

## Contribution to the archaeozoology of the Brandberg, Namibia

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A description and interpretation is given of the faunal remains of archaeological sites in three sections in the inner Brandberg, Namibia. Excavations in rock shelters and open-air sites yielded material belonging to the Middle Stone Age, Late Stone Age and the *Brandberg Culture*. Taphonomic analysis shows that the faunal remains are of polygenetic origin, but humans were responsible for the accumulation of the majority of the material. *Procavia*, *Oreotragus* and *Pronolagus* were the most frequently consumed animals in all three periods. The presence of domestic cattle in two sites of the *Brandberg Culture* period is discussed.

### INTRODUCTION

The Brandberg, together with other mountaneous areas in the central Namib, have been investigated archaeologically with the aim of unraveling the occupation history of the region by the present-day ethnic groups (Breunig 1986, 1988, 1989a, 1989b; Jacobson 1978; Kinahan 1986, 1991; Richter 1991; Rudner 1957; Wadley 1979; Wendt 1972). Archaeozoological data are available only from Avery (1984) and from Cruz-Uribe & Klein (1983). The faunal remains described here were collected during archaeological excavations carried out by the second author from 1984 to 1987. The investigations were part of a research programme of the University of Cologne (Germany), which focused on the prehistory of the upper Brandberg with special emphasis on the mountain's rock art (Lenssen-Erz 1994; Pager 1989, 1993, 1995). Previous studies of the Brandberg are those of Rudner (1957), Jacobson (1978) and Kinahan (1991).

The excavations took place in three different sections of the inner Brandberg: the Amis Gorge; the Umuab Gorge; and the Numas Gorge. Traces of occupation were found from the Middle Stone Age (MSA), the Late Stone Age (LSA) and the *Brandberg Culture* (BBC), which represents the youngest phase of the mountain's occupation.

The Brandberg is presently not inhabited, but the Dama, who were traditionally hunter-gatherers, live in the region. They have recently obtained livestock from the Nama people and the bantu-speaking Herero (Steyn & Pisani 1985). The radiocarbon dates of the deposits studied range from about 7000 B.P. - 2500 B.P. for LSA sites. There is a cluster of dates around 3000 B.P. All of these sites are pre-ceramic, and exhibit no sign of domestic stock. Contrary to Kinahan's results (Kinahan 1991), we found no secure traces of pastoral activity prior to about 500 B.P. (as indicated by uncalibrated radiocarbon dates). Some of the sites are dated to the last five centuries. Occupation of this period is termed the *Brandberg Culture* (according to Rudner 1957). MSA deposits were difficult to date. One exception is a charcoal sample of Amis 11 with an age of >44000 B.P.

### MATERIALS

Materials examined for this study have been deposited with the National Monuments Council of Namibia.

The material described here is very well preserved, except for the Oshilongo remains. The latter material all originates from the surface and is heavily fragmented. Bone from LSA and more recent contexts generally shows very little weathering and organic remains such as hair,

feathers, nails, ligaments, mammalian scats and owl pellets are preserved in the younger levels. Bones are less numerous and sometimes coated with a whitish matrix in the MSA levels.

A species list is given in Table 1. Identifications were carried out with the aid of the reference collection of the Royal Museum of Central Africa (MRAC). Additional comparative material was provided by the archaeologists who collected carcasses of sub-recent vertebrates on the Brandberg. Bone measurements were taken according to Driesch (1976) and are given in millimetres. Unless otherwise stated, the data outlined below referring to the geographical distribution and ecology of mammals are from Smithers (1983).

The faunal remains studied here originate from the following sites (radiocarbon dates cited are uncalibrated):

Amis 6: Rock shelter with unstratified deposits of less than 30 centimetres in thickness. The stratigraphy could be disturbed, but most of the cultural material appears to belong to the BBC.

Amis 10: Large rock shelter. With more than a thousand paintings, it is the Brandberg's and Namibia's richest rock art site. 1.5 m of deposits with a total of more than 30 000 stone artefacts of the MSA and LSA investigated. The MSA is not dated. Radiocarbon dates for the LSA range between 5300 B.P. and 2700 B.P. A small pit with no diagnostic cultural material is dated at 1620 B.P. Exfoliated flakes with traces of paint were found in the LSA layer, providing a minimum age of the painting of about 2700 B.P. (Breunig 1989a: 33f.).

Amis 11: Rock shelter situated close to Amis 10. It yielded a deposit with artifacts of about 1 m in thickness, which is less than at Amis 10. MSA, LSA and BBC layers have been identified. A MSA charcoal sample is dated at >44 000 B.P.

The dates for the LSA layer range between 3000 B.P. and 2500 B.P. Pits reaching LSA levels chiefly represent the BBC. Consequently, some materials could have been mixed, as evidenced by a few inconsistent radiocarbon dates. As the BBC is mostly found in open-air settlements with rather poor faunal preservation, the rock shelter's rich bone inventory is of interest.

Amis 12: Rock shelter with deposits investigated to a depth of 1.2 m below the surface. The bones examined here originate from surface levels, belonging to BBC as indicated by the sequence of radiocarbon dates.

Amis 17: Rock shelter with LSA deposits dated at 2400 B.P. and 2700 B.P.

Umuab 21: Rock shelter. Most of the cultural material was found in a layer with microliths and some potsherds indicating a ceramic LSA. According to a radiocarbon date of 500 B.P., this material either belongs to a very late stage of the LSA, or the complex is mixed with finds of the BBC present on the surface.

Umuab 28: Rock shelter with a stratigraphy similar to Umuab 21. The microlithic industry is dated at 700 B.P. and 800 B.P.

Umuab B1: Open-air site with 11 circular stone structures, which are mainly interpreted as hut remains. Among the nearly 2000 surface finds are those of European origin, indicating a late stage of the BBC (probably around the turn of the century). The historical dating is confirmed by radiocarbon dates.

Umuab B2: LSA open-air site close to Umuab B1. The site mainly consists of a stone industry with several microliths and a few bones. Bones are dated at 3300 B.P.

Umuab A: Large circular stone structure (hut remain) of the early BBC (460 B.P.).

Oshilongo (Numas Gorge): Large open-air site with 21 stone structures. More than 13 000 surface finds were recorded. The lack of finds of European origin, and a consistent set of radiocarbon dates, point at a stage at the middle of the BBC.

Katarakt (Numas Gorge): Large stone structure of early BBC. A charcoal sample was dated at 350 B.P.

Numas 25: Rock shelter with undated LSA deposits.

## DESCRIPTION OF THE FAUNA

### Molluscs

At Amis 6 three fragments of the patellid limpid *Patella* Linnaeus (Patellidae) were found. Dr. R. Janssen (Frankfurt) identified one of which. A complete Pectinidae shell with polished edges and a perforation was also discovered. These remains indicate an interaction with coastal populations during the *Brandberg Culture* period. *Dorcasia alexandri* Gray (Dorcasiidae) a landsnail typical of hot and dry habitats (Van Bruggen 1969) is the only local mollusc species represented at the sites.

### Fishes

In the lower levels of Numas 25 an angulo-articular of an air-breathing catfish was discovered (Figure 1a). On the basis of its shape it is attributed to a species of the genus *Clarias* Scopoli (Clariidae) (*vide* Driesch 1983). The bone belonged to an animal of some 40-50 cm standard length. Approximately 2 km north of the Brandberg, water is seasonally present in the ephemeral Ugab River. Fish are washed-down the Ugab following exceptional rains, and are trapped in shallow pools when the water recedes (Steyn & Pisani 1985). It is likely that the *Clarias* bone discovered at Numas 25 belonged to an

individual caught in this manner. The species is very probably *Clarias gariepinus* (Burchell) the species thus far recorded from the Ugab River (Clinton Hay pers. comm.).

### Amphibians & Reptiles

A small amount of amphibia and reptilia material was discovered on the Brandberg sites. A complete mummified specimen of Hoesch's Toad *Bufo hoeschi* Ahl (Bufonidae) was found on Amis 12, at a depth of 40 cm. It represents an individual, which probably buried itself into the sediment, at the onset of the dry season. This species occurs in temporary rainwater pools on the Brandberg today (A.H. Kirk-Spriggs pers. comm.).

The Giant Plated Lizard *Gerrhosaurus validus* A. Smith (Cordylidae) is relatively well represented at the Brandberg sites. The identified fragments are from a virtually complete skull (Figure 1b), lower and upper jaw, vertebrae, limb bones, and several dermal scutes. It is not clear whether these remains result from animals that died naturally *in situ*, or whether they represent food waste of man, or carnivores.

The tortoise remains, found in MSA, LSA, and the *Brandberg Culture* levels, all belong to species of the family Testudinidae. A large carapace fragment, identified as the Leopard Tortoise *Geochelone pardalis* (Bell), was discovered in a *Brandberg Culture* level at Amis 11. This specimen is described in detail in a separate article (Cooper & Branch this volume). According to a recent survey by Elzen (1983), tortoises do not occur on the Brandberg, nevertheless, *Geochelone pardalis* is indicated as occurring in the area today (Branch 1988). The individuals recorded here are, therefore, likely to have been brought in from the nearby plains. The large carapace fragment shows traces of working (*vide infra*). Two vertebrae of snakes excavated at the sites could not be identified.



Table 1. cont. Species list of the Brandberg sites expressed in number of fragments. Non osseous remains such as eggshell fragments, feathers, mammalian scats, and hair are not included. For every site the cultural entities are indicated: MSA (Middle Stone Age), LSA (Later Stone Age) and BBC (*Brandberg Culture*).

| FAUNA  | AMIS |     |     |     |     |     | UMUJAB |     |     |     |     |     | NUMAS |     |     |     |
|--|------|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-------|-----|-----|-----|
|  | 6    | 10  | 11  | 12  | 17  | 21  | 28     | B1  | B2  | A   | Osh | Kat |       | N25 |     |     |
| mammals cont.                                  | BBC  | MSA | LSA | MSA | BBC | LSA | BBC    | LSA | BBC | LSA | LSA | BBC | LSA   | BBC | BBC | LSA |
| Dassie Rat ( <i>Petromus typicus</i> )         | 114  | 3   | 109 | 8   | 25  | 85  | 26     | 20  | 28  | 6   | -   | -   | -     | 9   | -   | 52  |
| N. R. Mouse ( <i>Aethomys namaquensis</i> )    | -    | -   | 2   | -   | -   | 1   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| Striped Mouse ( <i>Rhabdomys cf. pumilio</i> ) | -    | -   | -   | 1   | 1   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| gerbil <i>Gerbillurus/Desmodillus</i> sp.      | -    | -   | 8   | -   | 18  | 11  | 6      | 1   | 2   | -   | -   | -   | -     | -   | -   | 1   |
| small rodents                                  | -    | -   | -   | -   | -   | 2   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| Spotted Hyaena ( <i>Crocuta crocuta</i> )      | -    | -   | 1   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | 1   |
| African Wild Cat ( <i>Felis lybica</i> )       | -    | -   | -   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | 1   |
| Black-backed jackal ( <i>Canis mesomelas</i> ) | -    | -   | -   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | 1   |
| Suricate ( <i>Suricata suricatta</i> )         | 113  | 87  | 115 | 89  | 93  | 134 | 77     | 44  | 67  | 31  | 10  | 10  | -     | 128 | 62  | 150 |
| Rock Dassie ( <i>Procavia capensis</i> )       | -    | -   | 1   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| equid ( <i>Equus</i> sp.)                      | -    | -   | 4   | -   | -   | -   | -      | 1   | -   | -   | -   | -   | -     | 7   | -   | 3   |
| Springbok ( <i>Antidorcas marsupialis</i> )    | 11   | 20  | 55  | 31  | 13  | 26  | 9      | 2   | 3   | 12  | 3   | 35  | 1     | 15  | -   | 9   |
| Klipspringer ( <i>Oreotragus oreotragus</i> )  | -    | 1   | 5   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| small bovid (Bovidae)                          | -    | -   | 1   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| Gemsbok ( <i>Oryx gazella</i> )                | -    | -   | -   | -   | -   | 4   | -      | -   | -   | -   | -   | -   | -     | -   | -   | 18  |
| cattle ( <i>Bos primigenius</i> f. taurus)     | -    | -   | -   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | 55  |
| large bovid (probably cattle)                  | -    | -   | -   | -   | -   | -   | -      | -   | -   | -   | -   | -   | -     | -   | -   | -   |
| total identified                               | 299  | 122 | 765 | 149 | 160 | 292 | 129    | 68  | 101 | 51  | 13  | 45  | 1     | 243 | 62  | 232 |

## Birds

Fragments of Ostrich *Struthio camelus* Linnaeus (Struthionidae) eggshell occur on all the sites and represent imported material. Bird feathers are present in the younger levels of Amis 11, which are clearly attributable to the Speckled Rock Pigeon *Columba guinea* Linnaeus (Columbidae). This species is also well represented by bones at the Amis sites. It is likely that these remains originate from individuals that lived and nested in the rocky environment of the cave. These may have served as food for man or other predators, but some remains are from individuals which died naturally in the cave, as is indicated by the presence of articulating elements with the tendons still preserved. A lumbosacrale of a small passeriform bird, which could not be identified more precisely, was found at Umuab 21.

## Mammals

### *Crocidura* sp.

Amis 10 and 11 yielded almost complete lower jaws of small shrews of the genus *Crocidura* Wagler (Soricidae). On present information, the Reddish-grey Musk Shrew *C. cyanea* (Duvernoy), is the species most likely to occur.

### *Elephantulus* sp.

A larger elephant shrew species than the aforementioned is represented by mandibular fragments containing molars, and in some cases, premolars. One lower jaw is almost complete, and shows that the first premolar has a double root. This character distinguishes *Macroscelides* A. Smith (Macroscelididae) from the Bushveld Elephant Shrew *Elephantulus intufi* (A. Smith) and the Smith's Rock Elephant Shrew *E. rupestris* (A. Smith) (Macroscelididae), the two species which occur in the Brandberg area today (Corbet & Hanks 1968: 49). *Elephantulus intufi* differs from *E. rupestris* in being of a smaller size, but

this criterion is not considered here, due to a lack of comparative material. The presence or absence of an additional cusp on the lower P2 and P3 is also diagnostic (Corbet & Hanks 1968: 89), but these teeth are not preserved in the material under study.

### *Homo sapiens*

A human phalanx media of the second or third toe was found in a MSA layer of Amis 11a (Figure 1e & 1f). The level at which this element was excavated cannot be dated absolutely, but is estimated at more than 20 000 years, according to other dated MSA sites in Namibia.

### *Pronolagus randensis*

Remains of the rabbit genus *Pronolagus* Lyon (Leporidae), were excavated. Several principal upper incisors are preserved and have the rather elongate cross-section, which distinguishes them from *Lepus* Linnaeus. Moreover, three skull fragments have broad palatines resulting in narrow mesopterygoid space (Figure 1d), which indicates that they do not belong to *Lepus*. The Brandberg specimens are attributed to Jameson's Red Rock Rabbit *Pronolagus randensis* Jameson, considering the present-day distribution and habitat preferences.

*Pronolagus* lives gregariously in rocky habitats, with palatable grasses, and some cover of scrub bushes. The remains of a soft nest made of fur, was found in the upper levels of Amis 6, indicating that the rock shelter itself was on occasions inhabited by rock rabbits. Rabbits may have been captured using snares, but hand capture is also possible.

### *Xerus princeps*

The distal part of a tibia has been identified as belonging to a species of the ground squirrel genus *Xerus* Ehrenberg (Sciuridae), on the basis of size, shape and present-day distribution. The

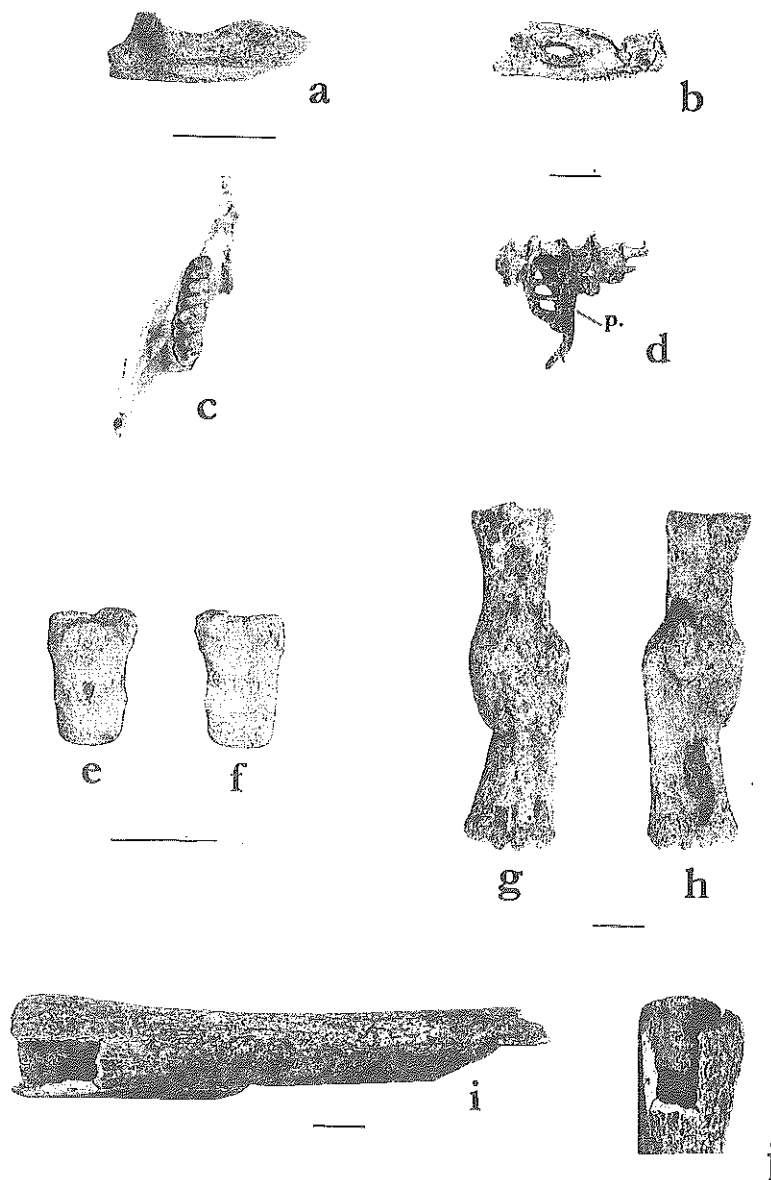


Figure 1. a, *Clarias* sp. lateral aspect of right angulo-articular (LSA level from Numas 25); b, *Gerrhosaurus validus* right lateral aspect of skull (BBC level from Amis 6); c, *Petromus typicus* occlusal view of mandible (BBC level from Amis 11); d, *Pronolagus randensis* ventral view of skull fragment (note: the wide palatine (p.)) (LSA level from Amis 10); e, *Homo sapiens* phalanx media of second or third toe, dorsal aspect (MSA layer of Amis 11); f, *Homo sapiens* same in ventral aspect; g, *Oreotragus oreotragus* metacarpal with healed fracture, dorsal aspect (MSA level from Amis 11); h, *Oreotragus oreotragus* same in plantar aspect; i, *Antidorcas marsupialis* dorsal view of radius (LSA level from Numas 25); j, *Antidorcas marsupialis* detail of the worked part of radius. Scale bars = 1 cm.

Ground Squirrel *Xerus inauris* (Zimmermann) and the Mountain Ground Squirrel *Xerus princeps* (Thomas) are the two species known to occur in Namibia. The former species prefers open flat country, whereas the latter occurs principally in rocky habitat. The species identification is solely based on these habitat differences. Steyn & Pisani (1985) discuss this species as being among the game animals hunted by the Dama.

#### *Petromus typicus*

The Dassie Rat *Petromus typicus* A. Smith (Petromuridae) is, after *Procapra* Storr, the best represented animal species at the Brandberg sites. It is the only representative of the family Petromuridae, and has unique cheekteeth with deep, oblique foldings, giving them a laminate appearance (Figure 1c). Remains of this species, especially skull and jaw elements, were found in nearly every layer. Teeth or bones of this species were also included in the carnivore scats, as well as the only preserved owl pellet. These rodents have a total length of some 30 cm, and weigh more than 200 g. If their mass is considered, it cannot be excluded that they may have formed part of a human diet. This rock-dwelling species utilize latrines, which results in the staining of rocks. While this makes it easy to locate these animals, Hoesch & Leymann (1956) contend that they are almost impossible to catch in traps.

#### Small rodents

Small rodent remains consist of several upper and lower jaws with molars *in situ*. Remains of the Namaqua Rock Mouse *Aethomys namaquensis* (A. Smith) (Muridae) were present in the LSA levels of Amis 10 and in the BBC levels of Amis 11. Striped Mouse *Rhabdomys* cf. *pumilio* (Sparrmann) was present in both LSA and MSA levels of Amis 11, whereas the LSA levels of that site also yielded a jaw of gerbil genera *Gerbillurus* Shortridge or *Desmodillus* Thomas & Schwann (Cricetidae). Small rodent

remains are likely to have entered the deposit by means of owl pellets or carnivore scats.

#### *Crocuta crocuta*

Two complete metapodials of a hyaena (Hyaenidae) were located in the *Brandberg Culture* levels of Amis 11. The diaphyses of both elements, a second metacarpal and a fourth metatarsal, had been worked (Breunig 1989b: 236). Of the two species occurring in Namibia, the Brown Hyaena *Hyaena brunnea* Thunberg is said to be better adapted to arid conditions than the Spotted Hyaena *Crocuta crocuta* (Erleben). Comparison with our reference material indicates, however, that the remains are derived from the Spotted Hyaena. A strong overlap exists in the length of the metapodials, but the diaphysis width appears to be diagnostic: *Crocuta crocuta* has sturdier metapodials than *Hyaena brunnea*. These findings may indicate that in former times Spotted Hyaena was more widely distributed, and occurred near the Brandberg. It must also be understood, however, that since we are dealing with objects with a ritual meaning, the material may have been imported from a more distant area.

#### *Felis lybica*

A scapula and an ulna of a small cat were found at Amis 10 and Numas 25 respectively. These specimens have been assigned to the African Wild Cat *Felis lybica* Forster (Felidae) on the basis of the present-day distribution. Recent bone material of this species has been collected on the Brandberg, indicating that the species still occurs in the area.

#### *Canis mesomelas*

A proximal third metacarpal from Oshilongo is the only bone element of Carnidae found. As this bone occurs in a *Brandberg Culture* level, it cannot be excluded *a priori* that it may be derived from a domestic dog. However, no traces of



gnawing were found on the bone assemblage, which would support this view. The metacarpal was attributed to the Black-backed Jackal *Canis mesomelas* Schreber on the basis of the present-day occurrence of the species. Of all jackals, it is best adapted to arid habitats. The species feeds on invertebrates, vegetable food and vertebrates. Jackals scavenge on carcasses of medium to large mammals, but are known to kill small to medium-sized animals for food. Many well preserved scats were found at the Brandberg sites, which match well in size and form to those of Canidae. They contain considerable amounts of hair and skeletal elements of *Procavia* and *Petromus*. Plant and insect remains were found in some scats. These findings are in agreement with the stomach-contents analysis carried out on the Black-backed Jackal (*vide* Smithers 1983: 422).

#### *Suricata suricatta*

An upper jaw fragment, with P2 and P3 *in situ*, and an edentate mandible of a small viverrid were found at Numas 25. These remains were identified as belonging to the Suricate *Suricata suricatta* (Exleben) (Viverridae), as the upper jaw fragment has no alveole for the first premolar, which clearly separates the Suricate from the mongoose genera *Cynictis* Ogilby, and *Galerella* Gray. Suricates live colonially in warrens and are considered to usually avoid mountainous terrain, although, crevices among rocks are occasionally used for shelter (Dorst & Dandelot 1970: 128).

#### *Procavia capensis*

The remains of dassies are the most frequent encountered at the Brandberg sites. Among the lower incisors only unicuspid specimens were found indicating that we are dealing with the Rock Dassie *Procavia capensis* (Pallas) (Procaviidae). At Amis 12 nails of Rock Dassies were found. It is a gregarious species living in rocky terrain. Populations of *Procavia* are easily

located by means of their latrines, which are often extensive, and visible as whitish or amber-coloured parts on rocky slopes.

#### *Equus* sp.

At Oshilongo an almost complete equid astragalus was found with the following measurements: GH 53 LmT 49. There is some difficulty to assigning this specimen to a species. The extinct Quagga *Equus quagga* Gmelin (Equidae) probably did not move far into Namibia, and certainly not into the Brandberg region. Hartmann's Mountain Zebra *E. zebra hartmanni* Matschie is the only wild equid living in the region today, and is frequently observed at the foot of the Brandberg. The bone is rather small for Hartmann's Mountain Zebra, but nevertheless, falls within the variation of the species. As the specimen was found in the surface layer of Oshilongo, a site which also yielded domestic cattle, it is not *a priori* excluded that it represents a domestic form. The bone is too large for a donkey, but it falls within the variation of size for ponies and mules. The Dama, inhabiting the Ugab Valley, keep and utilise horses today (Steyn & Pisani 1985). In a LSA layer of Amis 10 a fragment of a navicular bone of an equid was found. It can be attributed to Hartmann's Mountain Zebra on the basis of its chronological context.

#### Bovidae

The Klipspringer *Oreotragus oreotragus* (Zimmermann), is the most frequently encountered bovid at the Brandberg sites. Of all identified bovids, it is the single species inhabiting the Brandberg. This small antelope is easily recognizable by its cheekteeth with shallow infundibula. The typical shape of metapodials and phalanges is attributable to the animal's walking on the tips of its hoofs (Van Neer 1989).

It was usually possible to distinguish Klipspringer remains by size from the Springbok *Antidorcas marsupialis* (Zimmermann), a considerably larger species. Very fragmented bones could not be identified to species and are labelled as "small bovid". No indication of sheep or goat could be found.

Among the larger bovid remains, only the Gemsbok *Oryx gazella* (Linnaeus) and domestic cattle were found. *Oryx* is represented by one proximal metatarsal in the LSA of Amis 10, whereas, cattle occur in the *Brandberg Culture* levels of Amis 11 and Oshilongo. The surface layer of Oshilongo is particularly rich in cattle bones. Moreover, it yielded numerous large bovid tooth fragments, probably all derived from cattle. None of the remains, however, permits a reasonable estimation of the shoulder height.

#### Traces

A single complete owl pellet found at Amis 11 has already been mentioned (*vide supra*). On all Amis sites mammalian scats have been recovered belonging to Klipspringer, Rock Rabbit and Black-backed Jackal.

Cut marks were only observed on a distal humerus of Rock Dassie at Amis 11. This site also contains large numbers of worked bone in the *Brandberg Culture* levels (figures *vide Breunig 1989b: 236 ff*). A well preserved bone point was found, probably made of a Klipspringer metapodial, as well as two other bone point fragments. Two spatula are clearly made of a flat bone as is indicated by the two outer layers of compact bone and an inner layer of spongiosa. The general form and size of the bone indicates the stylohyoid of cattle. A large fragment of cattle rib showing polish at its distal end is also present.

Two complete metapodials of Spotted Hyaena from the same site have been worked. They bear small carvings perpendicular to the length axis

and have been perforated near the proximal end. A carapace fragment of a tortoise (*vide Cooper & Branch this volume*) is clearly worked and bears traces that result from its manufacture into a tool and from its use. After removal of the plastron from the carapace, the latter was cut longitudinally in the middle of the neurals. The hind part of the carapace behind the seventh pleural was also discarded. Wear polish is present, especially along all its edges, and may have resulted from its use as a digging tool.

Worked bone was also present among the LSA material from Numas 25. A worked shaft of a Springbok radius was found (Figure 1i & 1j), of which only the distal half is preserved. Where the distal epiphysis was cut-off it has been polished into rounded edges. It seems likely that the medullar cavity of this, almost straight long bone, was used as a container. A carved bone fragment occurs at the same stratigraphic level. It consists of a flat bone, probably a Klipspringer scapula.

Large concentrations of *Procapra* humeri were discovered in a MSA level of Amis 11. Sixteen of the twenty-three dassie remains of unit 10/9b - 80 are humeri. These are complete bones, of which only the proximal epiphysis is lacking, as articular heads fuse very late in mammals and are, therefore, easily lost or destroyed (Brain 1967). One of the humeri exhibits cut marks near the distal end. If the concentration of these elements is not due to selective sampling by the excavators, then it may have resulted from intentional human action.

A pathological metacarpal of a subadult Klipspringer was found in a MSA level of Amis 11 (Figure 1g & 1h). A healed fracture occurs in the middle of the diaphysis. The two shaft pieces are fused in a dislocated position, which would have resulted in a shortening of the forefoot.

## INTERPRETATION

The well preserved faunal remains of the Amis sites, gives an insight into the polygenetic origin of assemblages from caves and rock shelters (*vide* Brain 1981; Sutcliffe 1969). There is evidence to suggest accumulation by natural death, raptorial birds, carnivores and man. Natural death *in situ* may be considered as the main cause of accumulation of several species. The *Dorcasia* landsnails, the mummified toad, some of the Rock Dassies and the Speckled Rock Pigeons (which normally inhabit rocky environments), may have died locally. Remains of small mammals, such as shrews and rodents probably entered the deposits as owl pellets or carnivore scats. *Petromus* remains occur most frequently in rock shelters (Amis sites, Umuab 21 & 28 and Numas 25), this may be regarded as an argument in favour of non-human accumulation. The fact that they are more numerous in the upper levels is explained by the better preservation in younger layers. The only preserved owl pellet contains *Petromus*, whereas the scats attributed to Black-backed Jackal contained insect remains, *Petromus*, *Procavia* and *Gerrhosaurus*. Brain (1981) has noted that leopard droppings may contain almost 50% *Procavia* remains. Although there is no osteological evidence for the occurrence of leopard at the Brandberg sites, there is still a likelihood that this large felid species contributed to the accumulation of dassie bones. We found

no evidence of the etching of bone by the action of gastric juices and, therefore, support that the rock dassie remains mainly correspond to human food waste.

Assuming this to be the case, *Procavia*, *Oreotragus* and *Pronolagus* are the three locally occurring mammals, representing the main human food resources in every assemblage. The relative importance of these species, calculated on the basis of the number of fragments excavated, is presented in Table 2. This was calculated separately for MSA, LSA and the *Brandberg Culture* levels in each area. No trends through time were observed; remains of *Procavia* are the best represented in each period, generally followed by remains of *Oreotragus* and *Pronolagus*. The figures presented in Table 2 are here taken to reflect the number of animal captures of each species respectively. If the live weight of the two species is considered *viz.* *Oreotragus*: 10-18 kg and *Procavia*: 2.5-5 kg, dassies may well have provided three to four times more meat than Klipspringer.

Besides the local fauna, we surmise that man also hunted and transported other animal products from the surrounding flats and massif. This is evidenced by the remarkable find of the *Clarias* catfish bone from the LSA site at Numas 25, which may have originated from temporary pools in the Ugab River, 2 km north of the site. Further evidence is furnished by the remains of Hartmann's Mountain Zebra, Springbok and

Table 2. Percentage frequencies of Rock Rabbit (*Pronolagus*), Rock Dassie (*Procavia*) and Klipspringer (*Oreotragus*) in the MSA, LSA and BBC assemblages from Amis, Umuab and Numas.

|                   | AMIS |      |      | UMUAB |      | NUMAS |      |
|-------------------|------|------|------|-------|------|-------|------|
|                   | MSA  | LSA  | BBC  | LSA   | BBC  | LSA   | BBC  |
| <i>Pronolagus</i> | 6.2  | 7.3  | 5.3  | 0.6   | 0.0  | 3.7   | 7.2  |
| <i>Procavia</i>   | 72.7 | 83.7 | 82.6 | 69.8  | 71.4 | 93.3  | 74.7 |
| <i>Oreotragus</i> | 21.1 | 9.0  | 12.1 | 29.6  | 28.6 | 3.0   | 18.1 |

Gemsbok derived from animals hunted at the foot of the Brandberg, and on the surrounding plains. The animal fauna of the Brandberg sites corresponds closely to that found to occur at the northern site of Austerlitz (Cruz-Uribe & Klein 1983), and at the south eastern Erongo sites. These sites include, Big Elephant Shelter (Wadley 1979), Striped Giraffe Shelter (Plug 1979), Fackelträger (Thackeray 1979), and the Etemba sites (Cruz-Uribe & Klein 1983). All yielded a fauna typical of rocky environments. Game from the surrounding open habitats was also hunted from the LSA onward.

Marine molluscs (BBC), Ostrich eggshell (all periods), tortoise carapaces (all periods), and worked bone of cattle and Spotted Hyaena (BBC) were probably brought in from elsewhere and used as utensils.

Remains of domestic animals are extremely scarce in central Namibia and are not older than a few hundred years. The surface pottery levels of Big Elephant Shelter yielded evidence of cattle and sheep, whereas in Striped Giraffe Shelter sheep and goat remains were shown to occur. The oldest evidence for ovicaprines in Namibia comes from Falls Rock Shelter (Kinahan 1986) and Mirabib Shelter (Sandelowsky *et al.* 1979). Dung floors at these two sites were dated at approximately 2000 and 1500 years respectively. The rarity of livestock remains may be related to the fact that almost all the archaeozoological information is derived from cave environments, which are mostly inhabited by non-herding communities. Cattle remains occur on the Brandberg in the younger levels at Amis 11 and are especially well represented at Oshilongo. The age of these levels is estimated at 200 to 300 years. This corresponds to the period of immigration of a bantu-tribe of cattle-herders: the Herero (Vedder 1923). The archaeological material associated with cattle remains, is attributed to the Dama, being traditionally hunter-gatherers in this area. Early travelers in Namibia reported that some Dama populations

possessed livestock, particularly sheep and goats, from the second half of the 19<sup>th</sup> century, but cattle were obtained later. Livestock was obtained by barter, theft or as payment for services to the Herero, or to the Nama people (Steyn & Pisani 1985).

Cattle are represented at Amis 11 by a malleolar bone and by three worked bones. The former may be regarded as food waste, but the three other elements may have been obtained by barter. The situation is different at Oshilongo. The large number of cattle fragments at this site, and the high meat yield of this species, indicates that cattle must have represented the main food resource at Oshilongo. Tooth fragments predominate among the cattle remains. Skull elements such as petrosals were found, but also phalanges and vertebrae. Since so many different skeletal elements are present, including those which are usually left at the butchery site, it is tempting to suppose that live cattle were herded up to the Brandberg. For reasons of access, however, this would have been a difficult task. Pasture for livestock was clearly available and of considerably better quality than in the surrounding Namib (Kinahan 1986). The problem of maintaining cattle herds may well have been the availability of water. Water holes are present near the site, but the amount of water is limited, and varies seasonally. In years with a prolonged drought the holes dry-up completely. During normal years, however, the supply is sufficient all year round for small human populations (Breunig pers. obs.). If, during this period of cattle herding, environmental conditions were as they are today, then there would probably have been sufficient water, to meet human and livestock needs.

Different explanations are possible for the association at Oshilongo of cattle and Dama archaeological material. The animals may have been obtained by barter or as payment for services rendered to the Herero or Nama. Another possibility is that the cattle did not

belong to the Dama. While herding the Herero or Nama cattle, the Dama may have brought part of the herds to the Brandberg during periods when little pasture was available in the surrounding Namib. Those herds may have been kept on the Brandberg as long as grazing and watering were possible, to later be driven back. The Oshilongo remains would then represent animals that were occasionally slaughtered, for example, because they became sick or wounded on the ascension of the Brandberg. This model is difficult to accept, as the problems of ascending and descending the massif would have meant a high risk of the loss of animals. Moreover, during periods of prolonged aridity, it may have been more opportunistic, to migrate north or east for better pasture. A more feasible explanation would be that the Dama regularly took one or more animals from the Herero or Nama herds. These cattle may have been forced to ascend the Brandberg and kept alive in the Oshilongo area for a period of time, if not to be slaughtered immediately. An alternative explanation may be that cattle were slaughtered at the foot of the Brandberg. The skeletal distribution observed would then indicate that all body parts, including those bearing little meat, were taken up the mountain. The effort to carry these less attractive portions may indicate that the available resources were limited, or that cattle were highly prized animals.

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#### REFERENCES

- AVERY, D. M. 1984. Micromammals and environmental change at Zebrarivier Cave, central Namibia. *Journal of the SWA Scientific Society* 38: 76-86.
- BRAIN, C. K. 1967. Hottentot food remains and their bearing on the interpretation of fossil bone assemblages. *Scientific Papers of the Namib Desert Research Station* 32: 1-11.
- BRAIN, C. K. 1981. *The hunters or the hunted? An Introduction to African cave Taphonomy*. The University of Chicago Press, Chicago, x + 365 pp.
- BRANCH, W. R. 1988. *Fieldguide to the snakes and other reptiles of southern Africa*. Struik Publishers, Cape Town, 326 pp.
- BREUNIG, P. 1986. Archaeological research in the Upper Brandberg/Namibia. *Nyame Akuma* 27: 26-27.
- BREUNIG, P. 1988. Pfostenbauten im Hohen Brandberg, Bericht über die dritte Kölner Brandberg-Expedition. *Newsletter SWA Scientific Society* 29(1): 1-6.
- BREUNIG, P. 1989a. Archaeological investigations into the settlement history of the Brandberg. In PAGER, H. (ed). *The rock paintings of the upper Brandberg, part I - Amis Gorge: 17-48*. Africa Praehistorica 1. Heinrich Barth Institut, Köln <loose sheets>.
- BREUNIG, P. 1989b. *Der Brandberg. Untersuchungen zur Besiedlungsgeschichte eines Hochgebirges in Namibia*. Habilitationsschrift. University of Köln, 419 pp.
- CORBET, G. B. & HANKS, J. 1968. A revision of the elephant-shrews, family Macroscelididae. *Bulletin of the British Museum of Natural History (Zoology)* 16: 45-111.
- CRUZ-URIBE, K. & KLEIN, R. G. 1983. Faunal remains from some Middle and Later Stone Age archaeological sites in South West Africa. *Journal of the SWA Scientific Society* 36/37: 91-114.
- DORST, J. & DANDELLOT, P. 1970. *A field guide to the larger mammals of Africa*. Collins, London, 287 pp.
- DRIESCH, A. von den 1976. *A guide to the measurement of animal bones from archaeological sites*. Peabody Museum Bulletin 1., Harvard University, Cambridge (USA), 137 pp.
- DRIESCH, A. von den 1983. Some archaeozoological remarks on fishes in Ancient Egypt. In GRIGSON, C. & CLUTTON-BROCK, J. (eds). *Animals and archaeology. BAR International Series* 183: 87-110.
- ELZEN, P. van den 1983. Zur Herpetofauna des Brandberges, Südwest-Afrika. *Bonner Zoologische Beiträge* 34: 293-309.
- HOESCH, W. & LEYMAN, E. von 1956. Zur Säugetierfauna Südwestafrikas. *Bonner Zoologische Beiträge* 7: 8-57.
- JACOBSON, L. 1978. *A study of functional variation in the Late Stone Age of western Damaraland, Namibia*. B.A. Honour Thesis, University of Cape Town, 44 pp. (unpublished)

- KINAHAN, J. 1986. The archaeological structure of pastoral production in the central Namib Desert. In HALL, M. & SMITH, A. B. (eds) *Prehistoric pastoralism in Southern Africa*. South African Archaeological Society Goodwin Series 5: 69-82.
- KINAHAN, J. 1991. *Pastoral nomads of the central Namib Desert. The people time forgot*. Namibian Archaeological Trust, New Namibia Books, Windhoek, 167 pp.
- LENSSEN-ERZ, T. 1994. Facts or fantasy? The rock paintings of the Brandberg, Namibia, and a concept of textualization for purposes of data processing. *Semiotica* 100-2/4: 169-200.
- PAGER, H., 1989. *The rock paintings of the upper Brandberg, part I - Amis Gorge*. Africa Praehistorica 1. Heinrich Barth Institut, Köln <loose sheets>.
- PAGER, H., 1993. *The rock paintings of the upper Brandberg, part II - Hungorob Gorge*. Africa Praehistorica 4. Heinrich Barth Institut, Köln, Vol 1 502 pp., Vol. 2 677 pp.
- PAGER, H., 1995. *The rock paintings of the upper Brandberg, part III - southern gorges*. Africa Praehistorica 7. Heinrich Barth Institut, Köln.
- PLUG, I. 1979. Striped giraffe shelter faunal report. *Cimbebasia (B)* 3: 71-72.
- RICHTER, J. 1991. *Studien zur Urgeschichte Namibias. Holozäne stratigraphien im umkreis des Brandberges*. Africa Praehistorica 3. Heinrich Barth Institut, Köln, 345 pp.
- RÜDNER, J. 1957. The Brandberg and its archaeological remains. *Journal of the SWA Scientific Society* 12: 7-44.
- SANDELOWSKY, B. H., VAN ROOYEN, J.H. & VOGEL, J. C. 1979. Early evidence for herders in the Namib. *South African Archaeological Bulletin* 34: 50-51.
- SMITHERS, R. H. N. 1983. *The mammals of the Southern African subregion*. University of Pretoria, Pretoria, xxii + 736 pp.
- STEYN, H. P. & PISANI, E. du 1985. Grass-seeds, game and goats: an overview of Dama subsistence. *Journal of the SWA Scientific Society* 39: 37-52.
- SUTCLIFFE, A. J. 1969. A section of an imaginary bone cave. *Studies in Speleology* 2: 79-80.
- THACKERAY, J. F. 1979. An analysis of faunal remains from archaeological sites in southern South West Africa (Namibia). *South African Archaeological Bulletin* 34: 18-33.
- VAN BRUGGEN, A. C. 1969. *Studies on the land molluscs of Zululand with notes on the distribution of land molluscs in Southern Africa*. Zoologische Verhandelingen 103, Leiden, 116 pp.
- VAN NEER, W. 1989. Contribution to the archaeozoology of Central Africa. *Annales du Musée Royal de l'Afrique Centrale, Sciences zoologiques* 259: 1-140.
- VEDDER, H. 1923. *Die Bergdama. Reihe B Völkerkunde, Kulturgeschichte & Sprachen* Bd. 7, L. Friedrichsen & Co., Hamburg, 199 pp.
- WADLEY, L. 1979. Big Elephant Shelter and its role in the Holocene prehistory of central South West Africa. *Cimbebasia (B)* 3: 1-76.
- WENDT, W. E. 1972. Preliminary report on an archaeological research programme in South West Africa. *Cimbebasia (B)* 2(1): 1-61.

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- KINAHAN, J. 1986. The archaeological structure of pastoral production in the central Namib Desert. In HALL, M. & SMITH, A. B. (eds) *Prehistoric pastoralism in Southern Africa*. South African Archaeological Society Goodwin Series 5: 69-82.
- KINAHAN, J. 1991. *Pastoral nomads of the central Namib Desert. The people time forgot*. Namibian Archaeological Trust, New Namibia Books, Windhoek, 167 pp.
- LENSSSEN-ERZ, T. 1994. Facts or fantasy? The rock paintings of the Brandberg, Namibia, and a concept of textualization for purposes of data processing. *Semiotica* 100-2/4: 169-200.
- PAGER, H., 1989. *The rock paintings of the upper Brandberg, part I - Amis Gorge*. Africa Praehistorica 1. Heinrich Barth Institut, Köln <loose sheets>.
- PAGER, H., 1993. *The rock paintings of the upper Brandberg, part II - Hungorob Gorge*. Africa Praehistorica 4. Heinrich Barth Institut, Köln, Vol 1 502 pp., Vol. 2 677 pp.
- PAGER, H., 1995. *The rock paintings of the upper Brandberg, part III - southern gorges*. Africa Praehistorica 7. Heinrich Barth Institut, Köln.
- PLUG, I. 1979. Striped giraffe shelter faunal report. *Cimbebasia (B)* 3: 71-72.
- RICHTER, J. 1991. *Studien zur Urgeschichte Namibias. holozäne stratigraphien im umkreis des Brandberges*. Africa Praehistorica 3. Heinrich Barth Institut, Köln, 345 pp.
- RÜDNER, J. 1957. The Brandberg and its archaeological remains. *Journal of the SWA Scientific Society* 12: 7-44.
- SANDELOWSKY, B. H., VAN ROOYEN, J. H. & VOGEL, J. C. 1979. Early evidence for herders in the Namib. *South African Archaeological Bulletin* 34: 50-51.
- SMITHERS, R. H. N. 1983. *The mammals of the Southern African subregion*. University of Pretoria, Pretoria, xxii + 736 pp.
- STEYN, H. P. & PISANI, E. du 1985. Grass-seeds, game and goats: an overview of Dama subsistence. *Journal of the SWA Scientific Society* 39: 37-52.
- SUTCLIFFE, A. J. 1969. A section of an imaginary bone cave. *Studies in Speleology* 2: 79-80.
- THACKERAY, J. F. 1979. An analysis of faunal remains from archaeological sites in southern South West Africa (Namibia). *South African Archaeological Bulletin* 34: 18-33.
- VAN BRUGGEN, A. C. 1969. *Studies on the land molluscs of Zululand with notes on the distribution of land molluscs in Southern Africa*. Zoologische Verhandelingen 103, Leiden, 116 pp.
- VAN NEER, W. 1989. Contribution to the archaeozoology of Central Africa. *Annales du Musée Royal de l'Afrique Centrale, Sciences zoologiques* 259: 1-140.
- VEDDER, H. 1923. *Die Bergdama. Reihe B Völkerkunde, Kulturgeschichte & Sprachen* Bd. 7, L. Friedrichsen & Co., Hamburg, 199 pp.
- WADLEY, L. 1979. Big Elephant Shelter and its role in the Holocene prehistory of central South West Africa. *Cimbebasia (B)* 3: 1-76.
- WENDT, W. E. 1972. Preliminary report on an archaeological research programme in South West Africa. *Cimbebasia (B)* 2(1): 1-61.

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