SOME ASPECTS OF HOLOCENE PREHISTORY IN CENTRAL SOUTH WEST AFRICA

With especial reference to Big Elephant Shelter, Erongo Mountains

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CHAPTER 1

INTRODUCTION

Archaeological background: The present state of archaeological research in South West Africa

The aims of my own research in central South West Africa are rooted in the history of archaeological work already carried out in the territory. For this reason, I begin with a discussion of the background of Late Stone Age archaeological research carried out in central South West Africa. For the purposes of the current research programme, central South West Africa is defined as the territory lying between the Latitudes 20 and 24 degrees.

Archaeological research in South West Africa is still in its infancy. Until five years ago, systematic excavation, analysis of material and detailed publication was rare. Many small excavations and surface collections have been made in the past without receiving publication at all. A summary of the known and published archaeological research on Holocene prehistory in central South West Africa follows; most of the sites mentioned in the text are plotted on the map (Figure 1).

The first archaeological investigator in South West Africa to carry out research in a systematic way was Lebzelter, from Vienna, who visited South West Africa in 1928-9. He published his findings in Die Vorgeschichte von Süd-und Südwestafrika (1930).

In the early 1950's, Fock began work as the State archaeologist in South West Africa and, in 1959, published a review of archaeological research in the territory.

ARCHAEOLOGICAL SITES IN CENTRAL SOUTH WEST AFRICA

partly after Wendt 1972

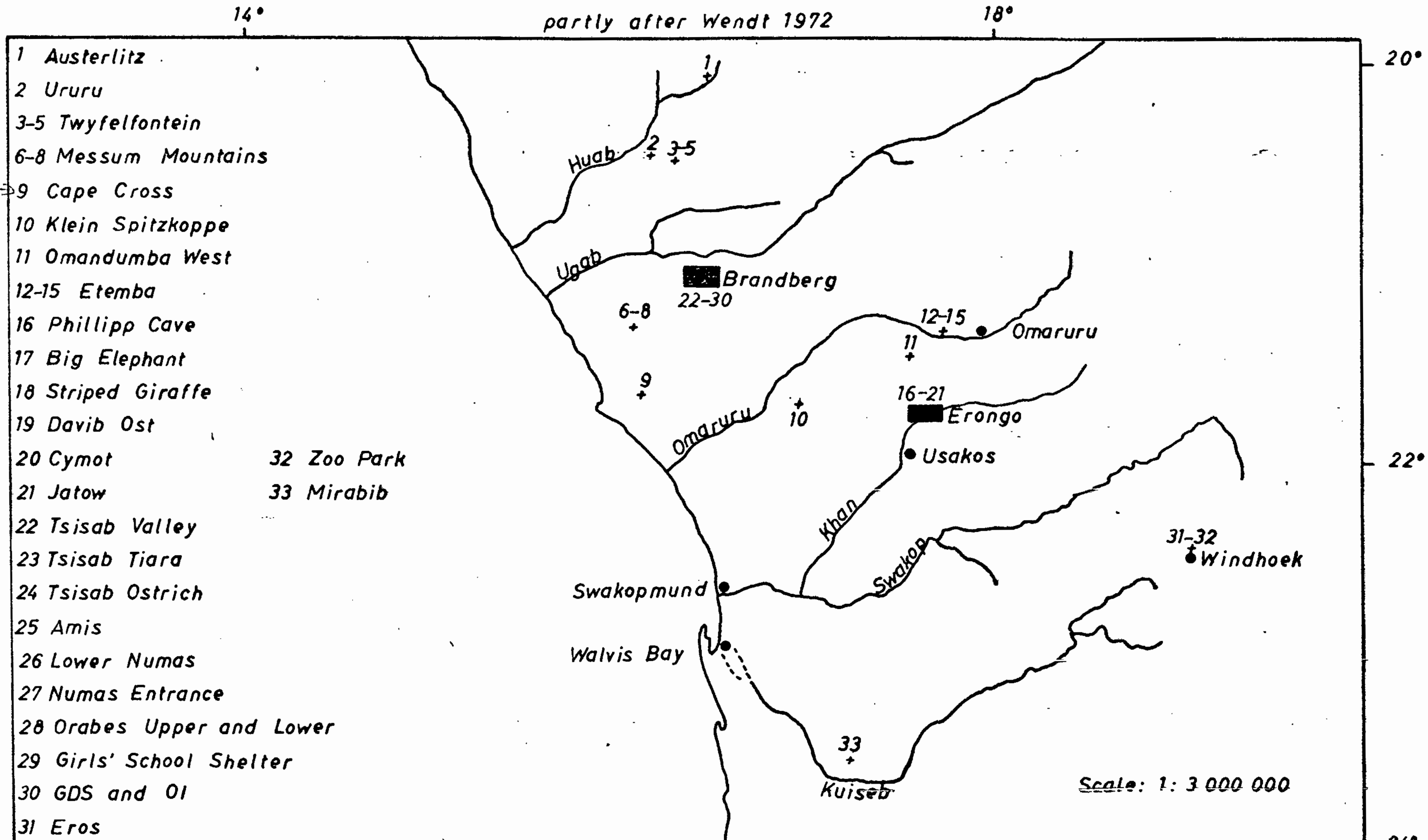


Figure 1

At this stage, no systematic excavations had been carried out (Fock 1959:12) and observations were mainly based on collections of surface material. Fock proposed that all archaeological cultures known from South Africa (with the exception of the oldest "Prechellean" and "Chelles") were also to be found in South West Africa.

In 1951, an expedition organized by the Association of Arts, in Windoek, visited a number of sites in Erongo, Brandberg and Spitskoppe. Surface collections of stone implements were made at Philipp Cave (Erongo), Rhino Cave (Gross Spitskoppe), Bushman's Paradise, Ghost Cave and Giraffe Cave (Klein Spitskoppe), the Tsisab Valley (Brandberg) and the petrified forest at Auros. From these collections, Rudner (1952) proposed a sequence of industries appearing in the territory. which was?

In 1953, a test pit was dug in Philipp Cave, Erongo, at the request of the Abbé Breuil. 12 stone implements were recovered from the excavation and a radiocarbon date (the first in South West Africa) of 3368±200 B.P. (C-911) was obtained from Bed 2. Results of the excavations were published by Breuil (1957) and Martin and Mason (1954).

In 1955, the South West African Scientific Society sponsored an expedition to the Brandberg. A few small excavations were made in the Amis Shelter, the Lower Numas Shelter, Lower Numas Cave and a few sites in the Upper Brandberg (Rudner 1957). Radiocarbon dates were obtained for Lower Numas Cave.

In 1959, Clark and Walton visited Big Elephant Shelter, mapped the occupation hollows, made a surface collection and published a detailed report (Clark & Walton 1962). Subsequently, 2 charcoal samples were collected from the site, by MacCalman, and radiocarbon dates were obtained (Beaumont & Vogel 1972).

In 1962, the South West African Scientific Society sponsored another archaeological expedition, on this occasion to the Erongo. Small excavations were made in Striped Giraffe Shelter, the Davib Ost Shelter, Cymot Shelter and Jatow Shelter. Material from the first three shelters was analysed and published by Sandelowsky and Viereck (1969). The Jatow Shelter material is missing from the museum and is unpublished. Radiocarbon dates were obtained for Striped Giraffe Shelter and Cymot Shelter. In the same year, MacCalman excavated Numas Entrance Shelter in the Brandberg. This excavation is unpublished apart from a note on the radiocarbon date (MacCalman 1965). This same published note provides a radiocarbon date for the Zoo Park elephant butchery site excavated near Windhoek. An excavation was also made by MacCalman at Eros Shelter; this is unpublished apart from 2 radiocarbon dates (Beaumont & Vogel 1972).

In 1968, Wendt began work in South West Africa on behalf of the University of Cologne. The purpose of the archaeological programme was to investigate the deposits of sites containing rock art and to establish some relationship between the art and the deposits (Wendt 1972). Wendt excavated a number of sites in the central part of South West Africa but, since 1970, his work has been concentrated in the south of the territory where research for his particular programme has proved most productive. For this reason, no further mention is made of Wendt's fieldwork after 1970. Wendt excavated the following sites in central South West Africa: Fackelträger, Etemba 2, Etemba 14, Etemba L1a and L2, all in the northwestern Erongo; Affenfelsen, Zwei Schneider, Hasenbild and Sieben Platten were excavated in the Damaraland Homeland and two sites in the Messum Mountains and one at Cape Cross were excavated. Details of the site excavations and radiocarbon dates were published by Wendt in 1972.

Excavations have been carried out at Mirabib Shelter, in the Namib Desert, by Sandelowsky (1974). This is the first site from which excavated material other than stone has been investigated in some detail. Botanical remains have been examined as well as faunal remains. It is hoped that the detailed site report, being prepared for press, will provide valuable data on ecological aspects and subsistence patterns of the area.

More recently, in 1974, Jacobson, now the State Museum archaeologist in Windhoek, began archaeological investigations in the Brandberg and vicinity. Excavations have been carried out at the Brandberg sites of Lower Numas Cave, Orabes Upper and Lower Shelters, Tsisab Ostrich Shelter, Tsisab Tiara Shelter, Girls' School Shelter and the open hut circle settlements GDS and O1 (Jacobson 1976b, Jacobson & Vogel 1975 and Jacobson pers. comm.). Investigations have also been made at the hut circle settlements of Zerrissene Mountain (Carr et al 1976). A number of radiocarbon dates have been received for these sites but no detailed descriptions of the material are available at this stage.

Wendt's programme, begun in 1968, marked the first problem oriented excavation in the territory. Nevertheless, publications of excavated material remained almost entirely lithocentric until Sandelowsky's 1974 report on Mirabib Shelter. One exception is Sydow's 1967 publication on the pre-European pottery of South West Africa. This describes the pottery collected mainly from surface sites and housed in various collections, mainly those of private collectors. Prior to 1974, no faunal or botanical studies had been made at any of the South West African sites and the subsistence economy of Holocene man was an unknown quantity.

Despite the earlier emphasis on stone artefacts, either collected from the surface of sites or excavated, there remains an exasperating lack of published information on the exact content of the artefact assemblages. A detailed artefact inventory is available for the surface collection of 61 stone pieces from Big Elephant Shelter (Clark & Walton 1962) and some broad figures are available for artefacts recovered from Striped Giraffe Shelter, Cymot and Davib Ost Shelters (Sandelowsky & Viereck 1969) and Lower Numas Cave (Rudner 1957). Viereck (1967) has published an inventory of the percentage frequencies of tools occurring in the "Damaraland Culture", together with the ranges of lengths, breadths and heights of microlithic and macrolithic implements. However, it is not clear as to how many site assemblages are combined in this inventory. Other reports tend to suggest that assemblages are of microlithic or macrolithic content and although the range of tool types is generally mentioned, no frequencies are given.

Despite the lack of quantitative information on Holocene stone assemblages, a number of suggestions have been made regarding the status of the lithic assemblages in South West Africa. In 1930, Lebzelter introduced the name "Erongo Culture" to refer to a "crude" Late Stone Age industry occurring in the Erongo area. Later, Martin and Mason (1954:148) proposed that the assemblage of 12 implements from Philipp Cave, in the Erogo, bore strong technological and typological resemblances to the Smithfield A of South Africa. Various authors have also described the Erongo assemblages as belonging to the Smithfield (Rudner 1952; Clark & Walton 1962). Rudner's explorations in the Brandberg led him to suggest that both the Wilton and Smithfield cultures were represented in the area. He excavated in Amis Shelter and concluded that the "Early Smithfield" overlay the Wilton in this shelter. He suggested that the recent Smithfield of Amis Shelter could, in turn, be related to the industries found in the open station hut circles of the Brandberg containing pottery, stone smoking pipes, rectangular side scrapers, high-backed side scrapers and fabricators. Rudner proposed the name "Brandberg Culture" for this industry (Rudner 1957).

In 1967, Viereck proposed that the term Damaraland Culture should replace the terms Erongo Culture and Brandberg Culture. Viereck (1967:14) suggested the replacement term on the grounds that the Damaraland Culture represented the latest horizon of the Late Stone Age in South West Africa and was distributed throughout old Damaraland. He proposed three variants of the Damaraland Culture: the Brandberg, Erongo and Neuhof-Kowas variants, based largely on the use of raw materials. Indurated shale was said to be used chiefly in the Brandberg, whilst porphry, basalt and quartzite were used in the Erongo. Viereck considered the type tool of the Damaraland Culture to be the fabricator, corresponding in form to Lebzelter's high-backed scrapers and cores (1967:16). The Damaraland microliths were described as being broader and larger than those of the Wilton, and having an absence of crescents, trapezes and thumbnail scrapers. Viereck's publication has recently received heavy criticism from Jacobson (1976a). Jacobson points out that whilst Viereck considers the terms Erongo and Brandberg Cultures too specific, regionally, he also uses localized names, the one variant being named after a farm. Secondly, Jacobson criticises the distinguishing of the variants on the basis of raw material differences, saying that the transportation of quartz and chalcedony over long distances indicates a similarity in behaviour in that fine grained siliceous rocks were preferred for microliths whereas any locally available rock was suitable for other forms of manufacture. Viereck has, furthermore, extended the original definition of the Brandberg Culture (as described by Rudner) to include an assemblage from the Erongo (Striped Giraffe Shelter) lacking pottery and including microliths. The inclusion of the Striped Giraffe Shelter material and that from Cymot Shelter would imply that the Damaraland Culture existed for some 5000 years; this, Jacobson feels is untenable. In conclusion, Jacobson proposes that the term Damaraland Culture be suspended from use but that the term Brandberg Industry be retained for the present and specifically used to describe the macrolithic/ceramic industry generally found associated with the stone hut circles.

From his extensive work carried out over large geographical areas of South West Africa, Wendt (1972:38) has proposed the following Holocene stratigraphy which can be expected in caves and shelters in South West Africa:

Indeterminate, crude predominantly macrolithic assemblages without any formal microlithic tools but partly associated with pottery	Predominantly microlithic assemblages, including a number of typical, formal microlithic tools, associated with pottery and/or objects of European origin, such as glass beads and metal objects
Typical microlithic assemblages ("Wilton") with pottery	
Typical microlithic assemblages ("Wilton") without pottery	
Indeterminate, crude, predominantly macrolithic assemblages	Indeterminate, essentially microlithic assemblages

Wendt suggests that, horizontally, in the different areas of South West Africa, at least 4 regional variants of a microlithic industry occur, all of these bearing resemblance to the Wilton Industry of the Cape Province.

The general impression gained from the published comments on Holocene lithic industries in central South West Africa is that some form of dichotomy occurs amongst the assemblages described and that this dichotomy might be comparable to that of the Wilton and Smithfield of South Africa.

The terms Smithfield and Wilton, the 2 archaeological cultural divisions long recognised as being part of Holocene prehistory, have received much attention in recent reviews (Deacon, J. 1972, 1974; Deacon, H.J. 1972, 1974). J. Deacon (1974:12) has proposed that the model of a Smithfield toolmaking tradition existing contemporaneously with the Wilton, throughout the Holocene, cannot be sustained. She suggests that segments are time controlled and that the Smithfield and Wilton are part of a linear development of the same tool manufacturing industry. However, H.J. Deacon recognises that stylistic differences in artefacts evidenced, for example, at Highlands (non-Wilton/Smithfield) and Melkhoutboom (Wilton) may represent some major division in social and linguistic terms (Deacon H.J. 1974:183). As a result of the current review of the terms Wilton and Smithfield as used in the Cape, these terms should similarly be reconsidered in South West Africa. The task would, however, be enormous and would involve reanalysis of most of the material excavated in the past, in order to provide workable data.

As far as the future of South West African prehistoric studies are concerned, a great deal of work needs to be completed both in the field and the laboratory before archaeological research can reach the same level of sophistication which has been achieved in other areas of southern Africa. The sites are not lacking and, as a result of the arid climate which persists over much of the territory, the potential exists for excellent preservation of organic material in shelter sites. South West Africa does, however, contain a number of built-in problems which hamper the speed and scope of archaeological research. The large territory, with its extremely small population, does not have the number of institutions supporting archaeological research which are available in the Republic. The lack of funds for archaeological research, always a complaint amongst research workers, is exacerbated in South West Africa. Furthermore, the distances involved in travelling within the territory, the extreme scarcity of water in most of the field areas, lack of student labour and the resultant necessity for the use of paid labour or voluntary inexperienced labour make fieldwork both difficult and expensive. Great, therefore, is the need for fieldwork which can elicit maximum returns in the form of information about all aspects of prehistoric life, including economic and ecological aspects, for the minimum effort and expenditure. Our greatest need is problem oriented research, for where this is lacking, both effort and finances are wasted.

So little is known about South West African prehistory, that it is not difficult to point to areas of research where future problem oriented work could contribute. In the sphere of lithic artefact studies, detailed quantitative analysis is required of dated assemblages occurring both in shelters and in the open. The documented assemblages are not sufficient in isolation; they need to be related on a small scale, to the local systems of which they are a part and, on a larger scale, to the southern African Holocene system of which South West Africa is a part. If there is a real dichotomy between the South West African assemblages either through time or in space, there is a need for the building and testing of models to examine and explain differences and changes. We need, not only the documented facts about artefacts but also the methodology for examining the mechanisms involved in the growth or decline of the systems behind the artefacts.

Furthermore, the lithic assemblages must be examined as being integral parts of the subsistence systems of prehistoric man. It is only through the systematic studies of non-archaeological traces such as faunal and botanical remains that we will be equipped to understand the mechanisms involved in the building of the archaeological record. We need to examine the potential of the land and to balance this against the actual utilization of the land in prehistoric times. In South West Africa, characterized by uncertain rainfall and frequent drought, research design should incorporate the effects of the precipitation variability on the animal and plant resources of the territory. This would involve long term study of the plant and animal life of any research area in question and would give a better understanding, not only of the short term annual cycles of subsistence patterning, but also the longer term annual cycles incorporating "good" and "bad" years. Further, we need to know the relationship between the individual site, such as the shelter, and its counterparts in the form of various kinds of open sites. The single site is likely to be only one segment of the settlement pattern adopted by mobile hunter-gatherers, thereby documenting only one segment of resource utilization in the total pattern of land exploitation.

Research oriented towards the understanding and solving of the type of problems outlined above has been underway in South Africa for a number of years and amongst research workers who have made a considerable contribution to the fields of problem oriented work are: J. Deacon, who has proposed models for the understanding of processes involved in changing artefact systems through time;

R.G. Klein, who has contributed a great deal of work towards the understanding of faunal distributions and man-utilization of fauna in prehistory; H.J. Deacon, who has pioneered quantitative analysis of prehistoric botanical remains in the southern Cape and J.E. Parkington, who has studied settlement patterns in the southwestern Cape and the cyclical movements of groups from coast to mountains.

From his botanical studies, H.J. Deacon (1974:116) has been able to suggest that the whole subsistence strategy and transhumance shown by populations in the Cape Folded Belt was closely coupled to Watsonia ecology. One aspect of research in South West Africa needs to be geared towards examining either comparable dependence on underground food supplies or, conversely, dependence on aboveground food plants. These different collecting patterns may have involved the use of different exploitation strategies in different vegetal zones which may, in turn, have influenced the archaeological remains present at sites (Deacon 1976). If this is the case, models are needed for the examination of the problems associated with this type of study. It is possible that man/land relationships varied in distinct areas of the territory and that this behavioural variability was dependent on the potential of the land. Along the coast we may expect to find selective adaptation to marine and terrestrial resources as has been recorded in the southwestern Cape (Parkington 1972a). Further inland, we may expect to find an annual cycle based on varied exploitation of seasonally available terrestrial foods and a possible fluid membership of groups to facilitate survival through periods of food and water stress. The vegetation zones of South West Africa are roughly parallel to the coast and are cross-traversed by rivers such as the Kuiseb and the Swakop. These rivers, the life blood of central South West Africa, may well have been important lines of contact between the different vegetal zones and studies of settlement patterns along the rivers may enlighten our knowledge of the extent to which exploitation of resources crosscut the various vegetal zones.

Amongst the present generation of South African archaeologists, there is an ever increasing concern with and use of statistical and process models for the defining and solving of archaeological problems but, nevertheless, ethnography still has its place in the framework of archaeological research. Providing that ethnographic analogy is used for the definition and not for the solving of archaeological problems, then its value is undisputed.

The ethnic diversity of South West Africa makes it essential that archaeological research in the territory should orient itself towards the problem of distinguishing the ethnic groups and their cultural systems in the archaeological record. H.J. Deacon (1974:184, 197) has suggested that the apparent divergent artefact traditions of the Smithfield and the Wilton may reflect some measure of social distance and that the scale of the Wilton unit may approximate a major linguistic division. Divergence in artefact traditions in South West Africa may similarly be related to social distance factors and linguistic groupings, but this possibility needs further exploration. At present, there is no time scale for the duration of occupation of the various groups in central South West Africa and before this can be established, we need to find means of distinguishing the archaeological traces left by each of the groups.

One of the most fascinating of the ethnic groups presently living in central South West Africa is the Dama, a Negroid Khoisan-speaking people who are historically known to have been clients of the Nama (Sydow 1967:15).

Although essentially hunter-gatherers, some Dama groups were pastoralists at the time when early travellers arrived in the territory and it appears that some of the Dama had acquired the art of metal working in advance of the Nama and Herero (Vedder 1938). Traditional strongholds of the Dama in early historical times included the Brandberg and Erongo Mountains and for this reason it is impossible to examine the archaeology of these mountain areas without also studying the possible inter-relationship between the archaeological traces and the Dama culture. Study of the Dama presents a number of problems revolving around the evidence that they are Negroid but speak a Khoisan language, that their origin in South West Africa is unknown and that there is diversity in their economic status. Research into the archaeology of the traditional strongholds of the Dama must therefore take into consideration the fact that at some stage during the course of the Holocene, the Dama made their entrance. We need to know when this occurred and what effects it had on populations which may already have occupied the territory. We need to know the economic status of the Dama when they made their début in South West Africa and if they were not already pastoralists at this stage, we need to examine the stimulus for and processes by which pastoralism and/or metal working was adopted by some groups of Dama. Research into the mechanisms behind the adoption of pastoralism by hunting groups is a problem applicable not only in South West Africa but in all of southern Africa traversed by pastoralists during prehistoric times. Clarke (1968:333) suggests that the disappearance of a technocomplex system reflects changes in the cultures and/or in the environment such that the technocomplex is no longer a stable strategy or that a strategy with a better pay off is offered by a new technocomplex. In other words, our expectation is that, because societies are conservative by nature, they would tend to attempt maintenance of stable equilibrium and avoid change until a situation of stress obliged them to alter their strategies in order to survive.

Whatever the role played by the Dama in the Holocene prehistory of South West Africa, the expectation here is that the archaeological record should document some form of change to coincide with the innovating influence of pottery, pastoralism and metallurgy.

Aims of my current research in central South West Africa

The main aim of my research is to provide the stepping-stone for examining some of the problems of South West African prehistory which have been outlined above. As such, the paper marks the beginning and not the culmination of the research.

Since little is known of the subsistence strategies adopted by prehistoric man in central South West Africa, one of the aims, here, is to investigate the adaptation of prehistoric man to the variable landscape offered by South West Africa. Problems associated with examining the man/land relationships include establishing the potential of the land in view of the unreliable precipitation received by the territory and examining the zonation of desirable food resources which would affect the movements and settlement patterns of people utilizing the resources. We need to know which resources attracted groups to the particular areas where traces of settlement are found and what may have stimulated the group to move to a different settlement area. We need to know whether a predictable cycle and pattern of subsistence strategy existed and whether this cycle continued through time. If a change in strategy is evidenced, paralleled by change in the norms of artefact manufacture, we need to establish models for explaining tne change. If climatic change can be ruled out, we can examine the possibility that some form of population pressure may have been imposed on the groups either by internal population explosion or competition for resources by an immigrant population in the territory. On a larger scale, we can eventually compare the adaptations of man in the different gross ecological zonations of the territory, such as defined by vegetation zones. We need to know whether the different potential of the distinct vegetal zones stimulated differential systems of land exploitation and artefact manufacturing traditions, how these systems operated through time and how or if they influenced their "neighbour" systems. From a methodological viewpoint, examination of the operation of the systems involves the study of the land's potential and the study of the utilization of the land's resources by quantitative examination of the faunal and botanical remains and implement assemblages left discarded at settlement sites.

One of my major interests lies in the documentation of the history and prehistory of the Dama people of central South West Africa. Before we can proceed with examining the problems of Dama origins and the process by which the Negroid Dama acquired their Khoisan language, we need to know the time scale of their presence in South West Africa and their changing economic status through time. If they arrived in South West Africa as immigrant pastoralists, we need to know the effects of their migration on the indigenous hunter-gatherer population and, conversely, if the Dama were an indigenous population, we need to examine the stimulus for and the processes by which some Dama groups adopted pastoralism, pottery making and/or metal working.

I decided to begin my investigations in the Erongo Mountains which lie in the Semi-Desert and Savanna Transition (Giess 1971). In a straight line, the mountains lie some

190 km from the west coast and although the prehistoric inhabitants may have had contact with the coast, it is unlikely that it would have formed part of the annual beat of these inland dwellers. It was entirely due to the detailed publication by Clark and Walton (1962) of the surface material recovered or mapped in Big Elephant Shelter, that I decided to begin my excavation programme at this site. I owe them a debt of gratitude for their careful observation which pointed to the potential of the site. The site report indicated that, at least in the surficial levels, there was excellent preservation of organic remains. In addition, Clark and Walton suggested that the last occupants of the site were Dama. Charcoal was collected from the site by MacCalman, in 1962, and the samples provided dates of 1400±80 B.P. (UCLA-724B) and 2550±80 B.P. (UCLA-724A); both dated samples were supposedly associated with pottery in the deposit (Beaumont & Vogel 1972). As a result of this information, Big Elephant Shelter seemed to provide optimal conditions for the aims of my research programme; firstly, the presence of organic material would enable the study of local resource utilization, secondly, a site in the traditional home area of the Dama might elicit information on the Dama, themselves, and, thirdly, the suggested dates for pottery at the site indicated that the site might document early and prolonged contact between hunter-gatherer and pottery making/herding communities.

It is appropriate, at this stage, to put forward hypotheses regarding the type of adaptations which we should expect to find the prehistoric occupants of Big Elephant Shelter making, both to the land and to the contact situation involving hunters and pastoralists. As regards adaptations to the land, we can assume that the normal characteristic of hunter-gatherer subsistence strategy, involving a simple and direct coupling with the environment (Clarke 1968:337) was present. We can also assume that the hunter-gatherers' intimate knowledge of the varied (but not rich) resources of the territory resulted in their adoption of a satisficer strategy for exploiting the land (Ibid:95). This implies the use of the most "prudent" strategy which aims at maximizing returns for the least amount of energy input and least amount of risk.

The contact situation between hunter-gatherers and pottery makers/pastoralists involves a more complex set of adaptations and a number of models and hypotheses are appropriate. Clarke (1968) has proposed a model for the theoretical explanation of behaviour of cultural systems through time. The cultural system ontogeny model can briefly be summarized as the birth, growth, maturing, decline and death of a system. This model has been used effectively by Deacon to explain the time controlled series of variations on the basic tool-kit of the occupants of Wilton Shelter in the Cape (Deacon,J. 1972). Deacon (Ibid:37) has suggested that there is a possible significance between the appearance of pottery at the site and the "death" of the Wilton cultural system. She suggests the possibility that the influx of the pottery makers into the area caused the exodus of the existing population.

Clarke (1968:349-54) has further proposed 5 cultural system interactions which are potentially operative in the sort of situation involving continued contact between hunter-gatherers and herders in any given territory:
1. tolerative where the interchange brings about no immediate change
2. symbiotic where the interchange is to mutual advantage of the systems
3. parasitic where interchange is to the advantage of one system only
4. competitive where an indirect interchange induces change in one or more competitors

5. disoperative where the interchange is to the disadvantage of one or both systems

Clarke suggests that in the case of interaction between pastoralists and hunter-gatherers, the 5 cultural system interactions might be sequential following the penetration into hunter-gatherer territory of intrusive pastoral groups. Initially, both groups might be able to adjust their movements within the territory to enable a tolerative interchange. Later, a symbiotic relationship might develop in which resources and/or services are exchanged for the mutual benefit of the systems. However, the apparently inevitable expansion of the herder group would impinge on the resources of the hunter-gatherers who might be reduced to a parasitic, then competitive and eventually disoperative interchange. Competitive and disoperative interchange might imply the resultant "death" of the affected hunter-gatherer system. During the stage of competitive interchange, demographic pressures placed on the hunter-gatherer groups would, theoretically, become obvious in the archaeological record.

Cohen (1975) lists the following types of archaeological evidence which may (under circumstances excluding the possibility of climatic change) be interpreted as evidence of population disequilibrium or stress caused by population pressure:

1. Increase in the range covered by the exploitive cycle of a group.
2. Expansion of the group into new areas presenting new difficulties in resource exploitation.
3. Utilization of parts of the environment previously unexploited.
4. Increase in concentration on water based resources relative to the use of land based resources.
5. Evidence of a shift from the hunting of large land mammals, which are high prestige food in most cultures,

to smaller land mammals,such as rodents, which are low prestige food items.

6. Evidence of a shift from the consumption of organisms at high trophic levels to the eating of organisms at lower trophic levels, in particular, the shift towards eating increasing numbers of plant foods.

7. A shift from the utilization of foods requiring little or no preparation to foods requiring increased amounts of preparation prior to their consumption: grinding, pounding, leaching of poisons etc.

8. Evidence of environmental degradation suggesting human interference, particularly through the use of fire and land clearance; it may be argued that increased human populations are increasing their interference in natural ecosystems to increase natural productivity of their preferred foods.

9. A steady decline in the size or quality of individuals exploited from a particular species through time (for example, the size of molluscs in a midden) may indicate that human populations are consuming resources beyond their carrying capacity, resulting in degradation of the exploited population.

10. A shift towards more and more eclectic food gathering patterns demonstrating reduced selectivity in foods eaten.

11. Evidence of regional isolation becoming prominent, as in the localized differentiation of artefact styles. The fluidity of a hunter-gatherer band would break down when resources became scarce, thereby discouraging the free movement of individuals across previously exploited territory.

Clarke's premise is that, if technocomplexes are ecological equivalents (that is if hunter-gatherers and herders exploit the same resource bases in the same territory), then a stable relationship is most unlikely

(Clarke 1968:355). If this premise is acceptable then we should almost certainly expect to find signs of population pressure exhibited in the archaeological remains of central South West African sites incorporating the contact situation between hunter-gatherers and herders. Part of the aim of the quantitative analysis of artefacts, faunal and botanical remains from Big Elephant Shelter, is to enable recognition of the anticipated change through time in the hunter-gatherer system.

CHAPTER 2

The ethnographic background: the place of the Dama in the history and prehistory of central South West Africa

Information in this chapter is drawn largely from historical documents written by early travellers/explorers, missionaries and people who aimed to settle or trade in the territory.

The stress throughout the chapter is on the Dama, a Khoisan-speaking Negroid group whose origin in South West Africa has long been considered a mystery. Since Erongo was one of the traditional home areas of the Dama it is impossible to examine the archaeology of the Erongo without also probing into the history of the Dama. The emphasis underlying each section of the chapter is that the traditional viewpoint of the Dama being the age old subservients of the pastoral Nama is highly simplified. A strong possibility exists that the Dama were instrumental in shaping much of the Holocene prehistory of central South West Africa.

Geographical distribution of ethnic groups as recorded in historical documents

Four ethnic groups were recorded by early travellers in central South West Africa: Dama, Nama (Khoi), Herero and San. The nomenclature used by early travellers is confusing to the reader and the following explanatory list of names, derived from a number of sources quoted throughout this text, will clarify the situation. Vedder (1938) is responsible for explaining the use of the names mentioned below.

DAMA	NAMA	HERERO	SAN
Berg Damara (Hill Damara)	Namaquas	OvaHerero	Bushmen
Damaras	Hottentots	Damaras of the Plains	Boschmans
Koup Damap	Goedonsie	Kamaka Damap	Bosjemans
Ghou Damup	Enequas	Cattle Damaras	
Zountama	Amacquas	Cattle Dammeraas	
Sambdama	Namacquoas	Commaka Dammerassen	
Damrassen			
Key Dammerassen			

In 1670, the crew of the Grundel saw yellow skinned people at Sandwich Harbour as did the crew of the Bode, 1677. The Captain of the Bode referred to these people as Hottentots and mentioned that they possessed cattle. The Captain's log states that between 14° and 15°S (the Highlands of southern Angola): "the Kaffirs commenced and the Hottentots came to an end" (Vedder 1938:9 - 14).

In January, 1792, Van Reenen's party arrived at Rheniusberg (Vedder (1938:33) believes these are the Rehoboth mountains), and Van Reenen commented: "These mountains are in the land of the Key Dammerassen, but now the Namaquas, or Goedonsie, have made themselves masters of the country..." (<u>in</u> Mossop 1935:311). The following month, Pieter Brand left the main party and travelled northwards; after five or six days journey, he met Damerassen (these people must have been Dama as he notes that their speech was like that of the Namaquas). From hearsay, Brand reported that the Cattle Dammeraas were a further nine days northwards, but he was unable to travel further as severe drought had made the route too dangerous.(<u>Ibid</u>:315-7).

Alexander (1838 2:72) recorded the presence of Nama in the sand dune area around Walvis Bay. These people told him that the Damaras of the Plains were a month away in the upper parts of the Swakop River. Along the Kuiseb River, Alexander found Damaras of the Hills and he noted: "The Hill Damaras are a numerous nation extending from the heights south of the Swakop to the Little Koanquip River." I am not certain of the geographic position of Alexander's Koanquip River, but when he began travelling south of Glenelg Bath (near Rehoboth), he commented that he had entered Namaqua territory and had left the Hill Damaras behind, although they extended still further west (Ibid:193). Alexander mentioned the presence of San along a tributary of the Kuiseb, however, these 'Boschmans' are described as being "tall and stout, as those to the north of the Great River usually are" (Ibid:145), and it is possible that the people referred to were hunter-gatherer Khoi rather than San.

Konkiep? near the Fish River canyon.

Galton's 1850 expedition confirmed Alexander's observations of Dama inhabiting the Kuiseb and he also specifically referred to the Dama as living in the Erongo Mountains: "No people inhabit Oosop, or the lower part of the river, except some straggling Ghou Damup..." "It seemed that these Ghou Damup have a stronghold of their own, a large table mountain, inaccessible except by one or more passes.... Erongo is the name of the mountain" (Galton 1853:41,50). Galton planned an expedition to the Erongo but, unfortunately for posterity, he was laid low with fever when he reached his goal and was obliged to turn back. He did, however, contact a Dama 'village' at the mountain foothills (Ibid:103). In 1855, Chapman (1868: 216) confirmed the presence of Dama in the 'Bokberg' (Erongo) as did McKiernan in 1875 (McKiernan in Serton 1954:38). The Omatako Mountains were also reported to have been a Dama stronghold (Galton 1853:136) as were the Waterberg Mountains and the Otavi district (McKiernan Op. cit: 67,74). In 1855, Dama were sighted along the Black Nossop and this region appears to have been their

we need a map with some topographic detail.

eastern boundary, whilst the Kuiseb River may have formed their southern boundary (Chapman 1868:167,172).

McKiernan met San east of Outjo (McKiernan Op cit.:49) and Chapman mentioned that prior to the Hottentot invasions, the areas around Rietfontein and Olifantskloof were Herero territory (Chapman 1868:165,166).

From these observations, we gain the impression that Hereros lived in the north of the territory being discussed, Nama in the south and coastal regions and Dama in the central region, more particularly in mountainous areas and along river courses (see Figure 2). San appear to have been sparsely scattered and Vedder mentions large numbers of them, occurring outside the area under discussion, in the Grootfontein area and the extreme easterly portion of the country (Vedder 1938:78-9). It is possible that San had more ubiquitous distribution in earlier times.

Interchanges of trade, war and intermarriage and clientship between herders, hunters and agriculturalists

1. Trade The historical records document a lively trade in South West Africa, domestic stock apparently serving as currency for desired exchange goods. Wikar mentions, through hearsay, that the Dama acted as middlemen, trading iron and copper for cattle, between the agriculturalist Wambo in the north of South West Africa, the Bechuanas in the east and the Nama of the South: "... those of our Namacquaoas who were married to Zountama women ... said that every year the Zountama take cattle to the Kawep and the Blip, and in exchange for cattle, they get a large supply of the beads (glass) from the tribes just mentioned: but when they come to our Namacquoas they give very few beads in exchange for an animal" (Wikar in Mossop 1935:79). Metal objects were also traded for livestock: Pieter Brand mentioned that when the Dama required

SOUTH WEST AFRICA

approximate geographical position of ethnic groups in South West Africa during the 19th Century partly after Vedder 1938

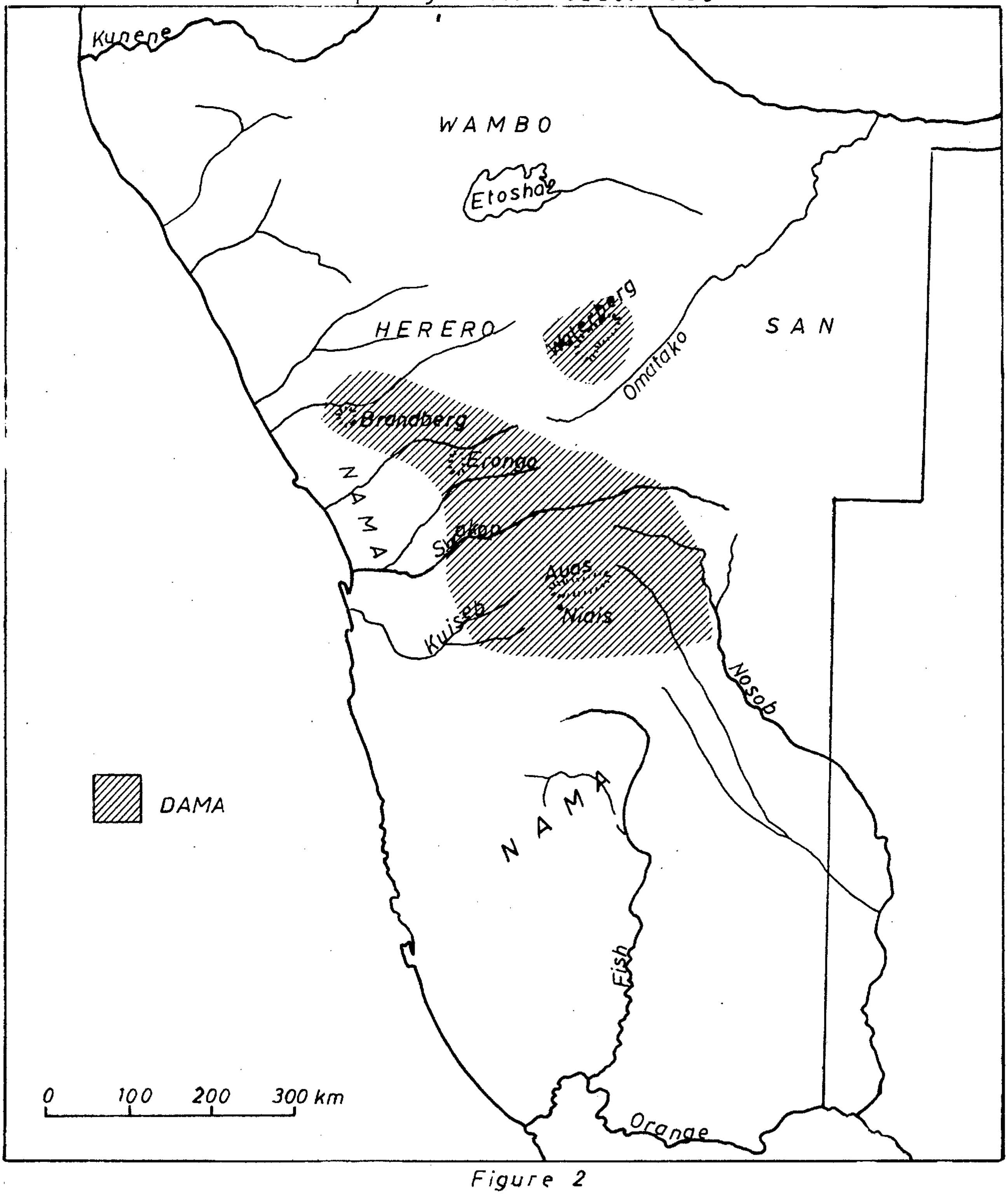


Figure 2

meat for food, they smelted copper into armrings and beads which were traded for cattle from the Dama (Ibid: 313). Brand also heard that the Dama bartered (or stole) cattle from the Commaka Dammerassen (Herero) in the north of the territory. Cook (1849:64) recorded that the Dama visited their 'conquerors' (the Nama) with presents of plants dug from the ground and wild honey and in return, received meat and milk.

The Herero apparently undertook trade with Portuguese on the west coast: an Herero woman, taken prisoner-of-war by Nama, told Alexander that they used to go to an inlet of the sea and exchange cattle for the iron, copper, knives and calabashes of the white people they called 'Oban' (Alexander 1838:172). Herero also traded with Wambo on the Kunene for Portuguese glass beads (Chapman 1868:167).

It is of great interest to note that the Dama were possibly the first smiths in South West Africa (Vedder 1938: 28). Many of the iron beads they manufactured may not have been of local ore, for Cook (1849:64) mentioned that iron was obtained from tribes near the coast who were occasionally visited by ships. Some copper was also imported and according to Chapman (1868:222), the Dama to the north of Walvis sometimes went to an old wreck, at about 19° or 19° 30' S to get copper to convert into beads. There is, however, evidence of local copper mining. Alexander found a Dama open-cast copper mine in the Rehoboth district: "There was a long trench in the ground, in which the Damaras had been digging for metal to forge rings between two stones. Sandstone and quartz were about the trench and every stone was covered with verdegrease" (Alexander 1938,2:191). Even earlier, in 1793, Pieter Pienaar had heard that copper mines were present between the modern day 'Protection Bay' and the Swakop River. He planned to visit the mines but was informed that there had been no rain in the area for five years and no water was available along the route. (Vedder 1938:38). The Nama of Walvis Bay told Alexander that they obtained their copper beads from a man who lived north of the Swakop River (Alexander 1838;2:106) and this copper supply may have been related to the mines mentioned by Pienaar.

The Herero do not appear to have had a knowledge of metal working, even by 1792, for Pieter Brand was told that they were still using kirries and stone tools (in Mossop 1935: 79). Vedder suggests that the Dama were smiths for the Herero, as well as for the Nama (in Hahn et at 1928:43). The Nama hired Dama smiths to make iron and copper beads, paying them the extraordinarily high wage of one she-goat for a days work (Wikar in Mossop 1935:79). It is, therefore, unlikely that these Nama had acquired knowledge of metal working. Nama, living approximately 320 km north of the Cape Peninsular did, however, have a knowledge of mining in 1661, for Meerhof recorded a 'native industry in two metals, copper and iron, materials available locally and in quantity" (Goodwin 1956: 48). Later, in 1762, Tielman Roos and P. Marais saw Namaquas smelting copper (Ibid).

Mining of ore seems to have been discovered very early in southern Africa, although the working of metal was probably not known at the time. There are now archaeological data indicating extensive specularite mining in the northern Cape and it is possible that the ore may have been used, in its raw state, for decorative purposes, since there is no evidence of metal working. Beaumont and Boshier (1974), report that the ore was extracted from Doornfontein, in 1120±40B.P. (Pta-187), by, apparently, hunter-gatherers of Khoisan physical type using stone mining tools. This enigmatic evidence suggests that the Khoi had knowledge of mining, if not metal working, at a very early date.

An early date of 870±100B.P. (SR 46) for the presence of copper beads was obtained from Numas Entrance Shelter in the Brandberg (MacCalman 1965:215). No other early dates have been obtained for metal objects, in South West Africa, but their presence is ubiquitous in the surface levels of sites in the territory. 3 glass beads, 10 iron and 2 copper beads were recovered from the undated surface levels of Big Elephant Shelter. Since the remains of 2 smoking pipes were also associated with the bedding unit, the date is probably not greater than about 200 years. Although the Brandberg and Erongo areas were traditionally Dama strongholds, the manufacture of the copper and iron beads recovered at the sites cannot necessarily be ascribed to their workmanship. No prehistoric mining or smelting sites have yet been discovered in the Brandberg or Erongo, though, in the Usakos area, small copper deposits do occur and, until recently, a small-scale mine operated at Henderson in the Khan valley.

Metal objects have also been recovered from the surface levels of Mirabib Shelter in the Namib Desert (Sandelowsky 1974:71), at Austerlitz and Messum 1, in the Twyfelfontein area and Pockenbank, Aar, Tiras and Uri-Hauchab 4, all in the south of South West Africa. (Wendt 1972:36). The presence of metal work and glass beads, in the surficial Holocene levels of sites throughout South West Africa, confirms the historical records of extensive trade links, though the local beating of scrap metal, to form items such as arrowheads, cannot be precluded.

Vedder (1938:28) has suggested that the Dama obtained their skill as blacksmiths from the Wambo; he mentions that the Wambo smiths were regarded as sorcerers and fled to live with the Hereros when they were in trouble for some apparent witchcraft. In December, 1875, McKiernan passed a party of Wambo blacksmiths on their way to Damaraland. He reported that they carried a small supply of iron and copper and travelled from village to village making knives, arrowheads and beads. In return for their services, they received sheep and goats which they re-traded for cows when they were able to do so. After a year or two, they would return to their homeland with a small herd (McKiernan in Serton 1954:74). Although he did not see the mines, himself, McKiernan heard that copper mines, present near Otavi, were one source of Wambo ore (Ibid:52).

There is no archaeological data to indicate the duration of time the Wambo have occupied the present Owambo, but Vedder (1938:165), using oral tradition, has suggested a sixteenth century date for their arrival in South West Africa. Certainly Wambo may not have been present in South West Africa in 870 B.P., when copper beads were already in use in the Brandberg. Vedder's suggestion that the Wambo practised metal working secretly and, when necessary, made their escape to the Herero, makes it unlikely that the Dama acquired their skills from Wambo, although a few isolated groups may have done so. It could be expected the Herero would also have obtained early knowledge of metal working if the source of the knowledge had been from Owambo. We know from Wikar (in Mossop 1935: 79), that the Dama traded with Blip (Bechuana) as well as Wambo and from Wikar's later comments, it is realized that the Blip were metal-workers: "The Blip come each year to the tribes living along this river (the Orange) to trade, bringing with them tobacco, ivory spoons, bracelets, copper and iron beads, glass beads, copper earrings and bracelets, knives, barbed assegais and also smooth axes and awls" (Ibid:147). Thus there was an eastern source for metal and glass beads as well as a northern one in South West Africa.

It must also be borne in mind that not all of the Dama were reported to have been metal workers and whilst some groups of Dama may have acquired the skill in very early times, others may have learnt the art several centuries later, and yet others may never have practised metal working. The same premise applies to the Nama and this underlines the fact that there is no simplistic answer to the question of the origin of metal working in southern Africa. In Zambia, dates for actual copper mining go back to A.D. 400±90 (N-1236) at Kansanshi mine, and decorative items of copper found at Kumadzulu, in southern Zambia, date to the sixth and seventh centuries A.D. (Bisson 1975:281). Presumably, copper items and/or the knowledge of copper working could have spread from Zambia, through Angola, into South West Africa any time after A.D. 400. The process need not necessarily have involved the movements of people for the metal items may have passed hands along trade routes and through war and inter-tribal marriage.

The important factor to come out of this study of early metal working is that the pastoral Nama were dependent on the Dama for their skills and that the Dama received their skills from a source other than the Nama. This begs the question of whether the stimulus to adopt pastoralism could likewise have come from another source.

2. Social relationships between the ethnic groups

Some historical reports appear to be contradictory as to the extent of social contact made between the various ethnic groups of South West Africa. This contradiction need not be taken to imply that the reports are inaccurate; in a country as vast as South West Africa, it is logical to suppose that social contacts would be limited where groups were separated by great distances, whereas groups in close geographical proximity would be more likely to interact with each other. Thus some of the Nama groups were reported to have been in contact with Herero herding bands, whilst others had little or no knowledge of Herero.

The Nama of Walvis Bay informed Alexander that they had no friendly relations with the Damara (Herero) and, furthermore, that they were afraid of these"strong and angry people" who had once come down to the Bay to attack them (Alexander 1838:72,74). Alexander was also told that there had been a recent battle between the Hill Damaras and the Damaras of the Plains and that the latter had gained the advantage (Ibid:107). The Dama themselves claimed that the Herero were their enemy (Ibid:133). In the southern portion of South West Africa, Nama groups appear to have had little knowledge of the northern Herero and certainly had not met them. At Warmbad, Nama told Jacobus Coetse that a black race, with long hair and wearing linen clothes, lived 10 days northwards (Vedder 1938:19). Further north, at the Fish River, the Nama had not heard of these long haired people but said

Tamqua = Tanqua = Sanqua = Sonque ? (= hunters/gatherers)

they believed that Tamquas (either Herero or Dama) lived northwards (Ibid:20). On their part, the Herero were afraid of the strength of the Nama for the Herero were a defenceless, stone tool using group, even in 1792, and the Nama bordering their southern territory were wont to raid their cattle. Conflict between Herero and Nama increased when the Herero began extending their grazing lands southwards into the Windhoek area. In 1830, with the rise to power amongst the Nama, of Jonker Afrikaner, who had emigrated from the Cape, wholesale massacres of Herero and raiding of their cattle began (Vedder in Hahn et al 1928:158).

In 1792, the Dama claimed that the reason they had no stock was because the stronger Nama nation had robbed them of their sheep, goats and horned cattle (Pieter Brand in Mossop 1935:314). In 1839, Cook heard a similar story from Dama on the Kuiseb River (Cook 1849:64).

Wambo were also fearful of the Nama in the south of the territory. Wikar was told that the Wambo desired trade with the Nama of the south and hoped to dispense with the services of Dama as middlemen, but the Dama (probably fearing loss of their own profits) painted a picture of the Nama being extremely hostile and the journey long and waterless (Wikar in Mossop 1935:79-81). As a result, the Dama continued acting as middlemen between northern and southern ethnic groups.

The apparent situation emerging from the evidence is significant and made more intriguing by the fact that (to the best of my knowledge) it has not been commented on before now. The Dama formed a loose buffer zone between the warlike Nama herders and the northern groups of Herero herders and Wambo agriculturalists. Whilst the Dama were acquainted with all of the ethnic groups and carried on trade with them, the southern Nama and the northern Negroid groups had little knowledge of, or contact with each other. Nama and Herero each express fear of the other in separate reports and it is possible that stories of the strength of each was played to advantage by Dama, as illustrated between the Wambo and Nama. Whilst social contracts of war and trade were carried on between Dama and the other groups, intermarriage was infrequent. There is some evidence from sero-genetic studies, to be discussed later, to suggest that Dama were reproductive isolates in South West Africa. Dama were despised by Nama who called them "Koup Damup" (Dung Damara) to express their contempt. Whilst Dama were generally shunned as marriage partners it appears that Dama women were occasionally taken as wives of Nama (Wikar in Mossop 1935:79), but it is not made clear as to whether the women were war captives. Dama genes were, therefore, incorporated into the Nama group but, since exchange of women was not reciprocal, the Dama gene pool remained unaltered.

3. Clientship

Clientship between Dama and Nama is well documented in historical records. The Dama gave their services either as smiths or stock-herders and in exchange received either payment in stock or food. Wikar (in Mossop 1935: 79) said: "These Zambdama, dwelling nearer to the Namaquas than the Zountama, come to work with the Namaquas. From iron and copper they beat out beads, both fine and coarse....The daily wage of these Samdama smiths among the Namaquoas is one she-goat". Pieter Brand commented that the Dama: ".... even render service to the Numaquas as slaves" (Ibid:313). Alexander found"a great town of Namaqua and Hill Damara huts, round and conical" at Niais, near Rehoboth. The Dama were apparently acting as cattle and sheep herders for the Namaqua (Alexander 1838:152, 181). The servant/master relationship is underlined by the separation in the village area of the round Nama huts and conical Dama huts. Galton (1853:42) said of the Dama: "These are a very peculiar and scattered race of Negroes who speak no language but Hottentot and are frequently slaves to the Bushmen." Possibly the term "Bushman" should not be taken too literally, for Galton stated: "There is no difference between the Hottentot and Bushman....The Namaqua Hottentot is simply the reclaimed and somewhat civilized Bushman" (Ibid:68).

It appears that Herero were also driven to clientship after having lost their herds to the raiding Nama. At Olifantskloof, Chapman saw Herero herding Namaqua cattle and commented that the Herero were "equalling in poverty the most wretched Bushman....They were once the possessors of immense flocks and herds and owners of the soil where they now grubbed for roots" (Chapman 1868:166).

4? Ownership of stock and the origins of stock in South West Africa and southern Africa

The Nama are reported to have owned large herds of sheep and cattle. Alexander noted that Nama in the Walvis Bay area owned sheep and cattle (Alexander 1838:84) and at

Niais, near Rehoboth, Nama were also in possession of stock (Ibid:181). Wikar (in Mossop 1935:79) mentioned that the Nama were "badly off for goats, but so much richer in cattle." During the course of his expedition along the Orange River, Wikar makes several references to the cattle and sheep of the Nama (Ibid:121,123,137, 165). Herero and Wambo were also reputed to have owned large numbers of stock, mainly cattle; however, the reports concerning the possession of stock by Dama vary considerably. Some groups were apparently stockless, others had previously owned stock which had been stolen by Nama, and some groups were reported to have sheep, goats and/or cattle. In 1793, Pienaar travelled along the Swakop River and found 5 Dama settlements, all without cattle (Vedder 1938:38). Moller's 1895-6 account of the Dama mentions that they did not normally own domestic animals although they sometimes herded a few goats (Moller 1974:153). Travelling along the Kuiseb, Alexander found deserted Dama villages and he specifically mentions that there were no kraals for sheep or cattle (Alexander 1838:121). Later, having met a Dama headman, he stated that the Dama had no sheep or cattle (Ibid:136). However, Galton, travelling to the foothills of the Erongo, in 1850, said: "....the Ghou Damup have plenty of sheep and goats" (Galton 1853:103). Chapman substantiated this claim, saying that the Nama stole large flocks of sheep and goats from Dama in the Erongo (Chapman 1868:216). McKiernan, in 1874, reported the Dama having large herds of goats (in Serton 1954:45). Wikar's report of Dama trading cattle for glass beads with the Wambo suggests that at least some of the Dama had once owned cattle but that they had been stolen by marauding Nama.

Vedder (in Hahn et al 1928:42) commented that the Dama consisted of an upper class, preferring to settle in the valleys with their goats, and a lower class (Wikar's Zountamas), living like hunter-gatherer San. Vedder suggested that the Dama may have obtained their goats from the Bechuana, since "birin", the word used for goat amongst the Dama, is of Bechuana origin (Ibid). However, Ehret mentions that goats are known by a name common to almost all Bantu languages, this suggesting a longer association between goats and Bantu speakers, probably a longer association than with other stock (Phillipson 1976:78). If this is the case, then the Dama may have obtained their goats from several Bantu speaking sources.

The origin of domestic stock in southern Africa and the dating of its appearance is a crucial issue affecting the study of the contact situation between herders and/ or agriculturalists and hunter-gatherers. In former years, two schools of thought existed as to the origins of domestic stock in southern Africa; one has postulated a southward Khoi migration with stock, the other favoured a diffusion of stock without necessarily involving vast population movements. Both points of view centre around controversy over the origin of the Khoi population in southern Africa. The first school of thought is typified by Payne's statement: ".... evidence suggests that the Hottentot originated in East or Central Africa" (Payne 1964:108), whilst the second school of thought suggests: " the evidence.... would fit better an hypothesis in which the yellow skinned cattle and sheep-herders represented components of a basic indigenous hunter-gatherer population of the Late Stone Age, whose culture had been variably altered by contact with early Iron Age farmers and metal-workers" (Inskeep 1969:24). Whilst my own sympathies lie with Inskeep's hypothesis, it must be pointed out that, in the light of research undertaken since 1969, his explanation of the arrival of stock in southern Africa may be somewhat simplistic. Phillipson (1976) draws attention to two distinct streams which can be recognised in the spread of the Early Iron Age. The eastern stream seems to be the earlier of the two, Kwale ware sites being the earliest known manifestations dating from the second century A.D. The western stream is best known in central Zambia, where it is represented by the Chondwe, Kapwirimbe and Kalundu groups, none of which have dates earlier than the fifth century A.D. Whilst sheep and goats were herded by some groups of both eastern and western Early Iron Age streams, only the western stream sites contain the remains of domestic cattle. Phillipson, therefore, suggests that cattle may not have spread to the eastern stream until relatively late, after contact had been established with the western stream. This evidence is complicated by the possibility that at least two separate introductions of cattle may have taken place in southern Africa. From the writings of J. von Plettenberg (in Moodie 1960 6:24), we know that Khoi cattle were distinguishable from those of the Bantu speakers in 1774. Payne (1964:109-10) states that the present-day Afrikander cattle are direct descendants of Khoi cattle, that is, of an early Sanga type; whereas the later migrations of Bantu speakers brought with them Sanga cattle of different origin. The cattle owned by Nama of South West Africa were probably of early Sanga stock, whilst the Wambo had a slightly different stock, "small but of a sturdy breed" (Hahn in Hahn et al 1928: 35), and probably exhibiting some shorthorn ancestry (Payne 1964:109).

On the basis of linguistic evidence, Ehret (1967; 1968) suggests that both sheep and cattle were present in southern Africa prior to the arrival of Bantu speaking groups. Ehret proposes that Bantu speakers in south eastern Africa may have acquired cattle from a Khoisan speaking people whilst the cattle in Angola and South West Africa were introduced by Bantu speakers who had acquired cattle further north (1967:1-2). Harinck's statement that Khoi word roots exist in the Xhosa terms for the variagated colour combinations of cattle (Harinck 1969:151) may lend support to Ehret's first proposal. Khoi are known to have carried on trade with the eastern

Bantu speakers and if the early eastern Bantu did not possess cattle, they may well have obtained them from Khoi traders. The technique of riding oxen was not used amongst early Sotho and Nguni people, but Khoi were seen riding oxen near Mossel Bay in 1497 (Wilson 1969a:56-8). To the best of my knowledge, Herero, Wambo and Dama did not make use of riding oxen in South West Africa, although the Nama did so. Galton used ride oxen for his expedition to the Erongo in 1850 (Galton 1853) and Moller reported that, in the 1890's, hordes of raiding Nama rode horses and oxen as far north as southern Angola (Moller 1974:33). The technique of riding oxen may have been an entirely Khoisan adaptation to aid their mobility as shifting herders and the relevance of this art to the origin of cattle in southern Africa is not properly understood. What is clear is that the advent of ride cattle was an innovation of some importance in southern Africa; there is a great difference between the mobility of mounted and unmounted pastoralists, particularly as regards their effectiveness as raiding units.

Despite the importance of ride-cattle to the economy of the Khoi and Nama groups, sheep are more important to Khoisan ritual than cattle (Wilson 1969a:56) and this argues for long standing associations between Khoi and sheep. Possibly the Khoi obtained sheep prior to cattle. Conversely, Bantu ritual, wealth and status is greatly dependent on possession of cattle, not sheep, which would suggest that many of the early Bantu speakers were essentially cattle-keepers and did not attach much value to small stock. This evidence could be seen as a contradiction of Ehret's suggestion that the eastern Bantu obtained cattle from the Khoi. It does seem fairly clear, however, that sheep and cattle have different histories as regards their arrival in southern Africa. Paintings of fat-tailed sheep occur in Rhodesia, South West Africa, the south-western Cape and the south-eastern Cape, whilst

couldn't these arguments be reversed? what is the actual evidence?

paintings of cattle are only known from the Drakensberg and the eastern Cape. This would seem to indicate that cattle were not present in the north and west when the paintings were executed (Inskeep 1969:23). Also, there is a fifth century date for cattle remains at the Transvaal site of Broederstroom (Phillipson 1976:68). This evidence is rather disturbing when compared with Phillipson's model of cattle arriving in the wsetern Iron Age stream. This, however, is not the only disturbing evidence. The earliest known dates for sheep remains have been obtained from sites in the southern Cape and the earliest of these dates predate the Iron Age presence of sheep even as far north as Zambia. At Die Kelders, sheep remains are dated to 1650±90 B.P. (GaK-3877) (Schweitzer & Scott 1973:547), and at Scotts Cave, sheep remains are dated to 1190±100 B.P. (SR-82) (Klein & Scott 1974). Schweitzer (1974) suggests that even earlier dates for sheep have been obtained and that dates from Hawston, Nelson Bay and Dikbosch indicate that sheep were already spread over much of the country 2000 years ago. The presence of sheep remains is now being recorded at South West African sites; sheep hair has been identified at Mirabib Shelter in the Namib Desert and a date of 1550±50 B.P. has been obtained for the occurrence (Sandelowsky pers. comm.). One sheep is represented in the surficial level of Big Elephant Shelter and Jacobson (pers. comm.) has recovered remains of sheep from two lower Brandberg sites. Cattle may also be present at the latter sites and possible cattle remains are also present at Big Elephant Shelter.

At present, the dating of domestic animal remains from archaeological sites has not clarified the complex question of the origin of stock in southern Africa. However, interest in the identification of faunal remains from sites is relatively recent, and the re-analysis of material excavated in the past, as well as the analysis of new material , will undoubtedly provide new, critical and possibly unexpected data. The evidence of sheep remains dating back 2000 years in the Cape is of considerable interest for it extends the expected time scale for the early contacts between stock herders and hunter-gatherers. The early date for sheep, from Mirabib, suggests a similar time scale in South West Africa. The overall picture which emerges from the fragmentary evidence gleaned from archaeological, historical and liguistic sources is that, whether by diffusion of the stock itself or by movements of people, there was not a simple linear movement of stock. There is some indication that sheep may have been introduced to southern Africa prior to cattle and that at least two separate introductions of cattle took place. There also appears to be a close association between Khoi and sheep and between Bantu speakers and cattle. Perhaps the most striking observation to emerge from the evidence is the fact that there was considerable fluidity in the economies of both Early Iron Age groups and the herding and hunting groups. There was differential possession of domestic animals and metallurgy. Not all of the herding groups owned both cattle and sheep, not all of the groups practised metallurgy and amongst those which did, there was sometimes differential use of copper and iron. Amongst the Dama, there was great economic variability, some groups being hunter-gatherers whilst others herded stock and/or worked metal and carried out active services as middlemen between various ethnic groups. Whilst sheep and cattle were desirable as far as Dama were concerned, goats seem to have been more commonly associated with Dama. The old name for Erongo, "Bokberg" (goat mountain), is perhaps significant in this regard. The association with goats may have environmental significance, in that goats are hardier than other stock, but may also imply that the goat was the first stock animal introduced to the Dama. The possibility of an early connection between Dama and goats would add a new dimension to the problems already associated with the origins of stock in southern Africa. Wikar's suggestion that Nama owned very few goats and Vedder's (1938) claim that Dama owned many goats, suggests that the Dama herding stimulus did not come from the Nama.

goats are often used after cattle + sheep when the veg has already suffered

5. <u>Early potters: Nama or Dama?</u>

Since pottery has been recovered from Iron Age sites and sites dated within the time range for the presence of domestic stock and domestic plants, it is generally assumed that there is some connection between pottery and domestication.

According to Rudner (1968:579), the pottery of South West Africa is of the same basic type as that found mainly in Great Namaqualand and northern Namaqualand. It is bag-shaped with pointed or rounded bases and has the addition of lugs. There is apparently a northern variation in old Damaraland, especially in the Brandberg and Erongo where lugs are often unpierced and some vessels have lug spouts or holes for suspension. This type of pottery is associated with both Nama and Dama groups. Peter Kolben, in 1731, and Mentzel, in 1778, described the manufacture of conical pots by Khoi herders (Rudner 1968:566) and Alexander (1838 <u>2</u>:135) mentioned that: "Clay cooking pots of a conical shape were in every hut" (of the Dama). Sydow (1967:63) said that the Herero were probably not potters by tradition; they used wooden containers or calabashes for their sour milk. The Wambo and Kavango have a pottery tradition but their pottery is quite dissimilar to the pre-European pottery found in the rest of South West Africa and it is unlikely that there is any connection (<u>Ibid</u>).

Very early dates for pottery are appearing in the southern Cape and South West Africa. At Big Elephant Shelter, there are possibly two early dates for pottery; 2600 B.P. and 2550 B.P. These dates are so much earlier than any other dates received from southern African sites that, in view of the fact that the stratigraphy of the site is complex, they should possibly be regarded with some suspicion. Another early date for South West African pottery comes from Eros Shelter: 1745±35 B.P. (GrN-5297) (Beaumont & Vogel 1972). From Boontebery Shelter, in the Cape, there is a date of 2050±95 B.P. (SR-166) for pottery and other early dates for pottery come from Nelson Bay Cave, 1930±60 B.P. (GrN-5703) and De Hangen, 1850±50 B.P. (Pta-127) (Klein 1974:252). These early pottery dates predate the earliest Iron Age pottery in southern Africa by several hundred years, and since the pottery style is quite different to that of the Iron Age, there is always the possibility that the pointed base pottery was an innovation isolated from the Iron Age influence.

conical bases + spouts are typical of Cape moving milk-drinking pastoralists.

Wilson (1969b:80) has suggested that cattle owners who spread fast and established themselves as rulers, were not necessarily as skilled craftsmen as the people they dominated. In Rwanda, both potters and iron workers were the Twa (pygmy) hunters and in Bu Nyakyusa, the potters were Penja who were absorbed by the incoming cattle-owning Kukwa. Clark and Walton's suggestion that the Dama may have been more efficient potters than the nomadic Nama(Clark & Walton 1962:15) is, therefore, a consideration worth attention.

The origin of the Dama in central South West Africa: theories past and present.

Moller (1974:153) suggested that the Dama, as well as the San, could be regarded as remnants of the aboriginal population of Africa who had been pushed southwards. Alexander (1838 2:133) inquired about the origins of the Dama and was told by a Dama headman: "We have always lived among these hills and we never knew of any other land." Vedder (1938:107) suggested: "Many people regard them as the original inhabitants of South West Africa and they may be right, although it is much more likely that the BergDamaras had found their way into the country before the Saan and Hottentots came on the scene. In that case, they only had to share the mountains and the plains with the Bushmen, between whose family holdings, such wide spaces intervened that there was room enough for both of them." Vedder (Ibid) puts forward another theory: "May not the wandering Nama tribes have picked up, in the course of their migrations in central Africa, servants of a Negro tribe, who went with their masters, who were wealthy in cattle, seeing that a plentiful supply of food is guaranteed in the service of a rich cattle owner? May it not be that through close contact between these Negroes and their yellow skinned masters, their own language was gradually forgotten with the succeeding generations, and the speech of their masters was adopted in its place?.....The fact remains that the BergDamaras were the first blacksmiths of South West Africa. May they not have brought with them their skills from the northern regions of Africa, the home of the blacksmiths, and have employed it in the service of their masters who had no knowledge of it, but required its products in the form of arrowheads and assegais." We have, therefore, Dama oral tradition which claims that Dama are indigenous to South West Africa and the suggestions by Moller and Vedder that these Khoisan speaking Negroids migrated southwards into South West Africa and were subjected by Nama groups either before or after their migration.

Jenkins, together with other medical researchers, has carried out extensive sero-genetic studies amongst the ethnic groups of South West Africa. He shows (1972:124-5) that the Gm phenotype can be used to distinguish Khoisan peoples from Negroid peoples and suggests the possibility that the physical differences amongst negroid groups may be due largely to varying amounts of Khoisan genes absorbed by the tribes. Sero-genetic studies carried out on the Dama show that they have received very little genetic contribution from Khoi or San and, furthermore, that they have been cut off over a long period of time from contact with other Negroes (Nurse et al:1976). The researchers consider the Dama to be reproductive isolates forming an ancient South West African stratum (Ibid).

Until fairly recently, the Dama were considered unique anthropological curiosities. However, Nurse and Jenkins (1976) have produced evidence of another Khoisan speaking Negroid group, the hunter-gatherer Kwengo of the Kavango. They also suggest that another Khoisan speaking Negroid people live in Angola. The Kwengo claim to have lived in servitude to the Mbukushu (who speak a Bantu language) and Nurse and Jenkins suggest that "the most likely reason for the adoption of a Khoisan language by a Negro people is enslavement"(Nurse & Jenkins 1976:58). Unfortunately, no detailed information is available on the relationships between the Kwengo and Mbukushu; it would be interesting to know the length of time the Kwengo have been clients of the Mbukushu and whether they were formerly clients of Khoisan speaking people. It is noteworthy that we have here a Khoisan speaking Negroid people with Negroid patrons, whilst the Khoisan speaking Dama had Khoisan patrons.

As regards the influence of clientship, Wilson (1969a:63-4) suggests: "Those clients who remain hunters and only visit their patrons intermittently, may retain much of their own culture, but those who settle do not. They learn the language of their patrons and lose their own; their crafts mostly disappear and they become absorbed into their patrons' culture. Where game and land were plentiful, the hunters remained independent - it was easy for them to vanish when they wished to do so - but where populations grew more dense and game was shot out by men with firearms, the bow and arrow hunters could no loger subsist. They stole cattle and sheep and were themselves shot as thieves, or they became permanent servants of herders and farmers. When the servant had no alternative means of subsistence and no freedom of movement, clientship became slavery or something akin to it." Wilson (Ibid) also suggests that the movement away from hunting, to clientship, is accelerated by drought. This factor would seem to have especial significance in South West Africa, where drought is recurrent and 30 years of drought may occur in a period of 77 years (see Chapter 4). During periods of drought, the small hunter-gatherer bands may have competed for water supplies and other resources with the larger and stronger bands of herders. One means of survival may have been to join the herder bands and thereby ensure their supplies of water and relatively secure food in the form of milk. Using the figure of 30 years of drought out of 77, a hunter may spend nearly half of his life in the service of a patron, providing that his response to drought nearly always resulted in clientship. Such long periods of clientship would oblige him to absorb much of his patron's culture. Some of the client groups may have remained in the service of their patrons even after the end of the critical drought period. MacCalman and Grobbelaar (1965:13) relate that a hunter-gatherer Tjimba man, Kaupatana, normally living in the Baynes Mountains of Kaokoland, became the client of stock owners in the valley during a period of drought: "Kaupatana had brought his family down to the Kunene on account of the extreme dearth of veldkos resulting from the latest drought. At Otjinungua, he was herding goats for one of the border guards in return for food." From the conversations of the Tjimba and the stock owners, it appears that this client/patron relationship was a regular one, but that the hunters returned to their mountain way of life once environmental conditions were favourable.

It has possibly not occurred to anyone to suggest that Dama may speak a Khoisan language because they have always done so. Favouring such a proposition is the fact that all Dama speak a Khoi language and there is apparently no trace of an earlier language in their vocabulary (Vedder 1938). Also, the Dama appear to have been a transitional people in that they were neighboured by Negroid people in the north (Wambo and Herero during historic times) and Khoisan herders and San hunters in the south. Lehr Brisbon's studies in Tibet have indicated that the transitional area between two different environments, each of which is inhabited by distinct economic groups, is occupied by a "transitional people" (Odum 1953:244). Humphreys (1972:172-9) suggests that such a marginal group of people existed in the Type R settlements located along the Riet River, Orange Free State/northern Cape. The area was transitional between Iron Age settlements and the Orange River hunter and herder territories. The Type R settlement occupants used typically Late Stone Age tool-kits but were pastoralists and built stone structures. The Dama claim to being a transitional people is equally great; they occupied a Semi-Desert and Savanna transitional zone and were culturally and economically hybridized, though not physically so. Although many Dama were essentially hunter-gatherers some groups practised herding and/or metal working.

From the archaeologist's point of view, it is important to be able to distinguish the cultural remains of the Dama from those of other groups in South West Africa, before a proper investigation of Dama origins can be made. The equipment used by Nama and Dama (and in most cases also by the San) was essentially the same: stone tools, pointed base pottery, bows and arrows, digging-sticks, ostrich eggshell beads, smoking pipes and leather garments, including sandals. From Alexander's descriptions, we know that the open site huts of the Nama and Dama were distinguishable (Alexander 1838:98, 121, 136). The Nama huts were round-topped and circular and were covered with mats which were transported on cattle when the Nama moved camp. The Dama huts were of a more permanent nature, they were of conical shape and were made of stakes meeting at the top. The huts were covered with grass or bark and stones were placed around their bases to prevent the grass from being blown away. It also appears that Nama villages were larger than those of the Dama: at the junction of the Numsep and Kuiseb Rivers, Alexander (<u>Ibid</u>:121,127) counted 18 Dama huts and on another occasion 12, but at the many encampments he saw in the area there were mostly only 3 or 4 huts together. At Niais, near Rehoboth, Alexander recorded that there were approximately 1200 people, including Dama clients, living in the Nama village, and at Aris on the Orange River, there were about 100 Nama, whilst at Bath, he found 500-600 Nama (<u>Ibid</u>:154,111,194).

In the archaeological record, the Nama villages may not be recognisable because the portable mat huts would leave no trace once the band moved on. There is a chance, however, that the stone circles of the Dama huts, and in some cases the brushwood from the construction, might remain. Stone circles have been mapped in the Brandberg and Zerrissene Mountain areas and these are attributed to the Dama (Carr <u>et al</u> 1976). Since the Dama raised a little tobacco (Alexander 1838:136) we can assume that some of their settlements were of a more permanent nature than those of the Nama. There is no evidence to show that the early Khoi cultivated tobacco although they were very fond of smoking both tobacco and dagga and bartered these products from agriculturalists (Wikar <u>in</u> Mossop 1935: 149; Wilson 1969a:61; Hewitt 1920:309; Maingard 1931:493). In 1677, Captain Wobman of the Bode commented that the Nama on the coast had little acquaintance with smoking

(Vedder 1938:11) so the habit of smoking may not have been widespread in South West Africa at the time. Both Khoi and Dama are reported to have used bone or soapstone smoking pipes (Vedder 1938:53; Hahn et al 1928:57; Alexander 1838:99). Dama cultivation of tobacco is interesting since this practice was not learnt either from Nama or Herero. In the 1850's, Chapman(1868:167) said that the Herero were "fast learning to smoke from the Hottentots" so that smoking does not seem to have been part of Herero tradition. Later in history, Dama were employed by Herero to cultivate tobacco for them (Vedder in Hahn et al 1928:43).

A further difference between the settlements of some groups of Dama and Nama might be the presence of evidence for metal working or smelting of ore at Dama sites.

All the evidence points to the Dama as a frontier people making selective adaptations to cultural aspects of all the groups in contact with them. Sero-genetic studies indicate that Dama have been long isolated from other Negroid groups and that they may form an ancient stratum in South West Africa. If this is the case, then South West Africa may have been inhabited by both early Negroid and early Khoisan/San hunter-gatherers. The economic gradings amongst the Dama, from simple hunting and gathering to herding, metal working and trading, argue against the use of a pastoral invasion model to explain the presence of Dama in the territory. It is unlikely that Dama made their entrance into South West Africa as fully fledged pastoralists and I would suggest that they were hunter-gatherers in South West Africa until some of the groups obtained the stimulus to become pastoralists and artisans. It is with this hypothesis that I proceed the examination of the archaeological remains from Big Elephant Shelter, a site in the traditional Dama homeland of the Erongo.

CHAPTER 3

Excavation, stratigraphy and dating of Big Elephant Shelter

Introduction

Big Elephant Shelter is situated on the farm Ameib (60) in the southern foothills of the Erongo Mountains at approximately 21°42'S and 15° 40'E (Figures 3 and 4). The mountains are included in the Semi-Desert and Savanna Transition, a vegetal zone defined by Giess (1971). The rainfall received by the area is characterized by its variability; whilst the Erongo falls between the isohyets of 200 mm and 300 mm, it has a percentage deviation from the mean annual rainfall of 50-60% (Wellington 1967:32-5). Rainfall and vegetation maps are provided in Chapter 4, where climate and vegetation are discussed in greater detail. The site itself has access to 3 major eco-zones: plains vegetated with perennial grasses and low bush, wooded stream and river courses and rocky hill-slopes. These eco-zones influence the distribution of fauna and plant foods available in the area and, in turn, the eco-zones would have affected the hunting and collecting strategies adopted by the prehistoric occupants of the area.

Big Elephant Shelter, elevated about 15 metres from the surrounding countryside, has been formed by an enormous boulder which rests on the top of a granite kopje. A rock platform in front of the shelter affords an excellent view of the plains and wooded stream courses below as well as the steep granite massif, with its basalt contact, which marks the southern extent of the mountain range. To the east, west and south of the site, there are numerous granite kopjes, some containing sites which have been excavated in the past (Figure 4). Several small streams

GEOGRAPHIC POSITION OF AMEIB

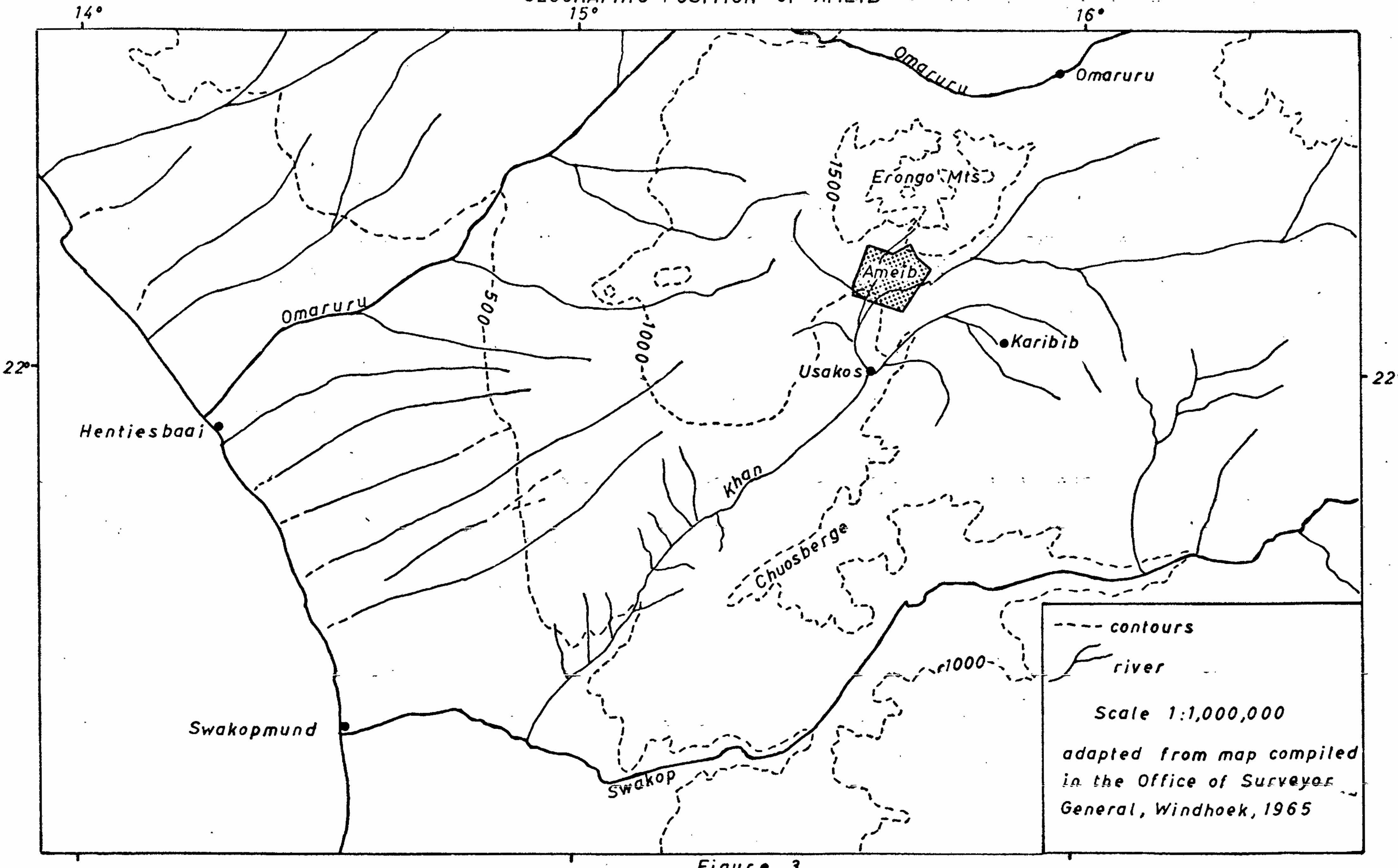


Figure 3

NORTHERN AMEIB

adapted from Gov. Survey Map 2115 DC

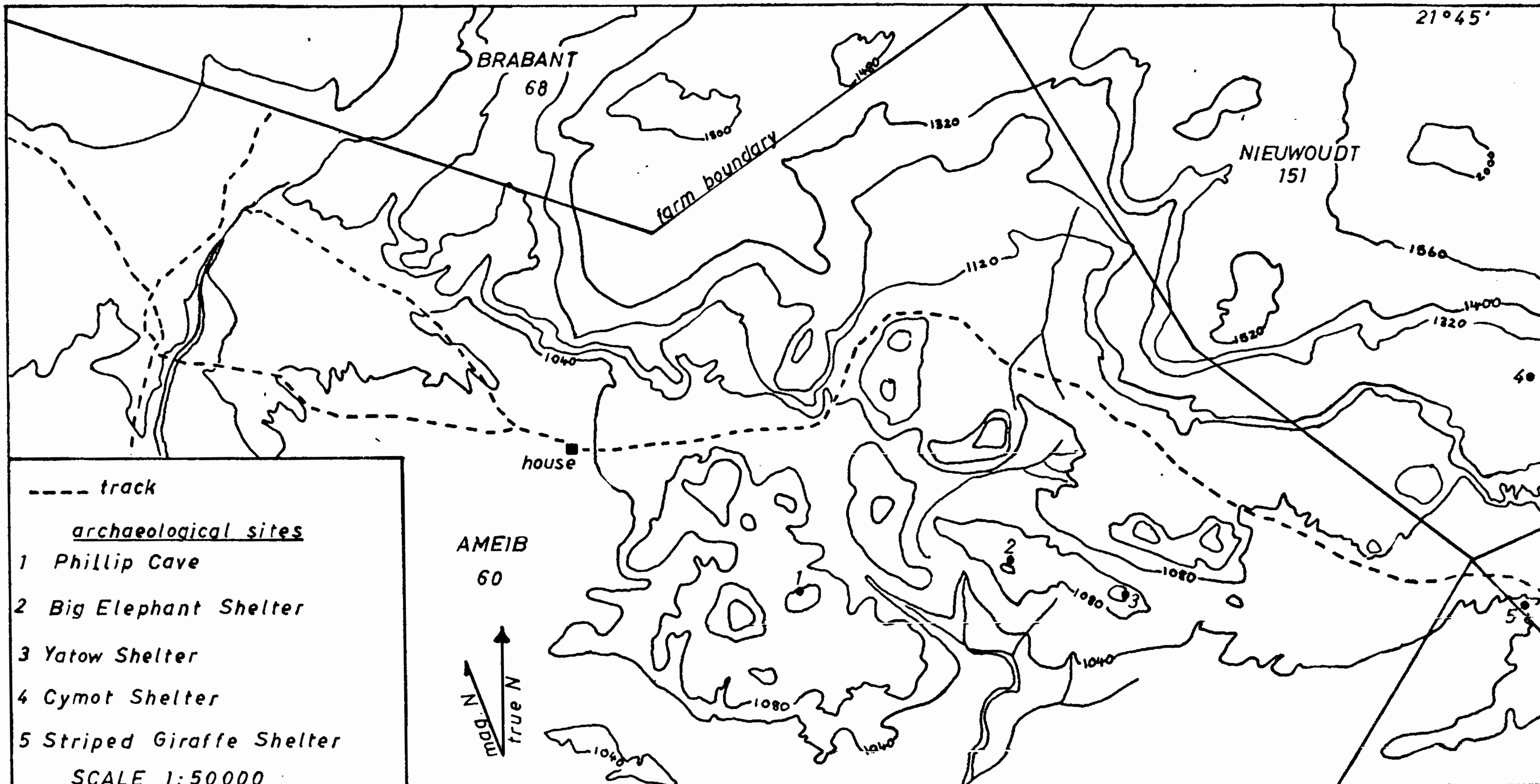


Figure 4

traverse the mountain foothills and drain into the Khan River which is a tributary of the Swakop River. During the rains and for a few months after them, surface water is available directly below the site. By winter, the streams are usually dry and water can only be obtained by digging in the dry stream beds.

Big Elephant Shelter can be divided into 2 sections; a narrow NE. Shelter with a low ceiling and a larger NW. Shelter. The former shelter contains sparse scatterings of shallow deposit on a large granite ledge (Figure 5). Only 1 metre square was excavated from this shelter and very little artefactual material was recovered. Features of interest in this shelter include a grinding hollow in the granite ledge and a pile of rocks which may originally have formed some protection for the adjacent occupation area (Figure 5).

The NW. Shelter contains 3 distinct occupation hollows partly filled with leaves and bedding grasses and surrounded by branches of collapsed brushwood screens. A fourth occupation hollow, having very shallow deposit, is situated at the junction of the NE. and NW. Shelters (Figure 5). Figure 6 maps the surface of the NW. Shelter and the excavation grid is superimposed over the plan. Figures 7 - 9 show the NW. Shelter prior to excavation, Occupation Hollow A and Occupation Hollow C. The size of the occupation hollows and their associated bedding areas would suggest that each hollow was occupied by a single nuclear family. The presence of discreet hearths in the hollows may suggest that each family prepared its own food and ate separately from the rest of the band.

Occupation Hollow B has been disturbed by previous small scale excavation which is unpublished. This excavation is marked on Figure 6 as "collapsed trench" since the early excavation was not filled and the surrounding deposit has slumped into the cavity. I had suspected that this small

BIG ELEPHANT SHELTER 1976
PLAN OF NE SETTLEMENT

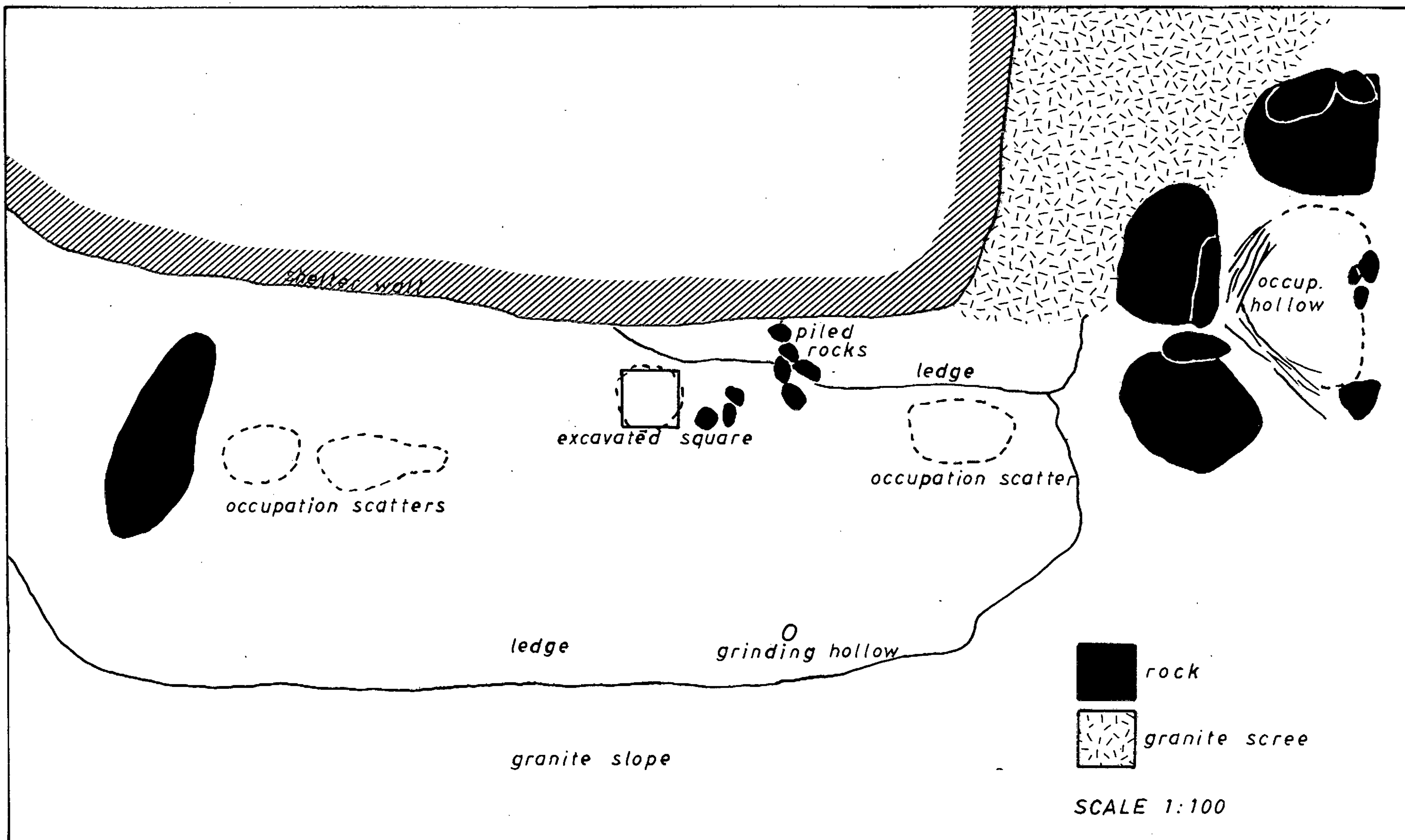


Figure 5

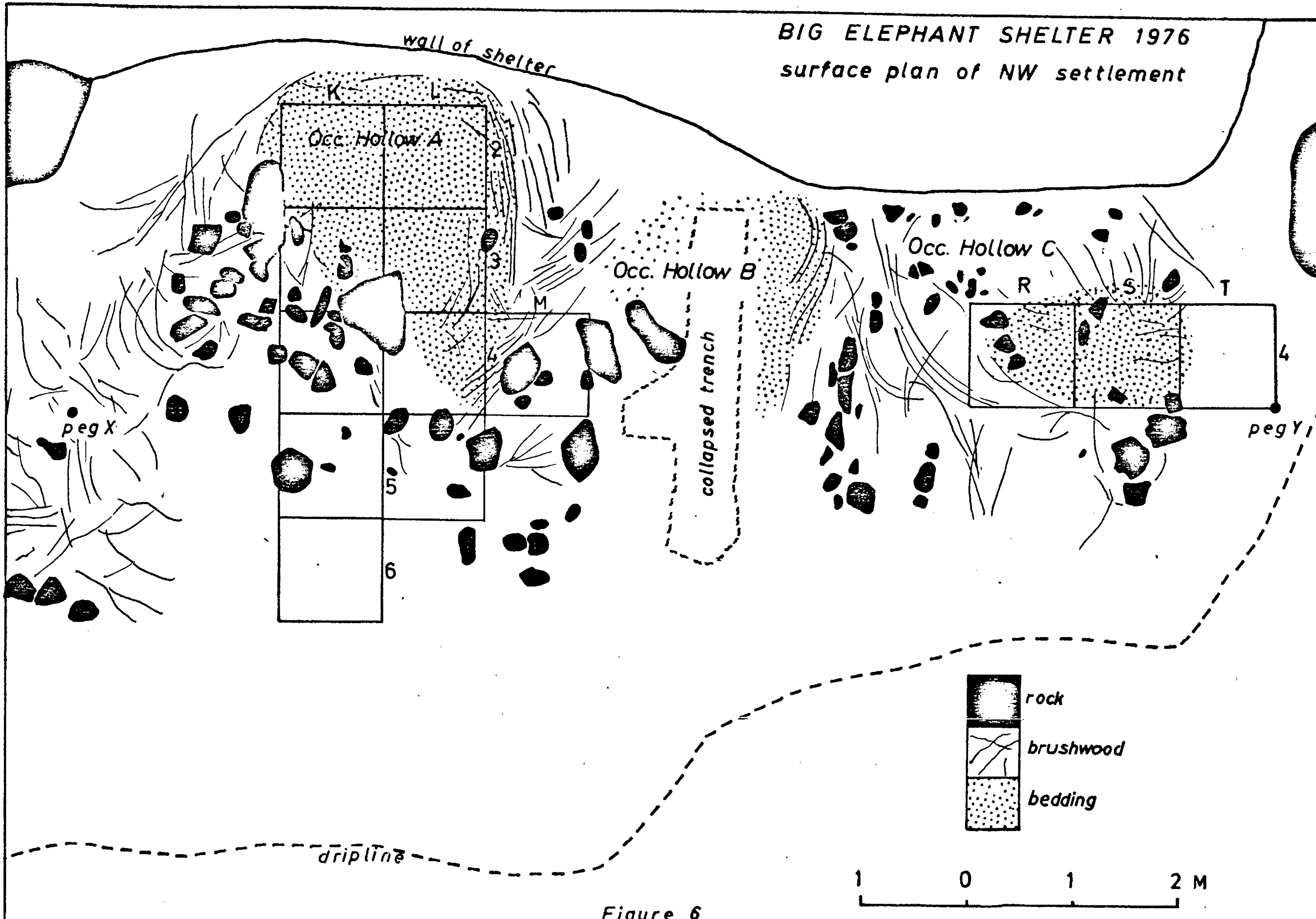

BIG ELEPHANT SHELTER 1976
surface plan of NW settlement
wall of shelter
K
L
Occ. Hollow A
2
3
4
M
5
6
Occ. Hollow B
collapsed trench
Occ. Hollow C
R
S
T
4
peg X
peg Y
rock
brushwood
bedding
dripline
1
0
1
2 M

Figure 6

DEPARTMENT OF ARCHAEOLOGY

Figure 7. The NW. Shelter prior to excavation
The ranging rod is graduated in ½ metres

Figure 10.
Occupation Hollow A after removal of bedding

excavation was made in 1962, during the course of collecting the charcoal samples for dating; however, communication with Cole (née MacCalman) who had collected the samples, suggested that the charcoal had been collected from 2 levels without actual excavation. Therefore, the excavated trench remains somewhat of a mystery. Recently, during re-analysis of implements from Cymot Shelter, I discovered some artefacts with catalogue numbers which did not match those of the Cymot material; a check in the museum acquisition records showed that the material was, in fact, from Big Elephant Shelter. No notes accompanied the artefacts which consisted of 6 scrapers, a piece of ground stone work, several packets of stone waste, 1 bone point, an iron bead and 303 ostrich eggshell beads. The quantity of eggshell beads suggests that the material may have been excavated and screened rather than collected from the surface. It is rather disturbing that the catalogue numbers on the artefacts match those given for the 2 charcoal samples in the museum records. Both charcoal samples are recorded as having been obtained from Trench 1, in an ash hearth in the centre of a bedding place. This is contrary to information published by Beaumont and Vogel (1972) which suggests that one date was obtained from the NE. Shelter and one from the NW. Shelter. Pottery was said to be associated with both the date of 2550±80 B.P. (UCLA-724A) taken from 6-9" and that of 1400±80 B.P. (UCLA-724B) taken from 3-6"; however, no mention of pottery is made in the museum records and none was present amongst the catalogued material.

Excavation procedure

Excavations at Big Elephant Shelter were begun in June/July of 1974 and continued in April 1975 and April 1976. Prior to excavation, a grid of metre squares was laid out over the total surface area of the NW. Shelter. The site plan was then drawn with the aid of a square wooden frame (having 1 metre dimensions and being laced with wire at 10 cm intervals) which was placed over each metre square of the site grid. All surface features, artefacts and bone were plotted. The plan containing the distribution scatter of artefacts has not been included here since previous surface collection at the site has made the picture incomplete.

Pegs X and Y were placed as permanent markers (Figure 6) and the datum line was established from these. Square K6, just outside of Occupation Hollow A (Figure 6) was chosen for excavation as a test pit, in order to establish the stratigraphy of the site. This proved to be a most unproductive procedure since the square contained no stratigraphy apart from a thin grassy lens near the soil surface. The bedding was then stripped from Occupation Hollow A and large bulk samples were retained. Figure 10 shows the hollow after the removal of the bedding; this illustrates the position of the hearth which was surrounded by stones. A half-burnt log was located in the centre of the hearth and a fire-drill, 2 upper grinding stones and 2 potsherds were recovered from the perimeter of the hearth. All underlying stratigraphic lenses were then removed to bedrock which, in areas of maximum deposit depth, was reached some 50 cm from the ground surface. Material from each of the lenses was retained separately. 3 methods of collecting material were adopted: 1. deposit was screened and material handsorted into various categories, 2. large unscreened bulk samples were collected and 3. bulk samples were collected and screened but not sorted. The second method was adopted primarily for the collection of botanical remains from plant rich layers. The third method enabled the collection of supplementary bulk samples; the removal of the fine fraction of the material during screening made the samples smaller and therefore easier to transport.

During excavation, note was kept of the volume of deposit removed from each stratigraphic level; the volume was simply measured in bucketsful. A total of 386,75 buckets

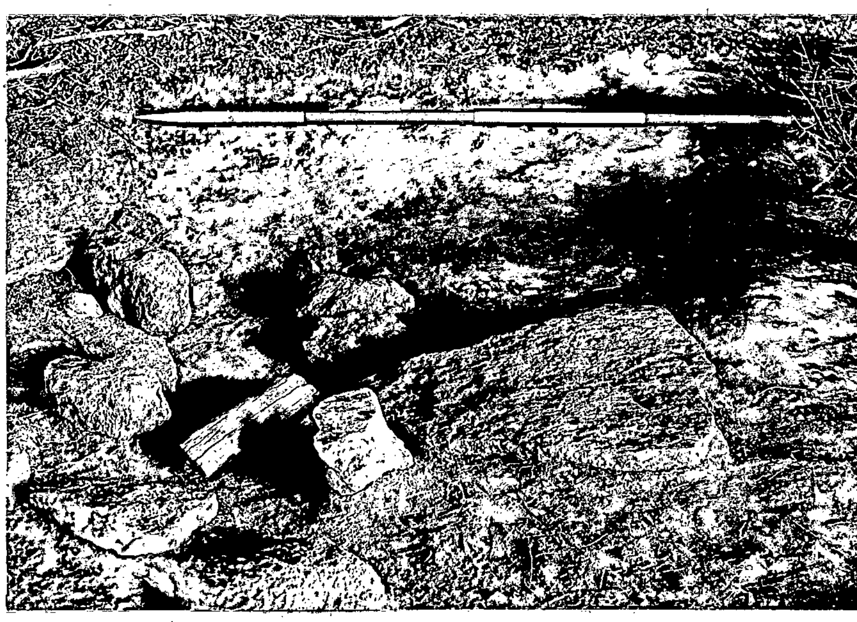


Figure 10.
Occupation Hollow A after removal of bedding

of deposit was removed from the 10 metre squares excavated from Occupation Hollow A, the 3 metre squares excavated from Occupation Hollow C and the 1 metre square excavated from the NE. Shelter.

Stratigraphy and dating

1. Description of stratigraphic lenses

In Occupation Hollow A and its vicinity, the stratigraphy proved to be highly complex with numbers of small and varied lenses. In terms of content, the lenses can be reduced to 3 major types: soil lenses containing plant material, soil lenses with little or no plant material, usually incorporating quantities of gravel or rock rubble, and ash lenses of various colours. Some of the variation amongst the lenses obviously relates to separate occupations of the site, whilst different activity areas, such as bedding places and hearths are factors to be taken into consideration. Proximity of the deposits to the shelter entrance has also influenced their nature, since the seepage of rainwater through the granitic sub-soil has resulted in acidic conditions not conducive to the preservation of organic remains. 15 distinct lenses were recognised in Occupation Hollow A and its vicinity; each of these lenses has been given a unit number and a descriptive name. The numbers are independent of stratigraphic depth and are not stratigraphically sequential. The names and numbers of the lenses are presented in Table 1. Whilst all material from each of the lenses was kept separately during the course of the excavation, it was later considered necessary to combine lithic artefacts from some of the levels in order to provide samples of larger size. For this purpose, the levels containing pottery (Units 2,3,4 and 11) were distinguished from the remaining units which can be considered pre-pottery levels. For the purpose of analysis of faunal and botanical remains, the units have been considered as entities.

Table 1

Big Elephant Shelter, 1976

STRATIGRAPHIC LENSES FROM OCCUPATION HOLLOW A

strat. unit		descriptive name
1		dung and plant
2	*	surface bedding
3	*	brown soil with plant (also known as sand under bedding to avoid confusion with Unit 7)
4	*	surface soil
5		brown soil I
6		hard brown soil with rubble
7		brown soil with plant
8		grey soil with plant
9		grey soil 2
10		grey soil I
11	*	ash lenses I
12		ash lenses 2
13		ash lenses 3
14		brown soil 2
15		brown soil and gravel

* pottery levels

In the shallow deposit of Occupation Hollow C, I have distinguished 2 stratigraphic units: a surface plant rich unit and a basal soil/ash lens. The thin lens removed from the NE. Shelter has been retained as one unit.

2. Sequence of stratigraphic lenses in Occupation Hollow A

Sections from Occupation Hollow A are illustrated in Figures 11-13. Figure 11 is the section through part of the western wall of Occupation Hollow A. Although there are varied lenses in this portion of the shelter, the stratigraphic sequence is relatively straightforward:

a. basal lenses The brown soil with rubble and grey soil are the oldest deposits in the excavated part of the shelter; these have been hollowed out by later occupants of the shelter whose occupation is represented by the grey soil with plant deposits. A charcoal sample (Pta-1557) collected from the grey soil with plant was dated 3130±40 B.P. The grey and dark ash lenses (numbered 13) probably represent a hearth associated with the grey soil with plant deposit.

b. dung and plant layer A later occupation level is represented by the dung and plant layer possibly associated with the ash lenses labelled 12. The dung and plant layer appears to be a floor deliberately laid by man since the areally restricted size of the layer makes it unlikely that it represents a natural dung accumulation. In parts, the dung was laid directly on to bedrock and it seems possible that the earlier shelter deposits were removed prior to the laying of the floor. At present it is not known whether the dung used for the floor was obtained from wild or domesticated animals. Remains of one sheep were recovered from the surface and although animals the size of sheep were represented in other levels, no certain identification can be made. At Mirabib Shelter, in the Namib, a similar occurrence of dung floors has been noted (Sandelowsky 1974:67) and sheep hair was found embedded in the dung (Sandelowsky pers. comm.).

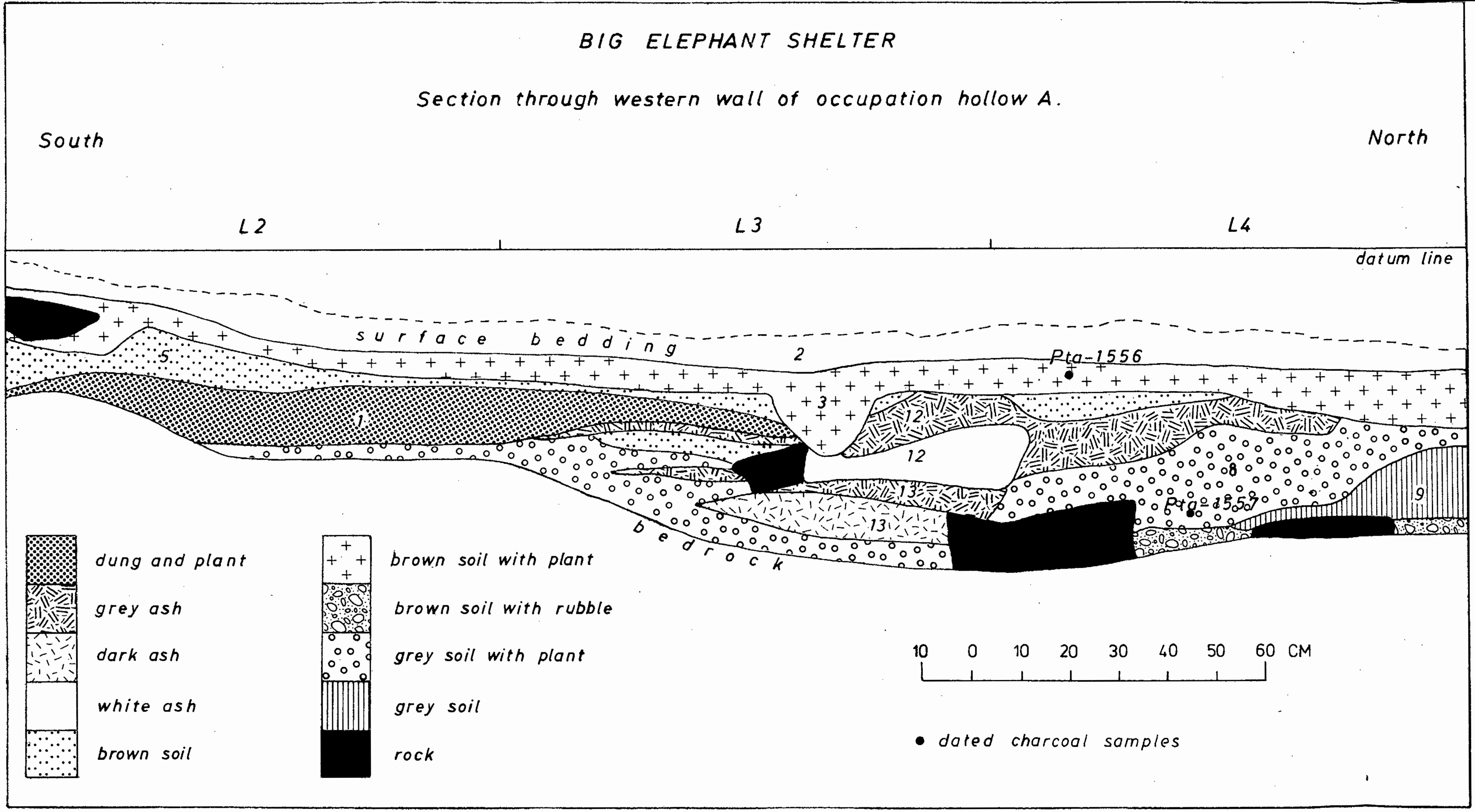

BIG ELEPHANT SHELTER
Section through western wall of occupation hollow A.
South
North
L2
L3
L4
datum line
surface bedding
bedrock
Pta-1556
Pta-1557
1
2
3
5
8
9
12
12
13
13
dung and plant
grey ash
dark ash
white ash
brown soil
brown soil with plant
brown soil with rubble
grey soil with plant
grey soil
rock
10 0 10 20 30 40 50 60 CM
dated charcoal samples

Figure 11

BIG ELEPHANT SHELTER

Sections through southern walls of occupation hollow A.

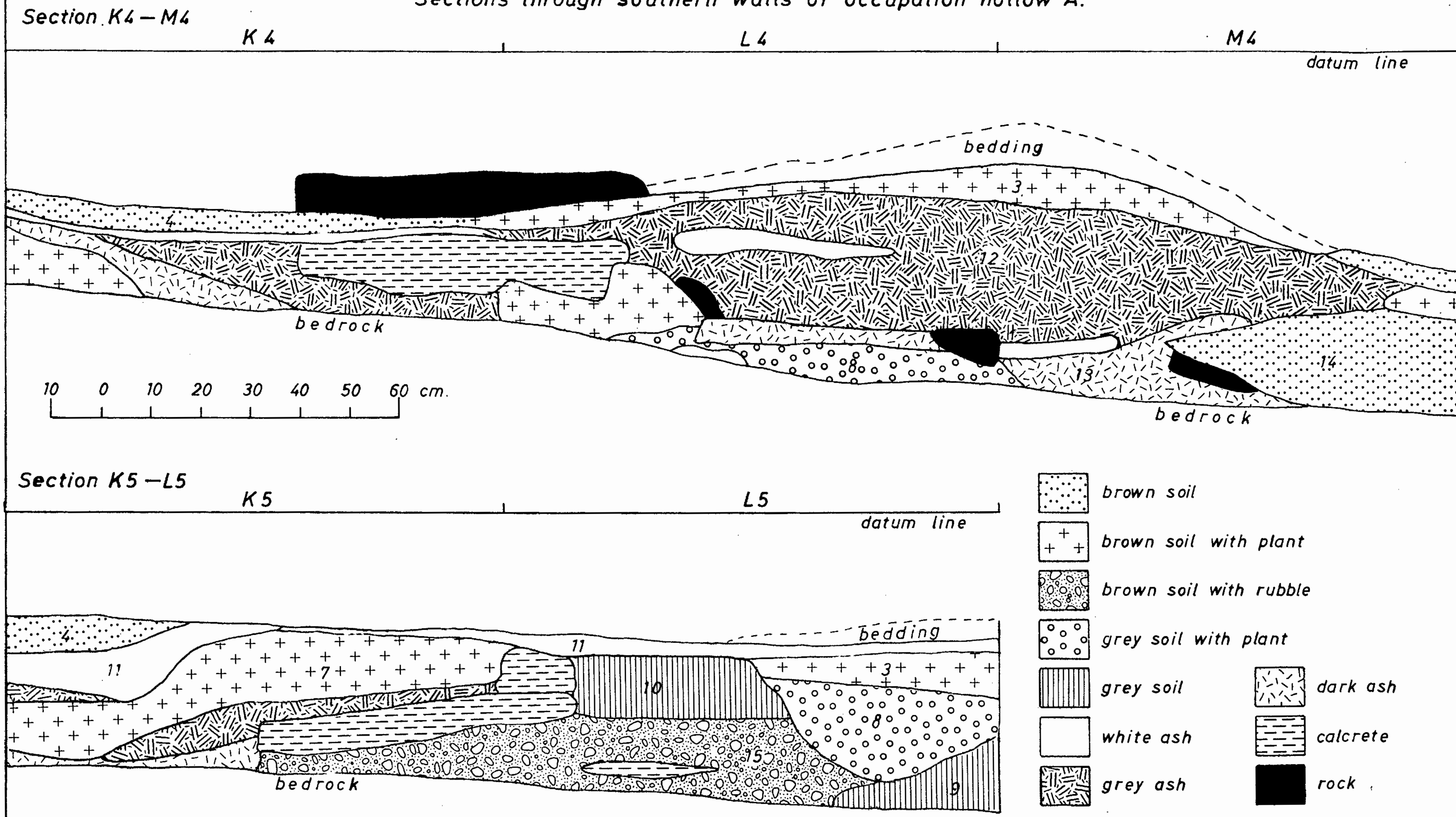


Figure 12

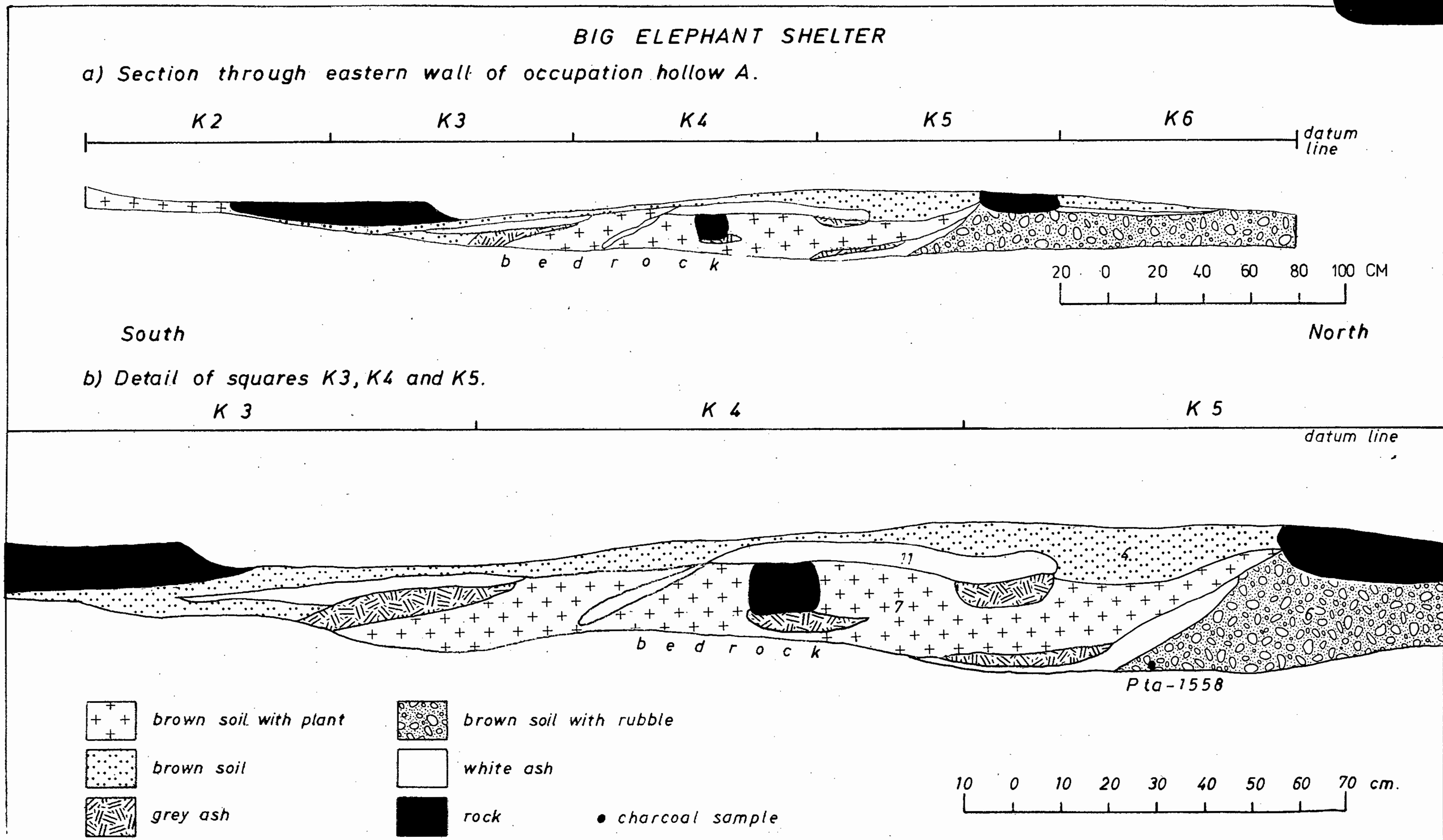

BIG ELEPHANT SHELTER
a) Section through eastern wall of occupation hollow A.
K2
K3
K4
K5
K6
datum line
b e d r o c k
20 0 20 40 60 80 100 CM
South
North
b) Detail of squares K3, K4 and K5.
K 3
K 4
K 5
datum line
11
4
7
6
b e d r o c k
Pta-1558
brown soil with plant
brown soil
grey ash
brown soil with rubble
white ash
rock
charcoal sample
10 0 10 20 30 40 50 60 70 cm.

Figure 13

c. light brown soil and brown soil with plant layers
The loose, light brown soil stratified above the dung floor contains very little artefactual or organic material and may represent a period of non-occupation of the site or occupation of very short duration. The brown soil with plant level appears as a plant rich layer under the surface bedding. A date of 2600±50 B.P. (Pta-1556) was obtained from Square L4 (Figure 11). 2 small "pits" excavated by the prehistoric occupants may be post holes. A stone rests in the "pit" in Square L2.

d. bedding layer The bedding layer is the most recent of the deposits in this part of the shelter. The bedding is composed of grass and leafy material overlying a prickly layer of *Blepharis sp*. Brushwood and bark twine lying on the surface of the bedding indicate that screens may have been erected to shelter the occupation hollows. I was not able to reconstruct the screens as Clark and Walton (1962) illustrated them, possibly because of subsequent interference with the site.

Figure 12 (Section K5-L5) lends support to the idea that the grey soil with plant layer (3130 B.P.) accumulated in the western area after prior excavation of earlier deposits by the cave occupants. There appears to be a mound of earlier deposit in the centre of Squares K5 and L5. The mound was firstly hollowed out from the west, where the grey soil with plant layer accumulated and, secondly, from the east, after which relatively recent deposits accumulated. The earlier mound of deposit is partly sealed by a calcrete slab. Similar slabs occur in other parts of the deposit and a satisfactory sedimentological explanation for them has not yet been found. They are always associated with ash and may be related to the action of fire on the deposits. Figure 12 (Section K4-M4) illustrates that the grey soil with plant deposit was also disturbed by digging and that parts of it were removed from both the east and the west.

is extremely provocative. In view of the complexity of the stratigraphy and the possibility of pottery having become incorporated in the level below the bedding through trampling, I would be cautious about considering the date as being a reliable indicator of the presence of pottery at a very early date. This suspicion is supported by the lack of pottery in the level dated 1080 B.P. Nevertheless, early dates for the presence of pottery and domestic animals are being obtained from other sites in southern Africa and the date of 2600 B.P. for the presence of pottery in South West Africa would not be incongruous.

CHAPTER 4

The subsistence strategy of the Big Elephant Shelter hunter-gatherers: analysis of faunal and botanical remains

Environmental background

1. Rainfall

South West Africa receives its main rains in summer when the Kalahari Low is most strongly developed. This convectional type of rainfall is highly variable and irregular (Wellington 1967:32-4). For the territory as a whole, the mean annual rainfall is approximately 273 mm but there is great disparity between the western and north-eastern areas. During the main rains of summer, the coastal Namib receives a mean precipitation of less than 12,5 mm whilst the north-eastern area around Grootfontein receives about 300 mm in summer and a mean annual precipitation of 400-500 mm (Ibid:32). The town of Usakos and the Erongo Mountains lie between the isohyets of 200 mm and 300 mm (Figure 14). However, these averaging figures are somewhat deceptive as the variability and, therefore, the reliability of rainfall is the crucial factor affecting the farmers, herders and hunter-gatherers, who depend on regular rainfall to provide essential foodstuffs. The variability of the rainfall can be derived from the deviations (over a number of years) of the actual rainfall from the mean rainfall for the period (Ibid:34). The deviation of rainfall from the annual mean is 50-60% in the Usakos area.

Rainfall figures are now available for the farm Ameib, on which Big Elephant Shelter is situated. Between 1911 and 1970, Ameib received a mean annual rainfall of 246 mm

SOUTH WEST AFRICA

Mean annual rainfall in mm

after Hüser 1976

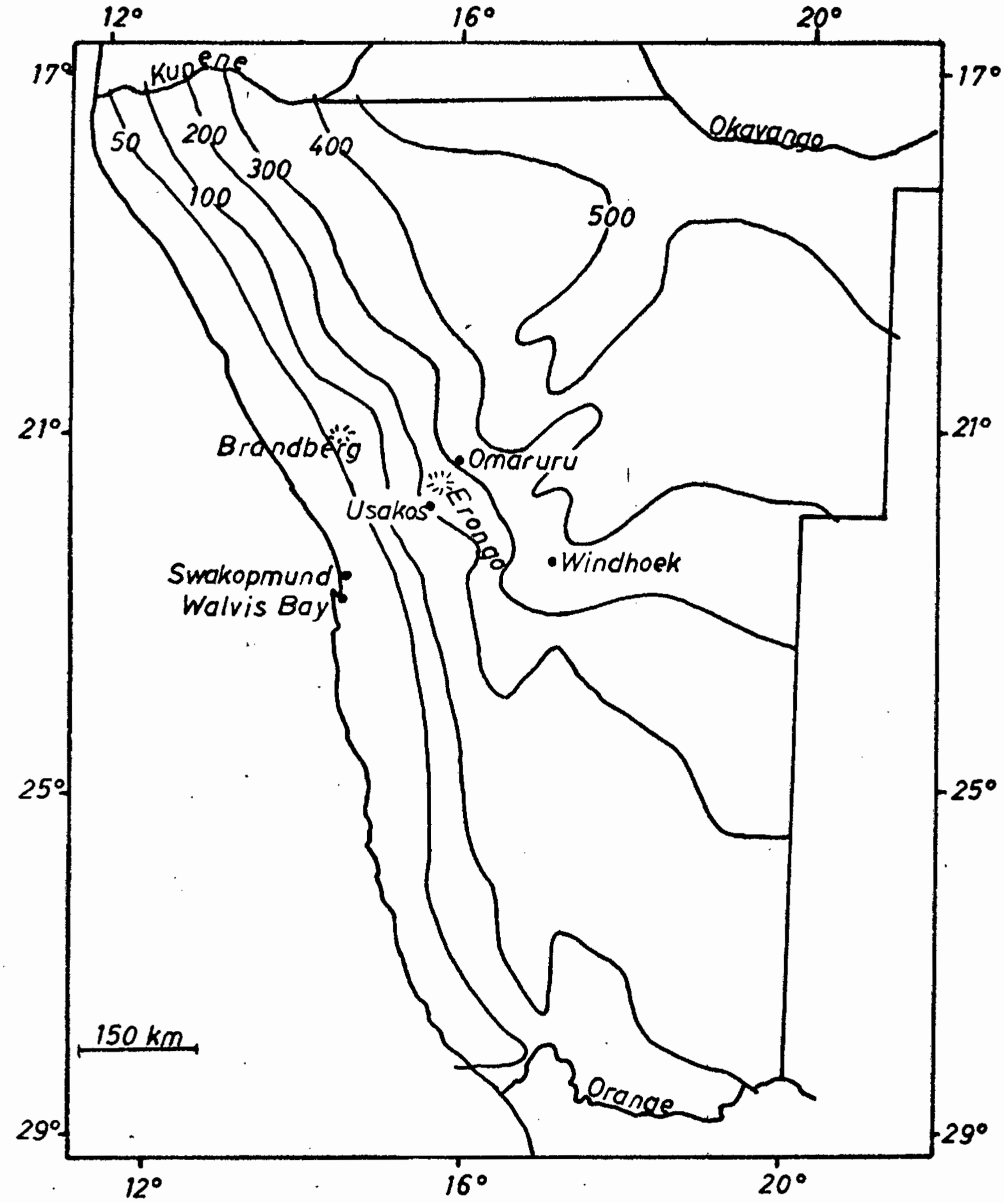


Figure 14

but the variability of the rainfall can be gauged from the following figures. In the season 1973/74, the rainfall was 175,2% of the mean, in 1969/70 it was 50% of the mean, in 1962/63 it was 207,5% of the mean and in 1961/62 it was 49,6% of the mean (Hüser 1976:22-3).

The very great excess of evaporation over rainfall in winter and spring seasons creates what is often called the hunger period in the territory. If the rainfall is less than normal for a particular year, the hunger period may continue into the summer months, thus constituting a drought (Wellington 1967:40). Although a number of conditions are of consequence in defining drought, a condition of drought is generally recognised in South West Africa if the annual rainfall is less than 85% of the normal (Ibid:41). Thus, drought conditions occurred at Ameib in 1969/70 and 1961/62 and in each case the drought was followed by periods of exceptionally high rainfall. The frequency of drought occurrences in the territory underlines the fact that drought is a major consideration when viewing the potential of the land for use by herders, agriculturalists and hunter-gatherers. Wellington (Ibid:42) records that during a 77 year period, the north of the territory had 30 years of drought, the south 34 and the north and south had drought together in 23 years. Spells of successive drought years in either north or south were: 1887/88-1889/90; 1893/94-1895/96; 1900/1-1902/3; 1912/13-1915/16; 1928/29-1932/33; 1944/45-1947/48; 1968/69-1962/63.

The availability of food and water during the annual hunger period, and also during years of drought, would have set limits on the size of population groups in the Erongo area. After the exceptional rains of 1974, surface water was available on Ameib until September but, in most years, water can only be obtained by digging in dry river beds. During drought, water is extremely scarce. Although no systematic studies of the effects of drought on veldkos have been carried out, Giess of the Windhoek Herbarium has suggested (pers.comm.) that at least some shrubs and trees either skip a flowering season or have inhibited flowering during drought, with a correspondingly low fruit yield.

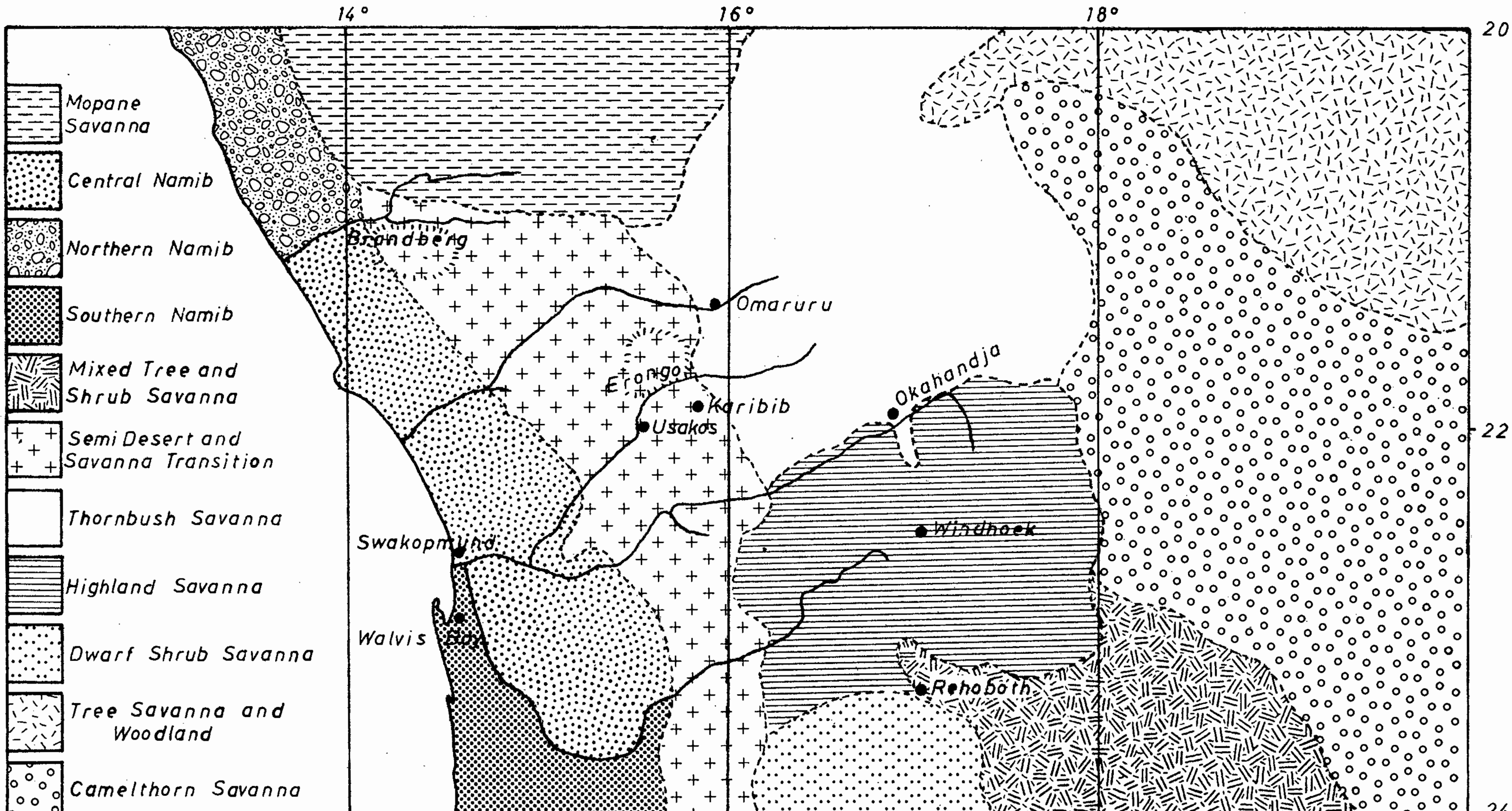
2. Vegetation

The vegetation zones of South West Africa have been determined primarily by the climate, especially rainfall, and also by the characteristic plant species in the zones (Giess 1971:6). The central portion of South West Africa is traversed by 11 vegetation types (see Figure 15). Working from west to east, these are the Northern, Central and Southern Namib, Mopane Savanna, Semi-Desert and Savanna Transition, Thornbush Savanna, Highland Savanna, Dwarf Scrub Savanna, Camelthorn Savanna, Mixed Tree and Shrub Savanna and Tree Savanna and Woodland. The Erongo Mountains lie within the Semi-Desert and Savanna Transition, a vegetation zone characterized by a great variety of species. Particularly characteristic of the zone, are the numerous species of Commiphora (Ibid:10).

Acacia and Euphorbia sp. are common in the Semi-Desert and Savanna Transition as are Boscia albitrunca, Grewia sp. and Ziziphus mucrunata. The perennial grasses originally included species of Aristida, Eragrostis, Enneapogon, Anthephora, Chloris, Heteropogon, Cymbopogon, Urochloa, Sporolus and Seteria, but as a result of poor farming practice, there is encroachment by thorn scrub, and inferior annual species are replacing the origin perennial grasses (Wellington 1967:60). Giess (1971:10) notes that the region has a number of woody species in common with the north-east of the territory (Grootfontein, Tsumeb and the Otavi Mountains) where the annual rainfall may be as high as 500 mm.

VEGETATION OF CENTRAL SOUTH WEST AFRICA

after Giess 1972



Scale 1:3000000
Figure 15

counts of individual species, and relevant information on the species, are presented in Tables 2-8. All the species present in the faunal list occur in the area today, with the exception of the blue wildebeest which may be represented in the faunal list. Klein (pers. comm.) notes that the "?" before and the "cf" after a number in the faunal list (Table 2) are meant to convey different levels of uncertainty about an identification, "cf" indicating a higher level of probability for correct identification than "?".

Raphicerus and klipspringer are represented in the small bovid category, but since duiker fall within the same size range, it is possible that some of the unidentified small bovid material may represent this species. Klein (pers. comm.) suggests that the Raphicerus sp. represented is probably R. campestris and this identification agrees with Joubert and Mostert's (1975) present day distribution census.

In the small/medium bovid category, Klein includes sheep/goat and springbok. The only positively identified sheep comes from the surface of Occupation Hollow A. Since no undomesticated small/medium bovids other than springbok occur in the area today, those remains which are not sheep are probably springbok.

In the large/medium bovid category, Klein has suggested the presence of equid remains and remains in the gemsbok size category. As regards the equid remains, Klein feels that these are related more closely to horse than zebra, on account of size. However, Equus zebra hartmannae (Hartmann zebra) is reputed to be the largest of southern African zebra and may be compared to the horse in build (Shortridge 1934:394). Since the Hartmann zebra occurs in the Erongo today, I would suggest that this may be the species represented. Klein suggests that gemsbok, kudu and blue wildebeest may be represented in the gemsbok size

Table 2

Big Elephant Shelter, 1976

FAUNAL LIST

	Occupation Hollow A strat. units													
	1	2	3	4	5	6	7	8	9	11	12	13	14	15
Lagomorpha gen. et sp. indet., hare(s)	-	-	-	1	-	-	1	1	-	-	-	-	-	-
Hystrix africae-australis, porcupine	-	-	-	-	-	-	-	1cf	-	-	-	-	-	-
Otocyon meaalotis, bat-eared fox	-	-	-	-	-	-	-	?1	-	-	-	-	-	-
Mellivora capensis, honey badger	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Genetta sp., genet	-	-	-	-	-	-	-	?1	-	-	-	-	-	-
Felis cf. libyca, wildcat	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Felis cf. caracal, caracal	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Procavia capensis, rock hyrax	2	4	3	3	1	2	4	7	1	1	1	3	2	1
Equus sp. (p), horses or zebras	-	-	1	1	-	-	-	1	-	-	-	-	-	-
Suidae gen. et sp. indet, pig	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Antidorcas marsupialis, springbok	-	-	1	-	-	-	-	-	-	1	-	-	-	-
Oreotragus oreotragus, klipspringer	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Raphicerus cf. campestris, steenbok	-	-	1	-	-	1	1	2	1	-	-	1	-	-

continued overleaf...

Table 2 continued...

	Occupation Hollow A strat. units													
	1	2	3	4	5	6	7	8	9	11	12	13	14	15
Ovis aries, sheep	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Bos taurus, cow	-	1cf	-	-	-	-	-	-	-	-	-	-	-	-
Bovidae -- general														
small	1	1	2	1	1	1	1	2	1	1	1	1	1	
small medium	1	1	2	1	-	-	1	1	1	1	-	1	-	1
large medium	1	-	1	1	-	1	1	1	-	1	1	-	1	-
large	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Varanus sp., leguaan	-	2	2	1	-	1	1	-	?1	2	-	?1	-	-
Chelonia, tortoise	-	1	-	2	1	1	2	2	1	1	-	1	-	-
Aves, birds	1	x	x	-	-	x	x	x	-	-	-	x	-	-

continued overleaf...

Table 2 continued...

	Occupation Hollow C
Procavia capensis	3
Bovidae -- general	
small	1
small medium	1
Aves	x
Varanus sp.	x

	NE. Shelter Settlement
Raphicerus sp.	1cf
Bovidae -- general	
small medium	2
Varanus sp.	2

Table 3

Big Elephant Shelter, 1976

RAPHICERUS & OREOTRAGUS.

Minimum numbers of individuals represented by various body parts (- + - = epiphysis unfused + epiphysis fused)

	Occupation Hollow A Strat. units														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frontlet	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
Maxilla	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Mandibular condyle	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Mandibular dentit.	1	-	1	-	-	1	1	2	1	-	-	-	-	-	-
Atlas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Axis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other cervicals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thoracic vertebrae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lumbar vertebrae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sacrum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

continued overleaf...

Table 3 continued...

	Occupation Hollow A Strat. units														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ribs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scapula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Humerus-proximal	-	-	-	-	-	-	-	-	-	-	-	1(0+1)	-	-	-
-distal	-	-	2(0+2)	-	-	-	-	-	-	-	-	-	-	-	-
Radius-proximal	-	-	-	1(0+1)	-	-	-	-	-	-	-	-	-	-	-
-distal	-	-	-	-	-	-	1(0+1)	-	-	-	-	-	-	-	-
Ulna-proximal	-	-	-	1(0+1)	-	1(1+0)	1(0+1)	1(0+1)	-	-	1(0+1)	-	-	-	-
Magnum	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Lunate	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Cuneiform	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unciform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scaphoid	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Metacarpals-prox.	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
-distal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

continued overleaf...

Table 3 continued...

	Occupation Hollow A Strat. units														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Phalanges-1st	1(0+1)	1(0+1)	1(0+1)	1(0+1)	-	1(0+1)	1(0+1)	-	-	-	-	1(0+1)	-	-	-
-2nd	1(0+1)	1(0+1)	1(0+1)	1(0+1)	-	-	1(0+1)	-	1(0+1)	-	-	-	-	-	-
-3rd	1(0+1)	-	-	-	1	-	1	-	-	-	-	-	-	1	-
Ilium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ischium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pubis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Femur-proximal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-distal	-	-	-	1(0+1)	-	-	-	-	-	-	-	-	-	-	-
Tibia-proximal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-distal	-	-	1(0+1)	1(0+1)	-	-	-	-	-	-	-	-	-	-	-
Patella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcaneum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Astragalus	-	-	1	1	-	-	1	-	-	-	-	-	-	-	-
Lateral malleolus	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Naviculo-cuboid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

continued overleaf...

Table 3 continued...

RAPHICERUS & OREOTRAGUS

Minimum number of individuals represented by various body parts (- + - = epiphysis unfused + epiphysis fused)

	Occupation Hollow A Strat. units														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Metatarsal-proxim.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
-distal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sesamoids-proximal	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-
Cuneiform 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cuneiform 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indet. distal metapodial	-	-	-	-	-	1(0+1)	1(0+1)	1(0+1)	-	-	-	1(0+1)	-	-	-
minimum no. individuals	1	1	2	1	1	1	1	2	1	-	1	1	1	1	-

DEPARTMENT OF ARCHAEOLOGY

Table 4

Lagomorph -- minimum numbers of individuals represented by various body parts

	4	7	8
Dentition	-	1	-
Humerus-distal	1	-	-
Phalanges - 3rd	-	-	1
Astragalus	-	-	1

<u>Felis</u> cf. <u>libyca</u> -- minimum number of individuals represented by various body parts

	4
Phalanges - 2nd	1

<u>Felis</u> cf. <u>caracal</u> -- minimum number of individuals represented by various body parts

	3	4
Ulna-distal	-	1
Phalanges - 2nd	1	-

<u>Equus</u> sp(p). -- minimum number of individuals represented by various body parts

	3	4	8
Maxilla	-	1	-
Metacarpal-distal	-	1	-
Phalanges - 1st	1	-	-
- 2nd	-	-	1
- 3rd	-	-	1
Sesamoids-distal	-	-	1

Table 5

Big Elephant Shelter, 1976: Small/medium and Large/medium bovids

The minimum numbers of individuals represented by various body parts (-+- = epiphyses unfused and epiphyses fused)

Ovis & *Antidorcas*	Occupation Hollow A stratigraphic units									
	1	2	3	4	7	8	9	11	13	15
Maxilla	-	-	-	1	-	-	-	-	-	-
Mandible	-	-	1	-	1	-	-	1	-	-
Ulna-proximal	-	1(0+1)	-	-	1(0+1)	-	-	-	-	-
Scaphoid	-	-	-	-	-	-	1	-	-	-
Metacarpal-prox.	-	-	1	-	-	-	-	-	-	-
Phalanges-1st	-	1(0+1)	2(1+1)	1(0+1)	1(0+1)	-	-	-	1(0+1)	-
-3rd	1	-	1	-	-	-	-	-	-	-
Tibia-proximal	-	-	-	1(0+1)	-	-	-	-	-	-
Patella	-	-	1	-	-	-	-	-	-	-
Calcaneum	-	-	-	-	1	1	-	-	-	-
Astragalus	-	-	1	-	-	-	1	-	-	-
Naviculo-cuboid	1	-	-	-	-	-	-	-	-	-
Cuneiform 1	1	-	-	-	-	-	-	-	-	-
Metatarsal-proximal	-	-	-	-	-	1	-	-	-	-
Sesamoids-proximal	-	-	1	-	1	-	-	-	-	-
-distal	-	-	1	-	-	-	-	-	-	-
Indeterminate distal metapod.	-	1(0+1)	-	1(0+1)	-	-	-	-	-	1(0+1)
minimum number individuals	1	1	2	1	1	1	1	1	1	1

Table 5 continued

Large/Medium bovids (e.g. Tragelaphus strepsiceros, Connochaetes taurinus, Oryx gazella)

The minimum numbers represented by various body parts (-+- = epiphyses unfused and epiphyses fused)

	Occupation Hollow A stratigraphic units								
	1	3	4	6	7	8	11	12	14
Scapula	-	-	-	-	1	-	-	-	-
Radius-distal	-	-	1(1+0)	-	-	-	-	-	-
Magnum	-	-	1	-	-	-	-	-	-
Metacarpal-distal	-	1(0+1)	1(1+0)	-	-	-	-	-	-
Phalanges-1st	-	1(0+1)	-	-	1(0+1)	-	-	-	-
-2nd	1(1+0)	-	-	1(0+1)	-	1(0+1)	1(0+1)	-	-
-3rd	-	-	-	-	1	-	-	-	-
Tibia-proximal	-	-	-	-	1(1+0)	-	-	-	-
Patella	-	-	-	-	-	-	-	1	-
Lateral malleolus	-	-	-	-	1	-	-	-	-
Cuneiform 1	-	-	-	-	1	-	-	-	-
Cuneiform 2	-	-	-	-	-	-	-	-	1
Metatarsal-prox.	-	1	-	-	-	-	-	-	-
Sesamoids-proximal	-	-	1	-	-	-	-	-	-
minimum number individuals	1	1	1	1	1	1	1	1	1

Table 6

Big Elephant Shelter, 1976

PROCAVIA CAPENSIS

The minimum numbers of individuals represented by various body parts (- + - epiphysis unfused + epiphysis fused)

	Occupation Hollow A				
	1	2	3	4	5
Occipital condyle	-	2	-	1	-
Maxilla	-	1	-	1	-
Mandibular condyle	-	1	-	2	-
Mandibular dentit.	1	-	-	1	-
Atlas	1	1	-	1	-
Axis	-	1	-	-	-
Other cervicals	1	-	-	-	-
Thoracic vertebrae	-	-	-	-	-
Lumbar vertebrae	1	2	-	1	1
Sacrum	-	2	-	1	-
Scapula	1	3	2	3	-
Humerus-proximal	-	4(0+4)	2(0+2)	-	-
-distal	1(0+1)	3(0+3)	2(0+2)	3(0+3)	-
Radius-proximal	-	1(0+1)	-	1(0+1)	1(0+1)
-distal	-	2(0+2)	-	-	-
Ulna-proximal	-	1(0+1)	3(0+3)	2(0+2)	-
-distal	-	2(0+2)	1(0+1)	2(1+1)	-
Carpals	-	1	-	1	-
Metapodials-prox.	1	1	1	1	1
-distal	2(1+1)	2(1+1)	1(0+1)	2(1+1)	-
Phalanges-1st	1	1	-	-	-
-2nd	-	3	2	4	-
Ilium	1	1	-	2	-
Ischium	1	1	-	2	-
Pubis	1	1	-	-	-
Femur-proximal	1(0+1)	3(1+2)	-	2(2+0)	-
-distal	-	2(0+2)	1(0+1)	2(1+1)	-
Tibia-proximal	-	2(0+2)	1(1+0)	3(2+1)	-
-distal	-	2(0+2)	1(0+1)	2(0+2)	-
Fibula-proximal	-	-	-	1(0+1)	-
-distal	-	-	-	-	-
Patella	-	2	1	-	-
Calcaneum	-	2	-	1	-
Astragalus	1	1	1	3	-
Ribs	-	-	-	-	-
minimum no. individuals	2	4	3	3	1

Table 6 continued...

	Occupation Hollow A				
	6	7	8	9	10
Occipital condyle	-	-	1	1	-
Maxilla	-	1	1	1	-
Mandibular condyle	-	-	1	-	-
Mandibular dentit.	-	2	-	-	-
Atlas	-	-	-	-	-
Axis	-	1	-	-	-
Other cervicals	-	1	-	-	-
Thoracic vertebrae	-	1	1	-	-
Lumbar vertebrae	1	1	1	-	-
Sacrum	-	-	-	-	-
Scapula	-	2	-	1	-
Humerus-proximal	-	2(0+2)	2(1+1)	1(1+0)	-
-distal	2(0+2)	2(0+2)	7(1+6)	1(0+1)	-
Radius-proximal	1(0+1)	2(1+1)	-	-	-
-distal	-	3(1+2)	2(2+0)	-	-
Ulna-proximal	1(1+0)	4(3+1)	3(1+2)	1(0+1)	-
-distal	-	2(1+1)	2(1+1)	1(0+1)	-
Carpals	-	-	-	-	-
Metapodials-prox.	-	1	1	-	-
-distal	-	1	1(0+1)	-	-
Phalanges-1st	-	1	-	-	-
-2nd	-	-	1	-	-
Ilium	-	-	1	-	-
Ischium	-	-	1	-	-
Pubis	-	-	-	-	-
Femur-proximal	-	3(1+2)	2(0+2)	1(1+0)	-
-distal	-	2(1+1)	4(3+1)	-	-
Tibia-proximal	-	3(2+1)	-	-	-
-distal	-	1(0+1)	2(0+2)	-	-
Fibula-proximal	-	-	-	-	-
-distal	-	-	-	-	-
Patella	-	1	-	-	-
Calcaneum	-	-	1	-	-
Astragalus	-	1	-	-	-
Ribs	-	1	1	1	-
minimum no. individuals	2	4	7	1	-

Table 6 continued...

	Occupation Hollow A				
	11	12	13	14	15
Occipital condyle	-	-	-	-	-
Maxilla	-	-	1	-	-
Mandibular condyle	-	-	1	-	1
Mandibular dentit.	1	-	1	-	1
Atlas	-	-	-	-	-
Axis	-	1	-	-	-
Other cervicals	-	-	-	-	1
Thoracic vertebrae	-	-	1	-	-
Lumbar vertebrae	-	-	-	1	-
Sacrum	-	-	-	-	-
Scapula	-	1	1	2	-
Humerus-proximal	-	1(0+1)	1(0+1)	-	-
-distal	-	1(0+1)	3(0+3)	1(0+1)	1(0+1)
Radius-proximal	1(0+1)	-	1(0+1)	-	-
-distal	1(0+1)	-	-	-	-
Ulna-proximal	1(0+1)	-	-	2(0+2)	1(0+1)
-distal	1(0+1)	-	1(0+1)	-	-
Carpals	-	-	1	-	-
Metapodials-prox.	-	-	1	1	1
-distal	-	-	1(0+1)	1(0+1)	1(0+1)
Phalanges-1st	-	-	-	-	1
-2nd	-	-	-	1	-
Ilium	-	-	-	-	1
Ischium	-	-	-	-	1
Pubis	-	-	-	-	1
Femur-proximal	-	1(1+0)	-	2(1+1)	-
-distal	-	1(1+0)	-	1(1+0)	1(1+0)
Tibia-proximal	-	1(0+1)	-	-	-
-distal	-	-	-	-	-
Fibula-proximal	-	-	-	-	-
-distal	-	-	-	-	-
Patella	-	-	-	-	-
Calcaneum	-	-	-	-	1
Astragalus	-	-	-	-	1
Ribs	-	-	-	-	-
minimum no. individuals	1	1	3	2	1

Table 7

Big Elephant Shelter, 1976

Occupation Hollow A

<u>Genetta</u> sp.	-- the minimum number of individuals represented by various body parts	
		8
Mandible		1?
Ischium		1?
<u>Hystrix africae-australis</u>	- the minimum number of individuals represented by various body parts	
		8
Patella		1cf
<u>Otocyon megalotis</u>	-- the minimum number of individuals represented by various body parts	
		8
Radius-distal		1?
Ulna-proximal		1?
<u>Mellivora capensis</u>	-- the minimum number of individuals represented by various body parts	
		3
Occipital condyles		1
Suid	-- the minimum number represented by various body parts	
		7
Humerus-distal		1

Table 8

Big Elephant Shelter, 1976

DENTITION

Oreotragus oreotragus	I		II		III		IV		V		VI		VII		Totals			Frontlets	
	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U&L	M	F
1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
Raphicerus cf. *campestris*																			
3	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-
6	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-
7	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	1
8	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	2	2	-	1
9	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-
13	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	1	1	-
Antidorcas marsupialis																			
3	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-
11	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-
Ovis aries																			
4	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-
Bovini (? *Bos taurus*)																			
2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-

range. Joubert and Mostert's distribution maps illustrate that the blue wildebeest is not extant near Erongo but Coetzee (pers. comm.) has suggested that its distribution may have been wider in early historic times.

In the large bovid category, the faunal remains have been tentatively ascribed to Bos taurus (cow). This identification seems reasonable in view of the fact that neither eland nor buffalo occur in Erongo district today (though eland are being introduced on to farms in the area); however, Coetzee (pers. comm.) suggests that eland may once have occupied Erongo territory.

Klein notes that half or more of the dassie remains exhibit surficial corrosion which appears to have come from exposure of the bone to the digestive juices of a predator, possibly leopard. This observation of non-human utilization of dassie is very pertinent since dassie remains form a large percentage frequency of the faunal remains. Dassie were, therefore, not as important to human diet as they first appear. I re-examined the dassie bone to see if there was any patterning in the occurrence of the corroded bone, however, this appears not to be the case; some of all the dassie bone from all the levels displays corrosion, though the greatest degree of corrosion is evident in the bedding area (Unit 2). Probably at least half of the dassie bone represents non-human predation.

Table 9 lists the faunal remains most likely to have been human dietary items and distinguishes between the pottery and pre-pottery levels. Apart from the higher frequencies of dassie remains in the pre-pottery levels and the increase of leguaan in the pottery levels, the percentage frequencies of faunal remains are very similar in both levels. Bovids form a fairly high percentage frequency of the diet in both pottery and pre-pottery levels; bovids falling within the combined small and small/medium

Table 9

Big Elephant Shelter, 1976

FAUNAL REMAINS PROBABLY FORMING PART OF MAN'S DIET

fauna	pre-pottery levels		pottery levels		totals	
	f	%	f	%	f	%
Hare	2	3,3	1	2,7	3	3,1
Hyrax (dassie)	24	39,3	11	29,7	35	35,7
Pig	1	1,6			1	1,0
Small bovids	10	16,4	5	13,5	15	15,3
Small/medium bovids	6	9,8	5	13,5	11	11,2
Large/medium bovids	6	9,8	3	8,1	9	9,2
Large bovids			1	2,7	1	1,0
Tortoise	8	13,1	4	10,8	12	12,2
Leguaan	4	6,6	7	18,9	11	11,2
TOTALS	61	99,9	37	99,9	98	99,9

and large category.

From the available faunal counts, it is not possible to determine whether hunting preference centred around solitary or gregarious game. Both are represented and the preferred habitats of the various bovids suggest that at least 2 hunting methods were adopted. Since there is evidence for the use of bow and arrow, both in the pottery and pre-pottery levels (see Chapter 5), it could be suggested that the plains game, springbok and gemsbok, and possibly also the mountain zebra, were hunted in this manner. For procuring shy bush dwelling game, like kudu and steenbok, traplines and/or pits may have been more effective. Historical accounts substantiate this idea; Alexander (1838:125-6) mentions the presence of both pitfalls and traplines near the junction of the Numsep and Kuiseb Rivers. He specifically refers to the use of traplines for capturing of small game: " There were... means for capturing small game. Thus a cord formed of the inner bark of a tree was tied to a young sapling, a loop was made in the cord and the sapling was bent down and fixed slightly to two cross sticks; the loop was opened and arranged on the ground above a hollow place and under a few blades of grass to conceal it, so that a deer, or even an ostrich, on passing through the opening where the noose was placed and putting a foot through it was immediately twitched into the air by one leg and thus became the prey of the Damaras."

It could be predicted that small animals hunted by means of traplines would show random selection in age sizes, since no preferential selection by man was involved. Contrarily, hunting with projectiles would have involved direct human choice and bovids included in this category might reveal preferences, for example, for adult males. Klein has provided some information on the dental ages of klipspringer, steenbok, springbok, sheep and ?cow (Table 8). Klein has arbitrarily defined 7 dental age states, 1-7 from younger to older. The klipspringer and cow are relatively young whilst the springbok and sheep are relatively old. Amongst the steenbok, there is a spread of dental ages from state 3-6, with 4 of the 7 individuals falling within dental age state 7. Using the information provided by Klein on fused and unfused epiphyses (Tables 3-7), it would appear that most antelope epiphyses are fused and, therefore, young adult or adult specimens are present. Amongst the dassie sample, greater variation is evidenced and specimens with both fused and unfused epiphyses were collected by human or animal predators. Unfortunately, the faunal sample is really too small to make any reliable statements about patterning in the age distribution of the hunted/collected game.

2. Microfaunal remains

V.A. Scott has identified the microfaunal remains from Big Elephant Shelter; the minimum counts of these remains are presented in Table 10. Most of the microfaunal remains are concentrated in the pottery levels, more particularly in the bedding (Unit 2). Aethomys chrysophilus (African rat) and Gerbillus sp. favour bushy country and open country, repectively, and the African rat specifically avoids rocks and hills (Shortridge 1934: 291,233). Both species are, therefore,likely to have been introduced to the shelter by humans or owls. This may also apply to Thallomys paedulcus (tree rat)which inhabits hollow tree trunks (Ibid:267). Petromys typicus (rock rat) and Elephantulus intufi (Bushveld elephant shrew) inhabit rocky territory (Ibid:329,23) and may have made their nests in the shelter.

Due to the known activity of owls in rock shelters, it would be difficult to assess the relative importance of microfauna to prehistoric man's diet; nevertheless, it is probable that rodents and reptiles may have been

Table 10

MICROFAUNA FROM BIG ELEPHANT SHELTER

Unit 2	Petromus typicus	1 left maxillary frag.
		1 right mandibular frag.
		1 auditory bulla
	Aethomys chrysophilus	1 left maxilla
		1 right maxilla
		2 left mandibles
		1 right mandible
	Thallomys paedulcus	1 left mandible
	Tatera sp.	1 right mandible
	Praomys natalensis	1 left mandible
	Suncus sp.	1 right mandible
Unit 3	Petromus typicus	1 pre-maxilla
Unit 4	Petromus typicus	1 right mandible
		1 pre-maxilla
Unit 6	rodent sp.	1 incisor
Unit 7	Petromus typicus	1 left mandible
	Gerbillurus paeba	1 right mandible
Unit 8	rodent sp. (cf P. typicus)	1 incisor
	do (not P. typicus)	1 pre-maxilla
OCH bed.	Elephantulus intufi	1 right mandible

important dietary items during times of plant and game shortage, as during the annual stress period prior to and during the rain season. In the mid-nineteenth Century, Chapman (1868:195) recorded that, in August, after early rains had fallen, the grass was on fire every night as a result of the Dama using fire to flush out a daily supply of mice and lizards.

It is notable that only small quantities of bird bone were obtained from the Big Elephant Shelter deposits. However, bird eggs may have formed an important protein ingestion of the cave occupants during the otherwise lean period. In each level of the deposit excavated, bird eggshell (excluding ostrich eggshell) was recovered, though the preservation of the brittle shell was better in the more recent deposits. Table 11 lists the weight of eggshell in each level. The higher frequency weight of eggshell in the pottery levels (0,7 gm per bucketful of deposit as opposed to 0,4 gm in the pre-pottery levels) can probably be seen as a reflection of preservation factors, since the eggshell in the pre-pottery levels was extremely fragmented. The eggshell has been identified by R. Jenson of Nature Conservation, as being that of guinea-fowl and francolin. This is significant in terms of establishing seasonal occupation of the site, for guinea-fowl and francolin have restricted laying periods. Guinea-fowl lay their eggs during the rains, usually from December to January (McLachlan & Liversidge 1958:101), though they may delay their laying time slightly if the rains are late (Jenson pers. comm.). Francolin lay their eggs somewhat later than guinea-fowl, between February and March/April (Jenson pers. comm.). Since both guinea-fowl and francolin lay their eggs in open country, under bushes and in grass, it is unlikely that the shells were naturally introduced into the shelter. The influence of non-human predation on the accumulation of shell in the shelter cannot be ruled out, but this premise also applies to other faunal remains

Table 11

WEIGHTS OF GUINEA-FOWL AND FRANCOLIN EGGSHELL

Stratigraphic unit	Weight in g
1	2,5
2	38,5
3	23,0
4	23,0
5	< 0,1
6	9,0
7	15,5
8	15,0
9	6,0
10	---
11	6,0
12	12,0
13	17,0
14	5,5
15	1,0
Occup. Holl. C surface	10,0
Occup. Holl. C soil/ash	15,0
NE. Shelter	1,0
TOTALS	200,1

from the site.

Discussion

The occupants of Big Elephant Shelter hunted or trapped a variety of bovids from 3 local eco-zones: the plains, bush covered areas and hill-slopes. Whilst small/medium bovids dominate the bovid sample, medium/large bovids are also present. Ground game in the form of tortoise, dassie and leguaan were also captured and it is possible that birds and microfauna also formed part of the diet. Guinea-fowl and francolin eggs may have been important sources of protein during the rain season.

In terms of procuring meat, the occupants of Big Elephant Shelter appear to have been opportunists, utilizing whatever game they could obtain from the available range. Although the faunal sample is small and probably does not allow for fixed conclusions to be drawn about dietary preferences, I would suggest that the evidence available points towards hunting and collecting of an unspecialized nature.

Botanical remains from Big Elephant Shelter

Botanical remains were well preserved throughout most of the Big Elephant Shelter deposits and it is therefore possible to examine the man-utilized plants of the area over a period of some 3000 years. It is expected that some of the seed remains may have been introduced into the shelter by birds, but seed remains generally have low frequency representation in the deposit and are not considered to have been important to the diet of the shelter occupants. For this reason, the bird collected fraction of the botanical remains does not significantly affect the total frequency counts of the bulk sample material.

It appears that man brought to the shelter those parts of plants which were useful to him. This collecting pattern sometimes presents a problem of species identification since seeds, twigs, leaves, flowers and fruits are placed in their proper context in the herbarium collections and isolated parts of plants from prehistoric collections are not easily compared with the completed samples. Ficus guerichiana and Grewia tenax are good examples; only twigs of F. guerichiana were present in the deposit and only seeds of G. tenax were present. F. guerichiana cannot be identified on twigs alone and the Grewia species needs twigs as well as seeds to identify it. Fragmentary prehistoric remains add to the problem of identification. Giess was able to identify the genus of several of the prehistoric specimens and the species of a few others; the remaining identifications were made by comparisons of the specimens with collections of plants made over a period of 3 years in the Erongo, Seeis, Grootfontein and Windhoek areas. Fruits and seeds were dried, leaves and flowers pressed and then compared with the prehistoric plant remains. Using this method, it was possible to identify the Grewia species, Vangueria infausta, Ficus guerichiana, Croton gratissimus, Boscia albitrunca, Cordia gharaf and Dombeya rotundifolia. In the case of Cyperus fulgens and Lapeirousia rivularis , the genus was recognisable in the prehistoric specimens and the species was confirmed by fresh specimens. All identifications were made in conjunction with W. Giess.

The botanical remains from Big Elephant Shelter are listed in Table 12. The plants can be divided into 5 broad categories: 1. trees, 2. shrubs, 3. herbs, 4. bulbs and 5. grasses. Relatively little information is available on South West African plants, but I have attempted to collate some published material for the following descriptions and have added my own observations from the field. Each of the plants represented at the site is briefly described and, where possible, the preferred habitat, flowering/fruiting seasons and ethnographically known uses of the plants are mentioned.

1. Trees

Boscia albitrunca   Family: Capparaceae

This is a small to medium sized tree with whitish trunk and rounded crown and small leathery leaves. It has common occurrence but favours alluvial soils (Malan & Owen-Smith 1974:154). The flowering time is usually September or October, although flowers may appear after rain or the flowering season may be skipped altogether. In December, 1975, I gathered ripe fruits in the Windhoek area but in December, 1976, the same tree had not yet flowered.

The edible fruit is eaten by humans, monkeys and birds. The foliage is very nourishing; stalks and leaves have a high vitamin A content and are rich in crude protein, averaging 14,6% (Palmer & Pitman 1972:621). During times of food shortage in Kaokoland, the roots are stamped, dried and ground into a meal (Malan & Owen-Smith 1974: 154). The protein content of this meal is 5,01 g per 100 g and the carbohydrate and fat contents are 20,56 g and 0,28 g, respectively (Palmer & Pitman 1972:232).

Erythrina decora   Family: Euphorbicaceae

This small tree occurs on rocky slopes. The blooms appear in winter and spring. The Erythrinas yield a poison with a curare-like and paralysing action (Palmer & Pitman 1972:953). The seeds are decorative and sometimes used for bead making.

Cordia gharaf   Family: Heliotropiaceae

This small tree grows mainly along river courses though one specimen occurs at the entrance to Big Elephant Shelter. The fruits have a sticky edible pulp. In Botswana

Table 12

Big Elephant Shelter, 1976
BOTANICAL REMAINS

1. TREES

Boscia albitrunca	(shepherd tree)
Erythrina decora	(lucky bean)
Cordia gharaf	(sandpaper tree)
Commiphora saxicola	(rock commiphora)
Dombeya rotundifolia	(wild pear)
Combretum sp.	

2. SHRUBS

Strophanthus amboensis	(osdoring)
Blepharis sp.	
Calicorema capitata	
Kleinia longiflora	
Croton gratissimus	(vaalbos)
Ricinus communis	(castor oil plant)
Ximenia americana	(sour plum)
Vangueria infausta	(wild medlar)
Thamnosma africanum	
Grewia bicolor	(two coloured grewia)
Grewia flava	(raisin bush)
Ficus guerichiana	(wild fig)
Ziziphus mucrunata	(wag-'n-bietjie)
Helinus integrifolius	(soap tree)
Caesalpinia rubra	

3. HERBS

Abutilon sp.
Trichodesma africanum
Ondetia linearis

4. BULBS/CORMS

Cyperus fulgens (uintjies)
Lapeirousia rivularis

5. GRASSES

Enneapogon sp.
Rhynchelytrum villosum
Cenchrus ciliaris
Eragrostis superba

the tree flowers in September (Miller 1952:73) but in the Erongo Mountains, I found ripe fruits in mid-April of 1974 and 1975 and so it appears that the fruiting season may be variable, regionally. In Kaokoland, the wood of the tree is used for making bows (Malan & Owen-Smith 1974:157).

Commiphora saxicola   Family: Burseraceae
Growing mainly on rocky hills or stony slopes, this dwarf tree has a smooth bark, unlike most Commiphora species (Palmer & Pitman 1972:1041). The edible fruits are available after rains (Giess pers. comm.).

Dombeya rotundifolia   Family: Sterculiaceae
This is a small to medium sized tree which flowers irregularly throughout the year in South West Africa (Palmer & Pitman 1972:1476). In Erongo, the Dombeya flowered in April, 1976; in July and September of 1974, dried flowers were observed still clinging to the branches. The Dombeya bark fibre is very strong and can be used to make rope (Ibid:1475). There are no edible fruits.

2. Shrubs

Strophanthus amboensis   Family: Apocynaceae
6 species of this shrub occur in South Africa and northern South West Africa; the seeds and roots of all the species yield an arrow poison (Ibid:1929) and the wood is used for sacred fire sticks in Kaokoland (Malan & Owen-Smith 1974:150).

Blepharis obmitrata   Family: Acanthaceae
A shrubby annual or bi-annual browsed by small stock (Ibid:149).

Calicorema capitata   Family: Amaranthaceae
This is a dense and tough greyish green shrub of about 1 m high, growing on granitic hill-slopes (Nordenstam 1974).

Kleinia longiflora Family: Asteraceae

In Kaokoland, an extract from this succulent shrub is drunk as a cure for stomach ailments (Malan & Owen-Smith 1974:151).

Croton gratissimus Family: Euphorbiaceae

This is a shrub or tree often occurring on sand, though some were observed on hills in Erongo. In Botswana, the inflorescences appear in May and October to November (Miller 1952:43), but inflorescences were collected in the Erongo in July, 1974. The leaves are fragrant when crushed, with a lavender-like smell, and San girls use them dried and powdered for perfume (Palmer & Pitman 1972:1135). In Kaokoland, knobkerries and walking sticks are carved from the stems (Malan & Owen-Smith 1974:156).

Ricinus communis Family: Euphorbiaceae

This shrub reaches a height of 2 m and is found along river beds. Miller (1952:45) says that the shrub was introduced to Botswana and is not indigenous there; however, Giess (pers. comm.) considers that the plant is indigenous to South West Africa. There appears to be some difficulty in identifying Ricinus seeds, which can be confused with those of Jatropha sp. (Parkington pers. comm.), but Jatropha does not occur in the Erongo area (Giess pers. comm.) and the problem is not relevant to this study.

The seed of Ricinus communis is the source of castor oil. The entire seed is a very active poison on account of the presence of a toxalbumin, ricin (Watt et al 1932: 101). Ricin, which is not present in castor oil, is non-toxic by mouth but highly toxic on subcutaneous injection (Ibid).

I collected immature seeds from R. communis plants growing in the Langer Heinrich area of the Namib in September, 1974.

Ximenia americana Family: Olacaeceae

This is a large spiny shrub with edible fruits and oil rich kernels. The flesh of the fruit is rich in vitamin C and potassium, and there is also some protein value (Palmer & Pitman 1972:563). The Himba and Tjimba of Kaokoland sometimes use the oil extracted from the kernels as a substitute for the fat which they rub into their bodies (Malan & Owen-Smith 1974:160). Bushmen oil their bowstrings with the oil (Palmer & Pitman 1972:563). From Botswana, it is reported that the shrub flowers irregularly from April to November and that fruits usually appear in January (Miller 1952:12).

Vangueria infausta Family: Rubicaceae

This deciduous tree/shrub favours stony kopjes. The fleshy edible fruits have high vitamin C content (Palmer & Pitman 1972:2081). In the Erongo, ripe and unripe fruits were observed in April of 1975 and 1976. In July and September of 1974, and October of 1975, no fruits were present; however, in the Grootfontein area, ripe fruits were collected in November, 1974. Miller (1952:85) says that the Botswana trees fruit in November. There appears to be some regional variation in the availability of the fruit.

Thamnosma africanum Family: Rutaceae

This small shrub is found mainly along water courses. The roots and flowers are ground into a fragrant neck powder in Kaokoland (Malan & Owen-Smith 1974:163).

Grewia bicolor Family: Tilliaceae

Occurring commonly in rocky areas, the yellow berries of this large shrub are edible and the stems are useful for bows, arrowshafts and walking sticks, whilst twine can be made from its bark (*Ibid*:163).

Grewia flava Family: Tilliaceae

This species occurs along sandy valleys. The fruit contains some protein and has a high sugar content; Palmer and Pitman (1972:1429) suggest that it is the most sought after veldkos in South West Africa. The wood and bark are utilized as for G. bicolor. Miller (1952:53) says that G. flava flowers in the period from October to February in Botswana and my Grootfontein observations confirm this flowering period. In the Grootfontein district, there were 2 fruitings of Grewia, in 1974, which was a year of exceptionally high rainfall. In the Erongo, I collected fruits in April, 1975.

Ficus guerichiana Family: Moraceae
This spreading climber, with its leathery leaves, occurs on granite and rock faces. The fruits are edible and the bark can be used for tanning and dying skins; when the chopped bark is soaked in water, it produces a red stain (Malan & Owen-Smith 1974:160).

Ziziphus mucrunata Family: Rhamnaceae
This is a spreading shrub/tree growing on highlands and along banks of seasonal rivers. The small brown berries are edible (Ibid:162).I have collected ripe berries from Erongo in April and from the Seeis district in March.

Helinus integrifolius Family:Rhamnaceae
The chopped leaves from this shrub produce a lather when mixed with water and the Herero and Tjimba-Herero use this to wash clothes (Ibid:162).

3. Herbs

Abutilon sp. Family: Malvaceae
This yellow flowered species, about 1 m high, has been found in shaded rocky parts of the Erongo. Flowers and seeds have been observed in April and October.

Trichodesma africanum   Family: Boraginaceae
In the Brandberg area, this herb is reported to grow in shade (Nordenstam 1974:34).

Ondetia linearis   Family: Asteraceae
This is an erect, light green herb growing up to 0,4 m high.

4. Bulbs/corms

Cyperus fulgens   Family: Cyperaceae
This "uintjie" grows near permanent springs and on alluvial soil after rain (Malan & Owen-Smith 1974:155) but I have also observed stands of the plants growing in "pockets" of soil on rocky hillsides. The Cyperus fulgens plants, occurring in stands of high density (300-400 plants in 1 square metre) have wide geographical distribution in central and northern South West Africa though they do not appear to occur further west than Usakos or south of Rehoboth (Giess pers. comm.) and as such, their distribution may be restricted by the 200 mm isohyet.

No systematic long term studies have yet been carried out on the annual availability of C. fulgens bulbs but Giess (pers. comm.)has suggested that all year round availability would be unlikely as the old corms shrivel to provide nourishment for the new growing season initiated by rain. My own studies of Cyperus fulgens have, this far, only covered a one year cycle and it is hoped that a long term study of Cyperus ecology will be possible. It has not been practical to carry out monthly plant surveys in the Erongo locality so that all observations of C. fulgens have been made in the Windhoek area. Live C. fulgens specimens containing fresh and old corms, leaves and spikelets were collected in early February, 1976.The fresh corms were small and the old corms were shrivelled. The reddish brown spikelets which appear after rain make the plant easily visible (see Figure 16), but in the early winter, the leaves and spikelets die back leaving no trace of the bulbs under the ground. It is at this time that the bulb is most palatable (Dinter 1912:7) and I did observe that the new bulbs have a slightly astringent taste compared to the nut-like flavour of the winter bulbs. In September, 1976, when no leaves or spikelets were present, I unearthed a number of bulbs from a familiar Cyperus stand. In November, bulbs were still available in the same stand but a month later, although bulbs were still present, they were very small. In January, 1977, new leaves appeared and fresh bulbs formed after a total of 25 mm of rainfall during a 2 week period. The new bulbs were very small and old corm cases were found to be empty. Only single bulbs were observed on each plant. A month later the spikelets were developing and there was evidence of further bulb production in the form of "foetal" bulbs. From the plant collector's point of view, it would be poor strategy to utilize the developed bulbs at this stage as the digging involved would also destroy the "foetal" bulbs. In early February, 1976, the Cyperus spikelets were already well developed whereas this occurred a month later in 1977. This is almost certainly due to the delayed arrival of rain in 1977. Rain, therefore, seems essential to the triggering of the new Cyperus growth cycle, but it is possible that only small amounts of precipitation are required for this purpose. At the beginning of March, 1977, the "foetal" bulbs were developed, but still not fully sized. The field study of C. fulgens suggests a potential 9 month availability of the bulbs; the actual commencement of the "uintjie" season would, however, be determined by the timing of the first rains of summer.

Cyperus bulbs are relished by warthog and guinea-fowl as well as humans (Dinter 1912:7) and the value of the bulbs as chickenfeed was recognised by white farmers in

Figure 16.
Cyperus fulgens, February, 1977.

the early part of the century. Stores in Windhoek used to buy the bulbs from Dama, paying 6-8 M for a hundred-weight sack (Ibid).

The components of a Cyperus edulis bulb are as follows: water 48,03%, fat 0,38%, protein 0,38%, starch 49,0%, ash 1,46% and fibre 0,64% (Adlung 1913:6-7). The composition of a Cyperus fulgens bulb should be almost identical (Giess pers. comm.).

Lapeirousia rivularis Family: Iridaceae
The tubers are edible and the flowers appear after rain.

5. Grasses

Grass inflorescences recovered from Big Elephant Shelter bedding layers include Enneapogon sp. Rhynchelytrum villosum, Cenchrus ciliaris and Eragrostis superba. All of these grasses are perennial and are valuable graze for livestock. Amongst the OvaTjimba of south-western Kaokoland, Eragrostis porosa seeds are ground into meal and mixed with water to form a porridge (von Koenen 1964:86), but there is no evidence that grass seeds were similarly used at Big Elephant Shelter.

Analysis of bulk sample plant remains from Big Elephant Shelter

Two sampling strategies were adopted for the analysis of plant remains from Big Elephant Shelter and the methods used by H.J. Deacon (1974) have been followed to a large extent. Firstly, grab samples were taken from every screened bucketful of deposit removed from the excavation. Secondly, unsieved bulk samples were taken from the plant rich layers at various depths of deposit. The grab samples provided a means for checking the range of plant species occurring throughout the deposits and it was from these specimens that the initial identification of the plant material was undertaken. However, this sampling method does not allow for the assessment of the relative economic importance of the plant remains represented and the bulk sample analysis was designed to provide this quantitative information.

6 bulk samples were chosen for analysis. One was taken from the surface plant and rubble horizon of Occupation Hollow C (Sample 75/C) and the remainder were from Occupation Hollow A. Sample 74/A gswp was collected in 1974, from the grey soil with plant horizon dated 3130 B.P. Sample 74/A bed, was taken from the sand under bedding unit dated 2600 B.P. Samples 76/A bswp (brown soil with plant) and 76/A gswp (grey soil with plant) were collected in 1976 and the latter sample is related to Sample 74/A gswp, although the 2 samples were areally distinct.

Initially, the bulk samples were screened to remove the fine fraction. This fine fraction has been retained from the 1975 and 1976 samples, in the event that future techniques of plant analysis may elicit further information from it, but I have not attempted any detailed analysis, for the contents appeared to be mainly sand and fragmented portions of plants which were already represented in the samples. The screened material (of + 16 mesh fraction) was hand sorted into 7 categories (after Deacon H.J. 1974): 1. non-botanical remains (including bone, stone, shell, coprolites/owl pellets and earth lumps), 2. grass stems and inflorescences, 3. raw and processed materials (worked wood and twine, unworked wood-bark and twigs, charcoal), 4.principal edible plants, 5. seeds and fruits, 6. leaf-fall, 7. other botanical inclusions. Information on some of the non-botanical remains from the 1974 samples is not available since the samples were sorted prior to knowledge of Deacon's method and the non-botanical inclusions were, therefore, incorporated with the relevant material from their respective levels without quantification.

Deacon (Ibid:95) suggests that sieved bulk samples need only be of the order of 0,5 kg in weight in order to gain a reasonable estimate of the relative abundance of common plant elements in the sample. One of my 1974 samples falls short of this weight limit, nevertheless, I have included the results in Table 13.Of the 6 samples examined, 4 are at least 3 times greater than the required weight. Whilst the volumes of the latter 4 samples were equal, their weights after screening were variable, due mainly to differing amounts of soil and stone incorporated in the various deposits.

The remains present in categories 1,2,3,6 and 7 were quantified only in terms of weight but, in categories 4 and 5, the minimum frequencies of remains represented were recorded where this was possible. Various plant species required individual means for recording the minimum frequencies of their represented portions. Whole seeds were simple to count but, as in the case of Ximenia americana, the seed capsules were fragmented, probably as a result of cracking for removal of the oil rich kernel. In this case,the indentation on the capsule, indicating the previous position of the stalk, was taken as being distinct and each indented fragment was counted as representing one fruit. The many layered papery scales of the Cyperus fulgens corm tunic separate when removed from the edible portion and are therefore useless for frequency counts (they have, however, been included in the weight category). It was decided to count the rootlet that is attached to each bulb before the edible portion is removed. This rootlet remains intact when separated from the bulb and resembles a tiny spider, some 3 mm

Table 13

Big Elephant Shelter, 1976

RESULTS OF BULK SAMPLE ANALYSIS OF BOTANICAL REMAINS.

	75/C		74/A gswp		74/A bed		76/A gswp		76/A sub		76/A bswp	
	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f
1. NON-BOTANICAL REMAINS												
stone (Qtz & basalt)	106,5		NA		NA		195,0		7		52	
stone (granite)	1294		242		133		1600		1175		1260	
bone	7		NA		NA		153		65		20	
shell	2		NA		NA		3		6		2	
coprolites/owl pellets	64		1		18		-		8		-	
earth lumps	-		-		-		-		-		-	
2. GRASSES												
stems	60		16		136		33		81		48	
inflorescences	<1		<1		<1		<1		<1		<1	
3. RAW & PROCESSED MATERIALS												
worked wood & twine	11		<1				2		-		<1	
bark & twigs	142		54		116		83		168		68	
charcoal	95		47		5		225		160		125	

continued overleaf...

Table 13 continued

	75/C Wt. (g)	f	74/A gswp Wt. (g)	f	74/A bed Wt. (g)	f	76/A gswp Wt. (g)	f	76/A sub Wt. (g)	f	76/A bswp Wt. (g)	f
4. PRINCIPAL EDIBLE PLANTS												
Cyperus fulgens	59	281	11	76	3	5	26	203	14	70	34	190
Iapeirousia rivularis	<1	15	2	10	<1	1	1	8	1	30	<1	1
5. EDIBLE FRUITS												
Cordia gharaf	2	16	<1	6	<1	3	1	14	<1	18	<1	6
Vangueria infausta	<1	2(1)	<1	2(1)	<1	3(1)	<1	1	<1	1		
Ximenia americana	3	9	4	13	1	2	5	16	2	9	4	11
Boscia albitrunca	<1	1	<1	6(3)	<1	5(3)	1	13(7)	1	14(7)	1	18(9)
Commiphora saxicola											<1	3
Ziziphus mucrunata			<1	2								
curcubit							<1	5(1)	<1	4(1)		
Grewia sp.	<1	14(7)	<1	7(4)			1	17(8)	<1	10(5)	<1	5(3)

continued overleaf...

Table 13 continued

	75/C		74/A gswp		74/A bed		76/A gswp		76/A sub		76/A bswp	
	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f	Wt. (g)	f
6. LEAF FALL	23		7		178		9		62		28	
7. OTHER BOTANICAL INCLUSIONS												
Ricinus communis	<1		<1	3	<1	3			<1	2	<1	1
Abutilon sp.	<1				<1				<1		<1	
Helinus integrifolius					4	78						
Combretum sp.	2		<1		1		<1		1		<1	
Dombeya rotundifolia			<1		2				<1			
Trichodesma africanum	2				1				<1			
Erythrina decora			3	4			<1	1			<1	1
Blepharis sp.	<1				4							
Croton sp.	1				1							
Caesalpinia rubra	2	12	<1	3								
Ondetia linearis			<1	1								
Calicorema capitata	<1		<1									
Strophanthus amboensis			1									
unidentified pieces	1		2		<1		1		1		<1	
TOTALS	1877	330	390	115	603	15	2339	258	1745	141	2870	223

in diameter. Lapeirousia rivularis corm bases were used for the frequency counts of this species, but these do not provide a reliable minimum figure as the old and new bases can appear simultaneously on the corm. In the case of Ficus guerichiana, the entire fruit is edible and only twigs were represented in the deposits. Counts or weights of the twigs would not give an accurate estimate of the numbers of fruits brought to the shelter, so these remains were merely recorded as being present.

Results of the bulk sample analysis are recorded in Table 13. Two numbers appear next to several of the fruits listed. The first number refers to the actual number of seeds present and the second number refers to the possible number of fruits represented. Each fruit of Grewia sp, Boscia albitrunca and Vangueria infausta contains between 2 and 4 seeds and, for the purpose of calculating the frequencies and frequency percentages of fruits represented, I have taken the figure of 2 seeds per fruit as being the average. This method of calculation probably gives an over-estimation of the actual number of fruits eaten at the site.

Sample 75/C weighed 1879 g, but only 407,8 g constituted botanical remains. Of the latter, 34,8% by weight consisted of bark and twigs, 21,1% of charcoal and 14,8% and 14,5% of grass and C. fulgens respectively. The high frequency of C. fulgens (281) is particularly noteworthy as this represents a percentage frequency of 85,1% of the edible plants represented in categories 4 and 5. Percentage frequency representation of the various edible plants in the bulk samples are illustrated in Figure 17. Sample 74/A gswp weighed 389,4 g when screened and the botanical and the botanical fraction weighed 146,9 g. Possibly this small sample does not give an accurate representation of the plant components of the level gswp. 66,08% of the edible plant remains are C. fulgens and 25,2% are fruits.

BIG ELEPHANT SHELTER 1976

percentage frequency representation of edible plant foods in bulk botanical samples (using corrected figures)

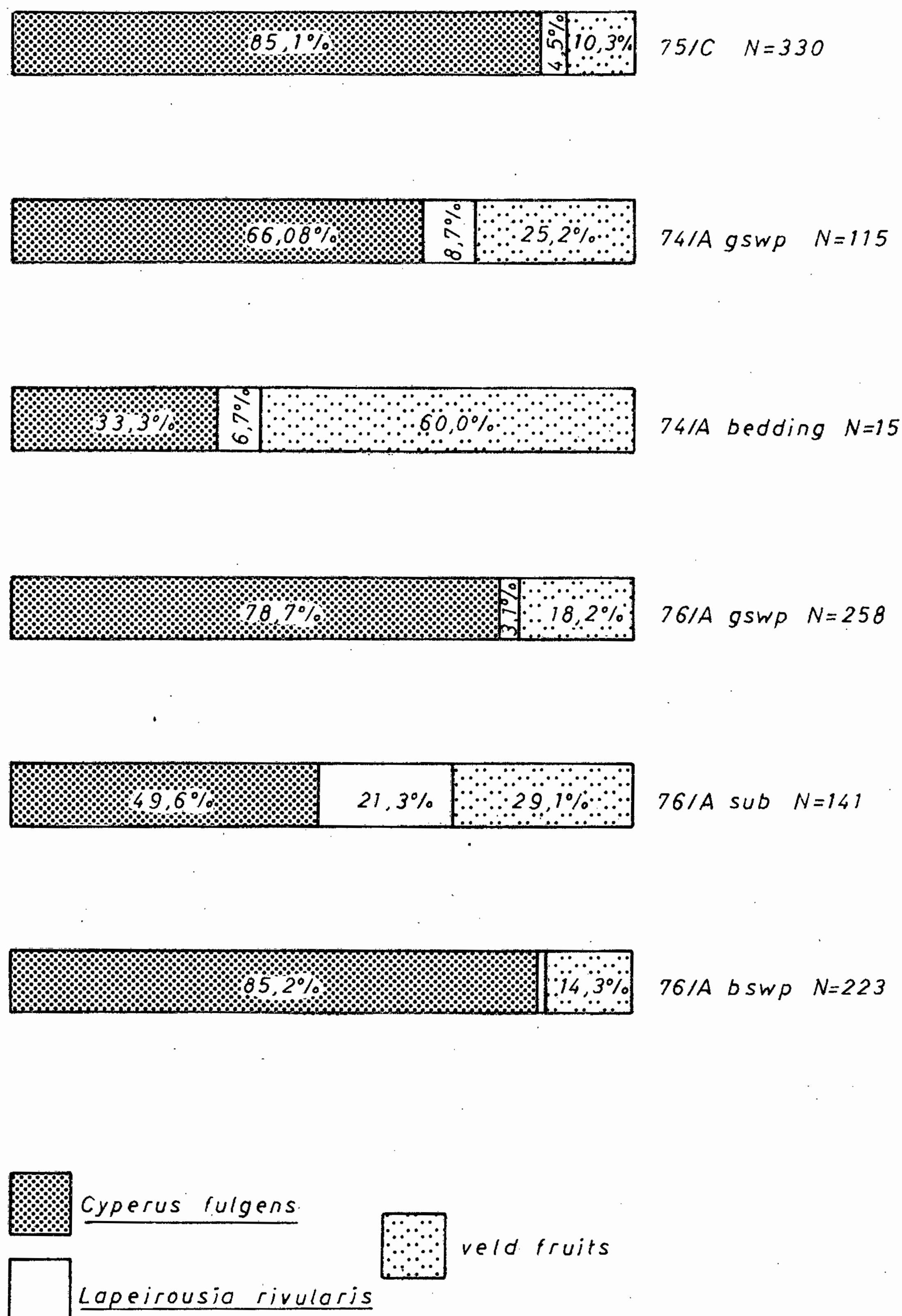


Figure 17

Sample 74/A bed weighed 602,8 g when screened, 451,8 g being botanical remains. As would be expected from a bedding sample, the highest weight percentages occur in the grass and leaf categories (30,1% and 30,3% respectively). The weight percentage of twigs/bark was high too (25,7%). Relatively small quantities of edible plant material were recovered from the bedding.

Sample 76/A gswp was the largest of the samples when screened (2338 g) but only 387,5 g of botanical material was recovered. Of the botanical remains, 58,1% comprised charcoal and 21,4% wood. A high frequency of C. fulgens is present (203), this forming 78,7% of categories 4 and 5. Sample 76/A bswp had a total screened weight of 1645 g, whilst botanical remains weighed 312 g. 190 C. fulgens rootlets were present, giving a frequency percentage of 85,2% of categories 4 and 5. Sample 76/A sub had a total screened weight of 1751,7 g and 491,2 g of botanical remains. Wood and charcoal have the highest weight percentages (34,2% and 32,5%). C. fulgens is present in lower frequencies in the sample (70) and has a percentage frequency of 49,6% in categories 4 and 5. The increase in the frequencies of Lapeirousia rivularis (30) is marked in this level; 21,3% of categories 4 and 5 comprise L. rivularis corm bases. Fruits comprise 29,1% of the edible plant sample.

In category 5, other botanical inclusions, some of the plant portions represented may have come from accidental gathering during the course of collecting bedding material. These species include Trichodesma africanum, Ondetia linearis, Calicorema capitata, Abutilon sp. and Thamnosma africanum. Blepharis sp. was deliberately collected for bedding material in Occupation Hollow A and a thick mat of this very prickly, woody plant was laid down to form the base of the bedding. Grasses and leaves were then laid on top of this matting. The Blepharis may have been used to act as a deterrent to the vast snake population of the Erongo. It will be noted that only 4 g of Blepharis were included in the bulk bedding sample; this is because the sample was removed from the grassy layer of the bedding, that is, above the Blepharis matting. Since Helinus integrifolius only occurs in the bedding layer, it may have been collected as part of the bedding rather than for use as soap.

Ricinus communis seeds appeared in small quantities throughout the deposit (with the exception of the bedding unit) and they were possibly utilized for their medicinal and/or poisonous properties. Erythrina decora, also having toxic properties, was limited to the bswp and gswp units, whilst Strophanthus amboensis was limited to the gswp unit. 3 linkshafts were recovered from the site, attesting to the use of bow and arrow, and it is possible that the toxic plants represented were utilized for arrow poison.

A number of wooden tools, including points, fire-drills, arrowshafts and digging sticks were found in the deposits. The wood used for the manufacture of these has not been identified, but ethnographic evidence of Grewia sp. being used for arrowshafts and walking sticks, and Croton gratissimus for walking sticks, suggests that these woods may have been used. The knotted bark fibre found at the site may have been made from Dombeya rotundifolia and/or Grewia sp.

Pieces of leather and leather riempies were found in all the surface levels and the gswp level, suggesting the use of leather for at least the last 3000 years. The presence of Ficus guerichiana in these levels may indicate the use of the plant for tanning but, since the fruits are edible, the assumption cannot be substantiated. Fruiting branches may have been returned to the site rather than individual fruits being plucked in the field.

On the surface of Occupation Hollow C, a cylindrical roll of papery bark, some 30 cm long, was found. The cylinder was empty, but it may have been used as wrapping material in the same way that Boophone leaves were used in the Cape (Deacon,H.J. 1974:102). The papery bark has not been identified, but it may be from one of the Commiphora species which are so common in the area.

Implications of the bulk sample analysis

The primary objective of the bulk sample analysis of botanical remains was to establish the relative importance of the plant foods represented at the site, thus investigating the adaptations of prehistoric man to locally available plant resources. Of the plant foods represented, Cyperus fulgens is undoubtedly the preferred species and can be considered the staple plant food throughout the occupation of Big Elephant Shelter. There are a number of factors which would have made C. fulgens an obvious choice as a staple plant food (given the available range of plant foods in the area). Firstly, it occurs in stands of high density and relatively little work energy would be required to obtain enough corms for a meal. Secondly, the natural underground storage system of the bulbs allows for their utilization over long periods of time without necessitating artificial storage. Because of the high density of the stands of plants in predictable localities, the lack of visibility of the plants for part of the year probably did not present any collecting problems to the experienced veldkos gatherer. Thirdly, the high carbohydrate content of the bulbs (51 kg of starch being obtained from 100 kg of bulbs (Dinter 1912:8)) would ensure an appetite satisfying meal. However, to enable maintenance of good health, the bulbs would need to be supplemented by food sources containing protein and vitamins.

The presence in the shelter of bones from meat meals and the presence of seeds and seed capsules of veld fruits suggests that the necessary protein and vitamins were indeed ingested by the shelter occupants. The quantities of veld fruits represented in the bulk botanical samples suggest that fruits may not have assumed any great importance beyond their role as dietary supplements.

The seasonal availability of food resources represented at Big Elephant Shelter determines, within broad limits, the times of year when the site was occupied. _Cyperus fulgens_ has a nine month potential usage but, since it is most palatable during the winter months, the bulbs may have been more extensively exploited in winter. _Lapeirousia rivularis_ would have similar availability since it begins to flower during the summer rains. Veld fruits appear after the onset of the rains and, depending on the plant species and the timing of the rains, would be available sometime during the period of December to April/May. In the central part of South West Africa where _C. fulgens_ corms were not available during the 2 or 3 months of the year comprising the annual hunger period, I would suggest a greater reliance on eggs and collected meat from ground-game. Eggshell remains, identified as coming from guinea-fowl and francolin, were recovered from all levels at Big Elephant Shelter. Since guinea-fowl lay their eggs during the rains, mostly in December and January, and francolin lay eggs from February to March/April, the eggs would have provided a most valuable source of relief food. Guinea-fowl and francolin lay clutches of 6-8 eggs (McLaughlan & Liversidge 1940:101) and, since guinea-fowl flocks may include several hundred birds and francolin coveys 20 birds, large numbers of eggs would be available for potential usage. Rodents and lizards may also have provided relief food but there is no proof of this from the faunal remains at the site. However, historical evidence suggests that rodents and reptiles were exploited by hunter-gatherers: Chapman (1868:217) observed that in August, when exceptionally early rains had fallen, the Dama burnt the veld in order to flush out mice and lizards for food. Burning of the veld probably had the dual purpose of promoting early veld plant growth.

The evidence from Big Elephant Shelter does not contradict the possibility that the shelter occupants may have remained in the area on a perennial basis. The diagram below illustrates the seasonal availability of plant foods and eggs represented at the site.

```
                              month of year

 F    M    A    M    J    J    A    S    O    N    D   J

      <-------------------------------------------->
                              C. fulgens

<-------->                                       <---->
 francolin eggs                          guinea-fowl eggs

<------------>                                   <---->
 summer fruits                             summer fruits
```

The actual availability of these resources is variable in that they are all dependent on the arrival of the rains for initiation of their growing or breeding seasons. The presence of the remains of resources which are available at different times of year does not imply that the site was occupied continuously throughout the year, but rather that the area as a whole was perennially occupied. The actual quantities of plant food remains present in the botanical samples tend to support the view that the shelter site was merely one form of settlement utilized by the hunter-gatherers of the area.

Using the figures obtained from the bulk sample analysis, it is possible to make some rough estimates of the botanical content of each of the stratigraphic levels from which the bulk samples were removed. Table 14 provides estimates of the frequencies of C. fulgens, L. rivularis and fruits represented in 5 of the stratigraphic levels; these figures have been obtained by multiplying the frequencies obtained from a bulk sample by the volume of deposit in the entire stratigraphic level. This was a simple matter since the volume of deposit is represented in bucketsful and each of the samples is half of one bucketful (apart from Sample 74/A gswp, which has been excluded from the exercise).

Since excavation at the site was areally limited, the figures should be regarded as absolute minimums for plant refuse represented in Occupation Hollows A and C. A number of other factors may have set limits on the amounts of plant actually present in the deposits: firstly, C. fulgens rootlets and the corm tunics of C. fulgens and L. rivularis are very light and could easily be blown away by wind before being covered by occupation deposit and, secondly, the site occupants may, themselves, have disposed of some of the refuse by burning or throwing it out of the shelter. Nevertheless, it is of interest to speculate on the number of meals which may have been consumed from Cyperus fulgens alone. Adlung (1913:7) has suggested that approximately 250 g of the corms would provide a daily food supply for an adult. Therefore, if the corms have a mean weight of 2 g each (when fully matured), then the corms alone accounted for a minimum of 121 man days in the surface level of Occupation Hollow C, 104 in Occupation Hollow A (gswp), 40 in Hollow A (sub) and 150 in Hollow A (bswp). Occupation hollow size, the area covered by bedding and the presence of individual hearths at the entrance of the discreet hollow suggests that each hollow may have been occupied by a single nuclear family which cooked and ate separately from the

Table 14

Big Elephant Shelter, 1976

ESTIMATED FREQUENCIES OF PLANT FOODS IN STRATIGRAPHIC UNITS FROM WHICH BULK SAMPLES WERE DRAWN.

botanical sample	vol. deposit in ½ buckets	*C. fulgens* f	*C. fulgens* f man days	*L. rivularis* f	fruits f	TOTALS f
75/C	54	15 174	121,4	810	1 836	17 820
74/A bed.	62	310	2,5	62	558	930
76/A gswp	64	12 992	103,9	512	3 008	16 512
76/A sub	70,6	4 942	39,5	2 118	2 894,6	9 954,6
76/A bswp	98,6	18 734	149,9	98,6	3 155,2	21 987,8
TOTALS	349,2	52 152	417,2	3 600,6	11 451,8	67 204,4

rest of the group. Assuming that one nuclear family consisted of 4-5 individuals, then the Cyperus supply would have to be divided by this number of individuals. Calculations of this nature suggest that the site may have had successive short term occupations, possibly in terms of weeks. It must be stressed that this type of estimation may be highly speculative and subject to error; it would be necessary to excavate the total area of the shelter and to analyse vast quantities of deposit containing botanical material before reliable figures could be obtained regarding the botanical content of the site. What is perhaps significant about the estimates quoted above, is that they suggest the shelter site may have been only one type of hunter-gatherer settlement in the area and, as such, the site only represents one segment of the Erongo settlement pattern (and possibly also only one segment of the long term subsistence strategy adopted) operative in prehistoric times. Parkington (1976:138-9) has commented that caves and rock shelters have attracted archaeological interest because of their tendency to act as deposit traps, but that ephemeral open site camps may have been more typical of hunter-gatherer settlement. The seasonal availability of resources represented at Big Elephant Shelter suggests that the site may have been occupied on several occasions during the course of a year but that occupation was not long term.

Apart from botanical studies undertaken on material from Mirabib Shelter, Big Elephant Shelter is the only other site in South West Africa documenting utilization of plant resources. For this reason, it is not possible to gauge the extent to which the Big Elephant underground plant collecting system is representative of prehistoric groups occupying the inland portion of central South West Africa. From frequent reference to "uintjies" made in the journals of early travellers in South West Africa, it would appear that underground plant foods were of

A recent ethnographic expedition to Kaokoland reported that the Okambambi group of OvaTjimba in the Baynes Mountains collected "numerous varieties of edible roots such as "uintjies" (Cyperus edulis) and berries" (MacCalman & Grobelaar 1965:9). The expedition was made in September.

The times of year when the observations were made are worth noting: February (1 observation), August (1 observation), September (4 observations), October (2 observations). Most of the observations were made in late/winter/spring, though one observation was made in late summer. The absence of winter observations is rather strange since Cyperus fulgens is most palatable at this time of year.

It is significant that the diet of some prehistoric groups in the Cape Folded Belt was also based on plants with an underground storage system, the staple being the Watsonia corm (Deacon, H.J. 1974).All groups with underground plant collecting systems have a number of factors in common, regardless of their geographic separation. Firstly, they share common environmental conditions in which underground foods probably provide the only abundant and reliable sources of plant food. In this sense, their economies are closely related to the ecology and annual growth cycles of the underground plants. Secondly, the high carbohydrate content, but low food value, of the underground foods would oblige the gatherers to seek other sources of protein and vitamins. Game hunting and/or gathering of ground-game and eggs and the gathering of seasonally available vitamin rich fruits would be essential for the maintenance of good health. Deacon (Ibid) suggests that the built-in storage systems of the underground food plants have enabled food collection to be carried out over long periods of time without necessitating the development of artificial food storage facilities. This implies a common behavioural pattern amongst all groups dependent on underground food supplies in that they are not required to settle on a semi-sedentary basis which would be a pre-requisite for groups practising artificial food storage.

Groups having economies dependent on aerial food plant collecting appear in the north-east and western desert areas of South West Africa. Curcubits are important in the desert areas and the great food trees are important in the better watered north-eastern areas. In the sand dune portions of the Namib Desert, Acanthosicyos horrida (the nara melon) constituted a staple in the diet of Topnaar "Hottentots". Alexander (1838:84) commented that the Nama in the sand dunes near Walvis used naras for a food and water supply except when the naras were out of season from May to August, when they caught fish and gathered sea foods along the coast. Moller (1974:172) also records the use of naras by Hottentots near the coast. Seed coats of nara were found at every level of excavations at Mirabib Shelter (Sandelowsky 1974:69) and this may indicate a 10 000 year tradition of nara utilization. The tsama melon seems to play a similar role in the Kalahari where it is utilized as a food and water supply by groups such as the Kung (Marshall Thomas 1959).

The great fruit trees of southern Africa, amongst which the marula (Sclerocarya caffra) and the manketti or mongongo (Ricinodendron rautanenii) are included, are noted for their exceptionally high fruit yields and the food value of the fruits. Marula fruits have a high vitamin C content and the kernels inside the stones are rich in oil and protein (Palmer & Pitman 1972:1191). The manketti nuts have a protein content of 29% and yield up to 63% of a yellow oil (Ibid:1153). In Botswana and the north-eastern parts of South West Africa, where there is red Kalahari sand cover, the manketti is one of the staple diets of hunter-gatherers (Ibid). Marula fruits were probably similarly important in the lowveld areas of southern Africa; marula remains have been discovered at sites in the Matopos, Rhodesia (Cooke 1963) and from Gwisho (Fagan & van Noten 1971). Marula stones were stored in caches at Bushman Rock Shelter (Sampson 1974:280).

Deacon (1976) has drawn attention to the dichotomy between the below and above ground plant collecting systems of gatherers in the southern and northern regions of southern Africa, respectively. He suggests that the major difference involved in the food values of the underground plants and aerial food plants may be a factor having economic implications for the plant collectors within the differentiated geographical zones of southern Africa.

Theoretically, at least, there would be little need for a meat diet amongst people who were utilizing protein rich nuts. I would suggest, however, that an important common factor to be considered in the examination of the above and underground food collecting systems is the tendency of gatherers to choose their staple foods from those available plants with the highest production yield and, therefore, minimum work effort. Whilst the summer fruits available in the Erongo are rich in vitamins and have some protein value, there is no indication that they were anything more than supplements to the diet of the Big Elephant Shelter occupants. I would relate this fact to the low production yield of the available fruiting shrubs/trees and the relative abundance of <u>Cyperus fulgens</u> corms which would have provided appetite satisfying meals with little work input.

It is obvious that above and underground food plants have their inherent advantages and disadvantages. Marula and manketti have very limited fruiting seasons and, where storage was not practised, the resource base would have to be altered to make use of other staples. Although storage was carried out in prehistoric times, at Melkhoutboom and Boomplaas (Deacon,H.J. 1974:114) and Bushman Rock Shelter (Sampson 1974:280), we do not know the extent to which the storage may have provided an out-of-season food or oil supply. Whilst it would be an advantage to store protein rich nuts for the annual hunger period, there may have been environmental factors making this storage impractical. Seasonal lack of availability of water in a particular area may have prohibited storage and obliged the hunter-gatherers to move on. Amongst the Topnaars, the reaction to the end of the nara season was to change their resource base and move to the coast where they could subsist on protein rich marine resources until the nara season returned. Since nara is food and water supply, there is probably little advantage to be gained by storing the dried parts of the plants.

There is potential for a greater degree of variability in the subsistence patterns of groups able to make use of abundant above ground plant food. Depending on local environmental conditions, the responses might vary from specialized collecting patterns and all year round storage with resultant sedentary settlement, to opportunistic collecting and extreme mobility of camps. Amongst groups practising underground plant collecting, the responses may have been less varied, except as regards reaction to shortage of corms/bulbs during the annual hunger period. The inherent advantage of the natural underground food storage system of geophytes is that it enables groups to wander freely in search of water and other resources. This type of system has obvious value for nomadic herder groups.

Response to the annual hunger period, of prehistoric groups living within easy reach of coastal stretches, is now fairly well documented. However, archaeological research into the reactions of inland groups to this stress has not yet received much attention. From ethnographic and historical data, it would appear that both dietary and social changes might take place. Greater use was probably made of meat and plant foods not generally favoured during the most plant productive season. *Boscia albitrunca* roots are an example of famine relief plants; in Kaokoland, these roots are ground into meal in times of food shortage. Marshall Thomas (1959) mentions that the Kung in the Kalahari make use of underground plants when the tsama season is ended. Inland groups may also tend to disperse into smaller units during times of food and water stress and Yellen and Harpending (1972) have tried to show that members of a hunter-gatherer band would be very fluid under such circumstances. In the Darling Basin of Australia, the Aborigines split their semi-sedentary summer camps and move in small groups across wider areas in order to cope with lessened productivity of the environment (Allen 1974:317).

The response of hunter-gatherers to drought, which can be seen as an extension of the hunger period, is not well understood. Presumably, population movement would have been restricted by the availability of water and, since game beats would be similarly restricted, there may have been a greater reliance on meat during these times. I would also suggest that competition for water between groups of uneven size and strength would be most likely to result in patron/client relationships during times of drought. Diversification from the staple to plants not generally utilized to any extent has already been mentioned. At Big Elephant Shelter, the increase in percentage frequencies of *Lapeirousia rivularis* in Sample 76/A sub, may represent such diversification. Throughout the deposits, *L. rivularis* is scarce but represents some 21% of plant remains in categories 4 and 5 in Sample 76/A sub. Hardly any information is available on *L. rivularis*, but I have observed that the species' abundance is limited relative to that of *C. fulgens* so that more work would be involved in finding enough L. rivularis for a meal than would be required in the case of Cyperus bulbs. An alternative is available to explain the increase of Lapeirousia rivularis in the surficial levels of Occupation Hollow A; the increase is coincident with the appearance of pottery at the site, thus, the plant food diversification may be related to contact with other groups in the area. Competition for food/water resources and land rights may have necessitated more intensive utilization of smaller areas. This is one potential modification of a hunter-gatherer group faced with population increase (Cohen 1975; Smith 1972:9).

In summarizing the evidence drawn from the botanical remains from Big Elephant Shelter, it may be said that the plant collecting pattern over the past 3000 years shows stability in the sense that the same range of plant foods was collected throughout this period and no change in the plant collecting system is evidenced through time. Whilst there is an increase in L. rivularis in one pottery level of Occupation Hollow A, a similar increase is not apparent in the pottery level of Occupation Hollow C (Sample 75/C). This would argue against a change in subsistence strategy resulting from population stress in the area.

The prevalence of Cyperus fulgens over all other plant foods, suggests that the whole plant food collecting system was geared to this staple. The dependence on one particular plant is in sharp contrast to the meat portion of the hunter-gatherers diet, where no particular species seems to have been dominant. Thus, man in the Erongo appears to have been an opportunist in so far as game hunting was concerned, but plant utilization was obviously adapted to specific reliable resources, of necessity restricted to the ecological zone. Deacon (1974:116) has suggested that the whole subsistence pattern and transhumance shown by populations in the Cape Folded Belt was closely related to Watsonia ecology and I would suggest a similar adaptation to Cyperus fulgens in the arid Semi-Desert and Savanna Transition of central South West Africa.

CHAPTER 5

Description of non-lithic artefacts from Big Elephant Shelter.

The non-lithic artefacts from Big Elephant Shelter can be divided into 4 categories: 1. items used for ornamentation, 2. implements, 3. leather and twine, 4. ceramics. The inventory of non-lithic artefacts is presented in Table 15. Recovered artefacts from each of the 4 categories are described and illustrated below.

1. Items used for ornamentation

a) Ostrich eggshell beads (illustrated in Figure 18)
The inventory of ostrich eggshell beads is contained in Table 16. The beads are classified as being either smoothly polished, unsmoothed, incomplete or broken. Unutilized shell pieces are also listed and their weights noted.

A large frequency of beads was recovered from Occupation Hollow C, where 1125 unbroken beads were recovered from the soil/ash lens. In the SW. corner of Square S4 of Occupation Hollow C, 528 beads were recovered from 1 bucketful of soil, together with 9 pieces of unworked shell and one piece having a pierced, polished hole, indicating that it had been a container. Possibly a cache of beads had been stored in the eggshell container which later broke. In Occupation Hollow A, the largest frequency of beads was recovered from Unit 6 (390). The greatest bead making activity appears to have taken place during the pre-pottery period (1584 smoothed beads out of

Table 15

INVENTORY OF NON-LITHIC ARTEFACTS FROM BIG ELEPHANT SHELTER

Artefacts	Stratigraphic level: pottery level f	Stratigraphic level: pre-pottery level f	Totals f
bone pendants	2	1	3
OES pendants	2	4	6
smoothed OES beads	151	1584	1735
stick beads	1		1
seed beads	1	3	4
glass beads	3		3
metal beads	12		12
decorated OES		1	1
OES discs	1	1	2
OES water bottle frags.		2	2
potsherds	22		22
clay pipe	1		1
linkshafts	1	2	3
points (bone)	2	2	4
other worked bone pieces	7	7	14
digging sticks	2	1	3
other worked wood	14	10	24
fire-drills	2		2
wood shavings	20	42	62
thin twine	10	5	15
thick bark twine	8	2	10
knotted twine or fibres	7	1	8
leather pieces	7	1	8
knotted thongs	3	1	4

Table 16

INVENTORY OF OSTRICH EGGSHELL BEADS AND OSTRICH EGGSHELL PIECES FROM BIG ELEPHANT SHELTER

Strat. unit		smoothed beads			unsmoothed beads	incomplete beads	broken beads	OES pieces unworked	
		f	mass (g)	mass (mean)	f	f	f	f	mass (g)
1	Occupation Hollow A	12	1,0	0,083	-	1	-	29	16,0
2		1	<1,0	--	-	1	-	18	10,0
3		21	0,5	0,023	2	2	-	40	24,2
4		81	4,2	0,052	1	13	-	105	58,0
5		2	<0,1	--	-	-	-	4	4,0
6		390	21,0	0,054	1	9	3	72	37,0
7		88	5,0	0,057	1	7	1	99	81,0
8		86	4,5	0,052	2	2	1	67	44,0
9		52	3,0	0,058	-	3	1	15	5,5
10		--	--	--	-	-	-	--	--
11		15	1,0	0,067	1	-	-	12	3,5
12		15	0,2	0,013	1	2	-	52	16,5
13		13	0,5	0,038	-	-	-	31	17,0
14		5	<0,1	--	-	1	-	16	9,0
15		4	<0,1	--	1	-	-	--	--

continued overleaf...

Table 16 continued

Strat. unit	smoothed beads			unsmoothed beads	incomplete beads	broken beads	OES pieces unworked	
	f	mass (g)	mass (mean)	f	f	f	f	mass (g)
OHC								
bed.	18	1,5	0,083	--	1	-	13	5,5
soil	919	50,0	0,054	206	2	9	89	70,0
NES	15	3,0	0,2		1		15	4,0
TOTALS	1735	95,4		216	45	15	677	405,2
Pottery level	151	10,2	0,068	4	18	-	203	105,2
pre-pot. level	1584	85,2	0,054	212	27	15	474	300,0

a total of 1735). A mean of 6,8 beads per bucketful of deposit occurs in the pre-pottery level, whereas a mean of 0,98 beads occurs in each pottery level bucketful of deposit. The high occurrence of beads in Occupation Hollow C is largely responsible for this distribution pattern.

Beads from each stratigraphic unit were weighed and the mean weight of beads in each unit was calculated. The largest beads recovered were those from the NE. Settlement, where some of the discs had a diameter of 10 mm. Small beads of 3 mm. in diameter were found associated with the large discs. The mean weight per bead is 0,2 g for the NE. Settlement and this is the highest mean bead weight at the site. Wendt (pers. comm.) has suggested that the very large beads appear to be associated with recent deposits. In Occupation Hollow A, the mean weight of pre-pottery level beads is 0,053 g whilst the pottery level mean bead weight is 0,049 g indicating little change in mean bead size through time. In Occupation Hollow C, the mean weight of pre-pottery level beads is 0,05 g whilst the pottery level beads have a mean weight of 0,08 g . In this case, there is a definite small increase in the mean size of beads in the pottery levels.

Two methods of manufacture of ostrich eggshell beads was noted. One method involved the initial drilling of a piece of eggshell and subsequent shaping of the bead, and the second method involved reversal of the process. Some beads were drilled from both sides of the eggshell, giving an hourglass section to the beads. Others were merely drilled from one side.

b) Other ornamental artefacts

5 whole pendants and 2 broken and 2 incomplete pendants were recovered from the site. (see Figures 18, 19 and 20).

2 of the pendants were manufactured from bone and the remainder from ostrich eggshell. Both bone pendants have irregular striations on them and the smaller of the two has been coloured with red ochre.

One Erythrina decora seed has been pierced for use as a bead and 3 curcurbit seeds have been cut to form beads (see Figure 18). The latter beads are extremely hard and I originally mistook them for bone.

3 glass beads were found at Big Elephant, 1 is light blue and the other 2 are deep red with black centres. The latter resemble beads illustrated by Wendt (1972:61). 9 iron beads and 2 copper beads were recovered from the surficial levels of Occupation Hollow A and 1 iron bead was found in the bedding of Occupation Hollow C. The iron beads are cylindrical and appear to have been manufactured from one long cylinder which was later cut into pieces. A few of these beads have a side "seam" suggesting that the beads making process was begun with a flat strip of metal which was later shaped into a cylinder. 1 copper bead also appears to have been cut from a long cylinder but the other has rounded rims and probably had a different method of manufacture.

Stick beads, threaded on to leather thongs, were also utilized (see Figures 18 and 21).

3 fragments of marine shell (identified as Donax by M.L. Penrith), recovered from the pre-pottery level of Occupation Hollow C and Units 4 and 14 of Occupation Hollow A, are of considerable interest. Although the fragments do not exhibit working, it is likely that the shells were brought to the shelter for use as ornaments. Whilst it is not improbable that the Erongo inhabitants may have visited the coast, it would seem more likely that Donax shells were trade items.

2. Implements

Wooden implements include 2 firedrills, remains of 3 diggingsticks, an entire arrowshaft and a broken arrowshaft, a wooden "peg", 4 cm in length and blunted at one end by the action of hammering, some pieces of cut reed, a smoothed stick with a serrated pattern cut on one end and some smoothed sticks of uncertain usage (see Figure 22 for illustration of some of these artefacts). The arrowshaft, similar to the one illustrated by Clark and Walton (1962:5), was found hidden in a rock crevice behind Occupation Hollow A. The shaft, measuring 95 cm in length, has a U-shaped nock, 4 mm wide and 6 mm deep. The shaft point is tapered and split as would be expected for the inclusion of an iron arrowhead.

The presence of 3 bone linkshafts (Figures 23 and 24) in the excavated levels of the site also attest to the use of bow and arrow, in this case, to the use of arrows with composite heads. 1 linkshaft (Figure 23) from Unit 8, which has been dated 3130 B.P., is still encased in brittle fibre twine. At the blunted end, a fine sliver, possibly of bone, is held in place by the twine. The sliver, 7 mm long, 2 mm wide at its base and 1 mm wide at the linkshaft edge, may have acted as a wedge to ensure a firm attachment either to the projectile tip or to the shaft itself. Small shiny lumps. which may be mastic, adhere to parts of the fibre twine. The entire linkshaft is 6,5 mm in length. Another linkshaft, not as well preserved, measures 10 cm in length (see Figure 24, bottom). Half of this linkshaft has been burnt and there is a salt incrustation on the shattered burnt point.

Other implements of worked bone include the remains of a cylindrical bone tube 2,2 cm long with smoothly ground edges and an 11 cm long, flat sectioned piece of worked bone which has its tip broken (see Figure 24). The base of the implement was snapped and the lower section was later burnt. Some form of projectile may be represented, possibly a spearhead. 4 small bone points, 3 scraperlike implements and a smooth piece measuring 9 cm by 5 mm (possibly the remains of an awl) complete the range of bone implements from the site.

3. Leather and twine

Table 15 indicates that more leather working and twine/rope manufacture took place during the pottery period. Leather items include fragments of leather and leather thongs or "riempies". The thongs are about 4 mm wide and only short strips were found. None of the leather pieces appear to have belonged to garments, but Clark and Walton (1962) report that a leather sandal was recovered from the surface of the site.

Bark fibres were twisted to form both thin twine and thick rope (Figure 25). Untwisted lengths of bark fibre were also used and some of these lengths were found knotted around a stick from the bedding area in Occupation Hollow C. This type of fastening was probably used in the construction of the framework of screens which were placed around the bedding places.

4. Ceramics

The only diagnostic ceramic pieces excavated from Big Elephant Shelter include a broken decorated pot spout (Figure 26), one small rim sherd having 2 vertical rows of horizontal nail impressions, an undecorated, broken spout which might belong to a smoking pipe and a smoking pipe (Figure 27). The latter is 9 cm in length and 8 cm in circumference and the inner walls of the pipe have carbonaceous material adhering to them. The undiagnostic body sherds are 6 - 7 mm thick and most are of greyish colour, although a few are blackened on the outside, suggesting use in the fire. Clark and Walton (1962:10) illustrated several diagnostic ceramic pieces collected from the surface of the site. The illustrations suggest that the pottery from the site resembles the conical pottery with lugs attributed to both the Nama and Dama of South West Africa. I had hoped to examine the collection of artefacts made by Clark and Walton, however, these are housed in the Livingstone Museum, Zambia, and for political reasons, it was not possible for the collection to be sent to the State Museum in Windhoek.

Discussion of non-lithic artefacts from Big Elephant Shelter

The non-lithic finds from Big Elephant Shelter contribute towards an understanding of the way of life of its hunter-gatherers. They decorated themselves with a variety of ornaments; ostrich eggshell beads, seed and stick beads, bone and shell pendants. More recently, they added iron, copper and glass beads to their range of jewellery. The glass beads almost certainly represent some form of trade and, since there is no evidence for metal working at the site the metal beads may also be trade articles. Marine shell and ceramics may also have been trade items though the shell might reflect visits to the coast by the prehistoric group and ceramics may have been manufactured by the shelter occupants. The presence of clay pipes is interesting, firstly because of the implication of the smoking of dagga or tobacco and, secondly, because clay smoking pipes are rare in South West Africa. (Sydow 1967:52). Sydow (Ibid:Figure 92) illustrates 3 fragments of clay pipes collected on the farm Davib West (62), near Ameib. It is possible that the manufacture of these clay pipes was a local Erongo development.

A variety of bone and wooden implements was utilized. The bow and arrow was used for hunting, digging sticks were used for obtaining edible underground plants and drills were used for making fire. During pre-pottery times, the composite arrow was used but later the simple nocked arrowshaft also came into use and possibly iron arrowheads were used as well as stone or bone projectile tips.

The shelter occupants were conversant with the working of skin and used leather thongs for tying sandals to their feet as well as for the threading of some ornaments. Both Alexander (1838:132) and Vedder (1938:61) refer to Dama wearing leather sandals and Alexander has an interesting reference to the decoration of Dama women "... over the fore flap or apron there were hanging short thongs, on which were strung pieces of reed, bones of hares, beads, blue and white stones etc " (Alexander 1838:135). The reference to the use of thongs and pieces of reed is particularly noteworthy though Vedder (1938) mentions that San also used thongs for the threading of their jewellery.

Thin fibre twine was used for binding implements like linkshafts, and thicker bark twine was used for the fastening of the framework of brushwood screens which were erected to shelter the bedding places.

The range of implements and ornaments increased through time, notably after the introduction of pottery. The innovating introductions appear to have supplemented the traditional artefacts rather than having replaced them and the non-lithic assemblage of the pottery period gives the impression of cultural enrichment as a result of the innovations.

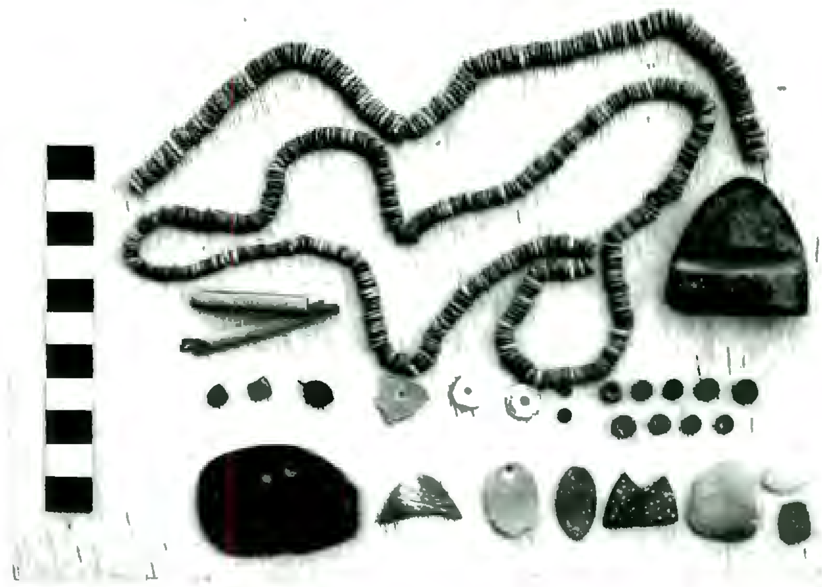


Figure 18. Jewellery from Big Elephant Shelter. Scale in cm. Top: OES beads; grooved stone. Left to right: stick, seed, unfinished OES, glass and metal beads. Bottom: bone and OES pendants.

Figure 19. Pendants from Big Elephant Shelter

Figure 20.
Burnt bone pendant showing striations

Figure 21.
Cylindrical stick beads threaded with a
leather thong

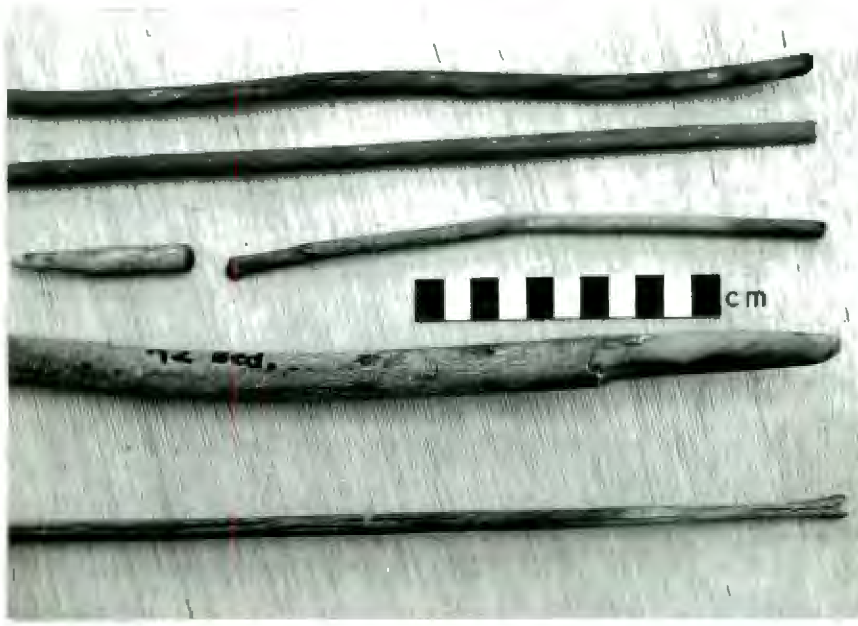


Figure 22. Worked wood.
Top to bottom: smoothed stick, broken arrow-shaft, fire-drill, smoothed stick, digging-stick, arrowshaft showing U shaped nock.

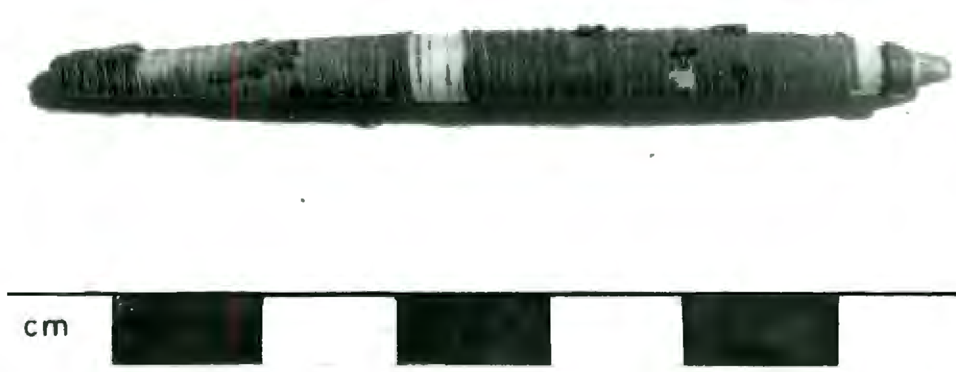


Figure 23.
Bone linkshaft encased in fibre twine

Figure 24. Worked wood and bone.
Top to bottom: fire-drill, broken linkshaft, broken ? projectile tip, burnt linkshaft.

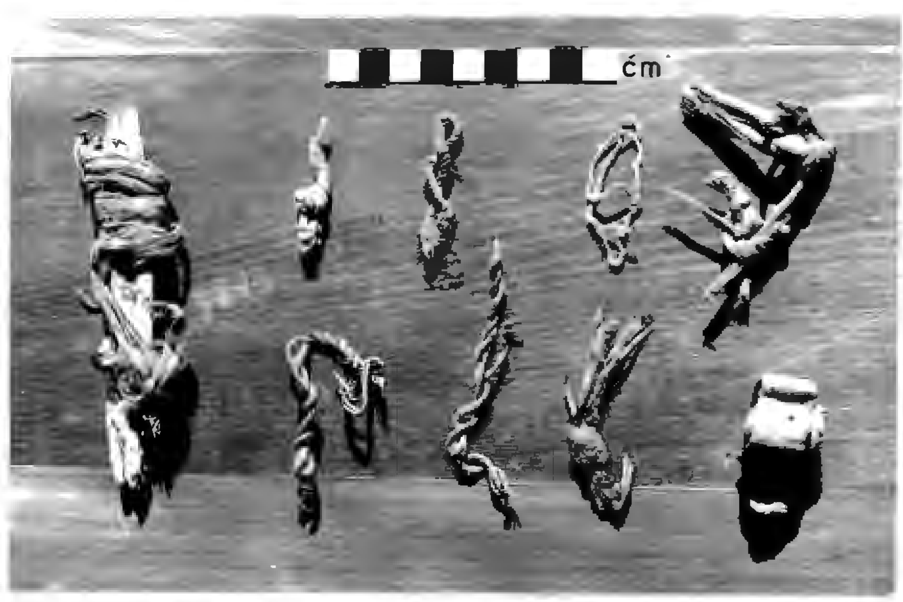


Figure 25. Fibre rope and twine.

Figure 26. Decorated pot spout.

Figure 27. Clay smoking pipe

CHAPTER 6

Big Elephant Shelter stone implement analysis

Aims of the analysis

1. To provide a detailed quantitative description of an assemblage from the Erongo Mountains.
2. To document possible changes in the stone tool-kit of Big Elephant Shelter through time. Since the deposit spans the contact period between pre-pottery hunter-gatherers and pottery using people who may also have been stock herders, the analysis aims to examine the influence of this contact on the implement manufacturing tradition of the hunter-gatherers.
3. To examine, critically, the status of the Big Elephant Shelter assemblage in the broader context of our present knowledge of lithic traditions in central South West Africa. To date, Erongo assemblages have been variously described as having Smithfield affinities (Clark & Walton 1962; Rudner 1952; 1957), as belonging to the Damaraland Culture (Viereck 1967) and as having affinities to the Wilton of the Cape (Wendt 1972:38).

Method of analysis

The stone assemblage has been divided into 4 major categories: 1. implements, 2. flakes, 3. cores, 4. chips and chunks. Category 1 has been further subdivided into implement types, that is, (a) a scraper category containing backed scrapers, core scrapers and other scrapers, (b) a backed tool category containing segments, backed blades and backed pieces, (c) borers, (d) outils écaillées and, (e) ground stone pieces. This breakdown of tool types is highly simplified in comparison with typologies used by authors like Wendt (1972) and, whilst standardization of South West African typologies would be desirable, it is also felt that the Big Elephant Shelter assemblage (containing only 299 formal tools) is too small to warrant detailed typological division.

In previous literature, for example Wendt (1972:31), backed scrapers have been termed "double crescents". I have substituted the name "backed scrapers" to indicate that backing and scraping edges are present. The term segment is used here in preference to "crescent" (after J. Deacon 1972:14). The name core scraper indicates that a core has been retouched for use as a scraper. I have included Viereck's (1967) "fabricators" in this class.

The Big Elephant Shelter tool types are illustrated in Figures 28,29 and 30. In Figure 28, numbers 1-6 are quartz segments, numbers 7,9 and 10 are quartz backed blades, 8 is a backed piece, number 11 and 12 are borers, numbers 13 and 14 are backed scrapers and numbers 15-28 are scrapers made either on quartz or basalt. Figure 29 illustrates a few large basalt scrapers; number 1 is a core scraper. The illustrations show the wide range of size variation in the scraper class. Figure 30 illustrates a few pieces of ground stonework from the shelter.

The method used for the quantitative analysis of retouched implements has been adapted from a paper by Parkington (1972b). In brief, the method is as follows:

1. Length and breadth of the tool

The length of the tool is taken as being its longest linear dimension, whilst the breadth is taken as being the maximum linear dimension bisecting the length.

2. Shape of the stone piece

The approximate shape of the stone piece is noted as

STONE IMPLEMENTS FROM BIG ELEPHANT SHELTER

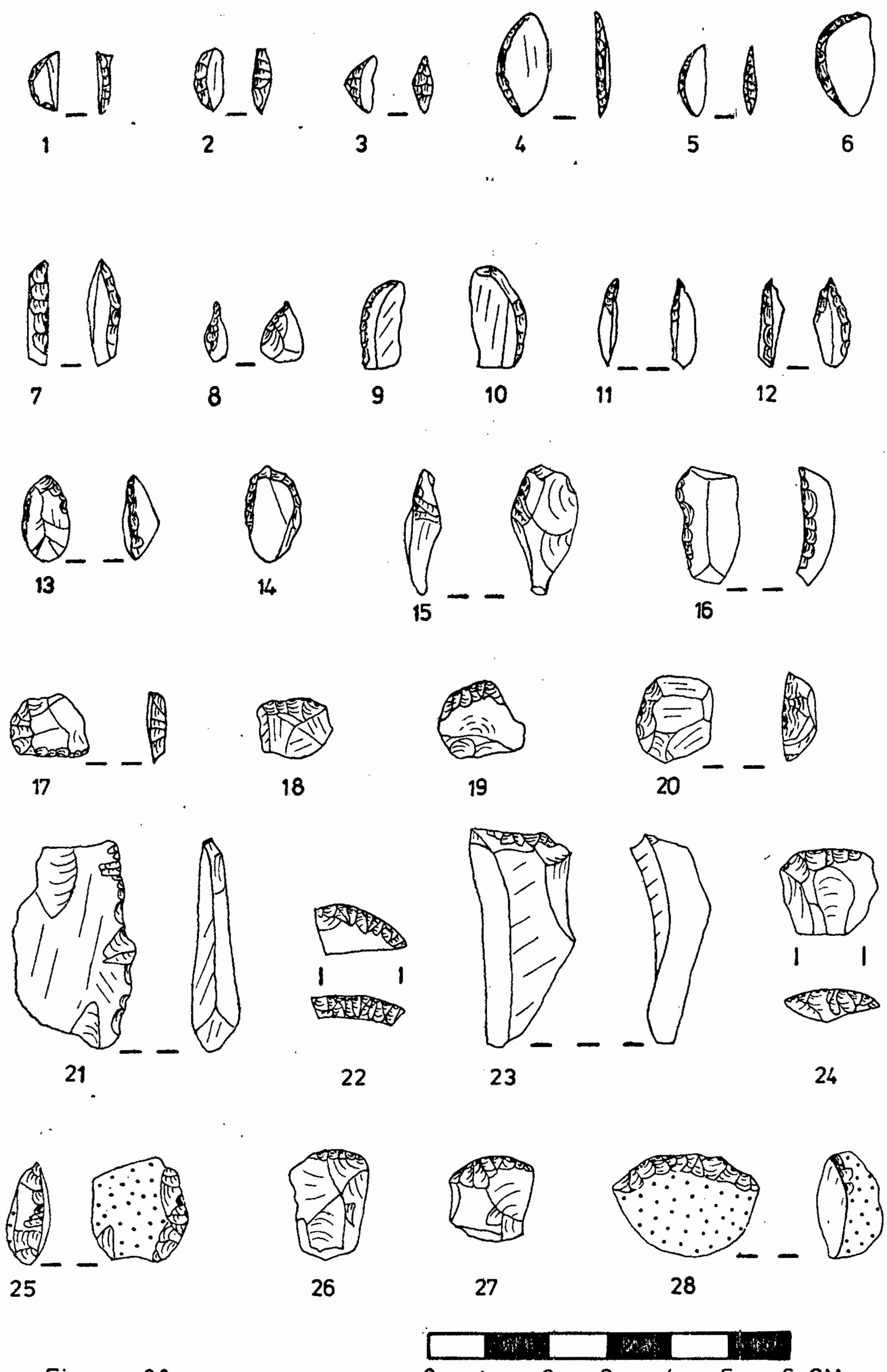


Figure 28

SCRAPERS FROM BIG ELEPHANT SHELTER.

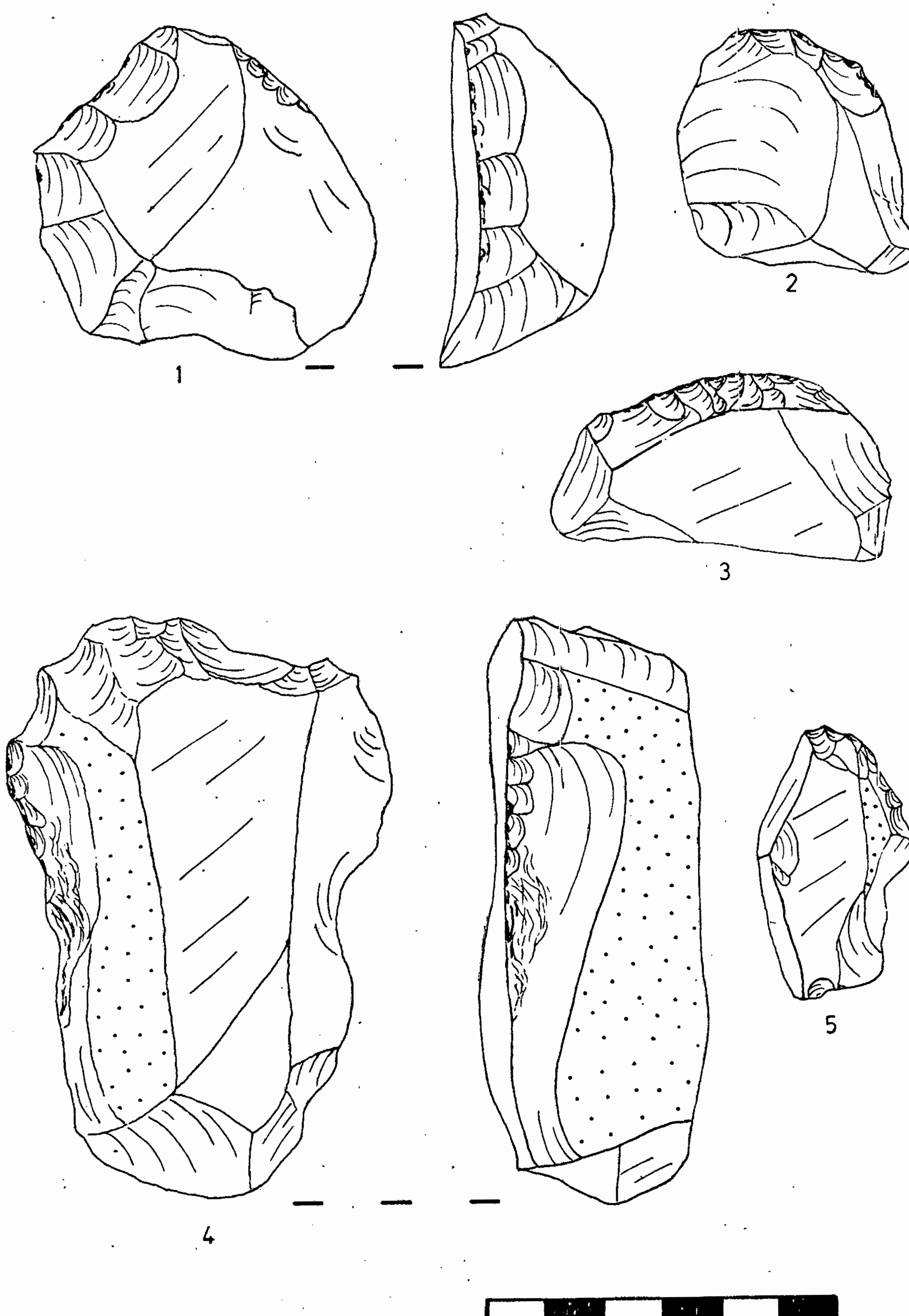


Figure 29

GROUND STONEWORK FROM BIG ELEPHANT SHELTER

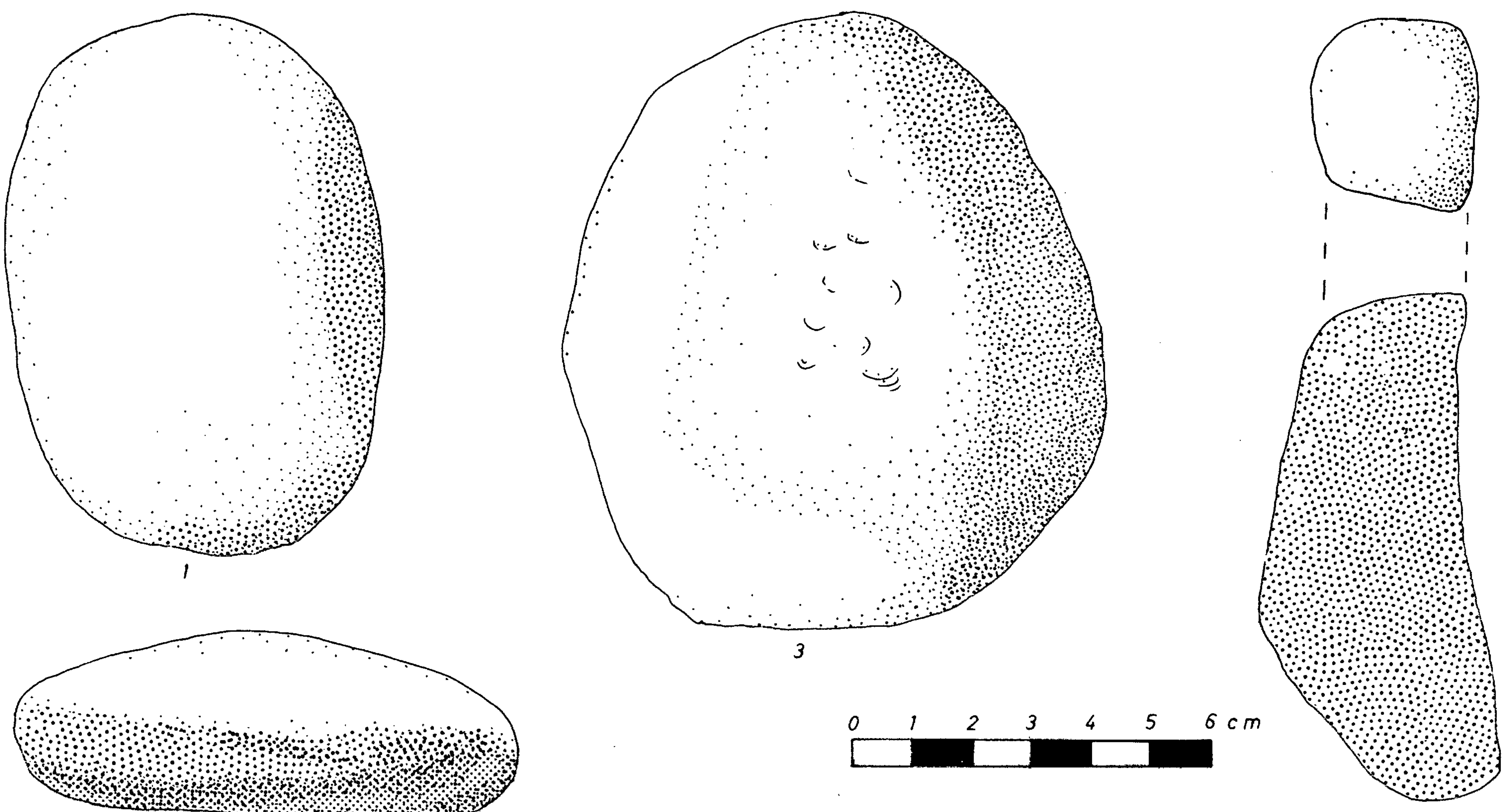
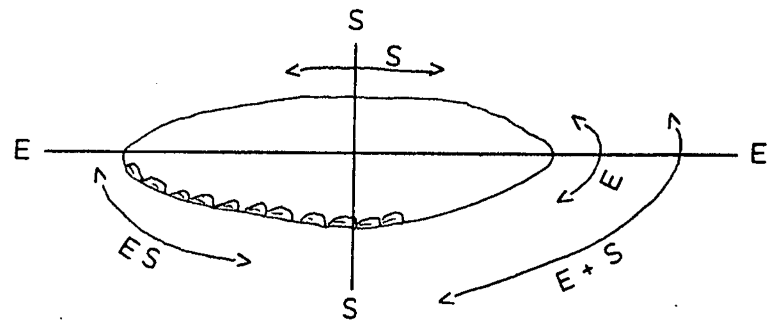


Figure 30

having either (i) length equal to, or smaller than twice the breadth or, (ii) length greater than twice the breadth.

3. Position of retouch on the tool

The figure below was used for recording retouch position. The line SS bisects the longest linear dimension EE at right angles.



4. Nature of retouch

This is classified according to the following attribute states:

(i) polishing or grinding

(ii) vertical retouch

(iii) approximately 45° retouch

(iv) shallow retouch

(v) crushing and splintering

(vi) overlapping retouch

(vii) combinations of the above

5. Extent of retouch

The extent of retouch on each tool is recorded as being:

(i) less than $\frac{1}{3}$ of the tool edge having retouch

(ii) greater than $\frac{1}{3}$, but less than $\frac{1}{2}$ of the tool perimeter having retouch

(iii) greater than $\frac{1}{2}$, but less than $\frac{2}{3}$ of the tool having retouch on its perimeter

(iv) greater than $\frac{2}{3}$ of the tool perimeter having retouch

6. Shape of the retouched edge

This is noted as being either convex, concave, irregular or a combination of these attribute states.

7. Weight

The weight of each tool was noted in g.

8. Raw material

2 categories of raw material were noted: (i) basalt and, (ii) cryptocrystalline quartz, including white and clear quartz and rare pieces of chalcedony and agate. The term quartz is used throughout the paper to indicate this category.

The stratigraphy of Big Elephant is extremely complex and, even with simplification, 18 different stratigraphic units have been recognised. With an assemblage containing only 299 implements, it is not viable to compare the implements from each of the units and it has, therefore, been decided to compare the units containing pottery with those which are apparently pre-pottery units. The pottery levels comprise Units 2,3,4 and 11 from Occupation Hollow A, the surficial unit from Occupation Hollow C and the shallow deposit from the NE. Settlement. The pre-pottery levels comprise all the other units.

Results of the stone implement analysis

The stone implement inventory is recorded in Table 17. The total assemblage contains 8% segments, 20,1% other backed tools, 5,7% borers, 1,3% backed scrapers, 7,4% core scrapers, 41,8% other scrapers, 0,3% outils écaillées and 15,4% of ground stone pieces. In the pre-pottery levels, scrapers comprise 51,8% of the implements and backed tools 29,4%; in the pottery levels, scrapers comprise 48% of the implements and backed tools 25,5%. The pre-pottery levels, therefore, contain higher percentage frequencies of backed tools and scrapers. The pottery levels contain higher percentage frequencies of ground stonework(by 5%), borers (by 3,2%) and segments (by 1,2%).

Table 17

Big Elephant Shelter, 1976

IMPLEMENT INVENTORY

Implements	Stratigraphic units, Occ. Holl. A														Occ. Holl. C		NE Shelter	Totals
	1	2	3	4	5	6	7	8	9	11	12	13	14	15	Surface	Soil		
backed tools																		
segments			2	7		4	4	3	1				1			2		24
other backed tools	1	1	3	9		9	9	5	5	1	1	3	3		1	7	2	60
borers			3	4			2	1	2	1						3	1	17
scrapers																		
core scrapers				7		5	3	3	1	1		1			1			22
backed scrapers			1			2					1							4
other scrapers	2	2	6	24	1	17	18	12	5	5	8	10	2	2	2	9		125
outils écaillées						1												1
ground stonework		2	1	11	1	1	10	5	3	2	1	3			2	3	1	46
TOTALS	3	5	16	62	2	39	46	29	17	10	11	17	6	2	6	24	4	299

Table 17(cont.)

Implements	pottery level f	pottery level %	pre-pottery level f	pre-pottery level %	TOTALS f	TOTALS %
backed tools						
segments	9	8,8	15	7,6	24	8,0
other backed tools	17	16,7	43	21,8	60	20,1
borers	8	7,8	9	4,6	17	5,7
scrapers						
core scrapers	9	8,8	13	6,6	22	7,4
backed scrapers	1	1,0	3	1,5	4	1,3
other scrapers	39	38,2	86	43,7	125	41,8
outils écaillées			1	0,5	1	0,3
ground stonework	19	18,6	27	13,7	46	15,4
TOTALS	102	99,9	197	100,0	299	100,0

With the exception of the single outil écaillé found in the pre-pottery level, the same range of tools appears in each of the levels and the tool percentage frequencies are not significantly different. A X^2 test(Langley 1968; Spiegel 1961) was used to compare the frequencies of tool types occurring in the pottery and pre-pottery levels. Where X^2 was 4,4 and D.O.F. was 5, a significant difference could not be proven at a probability level of greater than 10%. This suggests that the same range and similar proportions of activities were being practised during pottery using and pre-pottery times.

The implement sample from the pre-pottery level is larger (N=197) than that from the pottery level (N=102). During the course of excavation, note was taken of the volume of deposit removed from the site. A total of 386,75 buckets was excavated from the deposits; 233 of these were from the pre-pottery levels and 153,75 were from the pottery levels. Since 197 implements occurred in the pre-pottery levels, 0,84 implements were present in each bucketful of deposit. 0,66 implements occurred in each of the pottery level bucketfuls of deposit (102 implements being recovered from these levels). Thus, there is a marginally higher tool density in the pre-pottery levels, but this could be accounted for by compaction of the earlier deposits and also by removal of surface material by earlier collectors.

The inventory of flakes, chips/chunks and cores is presented in Table 18. Flakes constitute 35,9% of all the stone pieces, cores 1,7%, chips/chunks 59,1% and implements 3,4%. 45,2% of flakes are made on quartz whilst 54,8% of flakes are made on basalt. The basalt waste has a far greater mass than that of the quartz waste. The total mass of basalt flakes is 7227,8 g; giving a mean flake mass of 4,1 g. The total mass of quartz flakes is 1048,0 g, giving a mean flake mass of 0,72 g. The disparity in weights is due, in part, to the different

Table 18 continued

Strat. unit	FLAKES				CHIPS/CHUNKS		CORES			
	quartz		basalt				quartz		basalt	
	f	mass(g)	f	mass(g)	f	mass(g)	f	mass(g)	f	mass(g)
NE Sett.	12	5,0	35	60,0	49	27,0	1	3,0		
OCH Surface	233	119,0	172	550,0	556	580,0	12	48,0	3	120,0
OCH Soil	47	26,0	73	254,0	193	354,0	2	6,0	3	114,0
TOTALS	1442	1048,0	1749	7227,8	5252	11061,2	84	460,4	66	2507,4

TOOLS		FLAKES						CHIPS/CHUNKS		CORES					
		qtz.	b.	qtz.	b.	Totals				qtz.	b.	qtz.	b.	Totals	
f	%	f	f	%	%	f	%	f	%	f	f	%	%	f	%
299	3,4	1442	1749	45,2	54,8	~~3191~~	~~35,9~~	~~5252~~	~~59,1~~	84	66	56,0	44,0	150	1,7

specific gravities of the raw materials. Quartz has a specific gravity of between 2,65 and 2,66. The rock, basalt, has no fixed SG owing to the variable proportions of its mineral constituents; however, a typical basalt would have an SG of 3,0 or slightly greater (Ford 1966). Nevertheless, it is observable that large basalt chunks were preferentially selected for the manufacture of flakes and implements, particularly large scrapers.

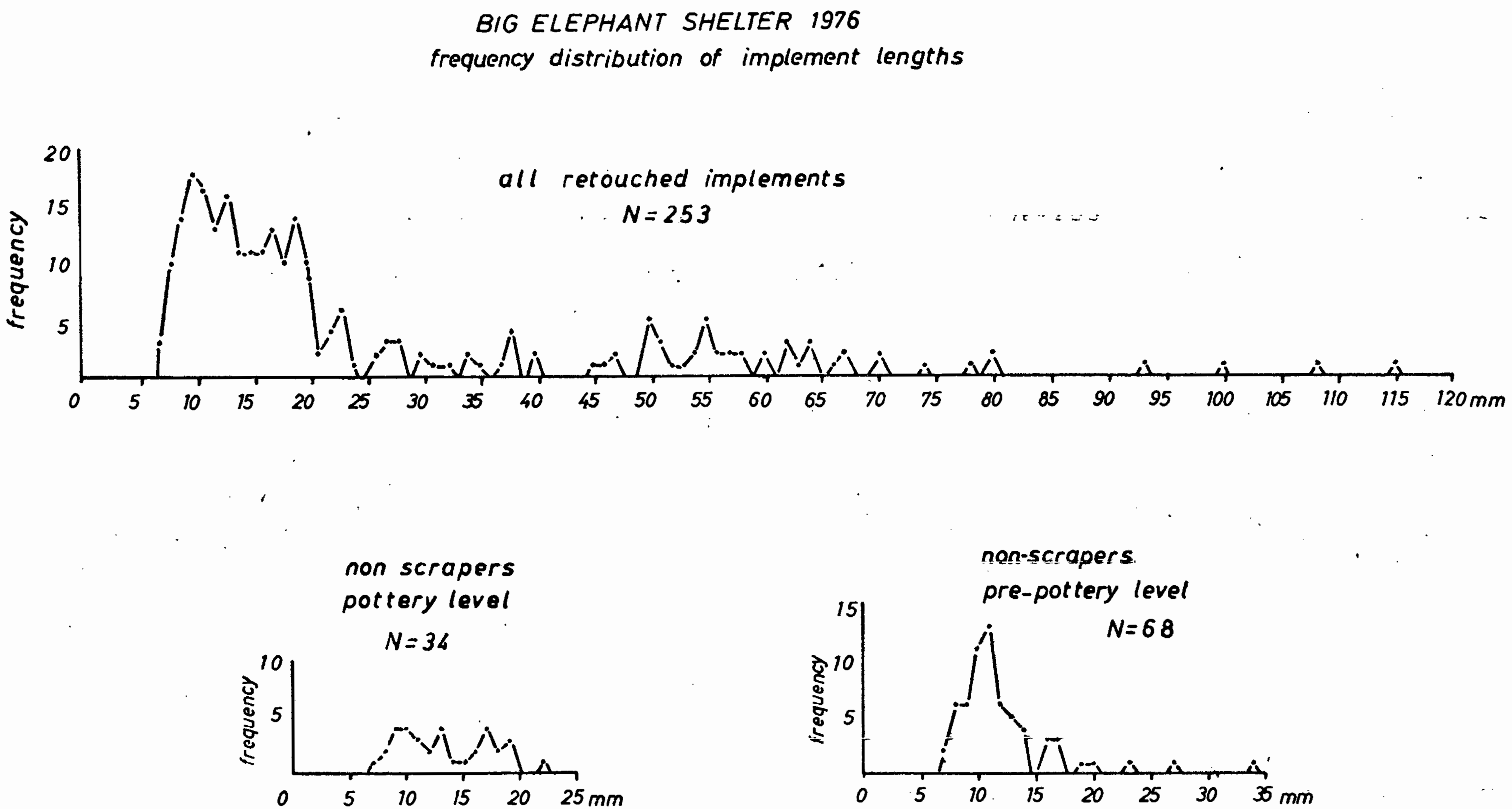
The remaining part of the analysis examines the morphology of retouched tools and compares the results from the pottery and pre-pottery levels.

1. <u>Length of the tool</u>

The frequency distribution of lengths of all the retouched tools from Big Elephant Shelter are plotted in Figure 31. The range of tool lengths is 7-115 mm, whilst the mean tool length is 24,9 mm. The mean length of the pre-pottery level tools is 23,22 mm and the mean length of the pottery level tools is 28,4 mm. The frequency distribution of implement lengths (excluding scrapers), from the pre-pottery and pottery levels is also plotted in Figure 31.The range of non-scraper tool lengths in the pre-pottery level is 7-34 mm and the mean length is 12,0 mm. In the pottery level, the range of lengths is 7-22 mm and the mean length is 13,3 mm.

Figure 32 shows the frequency distribution of scraper lengths in the pre-pottery and pottery levels. In the pre-pottery level, the range of scraper lengths is 9-108 mm and the mean scraper length is 30,7 mm. In the pottery levels, the range of scraper lengths is 9-115 mm and the mean scraper length is 38,8 mm.

Wendt (1972:28) differentiates microlithic, medium sized and macrolithic tools according to the following criteria: a microlithic tool is one having no dimension greater than 25-30 mm, a medium sized tool has at least one



BIG ELEPHANT SHELTER 1976
frequency distribution of implement lengths
all retouched implements
N=253
frequency
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120 mm
non scrapers
pottery level
N=34
frequency
10
5
0
5
10
15
20
25 mm
non-scrapers
pre-pottery level
N=68
frequency
15
10
5
0
5
10
15
20
25
30
35 mm

Figure 31

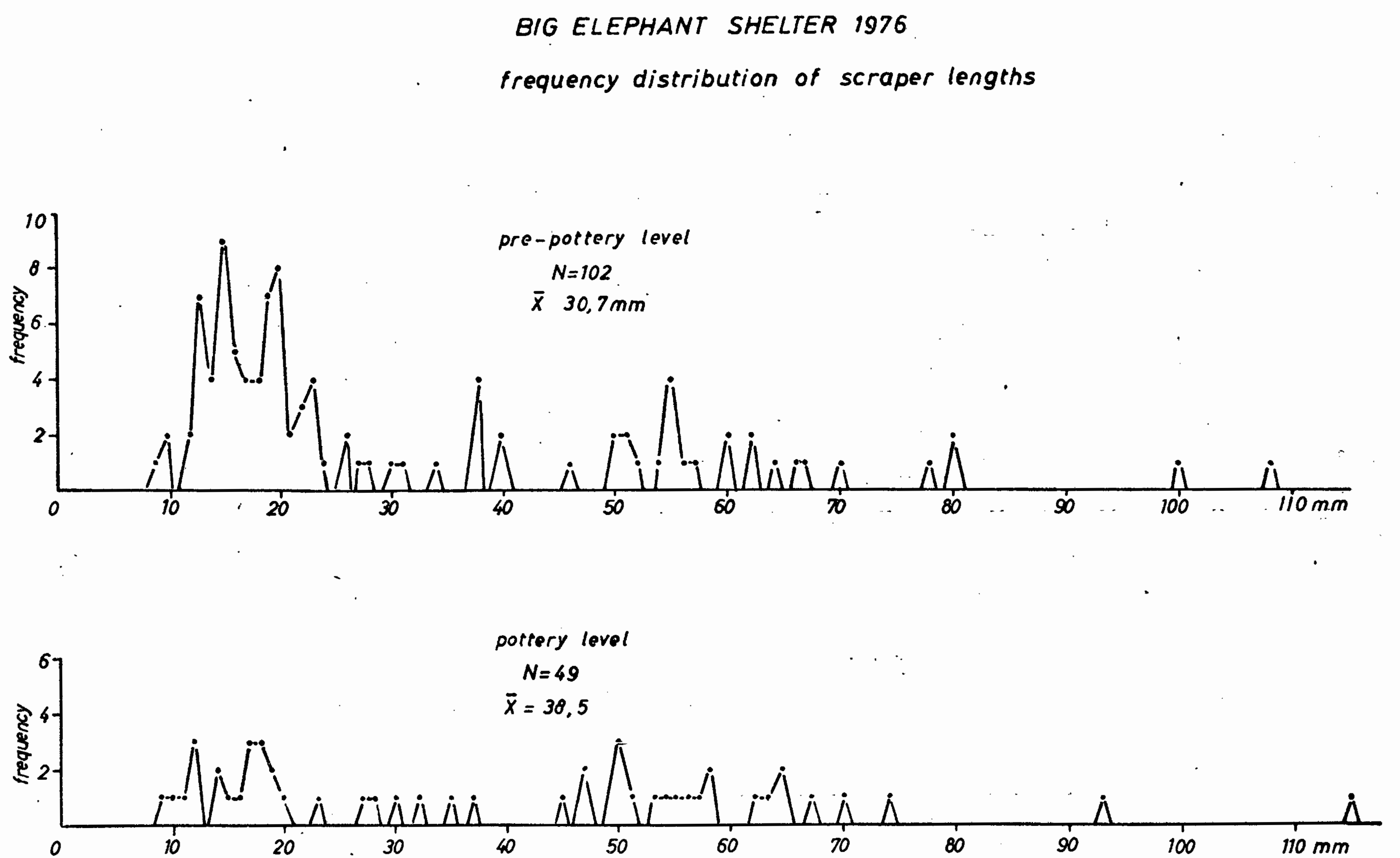

BIG ELEPHANT SHELTER 1976
frequency distribution of scraper lengths
pre-pottery level
N=102
X̄ 30,7mm
frequency
10
8
6
4
2
0
10
20
30
40
50
60
70
80
90
100
110 mm
pottery level
N=49
X̄ = 38,5
frequency
6
4
2
0
10
20
30
40
50
60
70
80
90
100
110 mm

Figure 32

dimension greater than 25-30 mm, but smaller than 50 mm, and a macrolith has at least one dimension greater than 50 mm. 75,8% of the Big Elephant Shelter retouched tools are microlithic, having lengths which are 30 mm or less. In the pre-pottery levels, 79,4% of tools are microlithic, 7,1% are medium sized and 13,5% are macrolithic. In the pottery levels, 68,7% of retouched tools are microlithic, 10,8% are medium sized and 20,5% are macrolithic. The pottery levels contain greater percentage frequencies of medium sized and macrolithic implements, all of which are scrapers.

Two X^2 tests were carried out in order to assess the significance of the differences in lengths of the pre-pottery and pottery level implements. The first test compared the mean lengths of the total implement samples from both levels, the mean lengths of scrapers and the mean length of non-scrapers. With D.O.F. of 2 and X^2 of 0,06, no significant difference in the mean lengths of the tools from the two levels could be proven at the probability level of greater than 10%. The second test compared the length distribution of scrapers in the pre-pottery and pottery levels. With D.O.F. of 2 and X^2 of 5,39, no significant difference could be proven at the probability level of greater than 5%. Since the pre-pottery basalt scrapers have a mean length of 49,4 mm and the pottery level basalt scrapers a mean length of 58,9 mm, a X^2 test was used to see whether this difference was significant. No significant difference could be proven at the 10% probability level, where D.OF. was 2 and X^2 was 4,43.

Of all the implements, the least variance is shown amongst the segments, where the range of lengths is 8-19 mm and the mean length is 11,3 mm. The pottery level segments are smaller than those from the pre-pottery level, having a range of lengths from 8-13 mm and a mean length of 10,1 mm.

Correlation is high between the length of tools (particularly in the scraper class) and the raw material used for their manufacture. Figure 33 shows the frequency distribution of basalt and quartz scraper lengths in the pre-pottery and pottery levels and in the combined levels. It is obvious from the bimodal distribution pattern, that the scrapers fall within 2 statistical population groupings based on raw material. The microlithic quartz scraper population has its highest frequency distribution in the 11-20 mm class interval (with mean scraper length of 18,3 mm) whilst the basalt population has highest frequency distribution in the 51-60 mm class interval (with mean scraper length 52,9 mm). Relatively few medium sized tools are present.

A X^2 test was carried out to compare the length distributions of the quartz and basalt scraper lengths and to gauge the possibility of the two samples having been drawn from the same population. Using 3 class intervals, one of 20 mm and less, one of 21-30 mm and one of greater than 31 mm, a X^2 value of 95,89 was obtained. With D.O.F. of 2, a significant difference was apparent, showing that 2 separate populations were almost certainly present. I would suggest that the 2 separate scraper populations represent functional entities, for example, the use of microlithic scrapers for precision work whilst the macrolithic scrapers may have been deliberately designed for heavy duty work.

2. Shape of the stone piece

78,3% and 79,9% of tools (from pottery and pre-pottery levels, respectively) have lengths equal to or smaller than twice their breadth, whilst 21,7% of pottery level tools and 21,1% of pre-pottery level tools have lengths which are greater than twice their breadth. Backed tools are largely responsible for the class of tools having lengths greater than twice their breadth; 81,5% of backed tools have this attribute.

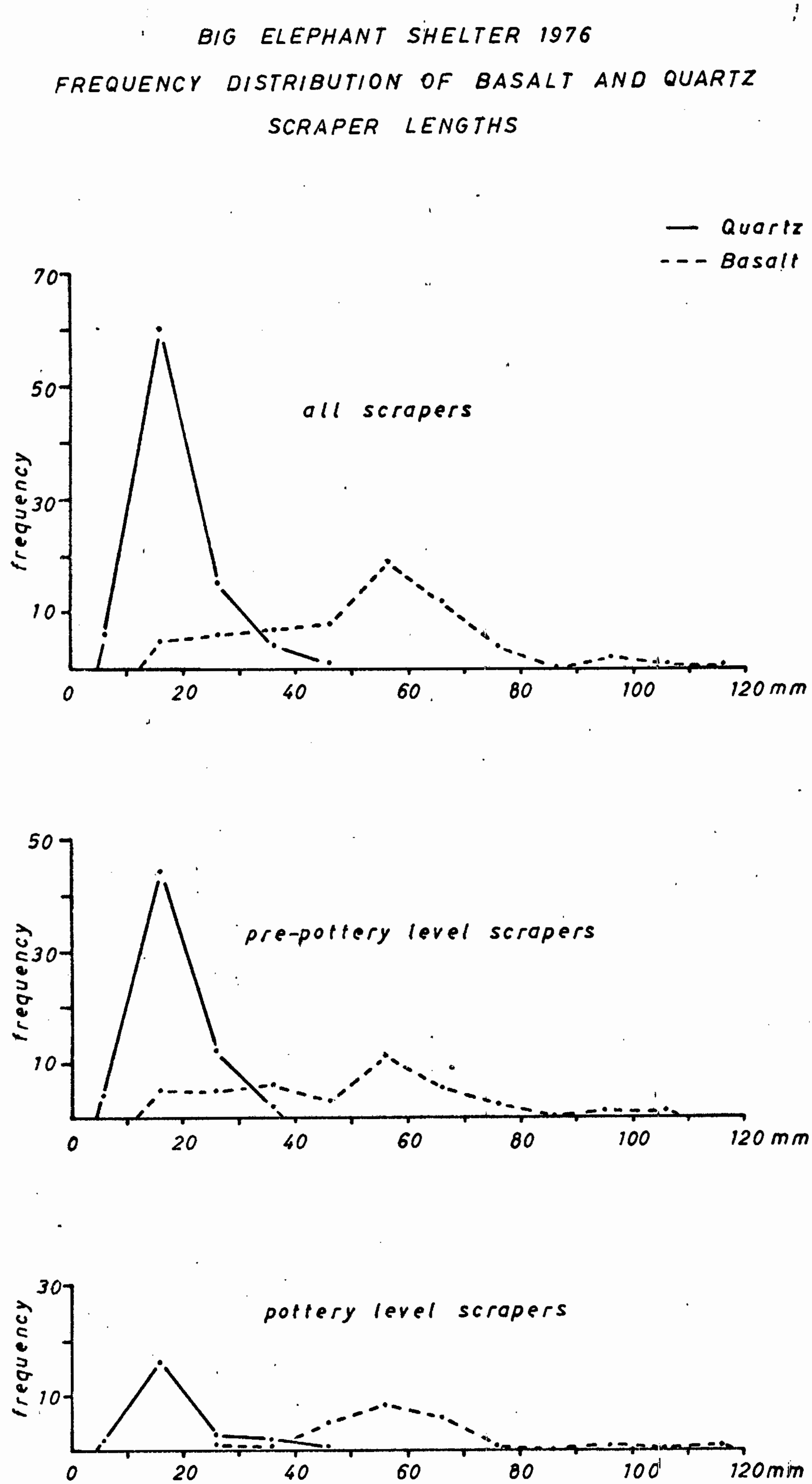

BIG ELEPHANT SHELTER 1976
FREQUENCY DISTRIBUTION OF BASALT AND QUARTZ SCRAPER LENGTHS
Quartz
Basalt
all scrapers
pre-pottery level scrapers
pottery level scrapers
frequency
0
10
30
50
70
20
40
60
80
100
120 mm

Figure 33

Widths and lengths were plotted on scatter diagrams, an example of which is shown in Figure 34. A tight clustering of non-scraper tools is evident as is the variance amongst tools of the scraper class. The frequency distribution and percentage frequencies of width/length ratios of all tools are illustrated in Figure 35. The width/length ratios were derived from $\frac{W}{L}$ x 100(Deacon, J. 1972:20). Since my length and width measurements relate to the shape of the stone piece, regardless of the position of retouch, the actual W/L ratios obtained are not comparable with those of Deacon.

The range of variation of Big Elephant Shelter tools includes stone pieces of long, narrow shape and short wide pieces which are almost square in shape. The mean W/L ratios of the pre-pottery and pottery level tools are 65,4 and 63,5, respectively. The pre-pottery level distribution curve of W/L ratios is fairly normal whilst the pottery level distribution curve shows a bimodal trend. There is a tendency for the pre-pottery level tools to have shorter, wider forms than tools from the pottery levels. 63% of pre-pottery tools have W/L ratios of between 60 and 100, whereas 51,1% of pottery level tools have the same range of W/L ratios.

A X^2 test was used to compare the W/L ratio frequency distribution in the pre-pottery and pottery levels. With D.O.F. of 6 and X^2 of 5,72, no significant difference could be proven at the probability level of greater than 10%.

3. Position of retouch

Retouch on the side of implements predominates. 48,2% of pottery level and 45,3% of pre-pottery level tools have this attribute. Figure 36 illustrates the frequencies and percentage frequencies of retouch positions amongst all tools and amongst scrapers of pottery and pre-pottery levels. In the pottery levels, there are higher percentage

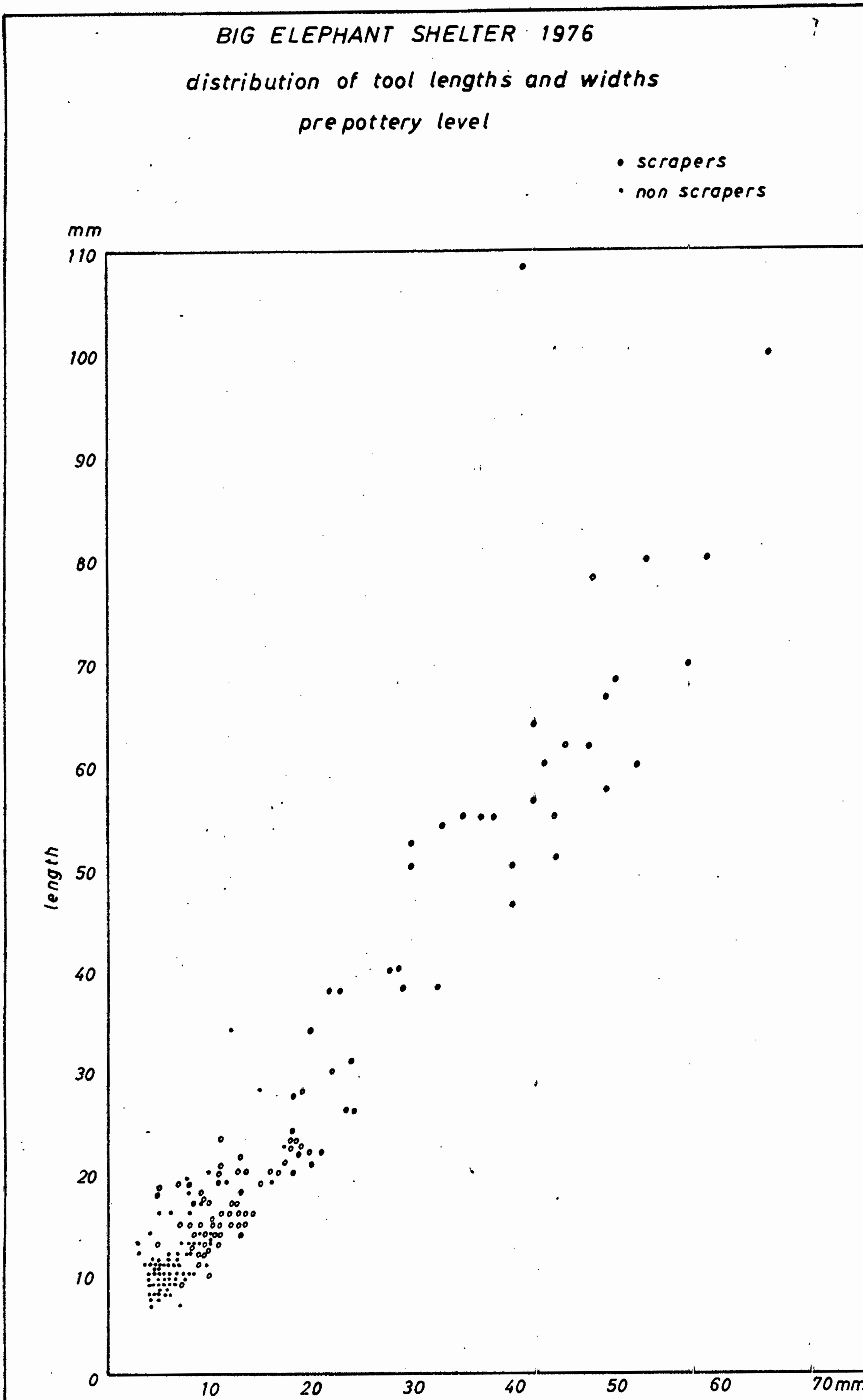

BIG ELEPHANT SHELTER 1976
distribution of tool lengths and widths
pre pottery level
scrapers
non scrapers
mm
110
100
90
80
70
60
50
40
30
20
10
0
length
10
20
30
40
50
60
70mm
width

Figure 34

BIG ELEPHANT SHELTER 1976

width/length ratios of all implements

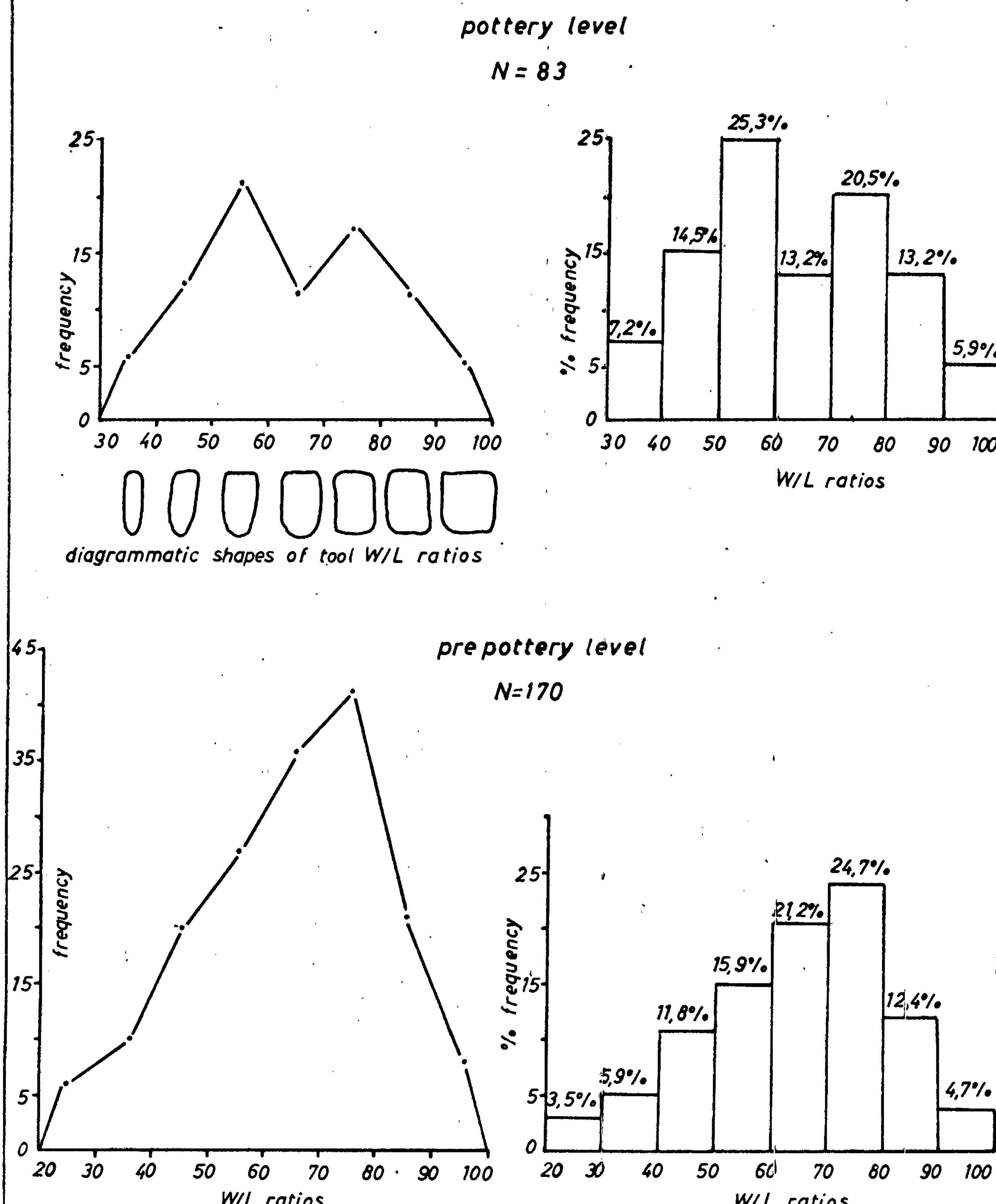
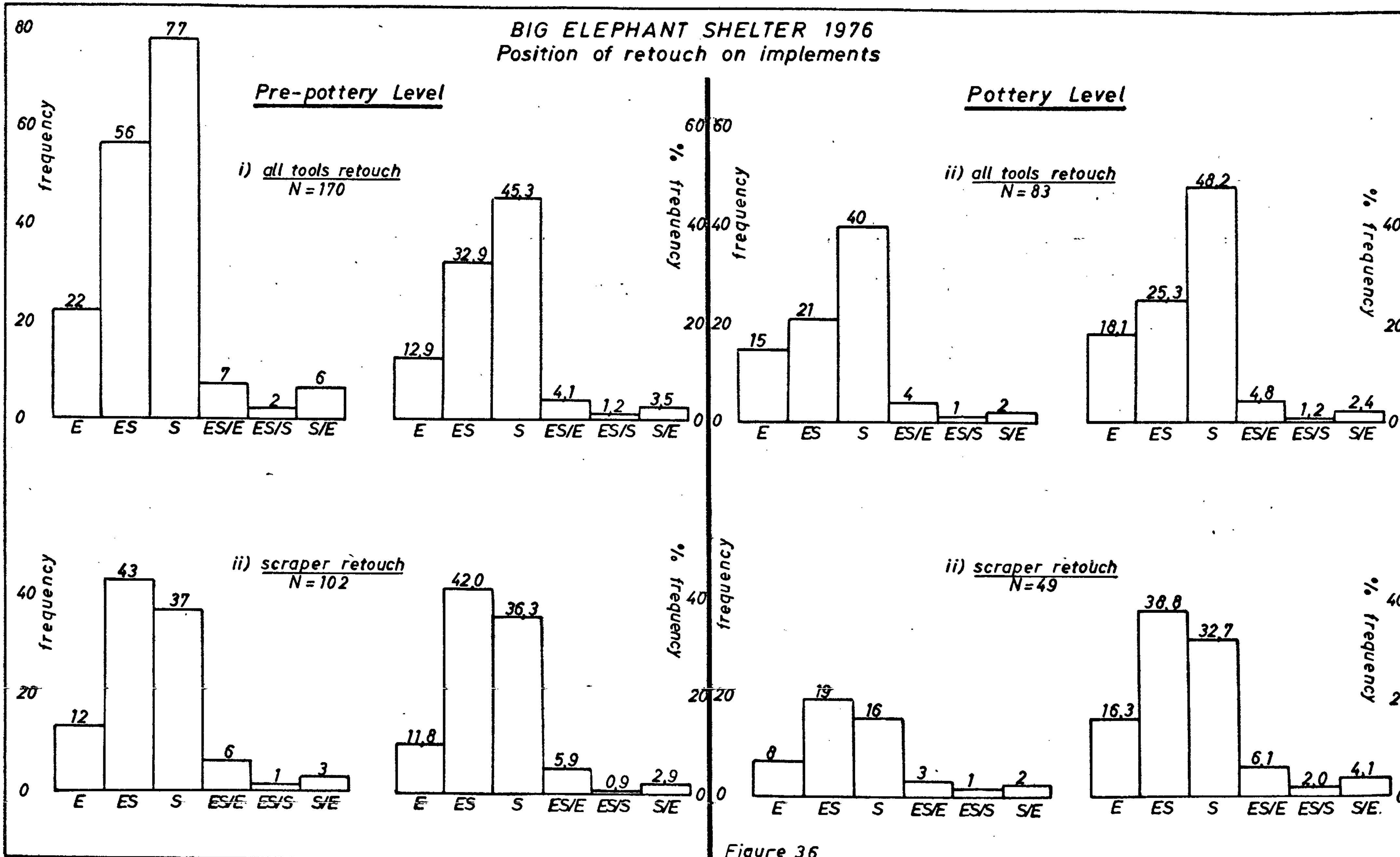


Figure 35


BIG ELEPHANT SHELTER 1976
Position of retouch on implements
Pre-pottery Level
Pottery Level
i) all tools retouch
N = 170
ii) all tools retouch
N = 83
ii) scraper retouch
N = 102
ii) scraper retouch
N=49
frequency
% frequency
22
56
77
7
2
6
12,9
32,9
45,3
4,1
1,2
3,5
15
21
40
4
1
2
18,1
25,3
48,2
4,8
1,2
2,4
12
43
37
6
1
3
11,8
42,0
36,3
5,9
0,9
2,9
8
19
16
3
1
2
16,3
38,8
32,7
6,1
2,0
4,1
E
ES
S
ES/E
ES/S
S/E
0
20
40
60
80
Figure 36

frequencies of side and end retouch. The ES position is most frequent amongst scrapers of both levels, but the pottery level scrapers have a higher percentage frequency of end retouch. Amongst the non-scrapers, side and end retouch show increases in the pottery level.

A X^2 test was used to compare the frequency proportions of retouch positions on scrapers. With D.O.F. of 3 and X^2 of 0,88, no significant difference between the pottery and pre-pottery level scrapers could be proven at a probability level of greater than 10%.

4. Nature of retouch

32,5% of the pottery level tools and 34,7% of pre-pottery level tools have vertical retouch. For convenience, I have combined Parkington's (iii) and (iv) categories, considering both to be forms of scraper retouch. 33,8% of pottery level tools have either shallow or vertical crushing. Other combinations of retouch constitute 14,5% of pottery level tools and 10% of pre-pottery level tools.

5. Extent of retouch

Figure 37 illustrates the extent of retouch on pre-pottery and pottery level implements. 44,5% of pottery level tools have less than $\frac{1}{3}$ of their perimeters retouched whilst 51,2% of pre-pottery tools have this attribute. Only 1,2% and 1,8% of pottery and pre-pottery level implements, respectively, have more than $\frac{2}{3}$ of their perimeters retouched.

6. Shape of the retouched edge

Figure 38 shows the frequencies and percentage frequencies of the shape of retouch on implements. The pottery level shows higher percentage frequencies of convex retouch (by 10,4%) compared with the pre-pottery level. Amongst tools of the scraper class, the shift towards convex retouch in the pottery levels is more pronounced (see Figure 39). 63,3% of pottery level scrapers have this attribute. Figure 39 shows that there is less variability

BIG ELEPHANT SHELTER 1976

extent of retouch on implements

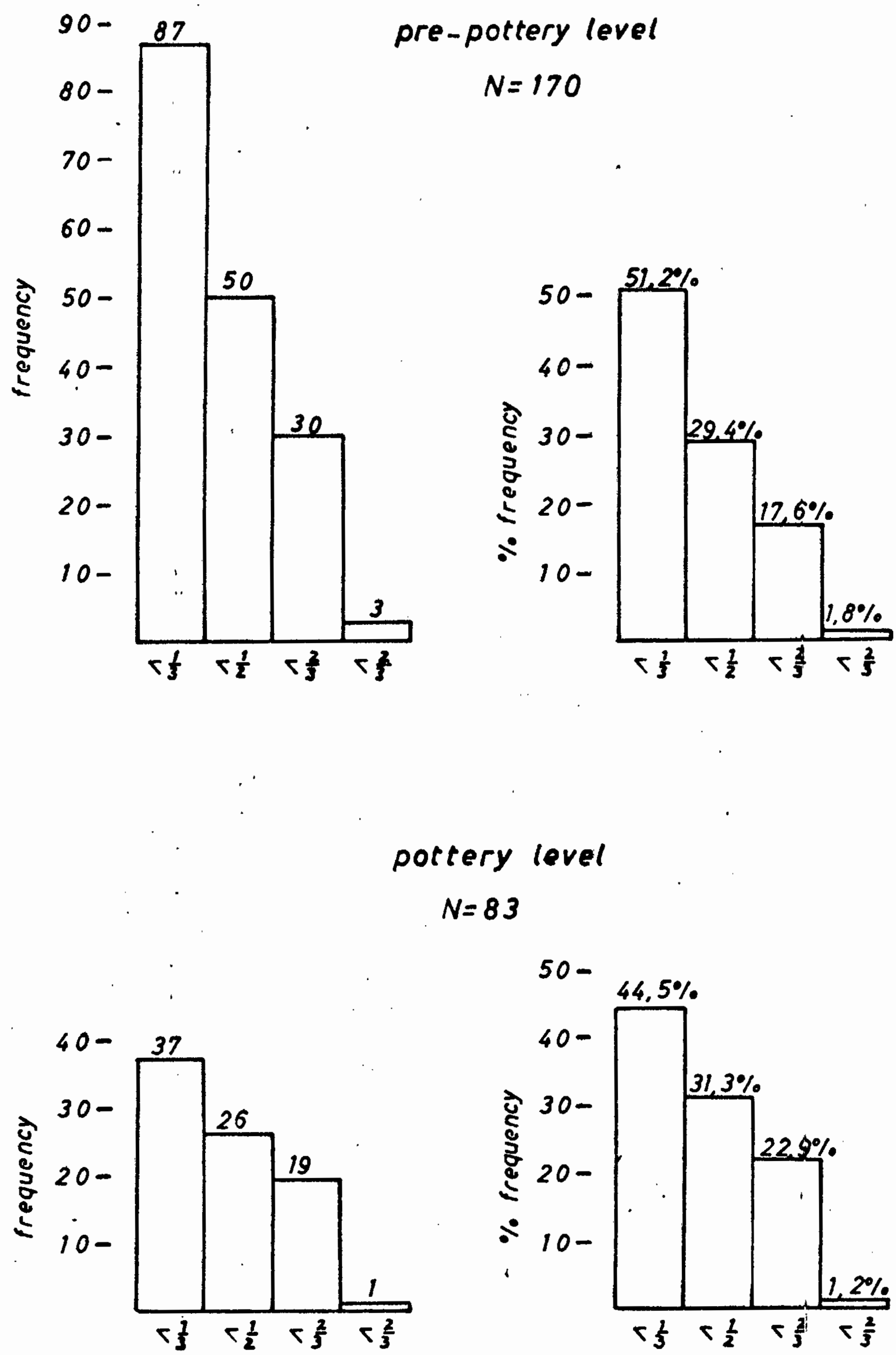


Figure 37

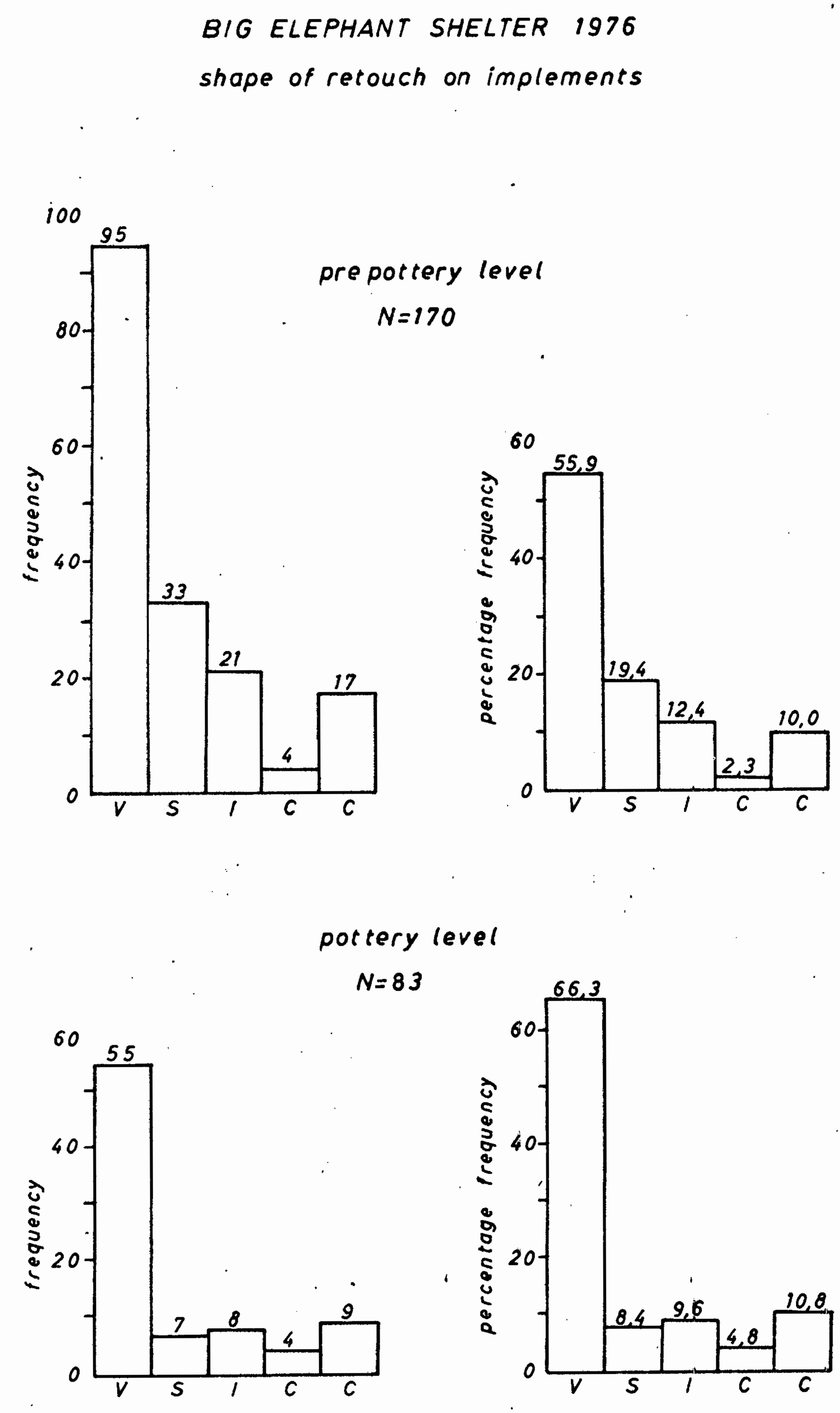

BIG ELEPHANT SHELTER 1976
shape of retouch on implements
pre pottery level
N=170
frequency
percentage frequency
95
33
21
4
17
55,9
19,4
12,4
2,3
10,0
V S I C C
pottery level
N=83
55
7
8
4
9
66,3
8,4
9,6
4,8
10,8

Figure 38

of retouch shape amongst the pottery level scrapers.

A X^2 test was used to compare the frequencies of shapes of scraper retouch in the pre-pottery and pottery levels. With D.O.F. of 3 and X^2 of 4,19, no significant difference could be proven at the probability level of greater than 10%.

7. Mass of tool in g

The largest mass category is that of tools weighing less than 1 g; 51,8% of pottery level implements and 52,4% of pre-pottery implements are included in this category. 20,5% of pottery level tools and 30,9% of pre-pottery implements weigh between 1 g and 10 g. 27,7% of pottery tools weigh more than 10 g, whilst 16,5% of pre-pottery level tools weigh more than 10 g. The range of weights in the latter category, varies between 10 g and 1000 g. In the pottery level, 46,9% of scrapers weigh more than 10 g, whilst in the pre-pottery level, 27,5% of scrapers have a mass of more than 10 g.

8. Raw material

Cryptocrystalline quartz is the material most commonly used for the manufacture of retouched tools; 72,4% of pre-pottery level implements and 68,7% of pottery level implements are made on quartz (see Figure 40). 43% of scrapers are made on basalt and 57% of scrapers are made on quartz. Only 3,1% of non-scraper tools are made on basalt.

The raw material chosen for the manufacture of an implement correlates highly with the tool type and the attributes of size and weight. Segments are always made on quartz although they could equally have been made on basalt (there are a few large basalt segments from Striped Giraffe Shelter). Basalt has primarily been used for the manufacture of large scrapers, whilst smaller scrapers are made on quartz. The mean length of basalt scrapers

BIG ELEPHANT SHELTER 1976

shape of scraper retouch

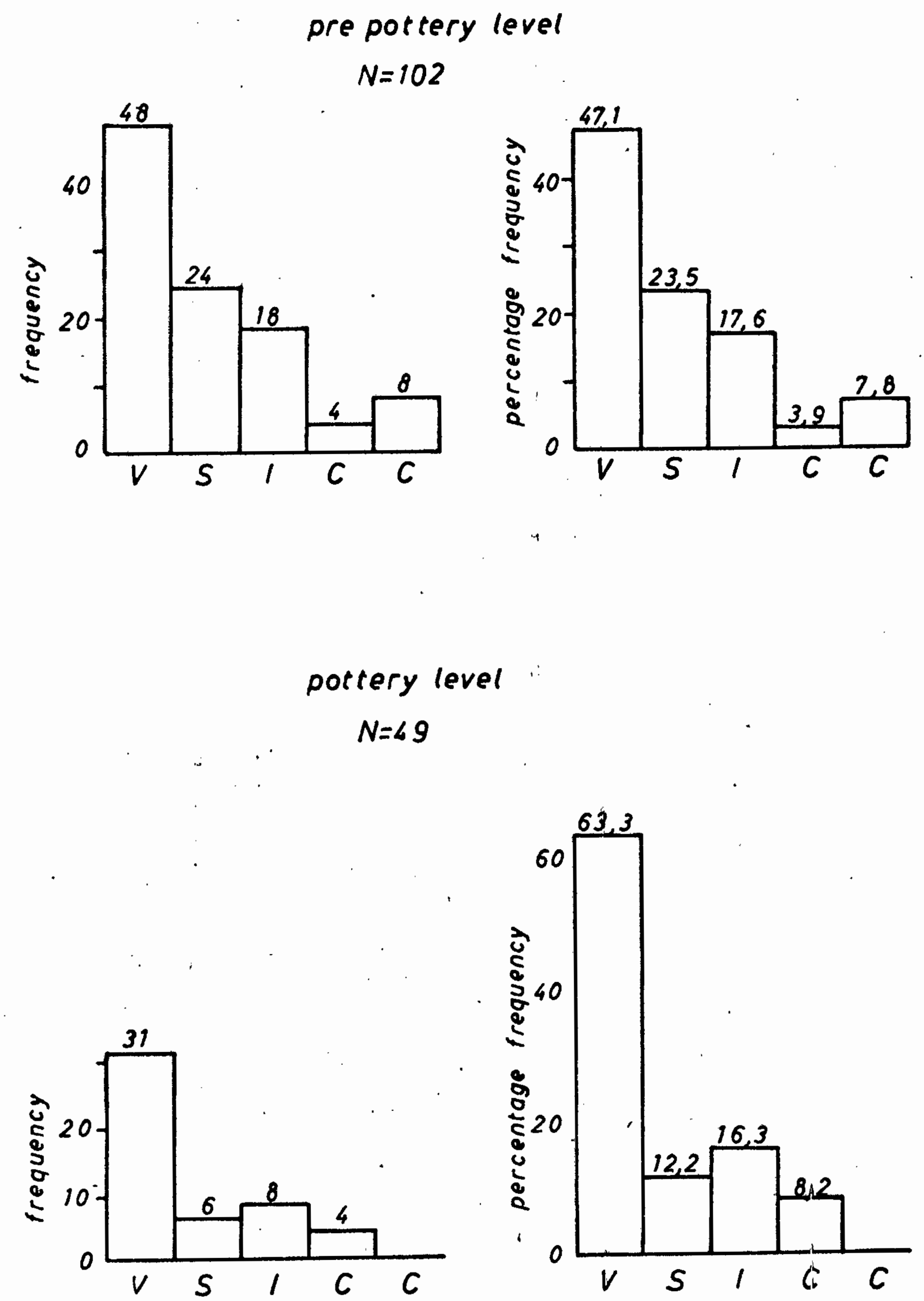


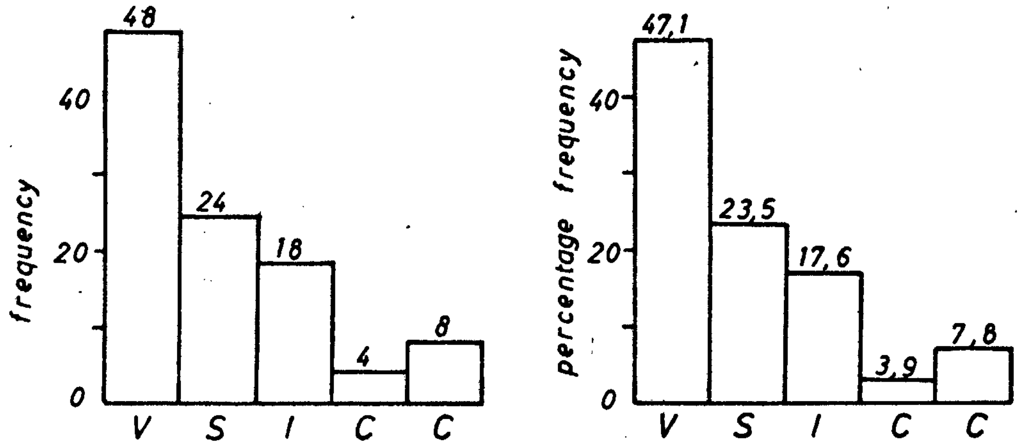
Figure 39

BIG ELEPHANT SHELTER 1976

shape of scraper retouch

pre pottery level

N=102



pottery level

N=49

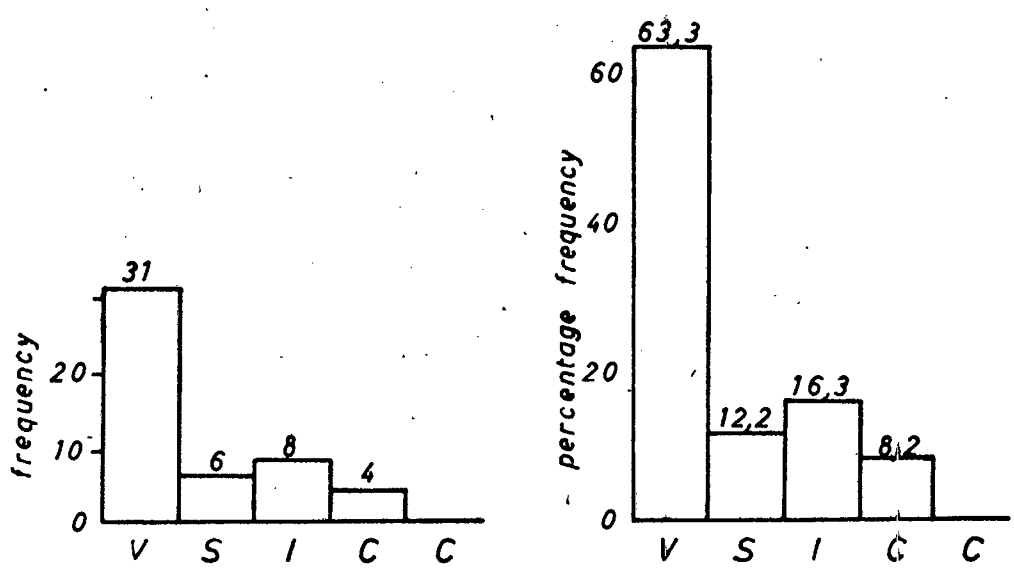
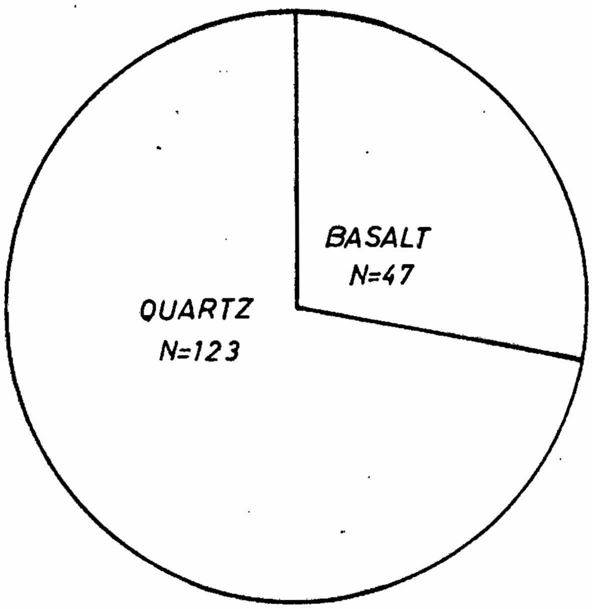


Figure 39

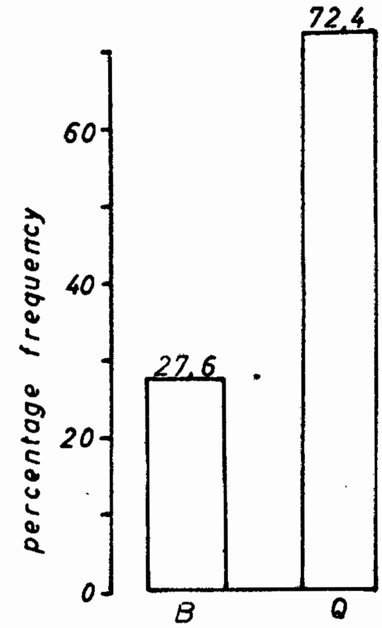
BIG ELEPHANT SHELTER 1976

raw material usage

pre pottery level

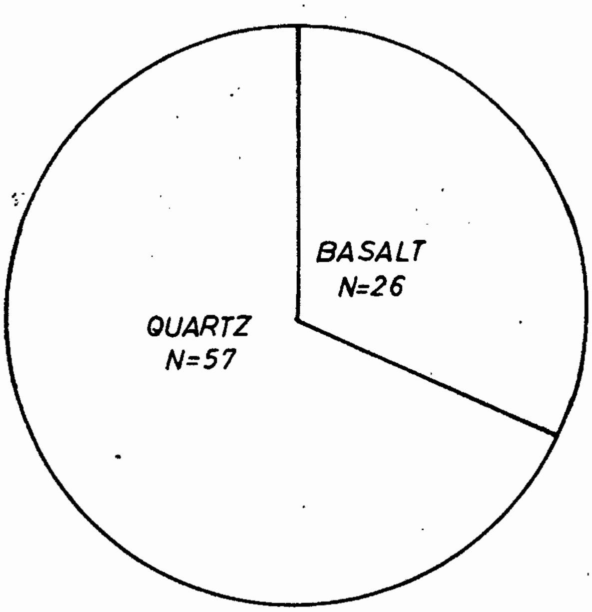


relative proportions of quartz and basalt utilized

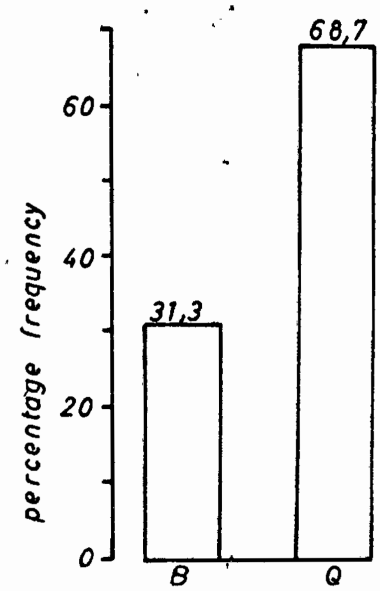


frequency distribution of raw materials used for tool manufacture

pottery level



relative proportions of quartz and basalt utilized



frequency distribution of raw materials used for tool manufacture

Figure 40

is 52,9 mm and the mean length of quartz scrapers is 18,3 mm. The non-scraper tools, made on basalt, have a mean length of 12,6 mm. In the pottery levels, basalt and quartz scrapers have mean lengths of 58,9 mm and 19,9 mm respectively, whilst in the pre-pottery levels, basalt and quartz scrapers have mean lengths of 49,4 mm and 17,7 mm, respectively.This indicates that, whilst basalt was suitable for the manufacture of small tools, it was preferred as a large tool raw material. Large chunks of both basalt and quartz occur naturally in the area.

Basalt tools are also considerably heavier than quartz tools. 88,5% of pottery level basalt tools weigh more than 10 g, and 61,7% of pre-pottery level basalt tools weigh more than 10 g. Of the pottery level quartz tools, 71,9% weigh less than 1 g, 26,3% weigh between 1 and 10 g and 1,8% weigh greater than 10 g. In the pre-pottery level, 62,9% of quartz tools have a mass of less than 1 g, 37,1% weigh between 1 and 10 g and none have a mass of greater than 10 g.

Summary of the attribute analysis on tools from Big Elephant Shelter

Of the total retouched tool assemblage, the mean tool length is 24,9 mm; scraper mean length is 33,3 mm and the mean length of other tools is 12,5 mm. Pottery level tools, particularly scrapers, are longer than those in the pre-pottery levels.

Retouch on the side of implements predominates in the non-scraper class, whilst ES retouch predominates amongst scrapers. In the pottery levels, higher percentage freq-uencies of scrapers have end retouch and higher percentage frequencies of non-scrapers have side and end retouch. Convex shaped retouch is most common and there is an increase of this attribute amongst scrapers in pottery levels.

Only slight differences are evidenced between the earlier and later levels, as regards the attributes of extent of retouch, nature of retouch, shape of piece and proportions of raw materials used. Approximately half of all tools have less than $\frac{1}{3}$ of their perimeters retouched; the nature of retouch is generally variable; approximately 78% of all tools have lengths equal to or smaller than twice their breadths; and cryptocrystalline quartz is the raw material most frequently used for the manufacture of retouched implements, although basalt accounts for some 30% of tools.

Size variability in the scraper class is one of the characteristic features of this assemblage. Whilst the microlithic elements (scrapers and non-scrapers), from Big Elephant Shelter, would appear to fall within the range of variation of the Wilton assemblage, illustrated and described by J. Deacon (1972), Big Elephant Shelter contains a very large scraper element which is absent from the Wilton assemblage. The scrapers form 2 statistical populations based on the attributes of length and raw material and these population entities are probably related to distinct tool functions.

When examining the implement assemblage (dominated by scrapers) from Wilton Shelter, Deacon (Ibid:36) used the hypothetical assumption that: "changes in the style or norms of artefact manufacture reflect cultural change, whilst variations in the frequencies of various tool types reflect changes in activity at the site." The morphological changes evident between the Wilton Shelter pre-pottery and pottery level assemblages are significant and Deacon has suggested that the "death" of the Wilton cultural system coincided with the appearance of pottery in the area. She suggests further, that the influx into the area of the pottery makers may have caused the exodus of the existing population. At Big Elephant Shelter, the situation is somewhat different. The similar range and percentage frequency distribution of implements, from the pottery and pre-pottery levels, suggests that the range of activities, involving the use of stone implements, was largely unaffected by the introduction of pottery and the possible contact with stock herding people. Some morphological changes are evidenced in the lithic implements from the pottery and pre-pottery levels, but the X^2 tests suggest that no significant differences can be proven. The morphological differences which have been noted should, therefore, be regarded as displaying a shift rather than a change in the norms of artefact manufacture. The evidence suggests a stable population, well adapted to the semi-desert environment, assimilating the innovation of pottery and other cultural aspects which may have been introduced at the same time, without undergoing any major change to their traditional artefact making system.

The evidence drawn from the lithic and non-lithic implements, as well as from the dietary information, makes it obvious that the contact situation between hunters and pastoralists, in the Big Elephant Shelter area, never developed beyond Clarke's (1968) tolerative or symbiotic interchange situations. Furthermore, population stress cannot be traced in the archaeological record using Cohen's (1975) suggestions for conditions of change which could be expected to become apparent through time. It is apparent that new models are needed for the Big Elephant Shelter situation, but before investigating this need, I will first compare the available evidence from other sites in central South West Africa with that obtained from Big Elephant Shelter.

CHAPTER 7

Comparison between the assemblages of Big Elephant Shelter and other sites in central South West Africa

This chapter contains general and quantitative comparisons between the Big Elephant Shelter assemblage and the other site assemblages in central South West Africa for which data are available.Due to the research strategies adopted by archaeologists working in the territory, most of the available site material has been drawn either from the Erongo or Brandberg Mountains.

To date, Erongo assemblages have been variously described as having Smithfield affinities (Clark & Walton 1962; Rudner 1952; 1957), as belonging to the Damaraland Culture (Viereck 1967) and as having affinities to the Wilton of the Cape (Wendt 1972:38). The aim of this chapter is, therefore, to examine, critically, the status of the Big Elephant Shelter assemblage in the broader context of our knowledge of lithic traditions in central South West Africa.

Jacobson of the State Museum, Windhoek, kindly allowed me to reanalyse the material from Cymot Shelter and Striped Giraffe Shelter. Both sites are in the southern Erongo Mountains, geographically very close to Big Elephant Shelter. The shelters were excavated in 1962, during the course of a South West African Scientific Society expedition to the Erongo. Results of the excavations have been published by Sandelowsky and Viereck (1969). The Cymot Shelter assemblage is extremely small and I was only able to locate 5 implements (2 core scrapers, 1 side scraper, 1 small side scraper and 1 backed tool) from the upper levels. The lower levels yielded only 1 bifacially worked chalcedony point. None of the 5 upper level implements would be out of place amongst the Big Elephant Shelter material, but because of the small sample, no quantitative analysis was undertaken.

Striped Giraffe Shelter contained a larger implement sample (N=103) and it was decided to reanalyse this in order to standardize the typological terminology and make the assemblage comparable with that from Big Elephant Shelter. Comparison of the 2 sites is appropriate since the date of 3080±100 B.P. (SR-64) (Sandelowsky & Viereck 1969) from Striped Giraffe Shelter and the date of 3130±40 B.P. (Pta-1557) from Big Elephant Shelter, suggest that the sites were occupied during the same time period. There is also a date of 4590±100 B.P. (SR-63) from Striped Giraffe Shelter (Ibid) so that the material from this site should extend our knowledge of Erongo assemblages for a further 1500 years.

The new implement inventory from Striped Giraffe Shelter is presented in Table 19. Of the total of 103 implements, 26,2% are backed tools, 56,3% are scrapers and 12,6% are ground stone pieces. Borers and outils écaillées constitute 4,8% of the assemblage. Segments form 22,9% of the pre-pottery level inventory, whilst they only represent 9,1% of the pottery level inventory (2 potsherds were found with the material from Spits 1 and 2 and I refer to these 2 spits as the pottery level). Borers, core scrapers and ground stonework have higher percentage frequencies in the pottery levels. This new inventory differs from Viereck's original description; Viereck did not divide the microliths into tool types apart from mentioning that the most common microlith was the curved backed blade (Ibid:8). Viereck's illustration of these backed blades, together with examination of the material itself, shows that most of these tools are, in fact,

Table 19

STRIPED GIRAFFE SHELTER

IMPLEMENT INVENTORY

	Pottery levels		Pre-pottery levels		TOTALS	
	f	%	f	%	f	%
segments	3	9,1	16	22,9	19	18,4
other backed tools	3	9,1	5	7,1	8	7,8
borers	3	9,1	1	1,4	4	3,9
core scrapers	5	15,2	8	11,4	13	12,6
other scrapers	14	42,4	31	44,3	45	43,7
outils écaillées			1	1,4	1	0,9
ground stonework	5	15,2	8	11,4	13	12,6
TOTALS	33	100,1	70	99,9	103	99,9

segments. I have placed Viereck's fabricators into the core scraper class for the sake of simplifying the typology. As regards the identification of the raw materials, I would disagree with both Sandelowsky and Viereck's use of the term indurated shale to describe material from the Cymot and Striped Giraffe Shelters. The raw material used is identical to that from Big Elephant Shelter, which I have classified as basalt.

Table 20 compares the implement inventories of Striped Giraffe and Big Elephant Shelter. The major difference lies in the higher percentage frequencies of segments in the Striped Giraffe Shelter pre-pottery level. The total percentage frequencies of all backed tools from the 2 sites are, however, very similar. Furthermore, the range of implements from the 2 sites is the same, suggesting that a similar range of activities was being carried out. At both sites, the pottery levels include higher percentage frequencies (compared with the pre-pottery levels) of core scrapers, ground stonework and borers.

Using the same method as that for the Big Elephant Shelter assemblage, lengths and breadths of the Striped Giraffe Shelter retouched implements were measured, and the raw material used for the manufacture of the implements was noted. The range of tool lengths from Striped Giraffe Shelter is 9-107 mm and the mean length is 31,7 mm. The frequency distribution of tool lengths is illustrated in Figure 41. The mean length of the pottery level tools is 36,4 mm, whilst the mean length of the pre-pottery level implements is 29,6 mm. Pottery level scrapers have a mean length of 46,05 mm, whilst pre-pottery level scrapers have a mean length of 38,2 mm. Basalt scrapers from both levels have a mean length of 65,7 mm, whilst quartz scrapers have a mean length of 20,5 mm. The mean lengths of tools, excluding scrapers, are 16,1 mm (pottery level) and 15,1 mm (pre-pottery level). An increase

STRIPED GIRAFFE SHELTER

frequency distribution of implement lengths

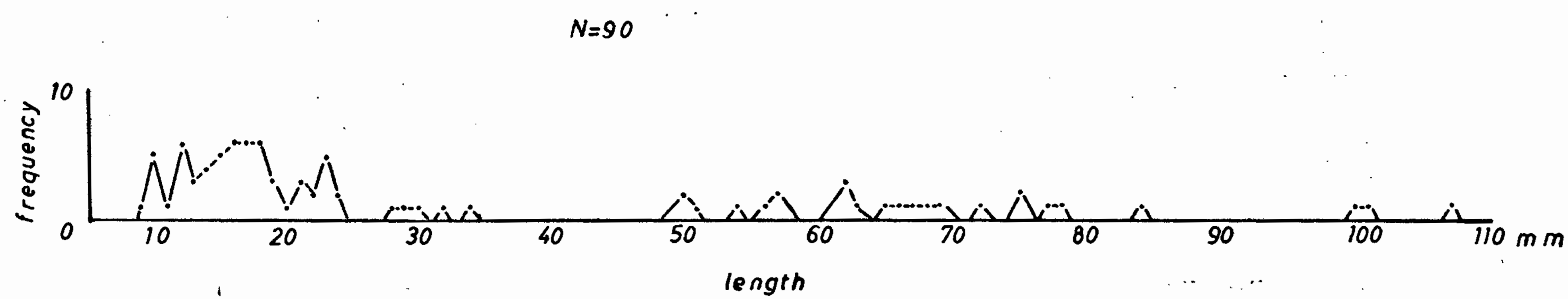


Figure 41

Table 20

Comparison of implement inventories
from Big Elephant Shelter and Striped Giraffe Shelter.

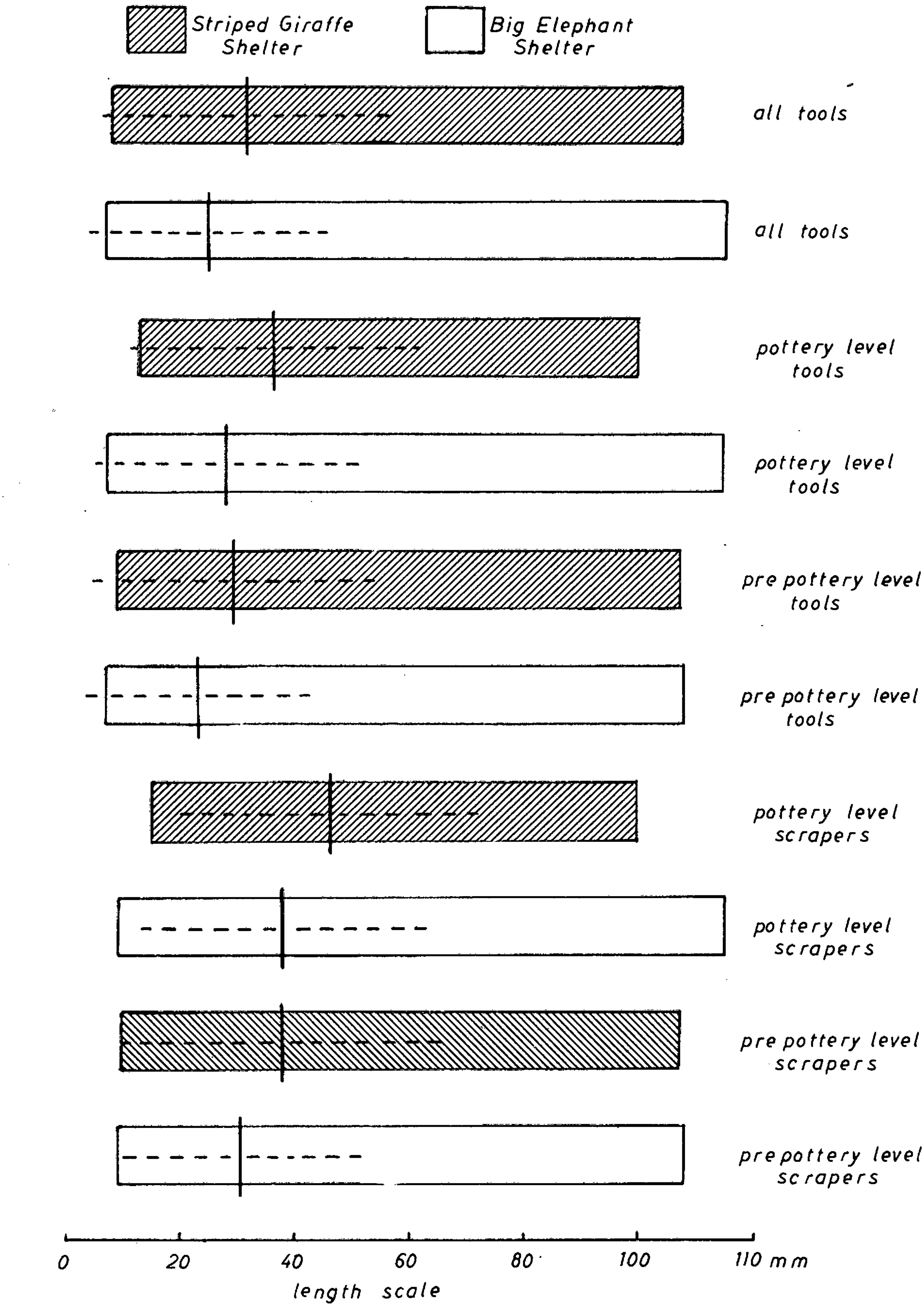
Implements	Big Elephant		Striped Giraffe	
	f	%	f	%
segments	24	8,0	19	18,4
other backed tools	60	20,1	8	7,8
borers	17	5,7	4	3,9
core scrapers	22	7,4	13	12,6
backed scrapers	4	1,3	-	-
other scrapers	125	41,8	45	43,7
outils écaillées	1	0,3	1	0,9
ground stonework	46	15,4	13	12,6
TOTALS	299	100,0	103	99,9

in the lengths of tools in the pottery level is noticeable, particularly amongst those of the scraper class. A X^2 test was used to compare the length distribution of Striped Giraffe pottery and pre-pottery level tools. With D.O.F. of 2 and X^2 of 1,4, no significant difference could be proven at a probability level of greater than 10%.

Bar diagrams, Figure 42, compare the length results from Big Elephant Shelter with those from Striped Giraffe. In each case, the range of tool lengths is greater at Big Elephant Shelter, whilst the mean lengths of tools are consistently smaller than those from Striped Giraffe Shelter. 70% of the Striped Giraffe Shelter assemblage has tool lengths of 30 mm or less, whilst 76% of the Big Elephant Shelter assemblage falls within this range. However, 20% of the Striped Giraffe Shelter tools are longer than 60 mm and only 7,9% of Big Elephant Shelter tools have lengths of greater than 60 mm. A X^2 test was used to compare the frequency distribution of tool lengths from the 2 sites. With D.O.F. of 2 and X^2 of 10,78, the difference between the length frequency distributions is almost certainly significant at a probability level of less than 1%. The proportion of very large scrapers from Striped Giraffe Shelter is, therefore, significantly different from the Big Elephant Shelter proportion of large scrapers. In the pottery levels, the difference may be more apparent than real, since early collectors of surface material at Big Elephant Shelter picked up the large scrapers which had easy visibility. In the pre-pottery levels, however, there is a real difference as 6,5% of Big Elephant Shelter tools are longer than 60 mm, whilst 16,1% of Striped Giraffe Shelter tools are longer than 60 mm.

Width/length ratios were calculated for the Striped Giraffe Shelter implements; the frequency distribution and percentage frequencies of these W/L ratios are illustrated

Comparison of implement lengths from Big Elephant Shelter and Striped Giraffe Shelter



the long rectangle shows the observed range of lengths; the vertical line marks the mean and the horizontal broken line shows the standard deviation from the mean

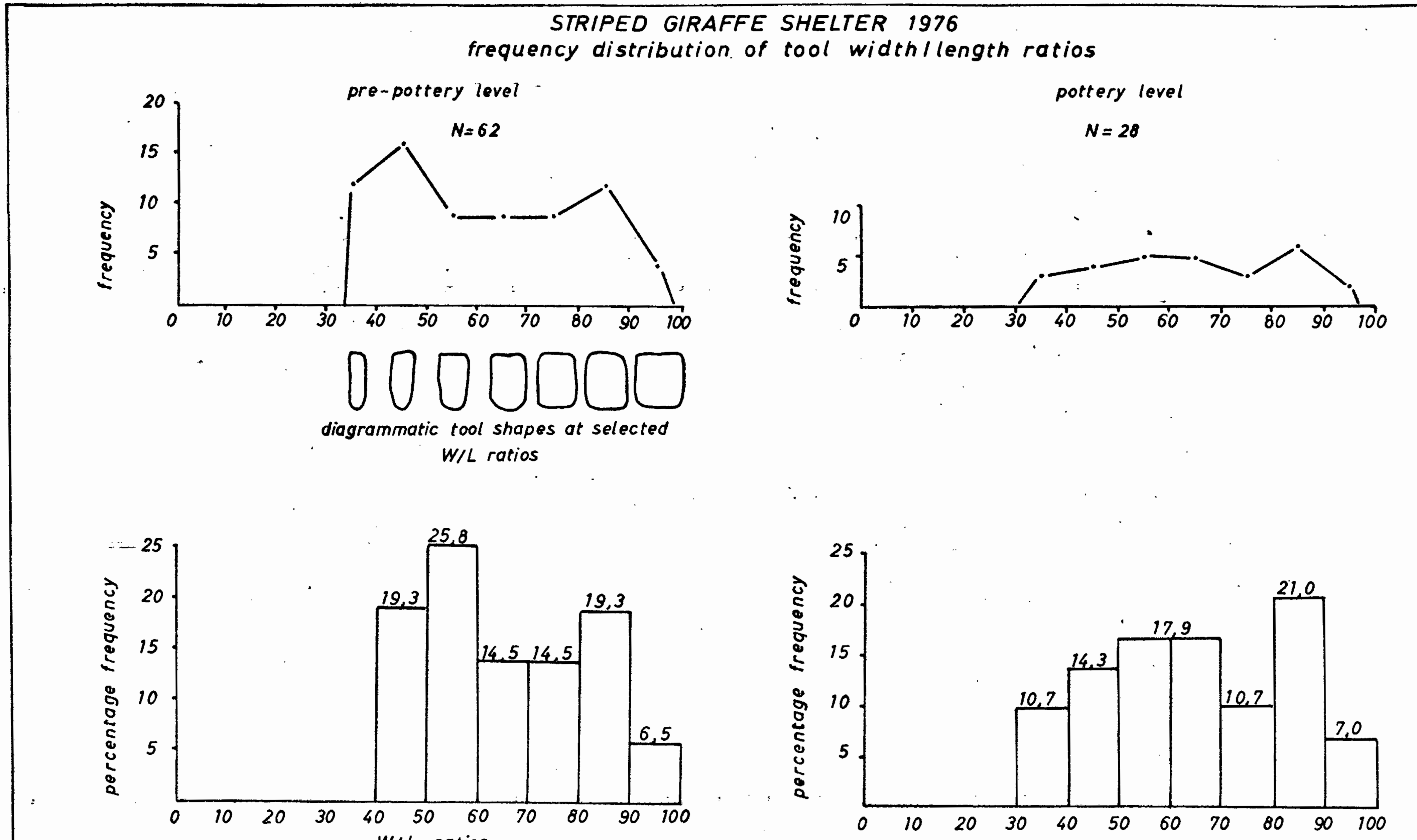
Figure 42

in Figure 43. The range of variation falls between stone pieces having long, narrow shape or a short, wide almost square shape. A comparison of these W/L ratios with those from Big Elephant Shelter, shows that the Striped Giraffe Shelter tools have greater percentage frequencies of W/L ratios in the 80-100 range. 28% of pottery level and 25,8% of pre-pottery level tools from Striped Giraffe Shelter fall within this range, whereas only 19% of pottery level and 17,1% of pre-pottery level tools from Big Elephant Shelter fall within this range. There is a greater tendency amongst Striped Giraffe Shelter tools to have extremely wide forms.

Bar charts in Figure 44 show the use of raw materials at Big Elephant Shelter and Striped Giraffe Shelter. At both sites, there is a slight increase in the use of basalt in the pottery levels, though quartz is the predominant raw material in all levels. A slightly higher percentage of quartz is evident at Big Elephant Shelter.

As noted at Big Elephant Shelter, the scraper sample from Striped Giraffe Shelter can be divided into 2 statistical populations based on the attributes of length and raw material. Like the quartz scraper population from Big Elephant, that from Striped Giraffe Shelter has its highest frequency distribution in the 10-20 mm class interval; however, the basalt scraper population has its highest frequency distribution in the 60-70 mm class interval whilst that from Big Elephant was largely contained in the 50-60 mm class interval.

In summary, it can be said that the similarities between the assemblages of the 2 sites are far greater than their differences, and that there is little doubt that the assemblages belong to the same lithic industry. The range of tool types utilized is the same and, using information from the attributes examined, morphological changes between the pottery and pre-pottery levels follow the same


STRIPED GIRAFFE SHELTER 1976
frequency distribution of tool width/length ratios
pre-pottery level
N=62
frequency
20
15
10
5
0 10 20 30 40 50 60 70 80 90 100
diagrammatic tool shapes at selected W/L ratios
pottery level
N = 28
frequency
10
5
0 10 20 30 40 50 60 70 80 90 100
percentage frequency
25
20
15
10
5
19,3
25,8
14,5
14,5
19,3
6,5
0 10 20 30 40 50 60 70 80 90 100
W/L ratios
percentage frequency
25
20
15
10
5
10,7
14,3
17,9
10,7
21,0
7,0
0 10 20 30 40 50 60 70 80 90 100
W/L ratios
Figure 43

Comparison of raw materials used at Big Elephant Shelter and Striped Giraffe Shelter

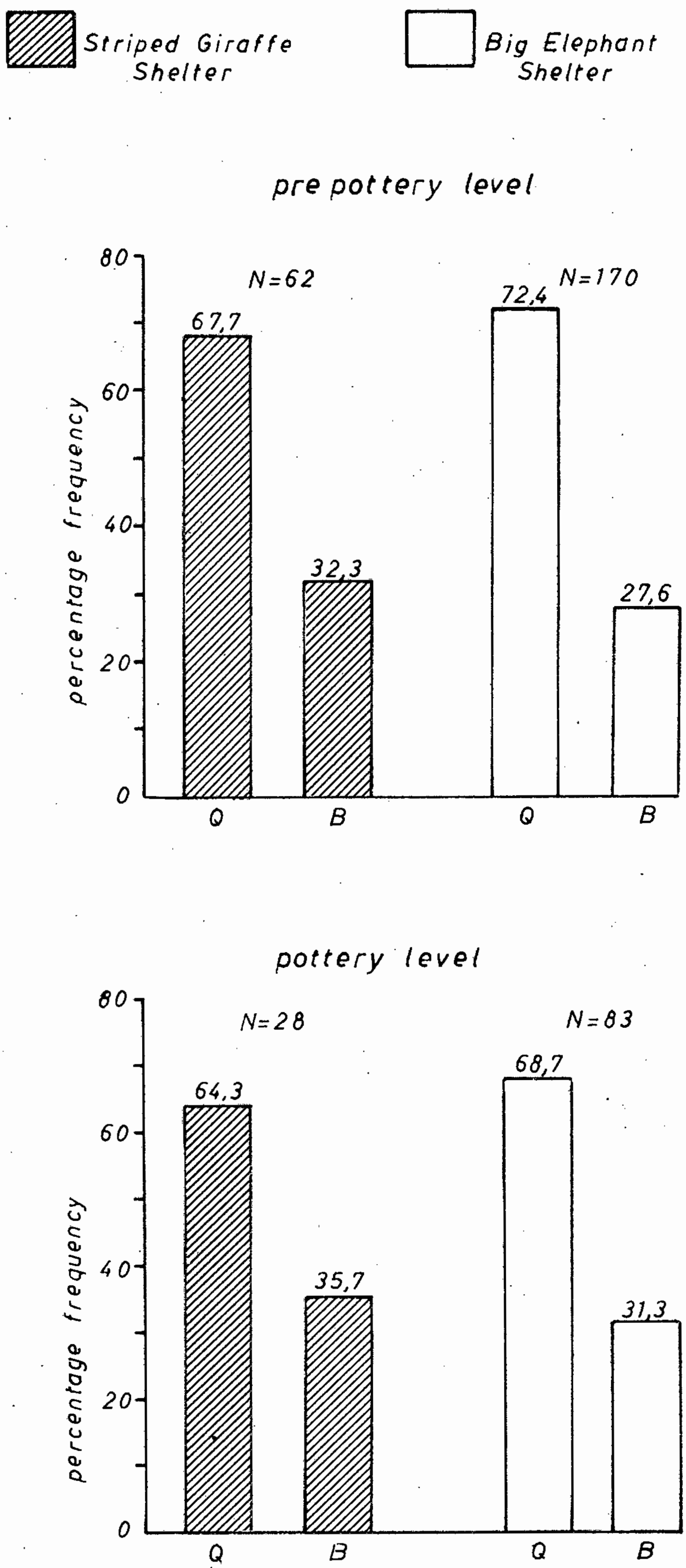


Figure 44

pattern. Both sites show a trend towards larger tools (particularly scrapers) in the pottery levels and an increase in the use of basalt.

Amongst the non-lithic artefacts from the 2 sites, there are also similarities; bone being used for the manufacture of similar implements and jewellery, eggshell for beads, pendants and water bottles, wood for the manufacture of pegs.

E. Wendt kindly allowed me to examine material excavated from Fackelträger in the northern Erongo and, from a purely intuitive study, it appears that this material is also closely related to the Big Elephant Shelter assemblage. The Fackelträger material does, however, contain large frequencies of outils écaillées and "double crescents" (backed scrapers)— tool types which have low frequency representation in both the Big Elephant Shelter and Striped Giraffe Shelter assemblages. As in the case of the former sites, Fackelträger contains bone tools and pendants, but has the addition of mica-schist pendants.

Wendt mentions that there are no marked differences between the Fackelträger material and that from the site, Etemba 2, also in the northern Erongo. Thus, at least 4 sites in the Erongo have assemblages which can be considered to have an industrial relationship. Dates of 2730±45 B.P. (Kn-460) and 2740±45 B.P. (Kn-461) are associated with Fackelträger material and there is a date of 1890±50 B.P. (Kn-465) for material from Etemba 2. Dates from the 4 sites span the time range of 1000 B.P. to 5000 B.P. and the presence of metal and glass beads and a smoking pipe at Big Elephant Shelter, suggest that occupation here was continued into more recent times.

Since little quantitative data is available for Holocene assemblages in central South West Africa, I have been obliged to restrict my comparison of the frequency distribution of implement types to the Erongo sites already mentioned and to 2 sites in the Brandberg: Lower Numas Cave and Upper Orabes Shelter. I am grateful to Jacobson for providing me with some unpublished and provisional data on implements from Lower Numas Cave and Upper Orabes Shelter. The Lower Numas Cave assemblage contains very high percentage frequencies of segments relative to other backed tools and scrapers. In terms of segment/scraper ratios, there may be some similarity between the Lower Numas assemblage and some of the Zambian Late Stone Age assemblages. Deacon (J.1974: 16) has commented that the Zambian sites (Gwisho and Nakapapula) which contain high proportions of backed tools relative to scrapers, should probably be classified as falling within a different artefact tradition to that encompassing assemblages from other parts of southern Africa.

Since the Brandberg is situated in a marginal position between the Namib Desert and the Semi-Desert and Savanna Transition, it is not inconceivable that it is part of a different resource utilization system (see Figures 14 and 15). The open grassland plains might support a higher population of gregarious grazing antelope than is possible in the better watered and more densely vegetated areas around the Erongo. Furthermore, Cyperus fulgens does not appear to occur in the Brandberg (Nordenstam 1974). Since botanical studies have not been carried out at archaeological sites in the Brandberg, the utilization of plant food resources in the area is still unknown.

The equilibrium polygon in Figure 45 (adapted from Clarke 1968: Fig. 104) illustrates the Erongo and Brandberg proportions of scrapers, backed tools and segments expressed as percentage frequencies of the total number of scrapers, backed tools and segments in each assemblage. The scraper category includes backed scrapers; at Orabes

Equilibrium polygon: segments, backed tools, scrapers
(Brandberg and Erongo)

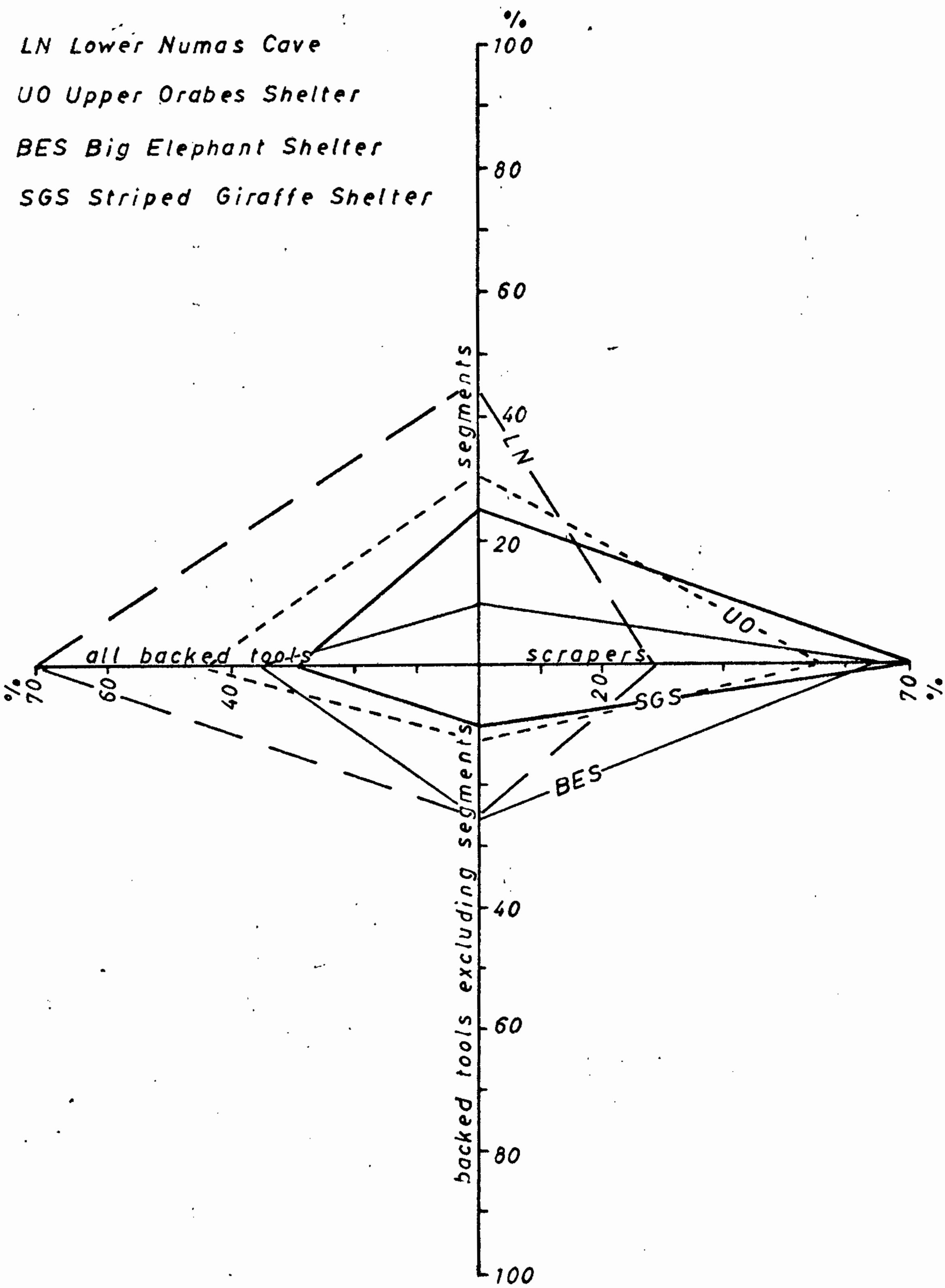


Figure 45

Shelter 40% of the scraper class are backed scrapers, but the other 3 sites contain very few backed scrapers. The equilibrium polygon shows an inverse relationship between the backed tool and scraper proportions of Lower Numas Cave and the 2 Erongo sites. This would tend to support the concept of different artefact traditions occurring in the Brandberg and Erongo areas in the time period of approximately 2000 B.P. to 4000 B.P. (see Table 21 for the appropriate dates). In the case of Upper Orabes Shelter, dated 180±45 B.P. (Jacobson & Vogel 1975), the segment and backed tool proportions decrease relative to scrapers. Whilst the segment percentage frequencies remain higher than those in the Erongo assemblages, the Upper Orabes polygon does not display the marked dissimilarity to the Erongo assemblages shown by the Lower Numas polygon. Therefore, in terms of segment, backed tool and scraper proportions, the Brandberg assemblages may show a trend towards becoming more like the Erongo assemblages through time. Obviously, it would be necessary to examine more assemblages before the trend could be confirmed.

Despite the limitations imposed by a lack of published quantitative data, a further point of comparison is possible between the dated Erongo assemblages and other dated assemblages in central South West Africa. It is possible to examine the time sequence covered by the assemblages which have been described by various authors as falling within the categories of microlithic, micro-macrolithic and macrolithic industries. Regretably, no detailed figures are available for material from most of the sites, so that only broad trends can be examined. I have used Wendt's 1972 criteria for the classification of microlithic and macrolithic tools and, since Jacobson's data is compatible with this classification, most of the site assemblages compared in Table 21 have the same terms of reference as regards microliths and macroliths.

Table 21

DATING OF MICROLITHIC, MACROLITHIC AND MIXED MICRO/MACROLITHIC ASSEMBLAGES IN CENTRAL SOUTH WEST AFRICA

years B.P.	microlithic assemblages	macrolithic assemblages	mixed micro/macrolithic assemblages
		7. ZM 80±45	
100			
	1. H 140±50		
	2. OU 180±45		
	3. E 14 190±60		
		7. ZM 220±35	
		8. 01 220±30	
		7. ZM 260±30	11. ? P 280±80
		7. ZM 345±40	
		9. GDS 360±40	
500			
	4. NE 870±100		
1000			12. BE 1080±50
			12. BE 1400±80
1500			
2000			
			13. E2 1890±50
2500			12. BE 2550±80
			12. BE 2600±50
			14. F 2730±45
	5. LN 2890±65		14. F 2740±45
	5. LN 2950±65		
3000			15. SG 3080±100
			12. BE 3130±40
			11. ?P 3368±200
3500			
	5. LN 3950±60		
4000	5. LN 4180±60		
4500			15. SG 4590±100
	5. LN 4840±50		
5000			
	6. M 5190±75		
		10. ZP 5200±140	
5500			16. ?C 5740±110
6000	6. M 6470±80		
to			
8000	6. M 8200±80		

continued overleaf....

Table 21 continued

Key to Table

Site abbreviation		Site name	Reference
1.	H	Hasenbild	Wendt, 1972.
2.	OU	Orabes Upper Shelter	Jacobson & Vogel, 1975.
3.	E 14	Etemba 14	Wendt, 1972.
4.	NE	Numas Entrance Shelter	MacCalman, 1965.
5.	LN	Lower Numas Cave	Jacobson, 1976b.
6.	M	Mirabib	Sandelowsky, 1974.
7.	ZM	Zerrissene Mt.	Carr *et al*, 1976.
8.	01	01, Brandberg	Jacobson & Vogel, 1975.
9.	GDS	GDS, Brandberg	Jacobson & Vogel, 1975.
10.	ZP	Zoo Park	MacCalman, 1965.
11.	P	Philipp Cave	Martin & Mason, 1954; Deacon, J. 1966.
12.	BE	Big Elephant Shelter	Beaumont & Vogel 1972; Vogel, pers. comm.
13.	E2	Etemba 2	Wendt, 1972.
14.	F	Fackelträger	Wendt, 1972.
15.	SG	Striped Giraffe Shelter	Sandelowsky & Viereck, 1969.
16.	C	Cymot Shelter	Sandelowsky & Viereck, 1969.

Microlithic assemblages include those with a predominance of microlithic tools and a small inclusion of medium sized or macrolithic implements, for example, the Lower Numas Cave assemblage contains only 6% of macroliths. Micro-macrolithic assemblages include the Erongo sites, for example, Big Elephant Shelter and Striped Giraffe Shelter, which have a predominance of microlithic implements, but have an approximately 30% inclusion of macrolithic tools. Macrolithic assemblages are those which contain no microliths or only rare examples of microliths. Table 21 lists the information. The Table illustrates that the microlithic and micro-macrolithic industries may be present contemporaneously over a period of approximately 5000 years. In the Erongo, 4 sites document the sequence of mixed micro-macrolithic assemblages and 2 others, Philipp Cave and Cymot Shelter might also be included with caution as the lithic collections are too small to be diagnostic. A long sequence of a microlithic tradition in the western part of South West Africa is evidenced at Mirabib Shelter (Sandelowsky 1974) and Lower Numas Cave (Jacobson 1976b). Dates from Orabes Upper Shelter, Numas Entrance Shelter and Lower Numas Cave, suggest that the microlithic tradition may have lasted some 5000 years in the Brandberg area and that it was still in use in early historic times. However, Jacobson has pointed out that, whilst the assemblage from Numas Entrance Shelter appears to be part of the same tradition as that from the Lower Numas Cave, there is a temporal gap between the dates of 870 B.P. and 2890 B.P. which none of the Brandberg sites fill. It is not yet known whether the gap has cultural or sampling significance (Ibid).

From the dated sites, the impression could be gained that, prior to approximately 1000 B.P., the predominantly microlithic assemblages occur in the west of the territory and the mixed micro-macrolithic assemblages are based largely in the east, more specifically in the

Erongo area. In the more recent prehistoric past, greater variability appears. In the western zone, the microlithic tradition continues in some shelters, for example, Numas Entrance Shelter, Orabes Upper Shelter and Hasenbild. However, at Lower Numas Shelter and Amis Shelter, the microlithic assemblages are overlain by undated assemblages with predominantly macrolithic content associated with pottery. Dates for the stone circle open settlements containing pottery and macrolithic implements have recently been obtained from the Brandberg and Zerrissene Mountains (Jacobson 1976b; Carr et al 1976). These dates indicate that there is an overlap in time between the microlithic tradition of the shelters, as at Upper Orabes Shelter, and the macrolithic assemblages with ceramics (Jacobson's Brandberg Industry) of the open site settlements.

In the eastern zone, dates more recent than 1000 B.P. are limited to 3 sites: Philipp Cave, Eros Shelter and Etemba 14. At Philipp Cave, the artefact sample is too small to allow comment. Eros Shelter, near Windhoek, has dates of 345±30 B.P. (GrN-5296) and 1745±35 B.P. (GrN-5297) (Beaumont & Vogel 1972). The stone material from Eros Shelter, relocated in early 1977, contains only 1 formal tool, a quartz scraper. Quartz waste is also present. The absence of other raw material can be ascribed to the fact that only quartz occurs naturally in the Windhoek area. At Etemba 14, the material has not been fully analysed (Wendt 1972:11) and it is not certain whether the material relates more closely to a microlithic or micro-macrolithic tradition.

Some undated sites in the western zone have been described as having microlithic assemblages: Affenfelsen, the Messum Mountain sites and Ghost Cave (Klein Spitzkoppe) (Wendt 1972). There are some assemblages from sites in the Twyfelfontein area which do not appear to be predominantly microlithic; these are from Austerlitz and Zwei

Schneider. At Ghost Cave, Rudner (1952:157) described a Smithfield occurrence appearing as a thin layer in the inner part of the cave; later excavations by Wendt (1972:16) revealed a microlithic assemblage under the dripline. This would appear to be the same type of sequence which Rudner described from Amis Shelter in the Brandberg.

A further point which should be made about the dating of sites is that, in the Erongo and Brandberg at least, there are no dates earlier than circa 6000 B.P. so that there appears to have been no occupation of the shelters in these areas during the early Holocene. "Middle Stone Age" implements have been recovered from the base of Fackelträger (Wendt 1972:10) and Cymot Shelter (Sandelowsky & Viereck 1969). Although the stratigraphic break evidenced in the Erongo is not yet understood, Deacon's comments on the similar situation in parts of the Cape, may have some bearing on the problem. Deacon (H.J. 1974: 179) points to the evidence supporting the contention that the early-middle Holocene was a period of climatic change. He suggests that an amelioration of climate in the late Holocene would have provided a trigger for population expansion from the previously optimal density areas. If this type of situation is applicable to South West Africa, we then have the problem of determining which regions of South West Africa, or neighbouring territory, would have provided optimal conditions during the early Holocene. The early Holocene dates from Mirabib Shelter suggest that this inner part of the Namib may have been one such area. If a true difference between the artefact traditions of the western and eastern parts of central South West Africa can be proven, then we may be dealing with at least 2 separate population expansions during the middle-Holocene, which were triggered from different optimal areas. The testing of this type of model would, however, be extremely difficult.

Discussion

A great deal of work, particularly quantitative analysis, needs to be carried out on the assemblages excavated in the past, before any meaningful statements can be made about their industrial status both in South West Africa and in the wider context. The present summary can only point to the broad trends which are apparent from largely intuitive studies made by various archaeologists. In addition to the quantitative studies of lithic assemblages, information is needed on the strategies adopted for prehistoric utilization of local animal and plant foods, for at this stage, the relationship between adaptation to locally available resources and lithic tool-kits is a virtually unexplored field in South West Africa.

Together with Wendt (1972:38), I would suggest that, in the present state of our knowledge, the implement assemblages in South West Africa should not be given industrial names. I would suggest,further, that the use, for example, of the term "Wilton Industry" to describe the microlithic assemblages in the territory, should be reviewed with the utmost care. Deacon (H.J. 1974:175) has commented: "Essentially the Wilton Industry is the <u>local</u> expression of a widely diffused Holocene small tool tradition that has been described from many regions of South, Central and East Africa " (my emphasis on local).

Great care must be exercised in seeking explanation for the variations in content of stone artefact samples which are either geographically distant or in close geographical proximity. A number of variables, influencing artefact manufacture may be operative. Firstly, there is the ethnic/linguistic variable, and the social distance factor between groups,to be taken into account. Secondly, the presence of distinct major ecological zones, is also to be considered; economic differences in these zones may crosscut cultural variables. Furthermore, within each major zone, there are distinct minor ecological zones, such as mountain ranges and riverine territory. The economic exploitation of these zones might involve distinct ranges of activities and tool-kits. Thirdly, there is a raw material factor which may complicate attempts to make meaningful comparisons between artefact occurrences.

As regards the ethnic/linguistic variable, it is known that, during early historic times, a number of ethnic groups resided in South West Africa: San, Nama and Dama and, more recently, groups of pastoral Herero. The archaeological identification of the settlements of these peoples presents enormous problems. Since both pastoralists and hunter-gatherers are dependent to lesser and greater extents on game and plant foods of the veld, it can be expected that the tool-kits of each may be broadly similar. Since barter and raiding are known to have been carried out between the groups, remains normally associated with pastoralism (pottery, bones of sheep, cattle and/or goats) may also be found at sites used by hunter-gatherers.

The second variable, that of distinct lithic assemblages occurring in distinct but adjacent ecological zones, has previously led to contradictory interpretation of the evidence. Such an example is evident in the western Cape where the differences between the coastal and inland assemblages have prompted Sampson to conclude:" ... the differences in artefact content are more likely to reflect two distinct stone-flaking traditions that represent two independent populations " (Sampson 1974:436). However, Parkington (1972a) has attempted to show that in the western Cape, the Cape Folded Belt and the coastal regions formed sub-systems within a cyclical annual system of human resource exploitation. The gross evidence points towards winter utilization of coastal resources at, for example, Elands Bay Cave, and summer utilization of terrestrial resources at mountain sites like De Hangen. Whilst at the University of Cape Town, I was able to examine the lithic assemblages from both sites and, whereas the assemblage from De Hangen would be included within the range of variation allowable for a Wilton sample, that from Elands Bay would be excluded. Thus, in this case, what appear to be divergent artefact traditions may well be the expressions of different resource utilizations by the same cultural group.

Comparable situations may have occurred in South West Africa and the possibility should be considered before cultural solutions are offered to explain variability in assemblages. Nevertheless, cultural diversity is recorded in central South West Africa and future archaeological work in the territory should concern itself with the problem of distinguishing these cultural groups.

Deacon (H.J. 1974:197,184) has suggested that the term "Wilton" has meaning for a definable area that contained but one section of the Holocene population and that the scale of the Wilton unit would find closest approximation in a major linguistic division. He proposes that the divergent artefact traditions of Melkhoutboom (Wilton) and Highlands (non-Wilton) must reflect some measure of social distance. In the absence of further information, I suggest that part of the explanation for the different artefact components of, for example the Brandberg and Erongo shelter sites, may lie in the same direction. As in the case of Melkhoutboom and Highlands assemblages, the range of tools appearing in the Erongo and Brandberg shelter sites is in close correspondence. However, stylistically, there is a difference; the Erongo samples are distinguished by great variability in the norms of manufacture of the scraper class and by the presence of 2 statistical populations in the scraper class, differentiated by attributes of length and raw material. Further differences in the artefact components of the 2 areas, namely the scraper/segment ratios, may relate to activity differences in the 2 mountain areas and may further point to the presence of 2 distinct artefact traditions. As regards activity differences, the segment rich assemblages may relate to greater reliance on projectiles for hunting, due to the open grassland terrain surrounding the Brandberg. H.J. Deacon (1972:34-5) has pointed to the possible relationship between backed tools and hunting with the use of projectiles. He has suggested that the fauna of open plains offered scope for hunting with bow and arrow or throwing spear, whereas hunting in more vegetated areas might achieve more success using trap-lines.

The appearance, in about 300 B.P. of the open site hut circles, containing macrolithic scrapers and ceramics, adds a further dimension to the problems relating to the status of lithic assemblages in South West Africa. The size and nature of these sites and the presence of bones of domestic animals (Jacobson pers. comm.) would support an argument for these sites being herder camps. Jacobson (1976a) has proposed that the macrolithic scraper assemblages from the open sites should be considered as belonging to the Brandberg Industry and that the earlier term Damaraland Culture (Viereck 1967) should be abandoned as applied to the micro-macrolithic element from the Erongo Mountains. Whilst agreeing that the term "Culture" is an unfortunate one, I would suggest that a number of factors need to be given consideration before the Brandberg Industry, as defined by Jacobson, is accepted as being a cultural entity unrelated to other assemblages in central South West Africa. I would point out that, from an intuitive point of view, there is a very real resemblance between the macrolithic scrapers of the Brandberg Industry and their counterparts in the Erongo assemblages described earlier (I am grateful to Jacobson for allowing me to examine some of the Brandberg Industry assemblages). This resemblance has been noted by authors other than Viereck: Clark and Walton (1962:14) said of the Big Elephant Shelter surface collection: "...the stone industry is the same as the so-called "Brandberg Culture" from the type locality, which was another traditional Berg-Damara area." Rudner also noted the similarity of the geographically separated assemblages by referring to the material from Philipp Cave and the material from the open site hut circles in the Tsisab Valley, Brandberg, as being of Smithfield origin (Rudner 1952). What was not realized at the time, was that the Erongo implement assemblages also contained microlithic backed tools. As mentioned in the previous chapter, the basalt and quartz scrapers of the Erongo form distinct statistical populations, probably based on function. The dates from the Brandberg open sites suggest that metal working may have been well established at the time and that stone tools once used for precision work and projectile tips may have been replaced by implements manufactured from iron. The large basalt scrapers and chunks may have remained the most efficient heavy duty tools. If there is a relationship between the large scraper elements of the Brandberg and Erongo, this poses the question of why the relationship should exist. The possible presence of early pottery in the Erongo may be one clue for future research but the implications should not be stressed at this stage of our knowledge of South West African prehistory.

Whilst the idea of the Brandberg Industry representing an intrusive cultural element in the Brandberg cannot be summarily dismissed, the possibility can also be entertained that the cultural remains present in the open site hut circles represent the variable alteration of some of the indigenous hunter-gatherer populations to incorporate a pastoral mode of existence. The suggestion that the open site settlements belonged to groups of Dama is feasible; however, this does not necessarily imply that the Dama were immigrant pastoralists in central South West Africa. A corpus of information now being collected by physical anthropologists suggests that some central parts of southern Africa, including the central and northern parts of South West Africa, were occupied by an ancient stratum of Negroid hunter-gatherers having a long history of differentiation from other Negroid groups.This information could argue for the long existence of Dama groups in South West Africa, and the hypothesis is supported by knowledge that, when early travellers arrived in South West Africa, they found Dama groups of hunter-gatherers as well as pastoralists and metal workers. The Dama were, therefore, in the state of flux which could be expected to occur when an indigenous population is gradually exposed to innovations and possibly also pressures from neighbouring groups having different technologies. The ethnographic picture is complicated by knowledge that groups of San also resided in prehistoric South West Africa. The lack of Khoisan/San genes in the Negroid Dama gene pool, suggests a measure of social distance between these groups which might be reflected in the prehistoric cultural remains left by the two groups. Whilst it is tempting to relate the apparently distinct artefact traditions of the Brandberg and Erongo to cultural and ethnic differences, for example, between Dama and San, our present knowledge of South West African prehistory is not detailed enough to allow speculation on prehistoric peopling in the territory. Nevertheless, future research in South West Africa may be able to build on the model of physically differentiated hunter-gatherer groups, having also a measure of social distance, existing either sympatrically or in definable areas of the territory.

CHAPTER 8

Summary of information obtained from Big Elephant Shelter: its contribution towards the understanding of the prehistory of South West Africa

Big Elephant Shelter is situated on the farm Ameib in the southern Erongo Mountains. The mountains lie within the Semi-Desert and Savanna Transition in an area of variable and uncertain rainfall. Within this gross ecological zone, there are three sub-zones in the site locality: plains, wooded river and stream courses and rocky hill-slopes. Each of the zones contains specific animal and plant resources: the plains support gregarious grazing antelope and stands of *Cyperus fulgens* plants; the wooded stream and river courses support the more solitary browsing antelope and a variety of fruiting trees/shrubs such as *Ziziphus mucrunata*, *Grewia flava*, *Ximenia americana* and *Cordia gharaf* as well as *Cyperus fulgens* and *Lapeirousia rivularis*; the rocky hill-slopes support fauna such as klipspringer, mountain zebra and dassie, and fruiting trees such as *Vangueria infausta*, *Grewia bicolor*, *Boscia albitrunca* and *Ficus guerichiana*.

The site, Big Elephant Shelter, consists of two settlement areas which have been called the NE. and NW. Shelters. Prior to excavation, the NW. Shelter contained three occupation hollows partly filled with leaves and bedding grasses and enclosed by branches of collapsed brushwood screens. The NE. Shelter contained isolated scatters of shallow deposit. Most of the excavating was directed at Occupation Hollow A in the NW. Shelter, where the deposit appeared to be of maximum depth and preservation of organic remains was good. The stratigraphy in Occupation Hollow A and its vicinity was found to be complex as a result of the hollowing out of the deposits by the prehistoric occupants of the site. Five radiocarbon dates have been obtained from charcoal samples in the NW. Shelter. These are as follows:

1400±80 B.P. (UCLA-724B)
2550±80 B.P. (UCLA-724A)
1080±50 B.P. (Pta-1558)
2600±50 B.P. (Pta-1556)
3130±40 B.P. (Pta-1557)

The former two dates were collected in 1962 by MacCalman, probably from Occupation Hollow B and the latter three dates were collected from Occupation Hollow A, in 1974. These radiocarbon dates span a period of approximately 2000 years but, from the presence of glass and metal beads in the surficial level of the site, it is expected that relatively recent occupation is also represented, thus extending the period of occupation by half a millenium or more. The presence of potsherds in the level dated 2600±50 B.P. is provocative, but because of the disturbances at the site by the prehistoric occupants, I would be cautious about accepting the date as being a reliable indicator of the early presence of pottery in the area.

Non-lithic artefacts recovered from the site include wooden arrowshafts, digging-sticks and fire-drills, bone likshafts, points and scraper-like implements, shell and bone pendants, seed and eggshell beads, glass, copper and iron beads and a very small collection of ceramics including a smoking pipe and a pot spout.

The lithic assemblage contains 299 implements comprising 8% segments, 20% other backed tools, 5,7% borers, 1,3% backed scrapers, 7,4% core scrapers, 41,8% other scrapers, 0,3% outils écaillées and 15,4% of ground stonework.

Comparison of the pre-pottery and pottery levels shows that, whilst the same range of tools is present in each, the pre-pottery levels contain higher percentage frequencies of borers, segments and ground stonework. Size variability in the scraper class is one of the characteristic features of the assemblage, the range of scraper lengths being 9-115 mm. In a statistical sense, the scrapers from Big Elephant Shelter (and also those from Striped Giraffe Shelter) are divided into two separate populations based on length and raw material. Scraper lengths display a bimodal distribution pattern which is related to the use of basalt and quartz for scraper manufacture. The microlithic quartz scraper population has its highest frequency distribution in the 11-20 mm class interval (with mean scraper length 18,3 mm) whilst the basalt population has highest frequency distribution in the 51-60 mm class interval (with mean scraper length 52,9 mm). Very few implements fall into the medium-sized category. The size differentiation between the microlithic quartz and macrolithic basalt scrapers suggests that distinct functions may have been related to the separate populations, for example the microliths may have been hafted and used for precision work whilst the macrolithic scrapers were used for heavy duty work. The question of whether the activities involved also had cultural connotations is a matter for conjecture.

Small morphological differences are evidenced between the implements in the pre-pottery and pottery levels; however, these differences are slight and I regard them as displaying a shift rather than a change in the norms of artefact manufacture. The most noticeable change is that of the increasing size of implements (mostly scrapers) through time. The evidence from the lithic and non-lithic artefacts supports the view that the site was occupied by a stable population group and that the introduction of pottery and possibly domestic animals (and, at a later stage, metal) neither caused the displacement of the population nor radically affected their conservative implement-making traditions.

The documentation of the Big Elephant Shelter and Striped Giraffe Shelter assemblages and comparison of these with some assemblages from the Brandberg, suggests that two artefact traditions may have existed contemporaneously within central South West Africa. In terms of scraper/segment ratios, there may be some similarity between the Brandberg sites and those from Zambia (namely Gwisho and Nakapapula) whereas the scraper/segment ratios from the Erongo area are more similar to those Wilton assemblages from the southern portion of southern Africa. Both cultural and activity differences may have been responsible for the apparent differences in the artefact traditions. It seems possible that the backed microliths may have been hafted for use as projectiles and that this method of hunting was used more exclusively in the open western territory than in the better vegetated eastern areas, where hunting with traps may have been more productive. In view of the fact that herding communities, as well as hunter-gatherers, are dependent on hunting for a proportion of their livelihood, the absence of backed microliths in the open site hut circle settlements of the Brandberg is noteworthy. The relatively recent dates obtained for these sites make it possible that iron projectile tips had replaced those of stone, but that large basalt chunks remained the most suitable material for heavy duty implements.

Patterns of utilization of plant and animal foods through time, further support the thesis of long term stability in the Erongo Mountains. <u>Cyperus fulgens</u> corms appear to have constituted the staple vegetable food of the Big Elephant Shelter occupants, both during pre-pottery and pottery periods. The meat diet of the shelter occupants was obtained from a variety of locally available fauna including small and medium/large bovids and ground-game like dassie, tortoise and leguaan. Small and small/medium bovids were represented in greater frequencies than larger bovids; this may reflect selection by man, or a utilization pattern involving the butchering and usage of large game carcasses away from the home site. There is a sharp contrast between the plant and meat diet of the group; the plant diet was based on a specialized collecting pattern orientated towards underground food resources whilst procurement of meat seems to have been based on unspecialized hunting/collecting patterns with no particular faunal species being preferred.

The major aim of the current research in central South West Africa has been to investigate the adaptations of prehistoric man to the environment provided by both the land and neighbouring population groups. In terms of adaptation to the land, Big Elephant Shelter has documented the response of an inland group to locally available resources. Underground food plants, more particularly Cyperus fulgens, appear to have provided the most reliable and abundant plant food supply. The inherent advantage of having a natural underground food storage system is that the food supply, unlike that obtained from the aerial parts of plants, is available for long periods of time without requiring artificial storage facilities. However, the low protein content of the underground corms would necessitate supplementary protein intake of meat or eggs. A study of the availability of food resources represented at the site suggests that perennial occupation of the site may have taken place with a subsistence pattern based on the utilization of corms, veld fruits, game meat and eggs. Guinea-fowl and francolin eggs are obtainable during the summer rains, veld fruits are available after the rains and C. fulgens corms have long term availability, possibly for nine months of the year, but are at their most palatable during the winter months. It is possible that the annual hunger period at the commencement of the rains, when plant foods are scarce and antelope have dispersed from waterholes to take advantage of new grass growth and widely available water supplies, may have been relieved by the collection of eggs, small rodents and reptiles. The dependence on specific underground plant foods suggests that the subsistence pattern of the Erongo inhabitants may have been largely determined by the ecology of these plants. In the simplest terms, this may have meant that they "followed the corms" rather than following game movements. Study of the ecology of the Cyperus fulgens plant over a number of years may well lead to a fuller understanding, not only of the inland central South West African groups' annual subsistence cycle but also of the long term subsistence cycle incorporating drought years and and productive years. Response of the inland groups to drought, seen here as an extension of the annual hunger period, is still not well understood. Undoubtedly, drought has been a major factor in the prehistoric past as well as during historic times in South West Africa and has had social and economic repercussions. Diversification to plant foods not normally utilized may have been one response to drought and this is possibly documented in the upper levels of Big Elephant Shelter, where there is a substantial increase in the frequencies of L. rivularis corms. My own study of Cyperus corms which, thus far, has only covered a one year cycle, showed that the new corms were formed and leaves appeared above ground only two weeks after the annual rains commenced in January, 1977. The rain in question comprised only 25 mm of precipitation, obtained on four days during a two week period. It is possible that only small amounts of precipitation are required to trigger the Cyperus growth cycle and providing that some rain falls during a drought year the bulbs may continue to proliferate. In terms of social adaptations to drought years, ethnographic records suggest that clientship to herder groups was one possible response to drought in the more recent past, whilst fluid membership of the band might be another.

In terms of studying the Erongo inhabitants' adaptations to the environment created by neighbouring population groups, the excavation of Big Elephant Shelter has provided, firstly, the opportunity for examining the possibility of the site being a Dama settlement and, secondly, the opportunity for examining the contact situation between a hunter-gatherer population and the innovating influence of pottery making, herding and metallurgy. Clark and Walton (1962) considered the surface material from Big Elephant Shelter to have been the cultural remains of a Dama group. None of the current evidence contradicts this viewpoint, but at the same time, the evidence cannot conclusively disprove that the occupants of the shelter were Nama or San groups. The problems associated with the separate identification of these groups are great and may remain so on account of their overlapping economies and, therefore, common cultural artefacts. The ethnic group known as Dama is not synonymous with a particular economic grouping for amongst the Dama encountered in early historic times there were hunter-gatherers, herders, metal workers, potters and traders, and a certain amount of fluidity seemed to exist between the economic groupings. Ethnographic evidence points to the Dama being a "transitional" people, economically and culturally hybridized, though not physically so. Their territory was a marginal one in the sense of being geographically adjacent to agriculturalists, herders and hunter-gatherers.

What does appear to be clear from the excavation of Big Elephant Shelter, is that a measure of cultural and economic stability existed throughout the occupation of the shelter and that cultural displacement did not take place. The implications of this evidence for the prehistory and history of the Dama are enormous if the cultural remains could indeed be attributed to the Dama. In the light of physical anthropological research which suggests that the Dama may be an ancient stratum long separated from the main Negroid stream, the intermittent or continuous habitation of the Erongo by Dama for the last 3000 years may not be incongruous.

It is obvious from the summary of information obtained from Big Elephant Shelter that, whilst our initial hypothesis of the hunter-gatherers' adaptations to the land have been satisfied, the models and hypotheses set up to explain the contact situation between hunters and herders have not met the same requirements. Clarke's (1968) model of a sequence of interchanges between hunters and herders involving tolerative, symbiotic, parasitic, competitive and disoperative interchanges,resulting in the eventual "death" of the hunter-gatherer system,has not been entirely applicable to the Big Elephant Shelter situation. Further, the archaeological record has not provided evidence for the stress situations amplified by Cohen (1975). Only one of Cohen's conditions for a situation of demographic stress can be met, that is, the increase in the consumption of plant foods not normally important to the diet. However, the observation of an increase of Lapeirousia rivularis in one stratigraphic level of the site could have the alternative explanation of being caused by a condition of drought.

The interchanges evidenced at Big Elephant Shelter do not appear to have developed beyond the tolerative and symbiotic stage during the time period when the shelter was occupied. Contact between the hunter-gatherers and pastoralists may have been limited to trade and patron/client relationships on occasions when this was beneficial to both economic groupings. Providing that land resources were not strained by overpopulation, some groups of hunter-gatherers could have maintained independence and retained their conservative traditions whilst absorbing selected artefacts and ideas from their neighbours, the herding groups. This type of relationship may have prevailed until, during historical times, expanding pastoral groups of Herero and Nama severely encroached on the hunter-gatherers' territory and resources. The competitive interchange arose out of the over-utilization of land resources and involved a conflict situation between hunters and herders in which the former regarded the domestic herds as fair prey, whilst the herders saw the hunters as undesirable predators. The ensuing disoperative interchange resulted in swift dislocation of the hunter-gatherer societies; they were either displaced to areas marginal to the territory suitable for pastoralism, absorbed into the herder groups (in the case of the Dama, this was on a master-servant basis) or simply exterminated. The critical expansion period of the pastoralists in South West Africa took place relatively late in history (the nineteenth century) and its effects on the hunter-gatherers appear to have been immediate and drastic. Since the expansion of the pastoralists also coincided with increased settlement of the territory by white immigrants, the dislocation of the herders could possibly have come about so quickly that archaeological evidence of the disoperative interchange period did not have time to accumulate.

With only the evidence from one area available at present, it would obviously be unwise to present detailed speculations for the explanation of what appears to be a stable equilibrium situation between hunters and herders in central South West Africa until the nineteenth century. Nevertheless, there is at least one piece of evidence which suggests that the situation documented at Big Elephant Shelter was not an isolated occurrence. In the

Brandberg, there is some indication that herders occupied the hut circle open sites whilst small shelters, such as Upper Orabes were still being used by hunter-gatherers. The date of 180±45 B.P. was obtained from the surficial levels of the site; the basal levels containing sheep remains are still undated (Jacobson pers. comm.). The presence of sheep remains at the small hunter-gatherer site suggests that a symbiotic exchange may have operated between the two economic groupings, though the possibility of raiding cannot be ruled out. What is interesting is that the Orabes Upper tool-kit may be part of a natural and uninhibited growth from the earlier system documented at Lower Numas Cave.

Thus, the evidence from Big Elephant Shelter and Orabes Upper Shelter would argue for a coexistence of hunters and pastoralists without the demographic stress situation which has possibly come to be expected from this type of contact. The argument that pottery making and pastoralism were recent innovations to South West Africa cannot be substantiated, or offered as explanation for the situation. There is a possibility that pottery was introduced to Big Elephant Shelter in approximately 2500 B.P. and Sandelowsky (pers. comm.) has indicated that the dung floor at Mirabib, in which sheep hair was embedded, has been dated 1550±50 B.P. (Pta-1535). Models and hypotheses must, then, be found to explain a long and relatively peaceful coexistence between herders and hunters in central South West Africa until the nineteenth century. All the evidence at Big Elephant Shelter points to an enrichment of the traditional cultural system during pottery times.

In previous chapters, a great deal of emphasis has been placed on the role of the Dama in the history and prehistory of central South West Africa. It is my firm belief that efforts to uncover the origins of the Dama and to understand the mechanisms behind their cultural and economic systems will, at the same time, elucidate many of the problems associated not only with South West African prehistory, but also southern African prehistory. Ethnographic data suggest that, prior to the southward migration of the Herero, two ethnic groups of pastoralists, the Nama and Dama, subsisted in central South West Africa in early historic times. There are a number of indications that the Dama may not have received their pottery making/metal working/tobacco growing or herding stimulus directly from the Nama, although the shared language of the two ethnic groups may suggest that Dama had some form of contact with Khoisan speakers over a long period of time.

Whilst the Dama and Nama have a number of common cultural traits, there are also differences. Perhaps one of the most important of these is that the Dama were apparently unmounted pastoralists whilst at least some of the Nama were mounted pastoralists and also used oxen as pack beasts. It was at the hands of the mounted Nama nomads that increasing numbers of Dama and Herero pastoralists became dispossessed by their stock. Since some Dama groups showed themselves to be shrewd middlemen who travelled long distances to exchange goods and services for livestock, we can assume that the advantages of ride oxen would have been apparent to them and that they would have adopted this form of transport if the opportunity had arisen. The suggestion is, that the Dama stimulus to adopt pastoralism came prior to the arrival of mounted Nama nomads and pack animals in central South West Africa. The different huts built by Dama and Nama can also be attributed to the lack of pack animals amongst the Dama livestock herds. The Nama transported their collapsible mat huts from camp to camp whereas the Dama built conical huts of a more permanent structure and abandoned them when they moved camp. Since some groups of Dama raised tobacco, they must have lived on a semi-sedentary basis on some occasions. Added to these suggestions is the evidence that the Dama were skilled metal workers whilst the Nama were not and we have the provocative situation arising which suggests that the traditional idea of the Dama as age old subservients of the Nama, being rewarded with stock for their services, is highly simplified.

Stimulus for the adoption of pastoralism by hunter-gatherers is little understood in southern Africa, though I would suggest that an established resource utilization pattern based on gregarious staples having wide and long term availability may be one suitable pre-condition. In South West Africa, frequent conditions of drought are another factor to be considered. Without elaborating on the processes by which Dama might have acquired the stimulus towards pastoralism and without entering into the controversy of diffusion, frontier or invasion models to explain the spread of innovations from one area to another, I would forward a very simple hypothesis to explain the type of contact situation between hunters and herders which may be present in both the Erongo and Brandberg. The model accepts as a prerequisite, the presence of the Dama in central South West Africa prior to the advent of pottery and pastoralism. By whatever process, some groups of Dama subsequently adopted pastoralism whilst others did not. The herders and hunters of Dama extraction would thereby share the same sets of cultural tradition regarding language, social behaviour, religion, territorial rights, systems of marriage, gift exchange and mechanisms for resolving disputes. Such interchange between the economic groupings would be predisposed towards a situation of toleration. Since the Dama are reproductive isolates in South West Africa, their gene pools showing exclusion of Khoisan/San genes, both Dama herding and hunting groups may have been dependent on each other for marriage partners.

As a result of the ephemeral open site camps of most herding groups and because of the poor conditions for preservation of organic remains in open sites, we still have little idea of the subsistence strategies adopted by herders. It can be expected that they would be dependent on the same plant and game resources as the hunters but that they would have the additional requirement of grass and scrub fodder for their herds. However, the annual cycle followed by a prehistoric herding group is still largely unknown. Clarke (1968:351,347) suggests that there is some possibility for the economic coexistence of hunters and pastoralists if each exploits either complementary niches or exploits the same territory and resources in rotation. Whether such strategies were possible in central South West Africa, or for that matter in other parts of southern Africa, remains to be explored. The possibility is that 2 ethnic groups of pastoralists coexisted in South West Africa in prehistoric times and it may be possible that the one population herded goats (Dama) whilst the other (Nama) herded sheep and cattle. Since goats are able to survive in territory where cattle cannot, it may be possible that the 2 groups of herders were able to avoid utilizing each others resources.

The excavation of Big Elephant Shelter has laid the ground for the understanding of one possible subsistence strategy in central South West Africa and it further prompts the need for the setting up and testing of models for examining the possibility of a tolerative and symbiotic interchange existing between prehistoric hunters and herders in the territory. The problems associated with the hunting and herding Dama of the Erongo and Brandberg are not parochial, but part of the wider problems associated with all of southern African prehistory. In other parts of southern Africa, research workers are increasingly concerning themselves with orientation towards the understanding of the mechanisms behind man/land relationships and changing man/land relationships through time. This includes, amongst other studies, examination of settlement patterns and resource utilization strategies; it involves the building and testing of models to examine the processes, for example, of how hunters are stimulated towards adopting pastoralism and the preconditions making the change possible. The methodological approaches used are becoming increasingly concerned with examination of non-archaeological data, with the aim of amplifying and enriching the archaeological data.

The study of Big Elephant Shelter and the adaptation of its inhabitants to their surroundings will, hopefully, provide the stepping stone in central South West Africa for problem oriented research of the type which is progressing in the rest of southern Africa. By necessity, my own contribution to problem oriented research has been limited; however, if this paper can stimulate enthusiasm for research into the problems that I have outlined, then this will have been Big Elephant's greatest contribution towards the search for knowledge of the prehistory of South West Africa.

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