B.H. SANDELOWSKY

## 1 INTRODUCTION

The archaeological project which forms part of the programme of the Desert Ecological Research Unit at Gobabeb focusses on the reconstruction of past environments in the Namib Desert. Wherever traces of human occupation are found they are recorded in order to explain behavioural adaptations to the environment.

In Africa drastic climatic changes such as the Ice Ages in Europe, did not occur during the Pleistocene. Here, environmental changes, which took place while early forms of man evolved, were of a more local nature. An accurate picture of what happened in Africa during the last 3-5 million years will emerge as the results of detailed studies in small areas are correlated.

The important influence which environment has on man is becoming The universal problems of pollution, increasingly obvious. overpopulation and the limited availability of important resources are matters of public concern. Since the changes which are threatening to bring about a crucial imbalance between man and his ecology can be traced to the more recent part of man's history, it is important to understand how he lived during that long time period preceeding the historical For approximately 99% of his existance on earth calendar. man lived by hunting and gathering, surviving in extreme conditions by adapting to his surroundings in various ways. Balikci (1968) suggests that adaptations can be analysed at three different levels i.e. the socio-ecological, the technological and the demographic By finding out what prehistoric environments were like levels. and how people lived in them, a better understanding of the factors involved in and leading up to present day problems is sought.

With these ideas in mind I started out on this project by looking for data which could attest to climatic conditions during the Pleistocene and Holocene as well as for evidence on human occupation. The following description of work done at two sites indicates the great amount of information available on this subject.

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## 11 MIRABIB HILL ROCK SHELTER (23°27'S 15°19'E)

Mirabib (also indicated as Anachankirab on some maps), is a granite inselberg approximately 40 km north-east of Gobabeb. Three kilometres cast of it there is a ridge of hills consisting of metamorphic schists and weathered granite outcrops belonging to the Damara System. Apart from one large shelter with paintings and cultural remains several small shelters have been located in these hills. In some of them artefacts can also be found but nowhere was the same depth of cultural deposit observed that is evident at the main shelter. Facing ESE it is situated in the side of a huge granite rock (fig. 1). An exfoliated slice of this boulder looks as though it had been cut off before it slipped down and is now forming a cleft. The fallen part is broken up into large slabs. A space between them forms a narrow, well-defined entrance to the shelter which is protected by rockwalls on all sides. On the vertical face of one of these rocks, situated at right angles to the back wall of the shelter, there are a few poorly preserved rock The shapes of five animals drawn in a dark red paintings. colour can be distinguished. A more weathered representation can be seen only when the light falls at a certain angle.

The plan of the shelter (fig. 2) was drawn according to a one metre grid that was laid out over the central surface of the shelter.

From dripline to backwall the shelter is 12 m deep and the central area measures 20 m across. On either side of this main area, gallery-like passages lead off for twenty to thirty metres around the edge of the hill beneath a slight overhang. The high roof allows easy movement in every part of the shelter. The ceiling, from the back wall outwards, is covered by a black layer of what could be the soot of fires. Such a deposit was not noticed in any of the smaller shelters in the surrounding. A line marks the outer edge of this sediment where exfoliation from the roof has taken place.

Two rock ledges in the backwall are covered with thick layers of white bird droppings. On the ground below these perches the remains of owl pellets are scattered. Many of them are broken and thousands of tiny bones litter the surface.

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Loose stones of various shapes and sizes were lying all over the In the south-western corner of the shelter shelter's floor. close to the backwall a pile of granite slabs looks as though it has been heaped up there intentionally. The stones have not yet been lifted and it is not known whether they bury something or what purpose they served. Not far from this stone heap, further towards the interior of the shelter, and against the back wall stones were found to lie in a horse-shoe formation (20 cm inner diameter) with one stone placed precisely in the centre of the semicircle. The central stone in the arc has a These stones have also not yet been lifted. ground surface. Closer to the centre of the shelter there is a row of large stones at right angles to the back wall. Some of them are resting on top of one another, suggesting that they may once have formed a low wall or divide.

Among many other larger stones of granite, quartz and schist 45 stones with one or more grinding surfaces were recorded from the surface in addition to five smaller pestle stones, two of which were still resting on a grinding stone. Polyhedrals of white quartz were also scattered over the surface.

Near the dripline a layer of dung with an even, smooth surface emerges beneath a layer of ash and cave earth near the front of the shelter. In the course of the excavation a similar surface of dung was encountered towards the back of the shelter below the surface layer of ash and cave earth. It appears to form a continuous surface with the layer near the front resembling a dung floor. I was told that Bushmen in Botswana paved the floor of a rock shelter with a mixture of dung and mud (Borland pers, comm.). Concentrations of ash and charcoal furthermore mark the floor of the shelter.

## The excavation

A datum point was fixed on a slab of bed rock in the south eastern corner of the shelter just below the paintings. A trench 3," m × 1 m was excavated at right angles to the back wall almost in the centre of the shelter below the most prominent rock ledge. Consequently the excavated area included a dense concentration of owl pellet material. All surface finds were bagged according to their relevant grid squares and the surface of the trench was then swept and sifted to an even level. The thickness of this surface

layer/ Page 4 ...

layer ranged from 0 - 10 cm. From then onwards layers 5 cm in thickness were removed by brush and trowel. At the deepest point bedrock was reached 70 cm below the surface.

All excavated material was sieved through a 3 mm screen. At all levels concentrations of owl pellet material was found. Since the small microfaunal bones slipped through the 3 mm sieve this material was put through a baker's meal sieve.

#### Stratigraphy

The section exposed along the walls of the excavation shows a complex layering of different materials (fig. 3). Lenses of ash, concentrations of vegetable matter and owl pellet material blend into one another. Five general layers seem to overlie bedrock:-

- 1) The surface layer varying in thickness from 5 to 15 cm contains dry cave earth with a great deal of ash and charcoal, vegetable remains, stone implements, worked and unworked fragments of ostrich egg shell. Pieces of twine, wooden implements and fragments of metal were limited to this layer.
- 2) Below this, portions of hard compacted deposit containing dung and vegetable matter seem to represent a continuation of the dung floor which is eroding out near the front of the shelter. This 'floor' varies in thickness between 3 and 10 cm.
- 3) Underneath it there is a darker layer which is firm as but not hard and compacted as the 'floor' above it. It contains more ash and stone artefacts, bone fragments, vegetable remains and ostrich egg shell fragments. In the lower part of this layer, which is approximately 10 cm thick, the content of ash and charcoal decreases.
- 4) At approximately 25 cm from the surface there is an admixture of fine sand or silt in the deposit which otherwise contains stone artefacts, bone fragments, ostrich egg shell pieces, vegetable remains and owl pellet material. The silty/sandy content increases with depth towards bedrock where granite spalls are intermixed as well.

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5) In grid square D bedrock slopes down towards the front of the shelter. Here another layer with charcoal and ash underlies the sandy layer and rests on bedrock.

## Dating

Charcoal samples for C 14 age determinations were taken at all levels of the excavation and three have been submitted to the CSIR Radiocarbon Dating Laboratory in Pretoria for analysis. One sample was taken from the layer above the dung floor and one from just below a compacted section of dung and cave earth approximately 25 cm below the surface. The third sample was taken just above bedrock (fig. 3).

## Description of the finds

A wide range of material was well preserved in this shelter. This was to be expected under such extremely dry conditions as those prevailing today. Apart from providing protection against moisture, the thick granite walls also prevent rapid changes in temperature.

Identification and analysis of most of the finds have not yet been completed. The following description is therefore a preliminary one which does, however, indicate the type of information which further work should provide.

Samples of the various layers, lenses and materials constituting the somewhat complex stratigraphy of this deposit have been submitted to experts in the fields of microbiology, conchology, botany, pedology and chemistry. The analyses of these materials is expected to provide data on past climatic and environmental conditions. Since charcoal has been found at all levels it will be possible to say at what time conditions indicated by the abovementioned evidence persisted.

### Faunal remains

The remains of animals were sorted into two categories: microfauna, comprising mostly the owl pellet material; and bones of larger animals including teeth, horncores and hoofs. Human skeletal remains have so far not been found or identified.

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The microfaunal material promises to provide the most valuable results because it occurred consistently throughout the deposit. So far a sampling of this material has shown that at least one species represented in the lowest levels of the deposit is conspicuously absent from later layers.

In keeping with the character of food remains found in archaeological excavations, the bones of the larger animals are all very fragmented. But the presence of preserved bone does allow the assumption that more extensive excavation could yield a valuable sample.

## Marine shell

Sixteen fragments of marine shell were found up to 35 cm below the surface (table 1). In addition to these fragments a number of unbroken Patella shells were found mixed with a cache of This accumulation of seeds and shells looks as though seeds. it may have been the contents of a bag or pot but no remains of any such a container could be discerned. Although the marine remains have not yet been identified by an expert, their presence in the deposit indicates that the inhabitants of this area must have had direct or indirect contact with the Such contact is also deferred from the find of a coast. cache of "valuables" consisting of a large whelk (mollusc) and four grooved stones in a cavity in another granite outcrop (fig. 4) half an hour's walk from the shelter, Once the marine shells have been identified it will be interesting to find out whether all the species are still found living on the coast today.

#### Ostrich egg shell fragments

Apart from the ostrich egg shell which was worked into ornaments 1 kg 130,69 gm of broken ostrich egg shell was found to be distributed in consistency with other materials throughout the thickness of the deposit (table 2). Of this quantity 189,55 gm were burnt. The weight of an average sized empty ostrich egg is 400 gm, and these fragments might therefore represent as few as 3 to 4 shells only.

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## Plant remains

Vegetable remains including stalks, stems, branches and leaves as well as seeds and pods were preserved in considerable quantities and at all levels of the excavation. The presence of pollen is unlikely under these conditions, but that has not yet been tested.

Identification and quantitative analysis of this material will provide valuable data for comparison with present day conditions. Similarities and differences will indicate what the vegetation around Mirabib was like at various times in the past.

## Distribution of marine shell

## Table 1

LEVELS	Fragments of marine shell
Surface	2
0-5	5
5-10	4
10 <b>-1</b> 5	1
15 <del>.</del> 20	2
20–25	-
25–30	-
30-35	2
35-40	
40-45	
45–50	n na na na haran na n
50-55	
55 <b></b> 60	-
60 <b></b> 65	



# Distribution of ostrich egg shell

# Table 2

LEVELS	Unworked Ostrich Egg shell				
	Burnt	Unburnt			
Surface	18,0 gm	26,05 gm			
0-5	20,5	50,5			
5-10	6,0	258,4			
10-15	14,7	52,0			
15-20	56,3	357,95			
20-25	6,4	157,35			
25-30	23,75	30,5			
30-35	6,6	8,3			
35-40	0,3	0,9			
40-45	-	-			
45-50		-			
50 <b>-</b> 55					
55-60	nanananan karan karan 				
60–65					

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## Li thic material

A total of 2324 pieces of worked stone were found (table 3). They range from fragments of shaped and polished objects such as pipe fragments to unretouched flake fragments. The terminology used to describe these stone implements is based on that used by S andelowsky (1972) and it closely agrees with that used by Wendt (1972).

The numbers in table 3 represent the finds in grid squares C and B only since the material from grid square D, still has to be sorted and counted.

#### Raw material

Quartz is the most commonly used raw material. The pestles and polyhedrals are made of white quartz. The majority of the microlithic artefacts were made of clear quartz. A vein of clear quartz of a fine grained variety well suited to the making of stone implements was found within half an hour's walking distance from the shelter in a mica schist formation.

A total of 114 microlithic artefacts were made from cryptocrystalline silica other than quartz. Chert and agate are well represented. The grinding stones are made of granite or micaceous schist. All the raw materials are available within the vicinity of the site.

#### Distribution

Relatively few microlithic artefacts were found in the surface layer. But the numbers increase with depth and the heaviest concentration occurs approximately 20 cm from the surface, below the dung floor. In grid square B this layer just overlies bedrock which appears 10 cm further down. The floor of the shelter slopes down from the back wall and appears in a corner of grid square C, 35 cm from the surface. Although the finds from the spits below 30 cm come from one grid square only a decrease in the quantity of stone implements is reflected. It coincides with a decrease in the content of ash and charcoal and a concomitant admixture of silty material in the deposit.

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The distribution of artefacts belonging to various typological categories seems to be consistent in the different levels. Apparently the quantitative increase of implements halfway through the thickness of the deposit coincides with better workmanship of the tools. But this impression has not yet been verified by statistical analysis.

### Isolated finds

A fragment of a smoking pipe carved out of soapstone was found in the surface layer. In the collection of the State Museum, Windhoek, there are at least two complete specimens of such cigar shaped pipes made of similar materials. Other specimens are housed in private collections. Wendt (1972: 32) reports finds of similar fragments from two excavations in the Uri-Hauchab and near Bethanie.

Also close to the surface a carefully shaped piece of stone with a perforation was found, probably representing a pendant. This was made of a talcic mica schist.

In the 10-15 cm spit one half of a small, well-shaped grooved stone made of soapstone, was found. It was broken along the groove where the stone was only a few millimetres thick. Not far away from this implement a curious, capsule-like, black, polished stone was lying. In diameter as well as in length it fits into the groove of the other stone, but whether this coincidence implies any connection between the two artefacts is not possible to say. Farther down in the deposit a similar capsule-like stone made of the same dark, fine-grained material was found. Apart from being a little larger it resembles the other specimen closely.

## Grindingstones

One complete grindingstone and a fragment of one were found on the surface of these two grid squares. Six more fragments of grindingstones, three of them fitting onto one another, were found at lower levels. According to the large number of these tools found on the surface of the shelter as a whole, these grindingstones must have been in great demand, particularly during the latter phase of occupation.

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Red staining on the polished surface of two of these stones implies that ochre was ground on them. It was probably used for the rock painting as well as for cosmetic purposes. Around some of the grindingstones the remains of cucurbit seeds were found. Possibly grinding of Nara was carried on, as is still done by some of the Topnaar people living along the Kuiseb River today.

## Pestles

One broken and one complete pestle stone resembling others found on the surface beyond the excavated area, furthermore attest to a great deal of grinding. A stone resembling these pestles was noticed in the Topnaar village of Sout Rivier on the Kuiseb River. It was said to be used for grinding up salt. Lumps of salt were found in the excavation and this may indicate another purpose to which the grinding tools were put.

## Polyhedrals

Two cobbles of white quartz with pecking marks are also representative of similar implements scattered over the remainder of the shelter's surface.

### Cores and flake tools

The majority (2021) of the remaining 2296 artefacts consist of flakes and flake fragments, mostly made of quartz. There are 86 cores and core fragments and 189 retouched pieces. Scrapers and segments are the most commonly occurring type of microlith. Comments about the technique of stone tool working and comparisons with other assemblages have to await a more thorough analysis of this material.

## Artefacts made out of organic material

The finds of well-preserved organic materials (tables 1, 2, and 4) indicate that the conditions of preservation in this shelter are excellent.

## Distribution of stone artefacts from grid squares C & B

Table	3
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-45 7 18 1 26	
-50 2 8 21 3 34	
-55	
	notal 2324

## Wooden tools

Three wooden implements of similar size were found. Two of them are evenly rounded cylindrical sticks. One has a tapered end or point. The other has blunt ends with a notch carved into its side one centimetre from the end. The third implement is longer and has red colour adhering to it.

### Twine

Two pieces of twine consist of two cords of vegetable fibre twisted around one another.

Long stems of grass were found tied into a knot, possibly representing a net.

## Rattle

A seed pod or cocoon (not yet identified) containing small stones or seeds may have been used as a rattle for musical effect.

### Leather fragments

Three small fragments of leather were found. They vary in thickness and texture. Unfortunately they are too small to indicate what they may have been part of.

#### Worked bone

Seven pieces of worked bone were found at various levels of the deposit. One complete and three broken beads represent the most common and at the same time the most striking type of bone work. The unbroken bead is made of bird bone and has an elongated, elegant shape. The other beads appear to have been shorter and broader. They are all well polished.

Two of the remaining bone artefacts are points which may have been used as arrow heads. Part of the surface on a fragment of long bone is polished but it does not indicate any specific tool type.

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#### Human ha**i**r

Human hair was found in various forms. A few tufts of tightly curled, otherwise unaltered hair was found as well as strands of hair baked together with clay and/or ochre. One such a string of hair 4 cm long, has an ostrich egg shell bead adhering to its end. Some hair and ochre was sticking to two sharp-edged chips of quartz.

## Feathers

Small tufts of fluffy greenish-yellow down feathers were collected but it is not known what they could have been used for. Quill feathers with V-shaped ends which must have been cut with a sharp tool may have been inserted into the shafts of arrows.

#### Worked ostrich egg shell

A total of 181 complete ostrich egg shell beads and 113 fragments of beads were recovered. There is considerable variation in the size of these ornaments and their degree of roundness. The radius of the smallest and most symmetrically rounded beads approximates the thickness of the egg shell. The largest beads have a radius of one centimetre giving almost the appearance of a disc or pendant, perforated in the centre.

In addition to the beads four larger pendants with perforations off-centre were found, as well as a few round discs which were not (? yet) perforated.

#### Metal

Four fragments of metal and two copper beads were found in the top layer of the deposit. A thin, twisted fragment of copper plate is covered by a green layer of corrosion. Two scraps, of what probably is iron, have dimensions no greater than 2,5 cm. It is not known what these three metal fragments may have been part of nor has it yet been ascertained whether they represent commercial products or whether they could have been hand-made. The latter query also applies to the fourth, very much sturdier metal find which resembles the blade of a pen knife. A slight unevenness of the surface of this blade

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could suggest handwork, but it might also be the result of corrosion and usage.

Two small copper beads resemble each other closely in shape and size. One was found closer to the surface than the other and this one was green and heavily corroded. The other one which was found 12 cm below the surface has a smooth, shiny surface with a reddish copper colour. It shows a seam along one side.

#### Pottery

In 1971 an almost complete clay pot was found near the entrance of the shelter. It lay concealed amidst some large rocks approximately 3 m beyond the dripline. The pot has a conical shape, pointed at the base with a wide opening, marked by neither a constriction near the neck nor any thickening or bevelling of the rim. There are no lugs and no decorations.

The paste is fairly coarse and of a dark grey colour. A thick layer of black soot adheres to large parts of the surface, especially around the opening.

In the excavation only five small body sherds were found close to the surface. One of these sherds is burnished but none of them are otherwise decorated. The paste is fine and of a dark colour.

### III DISCUSSION

The location of the Mirabib shelter lends itself well to a total area survey of the catchment area of this site. Since no present human occupation occurs within the wider vicinity a study of present ecological conditions will provide a reliable control for comparison with conditions as reconstructed for the past. The Desert Ecological Research Unit is engaged in a survey of mammals in this area. A survey of botanical material will be taken and a geological study of available raw materials and sources of fresh water has been started as well.

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Distribution of artefacts made of organic material

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T PUPI C		N L	5	efacts	Ostrich egg shell Veg. Artef.					
TFA 272	Hair	Feather	Leather	Bone arte	Beads	frags.	pendants	Twine	Wood	
surface	unaltered human hair	-	¥	-	13	7	-	×	2 wood tools	knitted grass
0-5 cm	hair with ochre	-	-	-	8	9	-	-	-	rattle
5 <b>-</b> 10	hair & bead	Ŧ	Ŧ	-	41	27	1	夫	-	
10-15	-	æ	-	bead & tool	41	7	2	-	-	_
15-20		Ŧ	-	bead	47	38	er og nædning og og er	-		ranneti i Kitike,ita,
20-25	-	-	-	bead	17	20	-	-	wood tool	
25 <b>-</b> 30	-	-	-	-	5	5	-	-	-	-
30 <b>-</b> 35	hair & ochre on quartz	•••	-	bead	7	6	1	-	-	-
35-40	-	-	-	-	2	-	-	-	-	-
40-45	, i se su su su su su su su su se	n mit im Vielam i	-		en an anne a fast sugara	l	ана — Р Анбриян и на та	-	-	
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55 <b>-</b> 65	-		-	-	-	l	-		-	
	an an ann an		- <b>-</b>	5	181	121	4	10.00	3	

Total

± = present

Presumably the most recent occupation at Mirabib took place under conditions as we know them today. The topmost layer containing metal fragments is probably no older than 3 to 4 hundred The associated finds indicate a hunter-gatherer way of years. life during which this shelter was used quite intensively, probably during those months after the rains when fresh water was still available in some of the hollows in the granite, or later when wild foods of the area were ripe. The great amount of ash in the deposit, the blackness of the shelter's ceiling if it is a result of smoke, the large number of grindingstones, stone artefacts and tools of wood, fibre and bone indicate that the site was probably occupied by family groups for quite some time. If these inhabitants indeed had the habit of paving the interior of the shelter with a mixture of dung and water or clay and vegetable matter this furthermore implies well-regulated occupation.

The finds of marine origin point to contacts with the coast. Work at sites along the coast and in the area between the coast and Mirabib, possibly along the Kuiseb River, may tell more about the nature of these contacts. Did the seasonal round of a single group include visits to the coast as well or were goods from the coast exchanged or traded for materials from the interior? Information on the social behaviour of these groups may be shown to dovetail with ecological conditions.

The ornaments and the strands of hair, in one case attached to an ostrich egg shell bead, attest to festive dress and make-up, possibly for ceremonial occasions which were performed here. Although the date for rock paintings is hard to establish it must be borne in mind that they may also be related to such activity. Once the season of occupation for this site could be established it would be interesting to find out whether it coincided with a particularly intensive period of social activity. This would provide data on adaptations at a socio-ecological level. Before it is possible to recover information of that kind, however, a great deal of work, both here and elsewhere will have to be done, since there are hardly any comparable data available **as** yet.

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Adaptations at the technological level, seem to resemble those of hunter-gatherer groups in similar evironments. The microliths, twine and wooden tools indicate hunting with bow and arrow, snares and traps. Leather fragments and pieces of bark may represent items of clothing or containers for carrying or storing things. Clay pots may have been used for storing as well as cooking. The cache of grooved stones and the sea shell imply that heavy items were stored when their owners had to carry things for long distances.

Some data leading to information on the demography of the Mirabib inhabitants might be obtained by calculating how much food could have been available. This would not necessarily determine the size of the group because many other factors would influence it as well. For instance the fact that certain foods are available does not imply that they are used. On the other hand, foods can be brought into an area that do not occur there ordinarily. The duration of the occupation would also play an important part. In addition cultural prejudices may have to be accounted for, i.e. what one group may consider a starvation diet may be adequate in terms of another set of customs. But by determining what a group would require physiologically to survive and by establishing the maximum population an area could carry, if its potential were used to capacity, certain limits are provided. It is more difficult to discover the cultural mechanisms that may have influenced or controlled the size of the population. Finds of skeletal remains could provide some information of this kind, but it is rather unrealistic to expect to find a sufficiently large sample of human bone within a limited period of time. Probably the most promising approach at present would be the one using analogies from modern groups.

## IV Sout Rivier site $(15^{\circ}0 \text{ E } 23^{\circ}32 \text{ S})$

Sout Rivier is the name of a small Topnaar village on the northern bank of the Kuiseb River five km downstream from the Research Station. The river makes a sharp northward bend here, with dunes accumulating on the rock surface which forms the southern bank. On the southern slope of the first ridge of dunes running parallel to the bend of the river an accumulation of cobbles, chipped stone and small fragments of bone were found. Discoloration of the sand due to ash can be noticed underneath the artefacts.

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Without rather sophisticated technical assistance an excavation in this loose dune sand, which is being set in motion by a strong wind every afternoon, was an unfeasible proposition. Consequently I decided to draw a plan showing the position of each object on the surface (fig. 5). A grid of one meter squares was laid out so as to enclose the full extent The grid measured 20 m by 10 m, with of this occurrence. the long axis parallel to the crest of the dune. After the first morning's work the appearance of the plotted squares contrasted sharply with that of the unplotted squares. The worked area had been picked clean of all finds leaving behind only many small marks in the sand attesting to the hundreds of times that thumb and forefinger had picked up a chip of stone or bone. Beyond the lines of string demarcating the worked squares the surface was covered with a dense scatter of flake fragments, bone splinters, pebbles, cobbles and ostrich egg shell fragments. Our surprise the next day was therefore considerable when the worked squares were again littered with artefacts and could hardly be distinguished from the squares not yet plotted. The marks of the previous day's activities - finger marks, foot prints and tyre tracks - had been blown away and a fresh surface of finds were exposed.

Plotting continued in the areas not previously worked and the plan (fig.5) therefore approximates the surface as it was first seen. Possibly that surface represents only the top of a much larger mound of midden material hidden beneath the sand. It was repeatedly noticed that wind uncovered small finds many metres beyond the boundaries of the grid. Wherever a heavy object such as the wheel of the car or a bucket had sunk a few centimetres into the dune sand the wind would expose minute pieces of bone and stone.

The finds collected from this site have not yet been sorted or counted and the following description will only indicate the types of material found here.

#### Stone

Large waterworn cobbles, some too large to be picked up in one hand, are the most striking feature in this assemblage.

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Most of them are made of a dark, fine-grained doloritic or dioritic stone, while some are made of quartz. Angular specimens of mica schist also occur. Today the closest source for these stones, particularly the large waterworn cobbles, is approximately 1 km away. They do not occur commonly in that part part of the river bed closest to the occurrence and only one accumulation of gravel with larger cobbles has sofar been located on the northern riverbank a few hundred metres down-The angular schist and quartz stones could have stream. originated from granite marking the southern riverbank directly below the site. Signs of working on these stones are represented by pecking marks and fractures. They may have been used as hammers or anvils. Commonly, chips are broken out of the stone and sometimes one or two well defined flake scars can be distinguished. A few of the stones have flat or slightly concave grinding surfaces. Many show natural fractures and heat spalls, possibly caused by fire. Isolated unbroken flakes represent the only conventionally worked stone tools.

#### Bone

The bone fragments collected sofar are too small to be identified. Possibly larger, more complete pieces will be found at a lower level. A number of identifiable tooth fragments have, however, been recovered. They mostly belong to large herbivores. The bone fragments resemble those found at Narabeb (Seely and Sandelowsky, 1973) which were examined and found to be partially or completely calcified.

#### Ostrich egg shell

A few ostrich egg shell fragments and beads were found. These represent the most formal type of artefact at this site.

#### Wood

A few small pieces of wood were found. They show no signs of having been worked. Some of these too, may have been mineralized, but they have not yet been examined to ascertain this.

No metal or glass was found on this site.

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## DISCUSSION

When the Sout Rivier site was first investigated it was suggested that it might represent a recent kill site where inhabitants of the nearby village of Sout Rivier had killed a gemsbok. The oldest people in the village were questioned about this place but denied any knowledge of it. This information, however, is hard to asses since strict laws against hunting have been enforced in the game park in recent years and people may be afraid of acknowledging awareness of game having been killed in the vicinity of their On the other hand the absence of glass and metal, village. the presence of ostrich egg shell beads and the fossilized appearance of the bone chips also support an older date for this site and it may well be that the modern inhabitants of Sout Rivier know nothing about it.

It should be possible to collect sufficient charcoal from this site to obtain a C 14 date. This will require some excavation since a charcoal sample from the surface only would not be reliable enough. If a date from Sout Rivier falls within the time range of the occupation of the Mirabib Hill rock shelter the information on these two sites would nicely complement one another.

The most obvious problem to be solved at the Sout Rivier site concerns the work procedure to be applied to a site situated on the side of a moving dune. The presence of both wood and bone allow one to hope that deeper down in the deposit larger and identifiable specimens of this sort will be found which could provide information on the environment. Should this site turn out to be somewhat like an iceberg, as could be indicated by the material that the wind uncovers far beyond the extent of the present surface occurrence, this deposit could yield data of geomorphological interest. If this is a dated midden of some size it gives a sine qua non date for the dune presently covering it. This dune is today part of a high, long ridge. Information of this sort would have relevance to the DERU project involving the measurement of dune formation and movement. This in turn contributes to an understanding of what is happening along the northern edge of the dune sea of the central Namib. Although it may be generally accepted that under present climatic conditions the dunes move northward it could be vital to know more precisely the circumstances and the rate at which this is taking place.

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## Illustrations

I The Mirabib hill shelter

II Plan of the surface in Mirabib hill shelter

III Section of trial trench in Mirabib hill shelter

- IV Cache of shell and grooved stone
- V Plan of the Sout Rivier dune site

### Tables

1. Distribution of marine shell

2. Distribution of ostrich egg shell

3. Distribution of stone artefacts

4. Distribution of organic artefacts