

ARCHAEOLOGICAL INVESTIGATIONS AT MIRABIB HILL ROCK SHELTER

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This archaeological project, which forms part of the programme of the Desert Ecological Research Unit at Gobabeb, focuses on the reconstruction of past environments in the Namib Desert. 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 the Mirabib Hill Shelter indicates the great amount of information available on this subject at this archaeological site. Ideally this data could be related to results of investigations into geomorphological phenomena in the central Namib such as the high silt beds occurring in the tributaries of the Kuiseb approximately 20 km south of Mirabib (Goudie 1972). It has been suggested that they represent a past dry period during which the Kuiseb may have been blocked, causing pools or pans in which this mud was deposited. Shells of fresh-water snails discovered in these silt beds indicate a possibility for dating.

Ponding of a river-bed occurs today at Tsondeb Vlei. An Early Stone Age site west of this vlei suggests that in the past the river may have penetrated further

westward than it does today (Seely & Sandelowsky in this volume). Possibly the time relationship between these occurrences could be worked out with the aid of further archaeological investigations at sites which have been located in the central Namib area. About 10 km from the coast between Walvis Bay and Swakopmund a beach terrace, possibly also of Pleistocene date, has been traced over a distance of approximately 30 km. It can be seen in the profile of a trench dug for a pipeline and it is marked by waterworn cobbles and warm-water molluscs. Underlying it there are cross-bedded red sands and silts.

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, the Namib Desert Research Station in South West Africa. A few kilometres east of Mirabib metamorphic schists and weathered granite belonging to the Damara System form a ridge of low hills where weathering and exfoliation has brought about the formation of several shelters (Beseler 1971: 105). In many of them microlithic artefacts, mostly of quartz, can be found as well as grinding stones, pot-

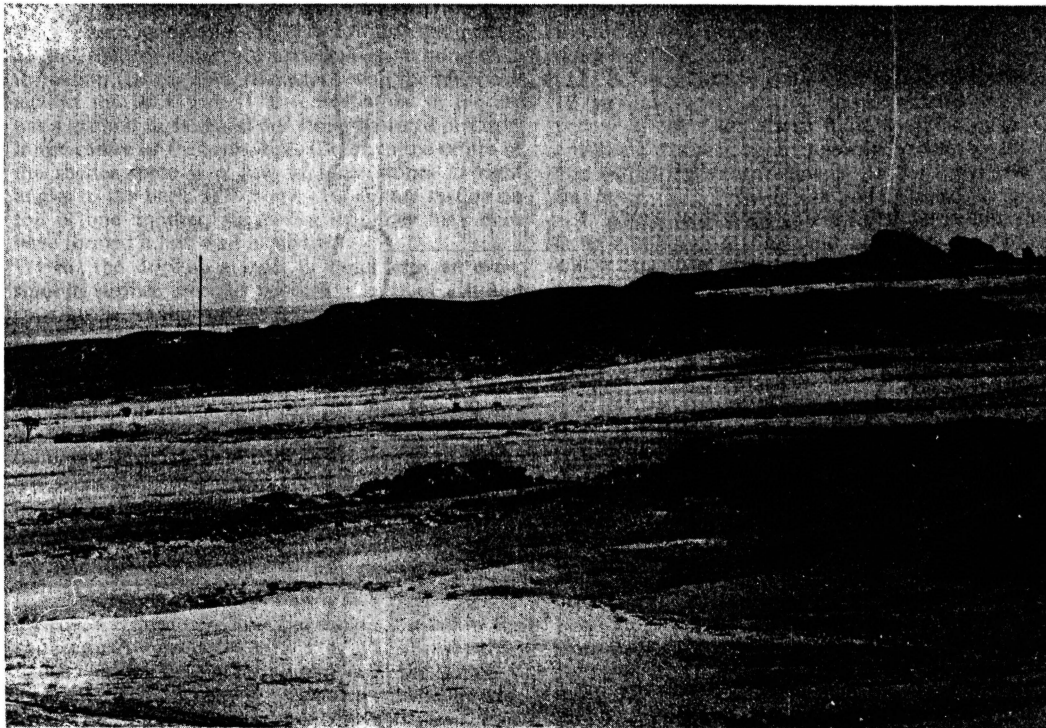
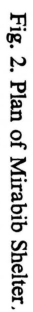


Fig. 1. The Mirabib Hill Shelter.

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sherds, ostrich eggshell and bone fragments. One particularly large shelter, the Mirabib Hill Shelter, contains a considerable depth of deposit and also has some paintings on one of the shelter walls. Facing ESE it is situated in the side of a granite outcrop (fig. 1). It looks as though a huge slice of rock was cut off and slipped down. The shelter is situated in the cleft between the main rock and the fallen part, which is broken up into several large slabs. A space between the slabs forms a narrow, well-defined entrance to the shelter, which is protected by rock walls on all sides. On the vertical face of one of these rocks, situated at right angles to the back wall, there are some poorly preserved paintings of animals and human figures.

From dripline to back wall 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 20 to 30 metres. The high roof of the shelter is marked by a black layer of what could be the soot of fires. Such a deposit was not noticed in the smaller shelters in this area.

Two rock ledges in the back wall 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. Granite, quartz and schist stones of various shapes and sizes were lying all over the shelter's floor and 45 of them had one or more grinding surfaces. Two pestles were resting on a large quern with two grinding surfaces. In the south-western corner of the shelter, close to the back wall, a pile of granite slabs appears to have been built up there intentionally. Not far away towards the interior of the shelter stones are arranged in a horse-shoe formation (20 cm inner diameter), with the open end against the back wall. The central stone in the arc has a ground surface and one stone is placed precisely in the centre of the semicircle. 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.

Near the dripline a layer of dung with an even, smooth surface emerges beneath a layer of ash and cave earth. As the surface layer of dust and ash was swept away this dung floor was found to cover the central area of the shelter. In the course of the excavation a second, similar surface was encountered approximately 10 cm below the top one. Dung floors of this sort are a rare occurrence, known to me only from one location in Rhodesia (Cooke pers. com.) and from Botswana where I was told that Bushmen paved the floor of a rock shelter with a mixture of dung and mud (Borland pers. com.).

The excavation

A datum point was fixed on a slab of bedrock in the south-eastern corner of the shelter just below the paintings. A trench 4.5 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 with bird droppings. Consequently the excavated area included a dense concentration of owl pellet material on the surface. The surface layer, which was swept

away to give a horizontal plane parallel to the datum line ranged from 0 to 10 cm in thickness. Subsequent layers of 5 cm thickness were removed by brush and trowel and bedrock was reached 70 cm below the surface at the deepest point (fig. 3).

All excavated material was dry sieved through a 3 mm screen. Wherever owl pellet material was found in dense concentrations the deposit was put through a baker's meal sieve since the small microfaunal bones slipped through the 3 mm sieve. In grid square E a sample of unsifted deposit from every layer was kept for special treatment in the laboratory.

Stratigraphy

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

1. The surface layer varying in thickness from 5 to 15 cm contains dry cave earth with ash and charcoal, vegetable remains, stone implements, worked and unworked fragments of ostrich eggshell. Pieces of twine, wooden implements and fragments of metal were limited to this layer.

2. Below this, portions of hard compacted deposit of dung and vegetable matter 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. In grid square E a second dung floor surface can be discerned approximately 10 cm below the first. Stone artefacts, ostrich eggshell fragments and pieces of bone are embedded in the dung floor material.

3. Below this there is a darker layer approximately 10 cm thick, which is firm but not as hard and compacted as the floor above it. It contains more ash and stone artefacts, bone fragments, vegetable remains and ostrich eggshell fragments. In the lower part of this layer, 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 eggshell pieces, vegetable remains and owl pellet material. The silty/sandy content with an admixture of granite spalls increases with depth towards bedrock in the two grid squares closest to the back wall.

5. In grid squares D and E bedrock slopes down towards the front of the shelter and here another layer with charcoal, ash and cultural material underlies the sandy layer and rests on bedrock.

Dating

Charcoal samples for C14 age determinations were taken at all levels of the excavation and three have been submitted to the C.S.I.R. Radiocarbon Dating Laboratory in Pretoria for analysis. The sample taken from the dung-floor layer gave a date of 5190 ± 75 B.P. (Pta 1011). A sample from approximately 25 cm below the surface was dated to 6470 ± 80 B.P. (Pta 1012). The third sample was taken just above bedrock in grid square C. It may date the very top of the layer of cultural material that is gaining in thick-

ness where bedrock slopes down towards the front of the shelter in grid squares D and E. This gave a date of $8\,200 \pm 80$ B.P. (Pta 1013). From these three dates it may be deduced that together with the lowest layer this deposit spans a period of roughly ten thousand years. The slow rate of deposition becomes understandable when the interior of this shelter is observed during wind and rain. The inside of the shelter is extremely well protected and hardly a breath of air stirs here while strong wind may be blowing outside. Similarly even the rare downpour of rain does not affect this sheltered area.

To have dates for a deposit containing such well-preserved faunal and floral material provides an excellent opportunity for reconstructing the environmental conditions in this area during the last millennium. The stratigraphy points to considerable changes and it will be most interesting to see whether the analysis of the material confirms these impressions.

The earliest layer with a considerable amount of charcoal may represent fairly regular occupation. The next layer, containing a great deal of owl pellet material and fine sand resembling wind-blown material, seems to have accumulated to greater thickness faster than the layer above it. This could imply a change of climatic conditions and more intermittent habitation. By contrast the uppermost layer again contains a great deal of ash, charcoal and cultural remains.

The extremely dry conditions in this area and the protection which the thick granite walls provide against moisture and rapid changes in temperature have ensured excellent preservation of a wide range of materials.

Identification and analysis of most of the finds has 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.

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, horn cores and hooves. Human skeletal remains have so far not been found inside the shelter. A number of what appear to be graves have, however, been found in the vicinity and it is hoped that cultural material may provide a link between those occurrences.

The microfaunal material 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 absent from later layers. The analysis of this material will be enhanced by a survey of small mammals presently living in this area (Stuart in press). Similarly there will be available for comparison a study of at least two collections of owl pellets. One of these has been made at an owl roost in a rock crevice at Mirabib Mountains in the immediate vicinity of Mirabib Hill Shelter. The second collection comes from an owl roost in a rather different habitat. It is situated on the bank of the Kuiseb River on the edge of the sand dunes of the central Namib (Brain in this volume). In keeping with the character of food

remains found in archaeological excavations, the bones of the larger animals are all very fragmented. More extensive excavation should, however, yield a valuable sample of larger animal bone as well.

Marine shell

Sixteen fragments of marine shell were found up to 35 cm below the surface. In addition to these fragments a number of unbroken *Patella* shells were found mixed with a cache of seeds. The marine remains have not yet been identified by an expert, but simply their presence indicates contact with the coast. Finds of this sort may contribute towards an understanding of a pattern of transhumance that was in all likelihood practised here.

Ostrich eggshell fragments

Apart from the ostrich eggshell which was worked into ornaments, broken ostrich eggshell was found to be distributed consistently with other materials throughout the thickness of the deposit. A considerable amount of the ostrich eggshell is burnt.

Plant remains

Seeds, pods, stalks, stems, branches and leaves constitute the recognizable vegetable remains which are found at all levels of the excavation.

Identification of this material will guide a survey of present-day vegetation in the catchment area of this site. The interpretation of the plant remains will furthermore be enhanced by an Ethno-botany study conducted on the use of plants by the indigenous Topnaar people living on the banks of the Kuiseb River. Ethnologically the most interesting observation on the plant remains concerns the occurrence of seed coats of a cucurbit, probably the Nara plant, *Acanthosicyos horrida* (Giess 1962). This melon, which constitutes a staple food of the Topnaars, grows in the sand dunes and in the valley of the Kuiseb River. The flesh of the fruit is used as well as the seeds, which contain an almond-like kernel. The seed coats of this plant are found at every level of the excavation and may indicate a 10 000-year-old tradition of nara utilization. Experiments on breakage patterns, dispersal and decay of the seeds are designed to test the fact that the seed remains in the excavation stem from human usage.

Lithic material

In two of the grid squares (B and C) a total of 2 324 pieces of worked stone were found (table 1). 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 Sandelowsky (1972) and it closely agrees with that used by Wendt (1972).

Raw material

Quartz is the most commonly used raw material. Most of the pestles and polyhedrals are made of white quartz, whereas the grinding stones are mostly made of granite or micaceous schist. The majority of the microlithic artefacts were made of clear quartz.

A total of 114 microlithic artefacts were made from

crypto-crystalline silica other than quartz. Chert and agate are well represented. 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.

Distribution

The numbers of microlithic artefacts increase with depth from the surface, the heaviest concentration occurring approximately 20 cm from the surface just 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.

The distribution of artefacts belonging to various typological categories seems to be consistent in the different levels. Apparently the quantitative increase of implements half-way through the thickness of the deposit coincides with better workmanship of the tools. But this impression has yet to be 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 specimens closely.

Stone artefacts

One complete grindstone and a fragment of another were found on the surface of these two grid squares. Six more fragments of grindstones, three of them fitting on to 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 grindstones must have been in great demand. Whether their occurrence on the surface indicates an increasing

demand during the latter phases of occupation is hard to say. A rapid accumulation of material would have been required to cover them completely. If they represented useful tools it is conceivable that the inhabitants of the shelter would have seen to it that they did not get covered with earth.

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. Recently a small mica schist stone with red colour was seen near a hut in one of the Topnaar villages. When asked what it was used for, I was told that the women use it to put 'cream' on their cheeks.

One broken and one complete pestle stone resembling others found on the surface was also found in the trench. A stone resembling these pestles was also seen in the Topnaar village. It was said to be used for grinding up salt. Small lumps of salt were found in the excavation and may represent one type of material ground. Rich deposits of salt occur at at least two places within one to two days' walking distance from the shelter.

Two cobbles of white quartz with pecking marks were found in the excavation while similar implements occur on the surface. These are classed as polyhedrals. The majority (2 021) of the remaining 2 296 artefacts consist of flakes and flake fragments, mostly 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

A number of artefacts are made of organic materials. 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 1 cm from the end. The third implement is longer and has red colour adhering to it. 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 part of a net. A cocoon of a moth containing small stones or seeds may have been used as a rattle for musical effect. Three small fragments of leather were found. They vary in thickness and texture. Unfortunately they are too small to indicate what they were part of.

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 arrowheads. Part of the surface on a fragment of long bone is polished but it does not indicate any specific tool type.

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 eggshell bead adhering to its end. Some hair and ochre was sticking to two sharp-edged chips of quartz.

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.

A total of 181 complete ostrich eggshell beads and 113 fragments of beads were recovered from the two grid squares B and C. 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 eggshell. The largest beads have a radius of 1 cm, 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 artefacts

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 penknife. A slight unevenness of the surface of this blade 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.

A similar completely undamaged pot was found beneath a semi-hollow granite boulder about a 15-minute walk from the shelter.

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

Discussion

The location of the Mirabib Shelter lends itself well to a total area survey of the catchment area of this site (Higgs & Vita-Finzi 1972; Vita-Finzi & Higgs 1970). Since no present human occupation occurs within the wider vicinity a study of present ecological conditions will enable a comparison with conditions as reconstructed for the past. The Desert Ecological Research Unit is engaged in an extensive survey of natural resources in this area. Within the framework of this study a 1 km grid of rain-gauges has been laid out over an area of 121 square kilometres surrounding the shelter. An attempt will be made to work out the relationship between rain and the productivity of the vegetation. The nature of this area requires this to be a long-term study because there is such a wide range between good and bad years (Morris & Muller 1970). On the basis of a few years of data it will, however, be possible to obtain an estimate of conditions. This will provide data for comparison with the organic materials from various time-depths.

The most recent occupation at Mirabib probably took place under conditions as we know them today. The remains found here indicate a hunter-gatherer way of life. Seasonal occupation of an area is a typical characteristic of this type of economy and Mirabib Hill Shelter was probably occupied for a few 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. Considering the long time it took for this deposit to accumulate it is possible that the shelter was not used every year but perhaps only during years of exceptionally good rains. This could possibly be correlated with year-to-year variations in plant growth.

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?

The ornaments and the strands of hair, in one case attached to an ostrich eggshell bead, attest to festive dress and make-up, possibly for ceremonial occasions. The rock-paintings 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 (Balikci 1968). This would provide data on adaptations at a socio-ecological level. But before it is possible to recover information of that kind a great deal of work in the immediate vicinity and elsewhere will have to be done, since there are hardly any comparable data available as yet.

Adaptations at the technological level, seem to resemble those of hunter-gatherer groups in similar environments. 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. Clay pots may have been used for storing as well as cooking.

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. The length of occupation might also have depended upon the favourability of the season and the number of inhabitants. 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 that using analogies from modern groups.

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