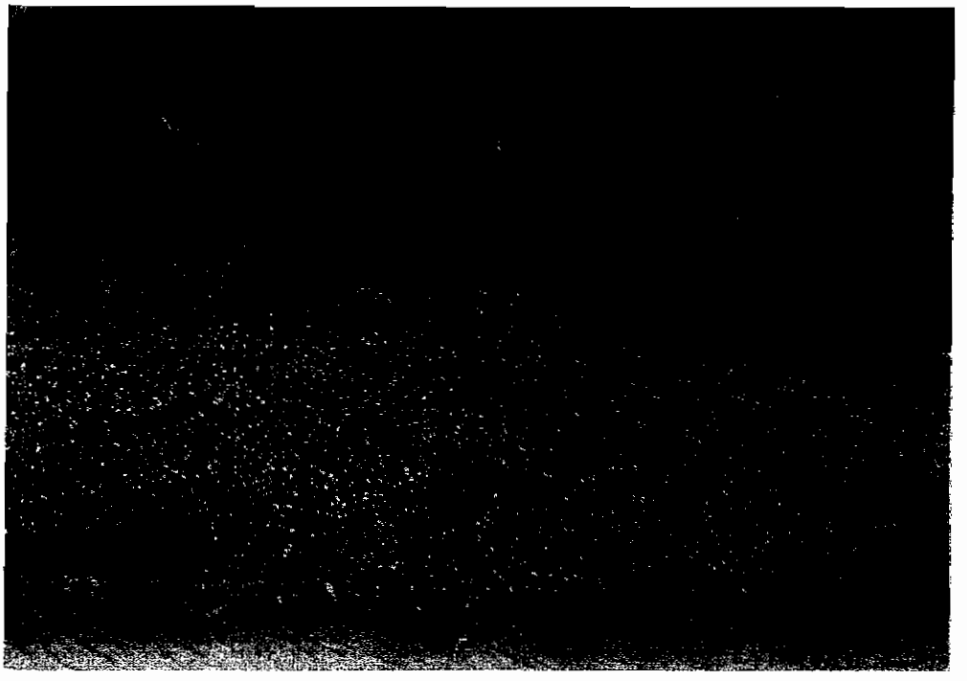


Plate 5

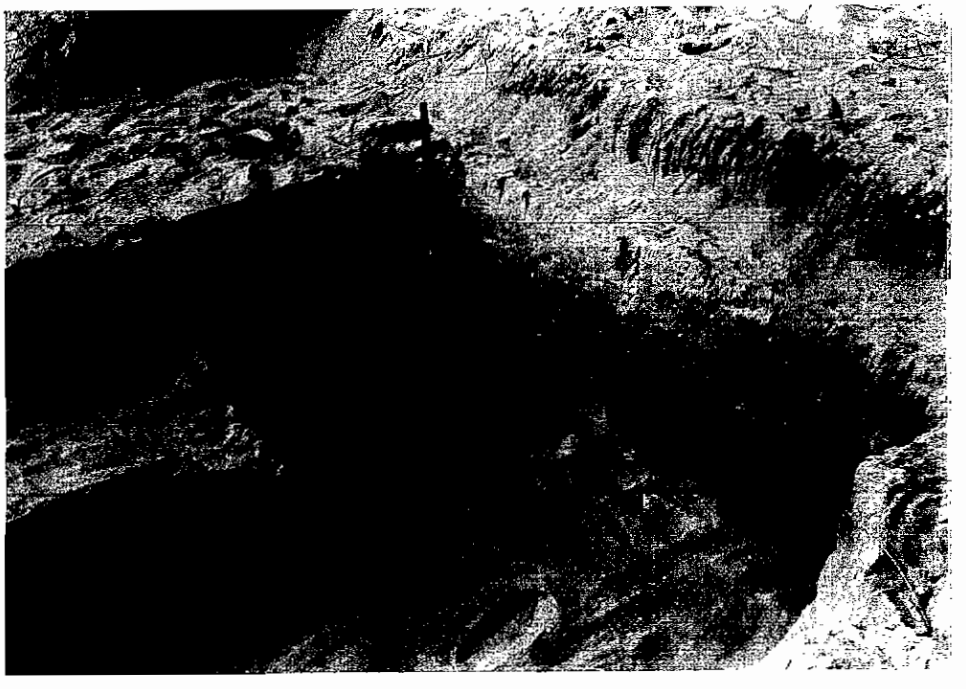
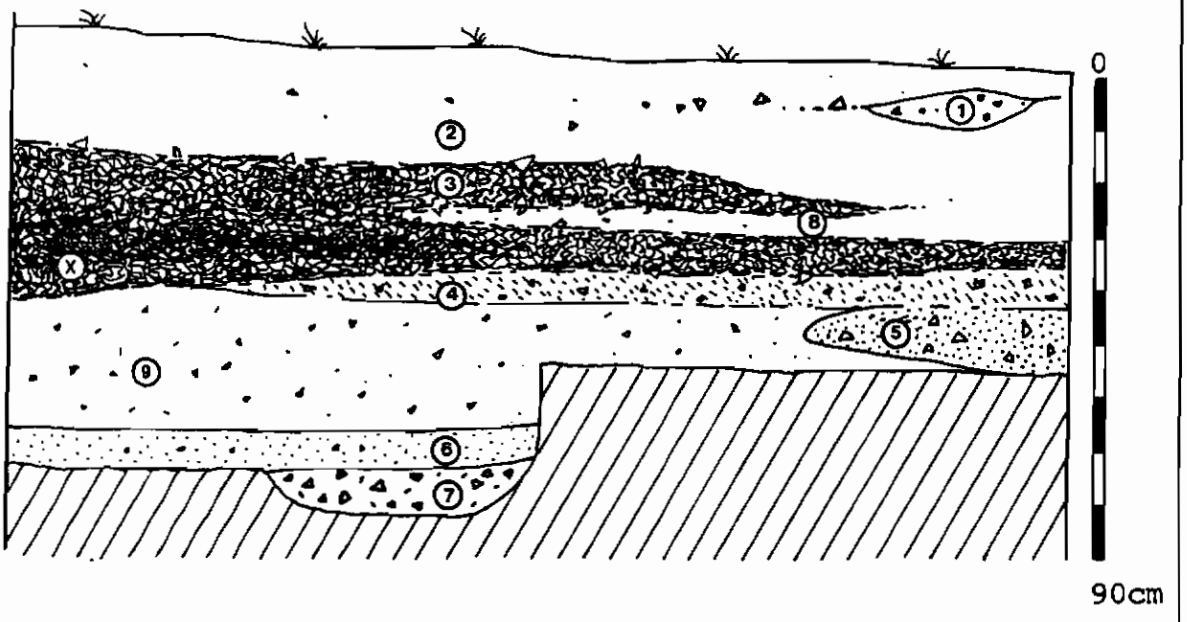


Plate 6



1. BAL
2. CHE
3. BDO
4. GDO
5. TRU
6. SES
7. FIA
8. WDO
9. WES
X. Pta - 6049 2430±40 BP

7 BSB 4 South section

Stone artefact frequencies

SITE	CHE		WES		GDO		BES		BDO		WCH		ROBD		GES		SES		FIA		TOTAL
BSD 4	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
CHIPS			3	20	4	40	1	14.29	2	28.57											10
CHUNKS			2	13.33	2	20	2	28.57	2	28.57	2	100			1	20			1	100	12
FLAKES	3	100	10	66.67	4	40	4	57.14	3	42.86			5	100	4	80	1	100			34
BLADES																					
BLADELETS																					
sub-total	3	100	15	100	10	100	7	100	7	100	2	100	5	100	5	100	1	100	1	100	56
%	100		83.33		100		100		100		100								100		683.3
BP-CORE			2	100																	2
IRR-CORE																					
SP-CORE																					
sub-total			2	100																	2
%			11.11																		11.11
BKD SCRAPER																					
SCRAPER																					
SEGMENT																					
MRP																					
MBP																					
sub-total																					
%																					
HS																					
US			1	100																	1
LGS																					
HS/GS																					
sub-total			1	100																	1
%																					0
TOTAL	3	100	18	100	10	100	7	100	7	100	2	100	5	100	5	100	1	100	1	100	59
%	5.08		30.51		16.95		11.86		11.86		3.39		8.47		8.47		1.69		1.69		

Raw materials

	CHE		WES		GDO		BES		BDO		WCH		ROBD		GES		SES		FIA		TOTAL
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
QTZ	3	100	17	94.4	10	100	7	100	7	100	2	100	5	100	5	100	1	100	1	100	58
QTZITE			1	5.55																	1
CCS																					
SIL																					
TOTAL	3	100	18	100	10	100	7	100	7	100	2	100	5	100	5	100	1	100	1	100	59
%	5.08		30.51		16.95		11.86		11.86		3.39		8.47		8.47		1.69		1.69		

Table 4

other excavated Brandsebaai sites in that terrestrial mammals such as steenbok/grysbok (*Raphicerus sp*) and Cape hare (*Lepus capensis*) were hunted. The lack of evidence for larger bovids and seals appears to be a shared peculiarity of the Brandsebaai sites.

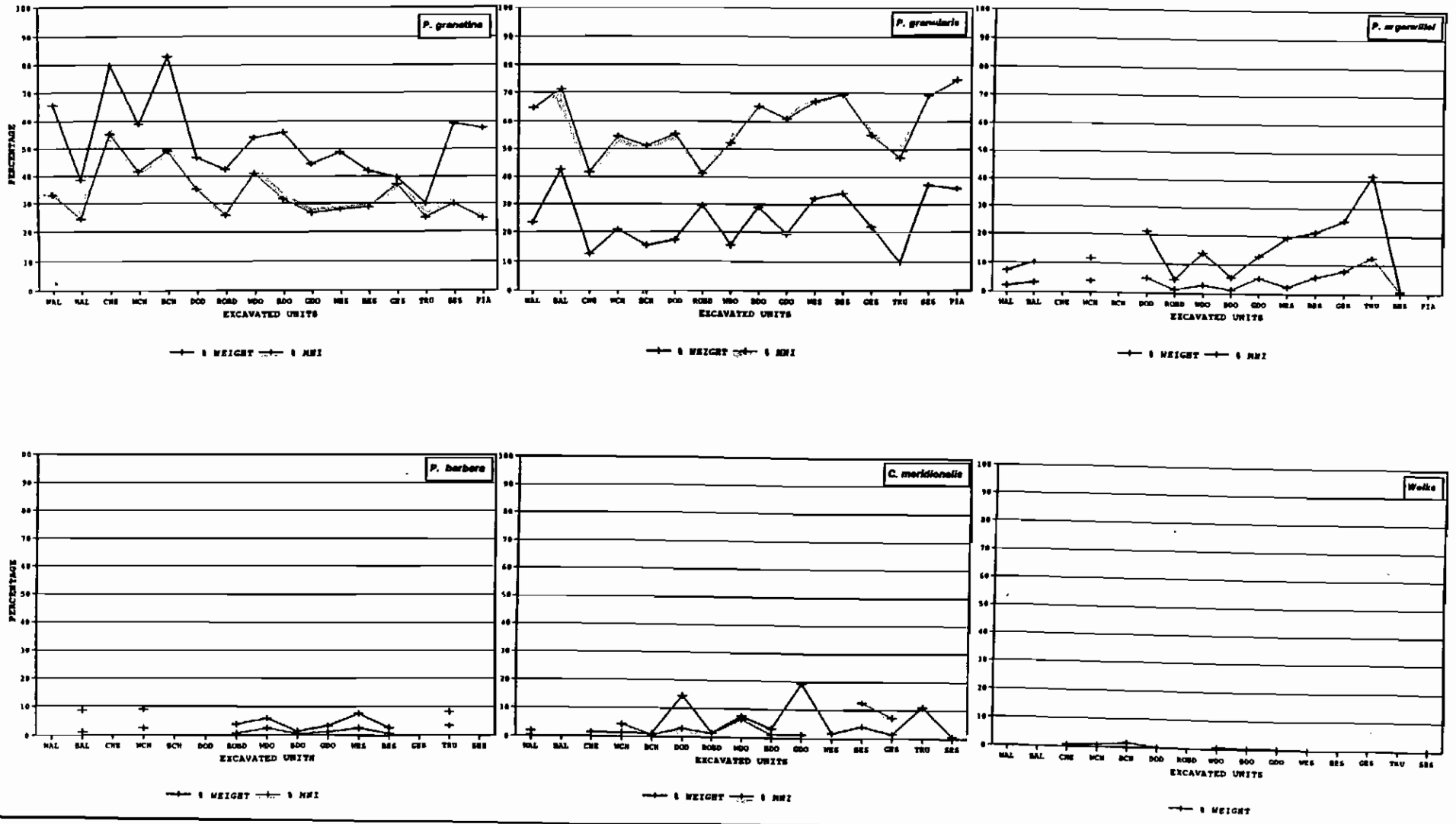
4.4.4 Shellfish

The limpets *P. granatina* and *P. granularis* dominate the shellfish assemblage in fifteen of the sixteen excavated units. The exception is the presence of a *P. argenvillei* lense in unit TRU towards the bottom of the sequence. *C. meridionalis*, whelks, *P. barbara* and for the most part, *P. argenvillei* are lesser components of the assemblage (Figure 8).

The exploitation strategy at this site focussed on the gathering of shellfish from exposed rocks of the mid-tidal or upper balanoid zones. The single instance (unit TRU) where *P. argenvillei* were collected in substantial numbers, probably reflects a single low tide that allowed people to collect these otherwise inaccessible shellfish in quantity.

4.4.5 Conclusion

The bulk of occupation at BSB 4 occurred shortly before the local introduction of pastoralism. As with BSB 1 and BSB 3 the stone tool assemblage is informal. Although the site once contained a well stratified archaeological sequence, the destruction of large tracts of adjacent coastal dune has resulted in the loss of potential spatial information. The sequence is interesting, but probably repeated in better preserved sites nearby.



8

BSB 4 Shellfish analysis - percentage frequencies

4.5 BSB 5

BSB 5 is a collection of archaeological material found during the initial Phase 1 survey by Parkington and Poggenpoel (1990) in the dump from an old prospecting trench. The location is hown in Figure 1. Compared to the other Brandsebaai sites, BSB 5 contains enormous quantities of ostrich eggshell fragments, many more stone artefacts and a faunal assemblage that is heavy and partly mineralised. Although the stone artefacts are almost all made from quartz and are not particularly diagnostic, some of the quartzite flakes show the prepared platforms that define Middle Stone Age (MSA) technology. Dates from MSA sites elsewhere in Southern Africa suggest that this disturbed site must be at least 50000 and perhaps as much as 100000 years old. The presence of marine shells along with the other items probably means that the site dates to a period of high sea level during the late Pleistocene, probably that which occurred about 120000 years before the present. Although many scatters of MSA artefacts have been found in many parts of South Africa, it is highly unusual to find an associated set of fossil bone and stone tools with marine shells. Sites of this age with such in-situ material are rare and prized internationally. The BSB 5 occurrence in the tailings of the prospecting trench implied that more in-situ finds may have escaped destruction in the sand bodies off the sides of the trench. Exploratory excavations were initiated to determine whether any in-situ material remained, and, if so, to record its context.

A mechanical excavator was used to clear slumped soil away from the south side of the trench so that a clean section could be examined for indications of buried lenses. Although occasional fragments of shell and quartz were seen, no discernible lenses could be identified.

A second attempt (test 1) at locating the MSA material involved using the mechanical excavator to cut a deep trench at 90 degrees off the south side of the prospecting trench. No archaeological material was seen in the upper 1m of soft red aeolian sands down to the interface with the compacted soils below. The trench was then excavated by mechanical means to compacted orange feldspathic sands at a depth of 2.70m below surface. At this point the excavation was discontinued as very little archaeological material had been located.

A shovel and trowel excavation against the lower sides of the prospecting trench (tests 2 and 3) produced evidence of archaeological material (fragments of shell) in the orange feldspathic sands encountered in test excavation 3. At the interface between the orange feldspathic sands and white-yellow sands of a Pleistocene beach, a number of fragments of fossil bone, a few stone artefacts and some marine shell were recovered. Soil and artefact samples were collected from 5cm spits. A view of the south side of the prospecting trench (Plate 7) shows the locations of the trench and the test excavations. Detail of test excavation shows the position of shell in this section (Plate 8).

Informed by this discovery, test excavation 1 was then continued by trowel through the orange feldspathic sands down to the interface with the lower beach sands. Here again archaeological samples of shellfish, small amounts of fossil bone and artefactual waste were obtained, confirming our observations from test 3.

4.5.1 Conclusion

There is little doubt that BSB 5 was a buried MSA open site that probably had the potential to produce spatial information of importance. Although we have been able to locate the stratigraphic context of the site, the finds can at best be described as an ephemeral scatter located in the lower portions of the feldspathic sand layer at the interface with the Pleistocene beach. The density of the archaeological material seen in the prospecting trench dump is very much more dense than the below surface

Plate 7

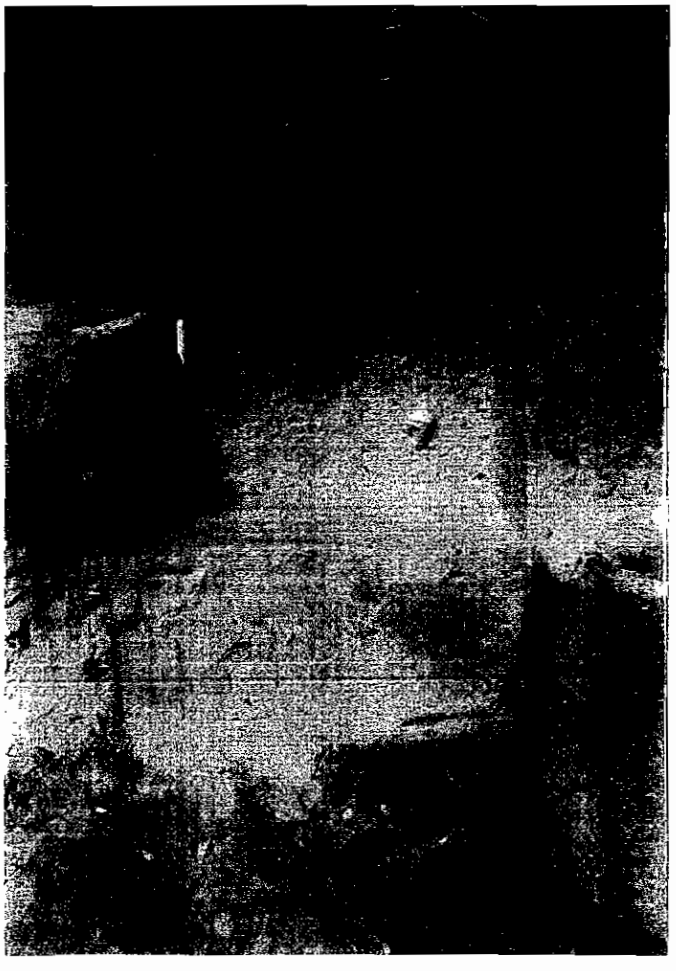


Plate 8

occurrences. We suspect that the old prospecting trench was excavated through the main body of the site, and in the process destroyed most of the spatial information that the site had to offer.

The archaeological materials still present in the dump are of extreme interest as the context of the site is established and potentially datable. Further investigation here is essential to recover the dumped assemblage, sample the geological context more thoroughly and obtain materials for dating. The area containing the prospecting trench and dump should continue to be protected until such time as arrangements can be made for their removal, analysis and curation.

4.6 BSB 6

BSB 6 is a Late Stone Age site lying in the vegetated dune area south east of Geustyn se Gat (Figure 1). Its situation, just inside the edge of the coastal dune system, provides protection from the wind as well as a view of the coastline (Plate 9). Unlike most of the sites excavated so far in this project, it has not suffered any disturbance as a result of mining and related activities. The visible portion of the scatter is some 36m long and 10m wide, with discrete piles of shell, fragments of quartz artefactual waste and potsherds that indicate the preservation of good spatial patterning. Part of the occupation of the site took place after the introduction of ceramics some 1800 years ago.

A 4 x 1m trench, positioned across the central portion of the site, revealed a shallow sequence of well defined shell lenses and piles (Plate 10). In addition, hearths with associated fragments of burned bone, shell and, in one instance, a stone artefact manufacturing area, are evidence that the in-situ behaviours of the site occupants are preserved under the sandy covering at BSB 6 (Figure 9).
The small test excavation conducted on this site should been seen as an exploratory investigation of the research possibilities.

4.6.1 Dating

The presence of ceramics on the surface of this site (Appendix C) led us to suspect that the site would date to the last 1800 years. A sample of *Patella granatina* shell was submitted to the QUADRU of the CSIR for radiocarbon dating, giving the following result:

Unit PSS1, square G21	Pta-6052	2170 ± 50 $\delta^{13}C$ = -0.0‰ AD 269(350)409

When corrected for the apparent age of sea water, this implies an age of 1700 years ago, probably one of the earliest local ceramic occupations. Webley's radiocarbon date of 1920 ± 40 BP (Pta-4753) is thought to mark the beginning of the ceramic sequence at Spoeg River Mouth (Webley 1992).

4.6.2 Artefacts

The stone artefact assemblage is essentially what we would have expected at a site of this age (Table 5). Like BSB 4, the assemblage is quartz dominated and consists of an informal collection of flakes, chips and chunks, with a few bladelets. There are no artefacts that could be classified as cores and no retouched pieces.

The most significant aspect of the artefactual analysis was that clusters of waste flakes and chips were associated with hearth areas. This is well demonstrated in unit DEL which is a hearth associated with burned stones, some large quartz chunks and smaller flakes and chips. This clearly represents an activity area where someone had sat close to a hearth while preparing stone tools. On similar sites in the western Cape large scale excavation, followed by artefact and bone refitting programmes, combined with GIS-based (Geographic Information System) analysis of spatial patterning of items, has enabled archaeologists to make detailed statements about the daily lives and social relationships of pre-historic people.

4.6.3 Animal bone

Although BSB 6 is a ceramic period site, no remains of domestic sheep were found in the assemblage. The faunal assemblage is similar to other Late Stone Age sites at

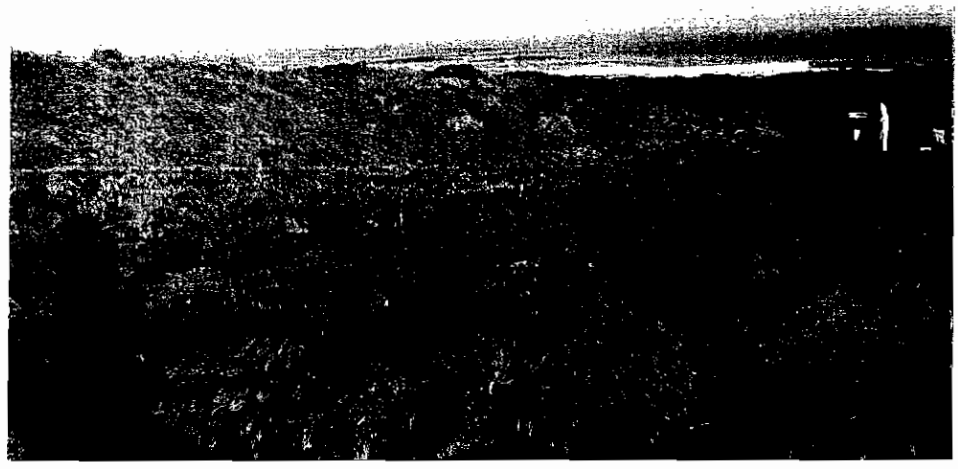
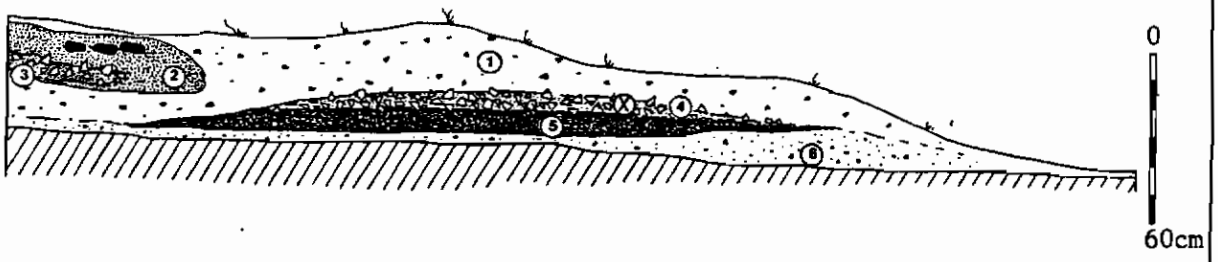


Plate 9

Plate 10



1. SS1
2. DEL
3. ECH
4. PIL
5. PBO
6. SS2
X. Pta - 6052 2170±50 BP

9 BSB 6 West section.

Stone artefact frequencies

SITE	SURF		SS1		SS2		DEL		GOL		PBO		TOTAL
BSB 6	n	%	n	%	n	%	n	%	n	%	n	%	
CHIPS	3	11.53			2	28.57	6	11.32	2	18.18	1	20	14
CHUNKS			1	50			14	26.41	1	9.09	1	20	17
FLAKES	21	80.76	1	50	4	57.14.	30	56.60	6	54.54	3	60	65
BLADES	2	7.69					3	5.66	1	9.09			6
BLADELETS					1	14.28			1	9.09			2
sub-total	26	100	2	100	7	100	53	100	11	100	5	100	104
%	100		100		100		98.14		100		83.33		
BP-CORE													
IRR-CORE													
SP-CORE													
sub-total													
%													
BKD SCRAPER													
SCRAPER													
SEGMENT													
MRP													
MBP													
sub-total													
%													
HS											1	100	1
US													
LGS													
HS/GS							1	100					1
sub-total							1	100			1	100	2
%							1.85				16.66		18.51
TOTAL	26	100	2	100	7	100	54	100	11	100	6	100	106
%	24.52		1.88		6.60		50.94		10.37		5.66		

Raw materials

	SURF		SS1		SS2		DEL		GOL		PBO		TOTAL
	n	%	n	%	n	%	n	%	n	%	n	%	
QTZ	26	100	2	100	7	100	49	90.74	11	100	4	66.66	99
QTZITE							5	9.25			2	33.33	7
CCS													
SIL													
TOTAL	26	100	2	100	7	100	54	100	11	100	6	100	106
%	24.52		1.88		6.60		50.94		10.37		5.66		

Table 5

Brandsebaai (Appendix A) and broadly reflects currently surviving animals in the area. Identified terrestrial animals consist of small bovids such as steenbok/grysbok (*Raphicerus sp*), Cape hare (*Lepus capensis*) and tortoise, which was found in most of the excavated units. At least 3 Jackass penguins (*Spheniscus demersus*) were found in the small portion of the site that was excavated. No seal bones and no large bovid bones were encountered in the analysis.

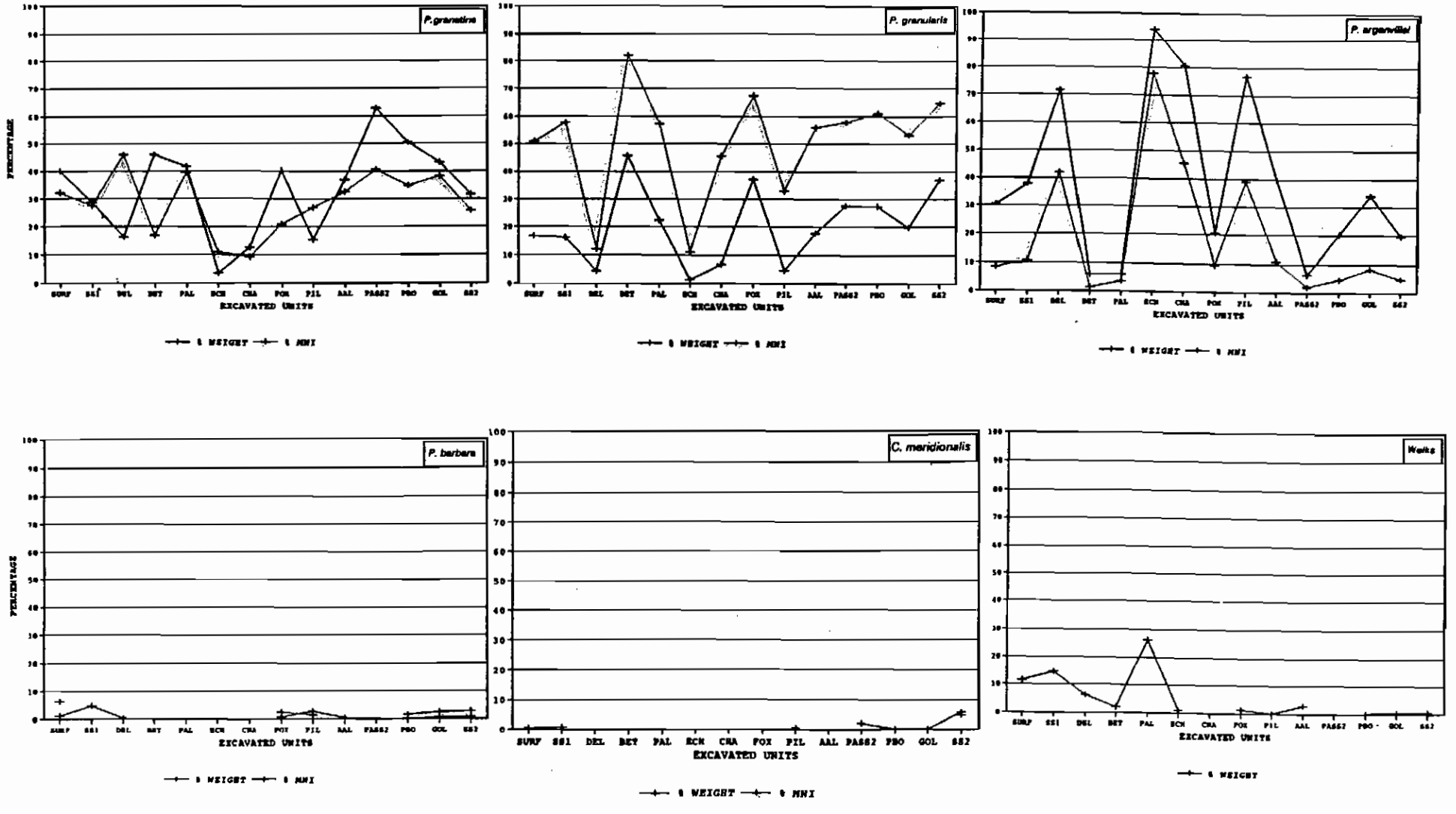
The well preserved spatial patterning observed among the stone artefacts also extends to the distribution of bone on the site. Hearth unit AAL contained many fragments of burned bone of small bovids and a jackass penguin. The study of the spatial patterning of food remains as well as the refitting of bone fragments from individual animals can provide valuable evidence about the way that different family groups shared resources. Hence, archaeologists are able to make inferences about the structure of prehistoric societies.

4.6.4 Shellfish

At BSB 6 discrete piles of shellfish, probably representing single gathering events, has enabled us to obtain a sense of the shellfish collection strategy of a group of people who were visiting Brandsebaai about 1700 years ago (Figure 10). In terms of overall weight of shellfish *P. argenvillei* dominate the assemblage, in the form of dense "piles" which exist against a background of more generally distributed *P. granatina* and *P. granularis*. In units ECH and CHA, *P. argenvillei* make up 95% of shellfish by weight and 80% of the minimum number of individuals. Very high frequencies of this species occur also in units DEL and PIL. *P. granatina* and *P. granularis*, the upper intertidal species, formed a staple food source which could be collected under most normal sea conditions and are usually collected together. At times of calm sea and spring lows, the group of people who were occupying site BSB 6 focussed their efforts on the collection of *P. argenvillei* in preference to other shellfish species that would also have been exposed at times of low tide. It is possible that people were scheduling their visits to the coast so as to coincide with monthly low tides. These preliminary observations can only be tested once we have excavated more open sites of similar age on the Namaqualand coast.

4.6.5 Conclusion

BSB 6 is a ceramic period site. The most interesting aspect of this site is the unique preservation of spatial arrangements among hearth features, bones and stone artefacts. The presence of specific activity areas has the potential to provide excellent information about peoples' daily lives. Because of this, the destruction of BSB 6 would constitute a significant archaeological loss. The spatial integrity of the site is so sensitive that even the driving of one vehicle over the site will cause irreparable damage. The vicinity of the site should be protected to ensure that this does not happen.



BSB 6 Shellfish analysis - percentage frequencies

5. DISCUSSION

The excavation of six sites at Brandsebaai has enabled us to make an important contribution to the establishing of a regional sequence for the Namaqualand coast. This area, which has been the subject of a great deal of debate, had not been subjected to any major archaeological exploration until Webley's research programme in the Namaqualand interior (Webley 1986) and her excavations at the Spoeg River mouth cave (Webley 1992). Even these investigations have restricted themselves to the last 2000 years or so. The recent archaeological survey of De Beers-owned properties by the Archaeology Contracts Office and this particular series of excavations constitute a less focussed but more general study. As a result of the information available from these excavations, we are able to suggest a preliminary human occupation sequence for the Namaqualand coast.

Although no Early Stone Age (ESA) sites have yet been excavated in Namaqualand, ESA artefacts have been observed near Koekenaap, along terraces of the Oliphants river, near Kleinsee, in a probable alluvial context, and from the surface of the sands near Brandsebaai. This indicates that people were living in Namaqualand some hundreds of thousands of years ago, but as yet details of the extent and nature of such occupation remain unknown.

Equally unexplored is the transition from ESA to Middle Stone Age (MSA). MSA sites have been recorded along the Namaqualand coast, but, again, no sites have been excavated. Our exploratory excavations on site BSB 5 have shown that a well preserved MSA site once existed deep below the red aeolian sands at the interface between the orange feldspathic sands and early Pleistocene beach deposits. It has been almost completely destroyed by prospecting. The dumps from the prospecting trench contain marine shell, fossil bone and ostrich eggshell fragments, as well as a variety of stone artefacts, from what had obviously been a well preserved human occupation some 120000 years ago. It is highly likely that similar sites still exist under the sands of the Brandsebaai area but will be difficult to detect and rescue before they are damaged by earth moving operations.

At present nothing is known of the details of MSA occupation or the transition from the MSA to the LSA period Only the most recent part of the LSA sequence is known to exist. It is possible that the absence so far of any material that would, elsewhere in Southern Africa, be dated to the period 50000 to 5000 years ago, is a reflection of a long hiatus in human occupation in the region. Only much more excavation and survey will explore this idea.

The earliest detailed LSA information comes from site BSB 2, as well as a number of observations from the De Beers Namaqualand coastal archaeological survey. The earliest levels of BSB 2, dated to 4000 years ago, yielded an artefactual assemblage which contained a small sample of formal microlithic elements made and recorded according to set conventions and norms. The patterns of artefact manufacture conform to those established for the sub-continent as a whole. We hypothesise that by 2500 years ago the microlithic element in stone artefact manufacture had disappeared. People were by then making less patterned artefacts from quartz and quartzite which were abundant in the vicinity. This may have been a result of changes in human value systems and conventions, but as yet there is not adequate information available on environmental factors that may have contributed to assemblage changes.

The next important changes that took place in Namaqualand were the introductions of domestic animals and ceramics into southern Africa. This is best represented in Webley's excavations at the Spoeg River mouth cave, which has produced what are so far the earliest dates for the introduction of domestic sheep into southern Africa (about 1900 years ago). This is generally thought to reflect the arrival of the historic

Khoi Khoi in South Africa. As herders, they brought with them a new world view, involving the concept of ownership, as well as a complex social structure suited to the transhumant lifestyle associated with the herding of animals. Although the Khoi Khoi herders and the San hunter gatherers were physically similar, it is probable that the advent of the stock keeping economy resulted in both cooperation and conflict at different times and in different places. On occasions, social tensions may have resulted in hunter gatherers moving into refuge situations, or gradually adopting aspects of the herding economy. The issue facing archaeologists is how to recognise these social processes in the surviving material record of changing artefacts.

At Brandsebaai the advent of pastoralism is not well represented, with BSB 6 containing ceramics but no sheep bone in the sample excavated. It is of interest to note that the stone artefact assemblage from this approximately 1700 year old site is no different from that at sites BSB 1, BSB 3 and BSB 4, which date between 2000 and 3000 years ago. It would appear that the advent of herding did not affect artefact manufacture at Brandsebaai, the disappearance of formal tools taking place well before this time. The absence of any domestic animals at BSB 6, if it is not a sampling problem, may indicate that the area was not favoured by herders, perhaps because more attractive grazing could be found elsewhere. BSB 6 was probably a camp of pottery-using hunter gatherers who came to the coast, perhaps as part of a seasonal round, to collect some of the larger species of limpets that are exposed at times of spring low tide. The latest date for pre-colonial occupation at Brandsebaai is about 400 years ago at site BSB 2, which probably means that, although no `contact period' dates have been obtained from the region, hunter gatherers/herders were still utilising this coastline into colonial times.

6. RECOMMENDATIONS

The reason for undertaking archaeological excavations at the Brandsebaai diamond mining area was to rescue the archaeological sites endangered by mining or related activities. Unlike plants and animals, which can be re-introduced back into mined areas, archaeological sites, once destroyed, can never be restored. It should also be pointed out that the destruction of shell middens left behind by prehistoric people is illegal under the National Monuments Act of 1969 (as amended) unless under a permit issued by the National Monuments Council to suitably qualified persons. A permit for the excavation and removal of archaeological material from Brandsebaai has been issued to the Archaeology Contracts Office at the University of Cape Town.

The excavations have allowed us to establish a rudimentary regional sequence and assess the significance of archaeological sites in the area. Our recommendations pertaining to the area of the De Beers-owned shoreline currently being mined for Diamonds by De Beers sub-contractors are as follows:

1. The archaeological material originating from the prospecting trench at site BSB 5 should be collected by a team of archaeologists without delay. In the meantime, the vicinity of the trench, including the old dump heaps should be left undisturbed. Any removal of archaeological material is illegal and should be discouraged.

2. Sites BSB 2 and BSB 6 must be conserved. No vehicles should be allowed access to within 30m of either site, and any human activity, particularly those that disturb the topsoil, in the vicinity of these sites should be discouraged. Should the vicinities of these sites have to be mined, or their protection not guaranteed, they will have be excavated in full.

3. The Namaqualand coast is archaeologically very sensitive. Many sites have already been destroyed as a result of mining operations. The management of cultural

resources should be considered an integral part of any environmental management schemes for this area. More specifically, there needs to be a Planning Document that guides future use of the Namaqualand Coast. Decisions as to where to allow recreational use, where to site Nature Reserves and where to encourage mining or township development cannot proceed without such a document. Included in this document there should be a listing of archaeological resources and their significance.

7. REFERENCES

Deacon, H.J., Deacon. J., Brooker, M. and Wilson, M.L. 1978. The evidence for herding at Boomplaas Cave in the southern Cape, South Africa. South African Archaeological Bulletin 33: 39-65.

Elphick, R.H. 1977 Kraal and Castle. KhoiKhoi and the founding of white South Africa. New Haven: Yale University Press.

Elphick, R.H. 1985. KhoiKhoi and the founding of white South Africa. Johannesberg: Raven Press.

Hart, T.J.G. 1989. Haaskraal and Volstruisfontein: Later Stone Age events at two rockshelters in the Zeekoe Valley, Great Karoo, South Africa. Unpublished M.A. thesis: University of Cape Town.

Jeradino, A. In press. Mid to late Holocene sea level fluctuations: the archaeological evidence at tortoise cave, south western Cape, South Africa. South African Journal of Science.

Jeradino, A.M., Yates, R.J., Morris, A.G. & Sealy, J.C. 1992. A dated human burial from the Namaqualand coast: observations on culture, biology and diet. South African Archaeological Bulletin. 47: 75-81.

Kinahan, J. 1989. Pastoral nomads of the central Namib desert. Unpublished Phd thesis. University of the Witwatersrand.

Parkington, J.E. and Poggenpoel, C.E. 1990. West Coast Heavy Mineral Sands Mining Project. Unpublished archaeological report submitted to the Environmental Evaluation Unit, University of Cape Town.

Robertshaw, P.T. 1978. The origin of pastoralism in the Cape. South African Journal of History 10:17-133.

Sampson, C.G., Hart, T.J.G., Wallsmith, D.L.and Blagg, J.D. 1989. The ceramic sequence in the Upper Seacow valley: problems and implications. South African Archaeological Bulletin. 44: 3-16.

Webley, L.E. 1986 Pastoralist ethnoarchaeology in Namaqualand. South African Archaeological Society Goodwin Series 5: 57-61.

Webley, L.E. 1992. Early evidence for sheep from Spoeg River Cave, Namaqualand. South African Field Archaeology. 1: 1-13.

Yates, R.J., Halkett, D.J. Manhire, A.H., Parkington, J.E. & Vogel, J.C. 1986. A late mid-Holocene high sea level: a preliminary report on the geo-archaeology at Elands Bay, Western Cape Province, South Africa. South African Journal of Science. 82:164-165.

8. ACKNOWLEDGEMENTS

We would like to thank Dr Graham Avery (South African Museum) for his assistance, and for allowing Peter Nilssen use of the comparative faunal collection at the South African Museum. Anglo-American allowed us use of a vehicle and their field station at Brandsebaai, and we are particularly grateful to Mr Kevin Bromberg for his support while we were in the field. Brand se baai Mines kindly provided a mechanical excavator and operator during the excavation of site BSB 5.

9. INVESTIGATION TEAM

Consultant	John Parkington
Principal investigators	David Halkett Tim Hart
Faunal analysis	
Mammal bone	Peter Nilssen
Bird bone	Graham Avery
Fish bone	Cedric Poggenpoel
Shellfish	Envor Jephta Dave Halkett Tim Hart
Lobsters	Dave Halkett Tim Hart
Artefactual analysis	
Lithics Ceramics Special finds	Dave Halkett Tim Hart
Field work	Dave Halkett Tim Hart Envor Jephta Mzondile Sasa Mzumzima Mjikelezi

T.J.C. Hart

Tim Hart

David Halkett

T.J.C. Hart pp

John Parkington

APPENDIX A

REPORT ON FAUNAL ANALYSIS FROM BRANDSEBAAI EXCAVATIONS

Prepared for the Archaeology Contracts Office
Peter Nilssen (10/1992)

Introduction:

Bone was sorted into categories (bird, mammal, fish, crayfish, microfauna, snake, and adiagnostic) and bagged accordingly, maintaining all labels.

I have counted all mammal, bird, and tortoise fragments (adiagnostic and diagnostic) and noted any peculiarities. I identified the mammal and tortoise remains and Dr. Graham Avery (South African Museum) identified the bird remains. Identifications were performed at the South African Museum. Species, NISP, and MNI lists are divided according to site and stratigraphic unit.

NOTE: Tortoise: the South African Museum have only two species (*Chersina ungulata* [ungulate tortoise] and *Geochelone pardalis* [leopard tortoise]) therefore identification of tortoise to species was not possible. Possibilities include *Chersina ungulata* (ungulate tortoise), *Homopus s. peersi* (speckled padloper), *Homopus s. signatus* (speckled padloper), *Psammobates tentorius trimeni* (tent tortoise), *and Psammobates geometricus* (geometric tortoise).

Conluding remarks:

In general, the absence of the Cape fur seal, dune molerat, and medium-large ungulates is curious. Most animals represented in the Brandsebaai excavations were most likely taken using snares or traps rather than "mobile" weapons.
No cut marks or hammer/anvil damage was observed macroscopically, but microscopic inspection may reveal the presence of same. The absence of cut marks is probably due to the fact that small animals can be processed with minimal damage to bone surfaces. Although one would expect some disarticulation, filleting is unnecessary since whole limbs are easily roasted, unlike those of larger ungulates which would require some degree of "portioning". A similar pattern is expected at the DFM where cut marks are relatively rare on small-medium bovids. Evidence for carnivore ravaging is almost entirely absent (only two fragments in the whole assemblage display tooth punctures).

SITE BSB 1

SURFACE

Species	NISP	MNI	Comment
tortoise*	45/	1	some burnt, most stained
indet.	15		4 burnt, other stained

LL1

Species	NISP	MNI	Comment
mammal	26		almost all stained/burnt
indet.	60		almost all stained/burnt
tortoise*	442/57	7	almost all stained/burnt
Ictonyx striatus (striped polecat)	1	1	
Raphicerus campestris (steenbok)	1	1	
R. melanotis (grysbok)	2	1	
Spheniscus demersus (jackass penguin)	1	1	

LPCO

Species	NISP	MNI	Comment
tortoise*	23/	1	ashy/charc looking
indet.	3		ashy/charc looking

BOT OF LPCO

Species	NISP	MNI	Comment
tortise*	2/	1	ashy/charc looking
indet.	1		

SITE BSB 2

SSC

Species	NISP	MNI	Comment
mammal	2		
indet.	2		
tortoise*	2/		
Antidorcas marsupialis (springbuck) OR *Pelea capreolus* (grey rhebok)	1	1	ash/charc. stained badly weathered

LLBS

Species	NISP	MNI	Comment
mammal	58		
indet.	28		
tortoise*	10/11	2	burnt/stained
Raphicerus sp.	1	1	
Sylvicapra grimmia (common duiker)	8	1	
Phalacrocorax carbo (Cape cormorant)	1	1	juvenile

BSBL

Species	NISP	MNI	Comment
mammal	9		
indet.	11		
tortoise*	10/10	2	5 burnt, other stained
Lepus capensis (Cape hare)	1	1	

BRL

Species	NISP	MNI	Comment
mammal	48		6/more burnt,other stained
indet.	45		2 burnt, other poss.staind
bird indet.	9		
tortoise*	235/34	5	44 burnt, other stained
?Sylvicapra grimmia (common duiker)	1	1	
Felis lybica (African wild cat)	1	1	burnt/stained
Phalacrocorax carbo (Cape cormorant)	1	1	juvenile
Spheniscus demersus (jackass penguin)	1	1	
Diomedea exulans (shy albatros)	2	1	

BBRL

Species	NISP	MNI	Comment
mammal	14		5 burnt/stained
indet.	40		2 burnt/stained
tortoise*	59/16	3	13/more burnt,other staind
Raphicerus campestris (steenbok)	1	1	
Sylvicapra grimmia (common duiker)	3	1	
Canis mesomelas (black-backed jackal)	1	1	?burnt

DLP

Species	NISP	MNI	Comment
mammal	22		12 burnt(some poss.staind)
indet.	38		6 burnt
bird indet.	9		2 burnt/stained
tortoise*	73/8	1	38 burnt/stained
Raphicerus campestris (steenbok)	2	1	1 burnt
Diomedea sp. (Albatros sp.)	1	1	

BUR

Species	NISP	MNI	Comment
mammal	1		
tortoise*	9/5	1	1 poss.burnt/stained

SITE BSB 3

SURF

Species	NISP	MNI	Comment
mammal	2		1 burnt/stained
indet.	2		1 burnt/stained
tortoise*	4/	1	2 burnt/stained
Raphicerus campestris (steenbok)	1	1	
Raphicerus sp.	1		juvenile

CB

Species	NISP	MNI	Comment
mammal	5		3 burnt
indet.	18		3 burnt
tortoise*	28/2	1	11 burnt/stained

HSL

Species	NISP	MNI	Comment
mammal	9		1 burnt
indet.	25		10 burnt/stained
tortoise*	30/3	1	14 burnt/stained
Raphicerus sp. (steenbok/grysbok)	8	1	3 burnt, some juvenile

THL

Species	NISP	MNI	Comment
mammal	30		4 burnt, other stained
indet.	26		3 burnt/stained
tortoise*	67/10	2	23 burnt, other stained
Raphicerus sp. (steenbok/grysbok)	3	1	all burnt
Felis sp probably *Felis lybica* (African wild cat)	1	1	

GPTL

Species	NISP	MNI	Comment
mammal	3		burnt/stained
indet.	1		burnt
tortoise*	42/2	1	all burnt/stained
Raphicerus sp. (steenbok/grysbok)	3	1	

ARG

Species	NISP	MNI	Comment
mammal	8		all burnt/stained
indet.	8		3 burnt/stained
tortoise*	7/		5 burnt/stained
Raphicerus sp. (steenbok/grysbok)	2	1	burnt/stained
Spheniscus demersus (jackass penguin)	1	1	

LAR

Species	NISP	MNI	Comment
mammal	26		all look burnt/stained
indet.	26		13 look burnt/stained
tortoise*	15/4	1	all look burnt/stained
Sylvicapra grimmia (common duiker)	1	1	burnt/stained
Raphicerus sp (steenbok/grysbok)	4	1	burnt/stained
Spheniscus demersus (jackass penguin)	2	1	1 stained

LBEE

Species	NISP	MNI	Comment
mammal	23		2 very burnt,othr b/s
indet.	56		4 burnt,other stained
tortoise*	37/2	1	2 v.burnt,other b/s
Raphicerus sp. (steenbok/grysbok)	3	1	1 burnt
Felis sp. probably *Felis lybica* (African wild cat)	1	1	

BEE

Species	NISP	MNI	Comment
mammal	21		2 burnt,other burnt/staind
indet.	48		12 burnt, other stained
tortoise*	38/1	1	19 burnt, othe rstained
Raphicerus sp. (steenbok/grysbok)	2	1	burnt/stained

SBTL

Species	NISP	MNI	Comment
mammal	29		3 burnt, other poss.staind
indet.	50		10 burnt, other stained
tortoise*	76/2	1	44 burnt, other stained
Arctocephalus pussilus (Cape fur seal)	1	1	
Raphicerus sp. (steenbok/grysbok)	4	1	some juvenile

CITI

Species	NISP	MNI	Comment
mammal	5/		2 burnt
indet.	17		7 burnt
tortoise*	25/3	1	15 burnt, other stained
Raphicerus sp. (steenbok/grysbok)	2	1	burnt

LIM2

Species	NISP	MNI	Comment
mammal	7		2 burnt, other stained
indet.	2		
tortoise*	16/4	2	8 burnt, other stained

BL2

Species	NISP	MNI	Comment
mammal	1		
indet.	2		
tortoise*	4/1	1	4 burnt, other stained
Raphicerus sp. (steenbok/grysbok)	1	1	?stained

SITE BSB 4

CHE

Species	NISP	MNI	Comment
indet.	39		
tortoise*	66/2	1	9 burnt

WAL

Species	NISP	MNI	Comment
tortoise*	13/	1	2 burnt

WCH

Species	NISP	MNI	Comment
indet.	6		
tortoise*	23/3	1	2 burnt, other stained

BCH

Species	NISP	MNI	Comment
tortoise*	/1	1	ash stained

DOD

Species	NISP	MNI	Comment
mammal	2		
bird indet.	2		
tortoise*	6/	1	1 burnt

WDO

Species	NISP	MNI	Comment
mammal	9		5 stained/burnt
indet.	61		4 burnt, other stained
tortoise*	37/	1	6 burnt, other stained
Raphicerus sp. (steenbok/grysbok)	1	1	

BDO

Species	NISP	MNI	Comment
mammal	10		3 burnt, other stained
indet.	50		7 burnt, other stained
tortoise*	168/12	1	27 burnt, other stained
Diomedea sp. (Albatros sp.)	1	1	

NOTE: plastron piece cf ROBD

ROBD

Species	NISP	MNI	Comment
tortoise*	2/1	1	2 burnt

GDO

Species	NISP	MNI	Comment
mammal	8		1 burnt, some stained
indet.	27		most stained
tortoise*	31/	1	15 burnt, other stained
Raphicerus sp. (steenbok/grysbok)	1	1	
Lepus capensis (Cape hare)	3	1	burnt/stained

WES

Species	NISP	MNI	Comment
mammal	5		
indet.	47		some stained
tortoise*	85/4	1	20 burnt, other stained
bird indet.	2		1 burnt
? *Larus dominicanus* (?kelp gull)	1	1	

GES

Species	NISP	MNI	Comment
indet.	2		
tortoise*	2/	1	slightly stained

BES

Species	NISP	MNI	Comment
mammal	2		stained
indet.	9		7 stained
tortoise*	2/	1	1 burnt, other stained
Raphicerus campestris (steenbok)	1	1	stained
Lepus capensis (Cape hare)	1	1	stained

SES

Species	NISP	MNI	Comment
indet.	27		stained
tortoise*	74/7	3	12 burnt, other stained

FIA

Species	NISP	MNI	Comment
indet.	11		2 burnt
tortoise*	11/3	1	4 burnt, other stained

SITE BSB 6

SURF

Species	NISP	MNI	Comment
mammal	5		burnt
indet.	15		5 burnt
tortoise*	76/12	3	22 burnt
bird indet.	1	1	
Raphicerus sp. (steenbok/grysbok)	8	1	

SS1

Species	NISP	MNI	Comment
mammal	5		3 burnt/stained
indet.	17		8 burnt, other stained
tortoise*	65/6	2	10 burnt, other stained
Raphicerus sp. (steenbok/grysbok)	3	1	
Spheniscus demersus (jackass penguin)	2	1	

DEL

Species	NISP	MNI	Comment
indet.	9		2 burnt, other stained
tortoise*	5	1	3 burnt, other stained

BET

Species	NISP	MNI	Comment
mammal	2		stained
indet.	3		2 very burnt
tortoise*	4/	1	2 burnt, other stained

PAL

Species	NISP	MNI	Comment
indet.	1		
tortoise*	/1	1	

ECH

Species	NISP	MNI	Comment
mammal	2		

PIL

Species	NISP	MNI	Comment
mammal	8		1 is acid etched
indet.	23		11 burnt, other stained
tortoise*	13/	1	5 burnt, other stained
Spheniscus demersus (jackass penguin)	1	1	

AAL

Species	NISP	MNI	Comment
mammal	42		31 burnt, other stained
indet.	59		47 burnt, other stained
tortoise*	12/2	1	6 burnt, other stained
Raphicerus sp (steenbok/grysbok)	7	2	4 burnt
Raphicerus melanotis (grysbok)	1	**	stained
Lepus capensis (Cape hare)	3	1	2 chewed, small carnivore
Spheniscus demersus (jackass penguin)	1	1	burnt/stained

SS2

Species	NISP	MNI	Comment
mammal	15		7 burnt, other stained
indet.	76		56 burnt
tortoise*	67/2	1	26 burnt, other stained
bird indet.	1		
Raphicerus sp (steenbok/grysbok)	4	1	1 burnt
Spheniscus demersus (jackass penguin)	2	1	
?Phalacrocorax carbo (?Cape cormorant)	1	1	

PASS2

Species	NISP	MNI	Comment
mammal	1		?stained
tortoise*	19/3	1	some stained

PBO

Species	NISP	MNI	Comment
mammal	26		5 burnt, other stained
indet.	92		13 burnt, other stained
tortoise*	946/30	3	37 burnt, other stained
Raphicerus sp (steenbok/grysbok)	6	1	
Spheniscus demersus (jackass penguin)	28	1	

GOL

Species	NISP	MNI	Comment
mammal	4		burnt, 1 juvenile piece
indet.	11		some stained
tortoise*	7/1	1	4 burnt
bird indet.	2		
Spheniscus demersus (jackass penguin)	1	1	

CHA

Species	NISP	MNI	Comment
mammal	1		

APPENDIX B

All sites: Cape Rock Lobster mandible statistics

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
BSB 1/B10/LL1	56	50	56	65	10.3	13.36
					8.27	12.26
					10.89	13.4
					9.32	12.83
					9.51	11.91
					11.43	11.02
					10.74	9.66
					9.5	10.05
					8.33	8.55
					8.87	
					10.58	
					9.14	
					17.92	
					14.22	
					8.39	
					10.89	
					10.97	
					11.16	
					10.32	
BSB 1/C10/BLPCO	3	1	3	2		9.16
BSB 1/C10/LL1	59	44	59	39	9.61	13.84
					12.48	10.33
					11.44	11.65
					7.75	10.56
					9.54	9.93
					12.9	11.16
					11.8	12.73
					10.66	8.4
					16.14	10.85
					10.53	12.44
					9.4	8.47
					8.73	
					10.16	
					11.42	
					9.65	

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
					8.98	
					9.53	
					9.43	
BSB 1/G3/LL1	57	52	57	41	9.1	9.03
					11.9	21.18
					11.56	9.09
					11.01	8.29
					12.28	10.95
					12.24	11.91
					6.83	10.26
					17.74	11.36
					8.29	10.4
					10.11	11.8
					10.74	9.95
					13.99	16.8
					9.02	19.2
					11.65	10
					14.62	22.9
					24.03	14.56
BSB 1/G3/LPCO	2	0	2	0		
BSB 1/G3/SURF	8	4	8	5	8.95	9.49
					10.79	11.22
BSB 2/J51/BBRL	2	1	2	2		
BSB 2/J51/BRL	14	14	9	14	11.49	17.27
					14.02	13.11
					16.61	9.03
					11.17	
					14.06	
					16.78	
					13.41	
BSB 2/J51/BSBL		0	0	3		
BSB 2/J51/DLP	1	1				
BSB 2/J57/BBRL	5	1	5	0		12.17
						13.99
						14.06

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
BSB 2/K50/BRL	11	11	8	2	14.38	21.76
					9.06	12.24
BSB 2/K50/BSBL	5	0	5	2		11.8
BSB 2/K50/LLBS	2	2	2			20.81
BSB 2/K50/SSC	1	1	0	0		
BSB 2/L49/BBRL	4	4	2	1		
BSB 2/L49/BRL	9	9	3	4		
BSB 2/L49/BSBL	2	2	1	0	11.39	
BSB 2/L49/DLP	3		3	1		
BSB 2/L49/LLBS	5	5	3	1		12.69
BSB 2/L49/SSC	1	1	0	0	16.43	
BSB 2/M45/BBRL	2	2	2	0	13.18	8.03
BSB 2/M48/BRL	20	14	20	3	21.58	22.22
					8.05	12.68
					10.77	15.4
						17.12
BSB 2/M48/BSBL	9	9	7	5		9.61
BSB 2/M48/BUR	2		2			15.43
BSB 2/M48/DLP	5	5	4	5	12.68	
					13.95	
BSB 2/M48/LLBS	1	1	0	0		
BSB 2/M48/SSC	2	0	2	0		
	1	1	0	0		
	1	0	1	0		

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
BSB 3/A10/BL2	3	3	0	0		
BSB 3/A10/CB	1	0	1	0		
BSB 3/A10/HSL	4	3	4	4		10.74
BSB 3/A10/SPBL2	1	1	0	0		
BSB 3/A10/SURF	1	0	1	0		
BSB 3/A10/THL	3	2	3	0	13.61	12.8
BSB 3/A11/GPTL	1	0	1	0		
BSB 3/A11/HSL	2	2	2	0		
BSB 3/A11/LIM2	2	2	1	0	10.46	20.81
BSB 3/A11/SBTL	1	1	1	0		11.08
BSB 3/A11/THL	6	6	5		12.79 15.35	11.67
BSB 3/A12/ARG	4 1	4 1	3 0	0 0	17.11	14.98
BSB 3/A12/BEE	1	1	1	3		
BSB 3/A12/CIT	2	0	2	2		7.05
BSB 3/A12/LAR	4 1	2 1	4 0	1 0	17.91 11.72	13.39
BSB 3/B10/HSL	1	1	0	0		
BSB 3/B10/LIM2	2	2	1	0		14.78
BSB 3/B10/SBTL BSB 3/B10/SBTL	2	2	0	0	9.62 17.5	

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
BSB 3/B10/THL	2	1	2	0	10.16	12
BSB 3/B11/CB	4	0	4	0		
BSB 3/B11/HSL	2	2	2	0		
BSB 3/B11/SBTL	1	0	1	2		
BSB 3/B11/SURF	1	1	1			
BSB 3/B12/BEE	3	0	3	0		18.6
	1	1	0	0		
BSB 3/B12/CIT	3	3	0	1		
BSB 3/B12/LAR	2	1	2	0		15.88
BSB 3/B12/LBEE	5	5	3	0	11.82	14.9
BSB 4/21/DOD	8	5	8	0	7.28	9.49
					9.03	13.23
					9.93	
					9.23	
BSB 4/E20/CHE	3	3	2	0		9.11
BSB 4/E21/BES	2	0	2	0		13.64
BSB 4/E21/CHE	5	5	1	0	8.55	
	2	1	2	0		
					7.41	
BSB 4/E21/WES	6	6	5	0	7.27	14.77
						10.45
BSB 4/E22/BAL	6	2	6	0		15.5
BSB 4/E22/BCH	1	1				
BSB 4/E22/BDO	10	10	9	2		11.28

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
BSB 4/E22/BES	1	1	1	0		
BSB 4/E22/GDO	7	4	7	0	10.58	13.29
	5	5	3	0	9.38	10.2
					8.64	9.95
						11.55
BSB 4/E22/WAL	4	0	4	0		
BSB 4/E22/WCH	2	1	2	0		
BSB 4/E22/WDO	10	8	10	3	8.44	10.07
					10.72	
					8.4	
BSB 4/E22/WES	4	4	3	2	11.5	
BSB 4/F20/CHE	3	3	3			
BSB 4/F21/BDO	8	4	8	5		10.69
						10.07
						12.45
BSB 4/F21/WCH	4	4	1	2	9.96	
BSB 4/F21/WDO	3	3	3	0		16.48
BSB 4/F21/WES	5	2	5	0	20.93	
BSB 4/F22/BDO	14	14	14	13	18	12.48
					9.14	9.84
					8	7.43
						11.51
						10.13
						11.4
BSB 4/F22/BES	2	2	2	0	10.93	
BSB 4/F22/GDO	9	8	9	4	9.94	9
					16.1	10.5

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
					9.57	
BSB 4/F22/GES	1	1	1	0		9.61
BSB 4/F22/ROBD	2	2	1	2		
BSB 4/F22/SES	2	2	1	0	12.08	
BSB 4/F22/WCH	1	1	0	0		
BSB 4/F22/WDO	1	1	1	0		
BSB 4/F22/WES	13	13	11	4	11.28	13.08
					10.2	11.94
					9.85	9.84
						10.25
						11.52
BSB 4/G20/CHE	1	1	0	0		
BSB 6/F21/SS1	4	3	4	0	13.45	12.65
					12.24	
BSB 6/F21/SURF	10	10	6	0	12.03	
					12.72	
					10.8	
BSB 6/G21/PASS2	2	2	2	0		
BSB 6/G21/PISS1	7	7	7	3	15.72	
					11.82	
BSB 6/G21/SS1	12	12	7	0	18.96	12.43
					13.45	7.84
					14.32	
BSB 6/G21/SS2	3	3	3			11.49
BSB 6/G21/SURF	18	17	18	4	11.23	12.27
					11.57	13.07
					9.89	13.29
					15.24	12.03

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
					12.96	10.43
					13.08	12.68
					12.55	12.68
					12.5	
					14.17	
BSB 6/H21/AAL	3	3	2	1	10.47	
					10.23	
BSB 6/H21/BET	2	2	0	0		
BSB 6/H21/CHA	1	0	1	0		17.25
BSB 6/H21/PAL	5	5	5	0	14.47	
					13.96	
					18.95	
					11.17	
BSB 6/H21/PBO	37	29	37	15	16.66	8.65
					11.13	13.95
					11.44	14.74
					13	12.19
					11.55	12.21
					13.76	13.06
					13.62	17.08
					14.12	14.28
					18.91	11.19
					12.23	15.67
					11.27	11.5
					13.16	13.14
					11.82	18.73
					17.85	12.73
						14.57
						7.72
						13.6
BSB 6/H21/PIL	5	3	5	6	18.61	19.32
					13.75	
BSB 6/H21/SS1	8	8	4		12.66	11.9
					12.3	11.25

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
					18.79	
BSB 6/H21/SS2	12	12	10	3	17.96	7.85
					9.01	
					10.79	
					14.91	
					14.48	
BSB 6/H21/SURF	37	37	31	8	12.78	11.26
					12.01	12.77
					13.02	11.68
					12.51	13.58
					14.65	17.81
					13.09	17.4
					12.86	21.37
					11.43	21.57
					12.83	14.99
					14.27	15.71
					12.59	13.27
					12.66	13.57
					11.93	13.05
					12.57	14.24
					11.05	13.13
					13.82	20.96
					11.55	14.49
						12
						12.26
BSB 6/I21/AAL	3	0	3	0		12.28
	2	2	1	0	8.75	
BSB 6/I21/DEL	7	5	7	2		13.87
BSB 6/I21/ECH	2	2	0	0	15.38	
BSB 6/I21/FOX	3	3	2		17.06	
BSB 6/I21/GOL	19	14	19	2	14.31	19.59
					8.29	12.45
					12.54	13.05
					12.26	10.64

APPENDIX B

UNIT	MNI	LEFT	RIGHT	FRAGS	M-LEFT (mm)	M-RIGHT (mm)
					9.79	7.44
BSB 6/I21/SS1	9	8	9	3	14.21	17.18
						14.11
						12.71
						13.68
						10.96
BSB 6/I21/SS2	9	9	3	1	11.09	
					7.1	
BSB 6/I21/SURF	22	17	22	15	12.34	14.52
					12.72	12.94
					16.15	19.64
					16.18	16.23

APPENDIX C

All sites: Ceramics

Site BSB 3

Unit	Fragments	Thickness (mm)	Temper	Decoration	Comment
B10 HSL	1	4.61	fine grit	?burnished	neck sherd
A12 ARG	1	5.4	grit	?burnished	body sherd

Site BSB 6

Unit	Fragments	Thickness (mm)	Temper	Decoration	Comment
H21 SURFA	6	5.7	grit	wind blasted	body sherd
		5.65	grit	wind blasted	body sherd
		6.39	grit	wind blasted	body sherd
		5.63	grit	wind blasted	body sherd
		5.04	grit	wind blasted	body sherd
		5.11	grit	wind blasted	body sherd
I21 SURFA	45	5.2	medium grit		body sherd
		5.73	medium grit	red slip	body sherd
		5.62	medium grit		body sherd
		5.79	fine grit	red slip	body sherd
		5	medium grit		body sherd
		5.82	medium grit		body sherd
		5.61	medium grit		body sherd
		5.7	medium grit		body sherd
		5.02	medium grit		body sherd
		5.41	medium grit		body sherd
		5.24	medium grit		body sherd
		5.63	medium grit		body sherd
		5.32	medium grit		body sherd
		6.23	medium grit		body sherd
		5.24	medium grit		body sherd
		5	medium grit		body sherd
		6.55	medium grit		body sherd
		5.37	medium grit		body sherd
I21 DEL	1	5.42	grit		body sherd

APPENDIX D

Ostrich Egg Shell

SITE	UNIT	WEIGHT (gm)
BSB 1	G3 LL1	2.3
	C10 LL1	4.2
	B10 LL1	1.4
BSB 2	L49 BRL	16.6
	L49 BSBL	1.9
	M48 BSBL	1
	K50 BRL	0.2
BSB 3	B12 LBEE	3.9
	B12 LARG	4.8
	B12 LARG	2
	B12 CITI	0.7
	B12 CIT	0.4
	B12 BEE	1.5
	B11 SBTL	0.5
	B11 HSL	0.7
	B11 CB	0.6
	B10 SBTL	1.1
	B10 LIM2	0.3
	B10 LIM2	0.9
	A12 LARG	2.1
	A12 CB	0.3
	A12 BEE	2.1
	A12 ARG	4.2
	A11 THL	2.6
	A11 SBTL	0.8
	A11 HS	3.2
	A11 GPTL	6
	A10 SURF	1.4
	A10 SPBL	1.1
	A10 LIM2	2
	A10 BL2	0.3
	A10 BL2	2.6
BSB 4	F22 SES	3.4
	F22 FIA	1.9
	E21 WES	1.2
	E20 CHE	1.3

Ostrich Egg Shell Beads

SITE	UNIT	EXT (mm	INT (mm)
BSB 2	M48 BSB	3.91	1.5
BSB 4	F22 BDO	3.57	1.58
	G20 CHE	6.37	2.8
BSB 6	F21 SURF	4.03	1.52

APPENDIX E

All sites: Fish

Body parts

		SURF	LL1				total
BSB1	hayomandibular		1				1
	hinge spine		2				2
	quadrates		1				1
	vertebrae	1	6				7
	total	1	10				11
		BUR	BRL	DLP			
BSB2	angular	1					1
	hinge spine		1	1			2
	spine	1					1
	vertebrae		1	1			2
	fragments		1				1
	total	2	2	2			6
		THL	CIT				
BSB3	vertebrae	1	2				2
	total	1	2				2
		DOD	WES	GDO	WDO	BDO	
BSB4	basi-occipital			1	1	1	3
	hinge spine			1		1	2
	pharangeal tooth cap	1					1
	pre-maxillary				1		1
	quadrates		1		2		3
	skull fragment			1			1
	spine		2			2	4
	supra-occipital			1			1
	vertebrae		2	1	3	3	9
	fragments		1		1		2
	total	1	5	5	7	7	25
		BET	AAL	PBO	GOL	SS2	
BSB6	angular			1			1
	basi-occipital		1				1
	cleithra			1			1
	epiphyal					1	1
	hayomandibular			1	1		2
	post-temporal		1				1
	pre-maxillary			1	1		2
	shoulder girdle					1	1
	spine		1				1
	sub-operculum			1			1
	supra-occipital					1	1
	vertebrae	1		5	3	7	16
	total	1	3	10	5	10	29

Species identified

BSB 2 M48 BURR	Hottentot	(Angular)
BSB 4 E22 WDO	Rock cod	(Pre max)
BSB 6 H21 PBO	Hottentot	(Angular)
	Hottentot	(Pre max)
BSB 6 I21 GOL	Hottentot	(Pre max)