Losing the spoor: Hai||om animal exploitation in the Etosha region

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Abstract / Zusammenfassung

The eviction of the Hai||om from their ancestral homesteads in the Etosha Game Reserve in 1954 marked *de facto* the end of their traditional way of living in a landscape that remains unique and fascinating to this day. Five decades after this decision, which was made by the South West Africa Administration, a project was initiated to document the remaining traditional knowledge about wildlife and its role in the subsistence of the San that once inhabited the southeastern Etosha. The respected elders Hans Haneb, Willem Dauxab, Kadisen ||Khumub and Jakob |Uibeb shared their knowledge about game animals and their exploitation for food with us. Oral history also focussed on the hunters' equipment, hunting methods, game dressing, and meat distribution, preparation and consumption including the taboos associated with these activities. Information on the use of raw materials of animal origin for manufacturing commodities and in folk medicine has been compiled as well. A small-scale excavation at the site of *‡Homob* was carried out parallel to this ethnohistorical approach to test whether certain aspects of the socio-cultural behaviour of the Hai||om had left identifiable remnants in the archaeological record of the Etosha. This indeed proved to be the case.

A cross-cultural comparison of the data generated in the frame of this project with those from 20th century San peoples living in the Kalahari revealed many parallels as well as some marked differences. This comparison not only illustrates the adaptiveness and behavioural diversity of the hunter-gatherer-societies formerly inhabiting arid southern Africa, but also underscores the uniqueness of the Hai||om culture of the Etosha, embedded in a contradictory context of a traditional mode of life and colonial policy developments.

Die Ausweisung der Hai||om von ihren angestammten Siedlungen im Etosha Wildtierreservat durch die südwestafrikanische Verwaltung im Jahre 1954 bedeutete *de facto* das Ende ihrer traditionellen Lebensweise in einer einmaligen, auch heute noch faszinierenden Landschaft. Fünf Jahrzehnte nach dieser Entscheidung wurde ein Projekt initiiert, um das noch vorhandene traditionelle Wissen der Hai||om über die wildlebenden Tiere und ihre Rolle in der Subsistenz jener San zu dokumentieren, die einst die südöstliche Etosha bewohnten. Die hochangesehenen Ältesten der Hai||om Hans Haneb, Willem Dauxab, Kadisen ||Khumub and Jakob |Uibeb teilten ihr Wissen über Wildtiere und deren Verwertung in der Ernährung mit uns. Die Gewährspersonen berichteten darüber hinaus auch detailliert über die Jagdausrüstung, die Jagdmethoden, die Zerlegungsweisen der verschiedenen Beutearten sowie über die Verteilung, Zubereitung und den Verzehr des Fleisches einschließlich der Tabus im Zusammenhang mit diesen Aktivitäten. Die Nutzung von Rohstoffen tierischer Herkunft für die Herstellung von Gebrauchsgegenständen sowie in der Volksheilkunde wurde ebenfalls dokumentiert. Parallel zu der ethnohistorischen Herangehensweise wurde eine kleine Ausgrabung am Siedlungsplatz *‡Homob* durchgeführt, um nachzuprüfen, ob bestimmte sozio-kulturelle Verhaltensmuster der Hai||om sich auch im archäologischen Fundgut widerspiegeln, was tatsächlich der Fall ist.

Ein interkultureller Vergleich der in diesem Projekt gesammelten Daten mit denjenigen für Sanvölker des 20. Jahrhunderts in der Kalahari lässt viele Parallelen aber auch auffällige Unterschiede erkennen. Er zeugt nicht nur von der Anpassungsfähigkeit und Verhaltensvielfalt bei den einst im ariden südlichen Afrika lebenden Jäger-Sammler-Gesellschaften, sondern auch von der Einmaligkeit der Hai||omkultur in der Etosha, eingebettet im Spannungsfeld zwischen traditioneller Lebensweise und kolonialpolitischen Entwicklungen.

Keywords Hai||om, Etosha National Park, animal world, exploitation until 1954, oral history, archaeology, archaeozoology, ethnoarchaeology, cross-cultural comparison
Hai||om, Etosha Nationalpark, Tierwelt, Nutzung bis 1954, Mündliche Geschichtsüberlieferung, Archäologie, Archäozoologie, Ethnoarchäologie, Interkultureller Vergleich

Introduction

For the San/Bushmen[1] communities located in the Etosha and Kalahari biomes, subsistence practices based on hunting and gathering still represented a viable strategy well into the 20th century A.D. However, by the time western scholars became interested in studying "Bushmen" in the 1950s, it was clear that many San people already participated in exchange networks with neighbouring peoples possessing livestock, pots, iron, and other goods of commercial interest. Anthropologists therefore turned their attention to the Ju|'hoansi Bushmen inhabiting the remote and harsh Kalahari biome in northeastern Namibia and northwestern Botswana because it was assumed that contacts until the middle of the 20th century A.D. between these Northern San peoples and the outside world had been marginal at best. Whereas fieldwork in the Kalahari biome between the 1950s and 1970s generated a wealth of data on "traditional" Bushmen, the Hai||om were not studied extensively during this period for two reasons. Firstly, they were not living in 'out of the way areas like Nyae Nyae or Caprivi' and secondly, the interest of many anthropologists at the time did not focus on people who were already incorporated into the colonial system. Frequently labelled as "impure" Bushmen, the Hai||om did not fulfil the requirements that represent an appealing unit of study (Dieckmann 2007a: 170).

However, the 'pristine vision' of the Bushmen portrayed in the works by Lee (1965, 1979), Marshall (1976), and others was challenged in the 1980s, e.g. by Wilmsen and Denbow, who regarded the Bushmen in general, and the Ju|'hoansi in particular, as a dispossessed proletariat marginalised by outside economic interests. This debate – referred to in literature as the Kalahari Debate – has been a stormy one (e.g., Denbow & Wilmsen 1986; Wilmsen 1989; Wilmsen & Denbow 1990; Solway & Lee 1990; Barnard 1992; Kent 1992, Lee 1993) and the arguments of the opposed schools of thought ("isolationists" *vs.* "revisionists") need not be repeated here. However, based on the Kalahari archaeological record, all Bushmen throughout southern Africa had clearly not been major players in the mercantile world since the first few centuries A.D. as the revisionists indicated, but neither were they living fossils of Palaeolithic hunting and gathering economies as has been suggested by the isolationists (Sadr 1997). According to Kent (2002), Sadr (2005), and others, different groups of Bushmen in different parts of the subcontinent experienced contact and assimilation at different times and to different degrees. Evidence for such variations in the timing and tempo of contact and assimilation among hunters and herders in and around the Kalahari comes from an increasing number of archaeological case studies. On the Kalahari's southeastern margin, for instance, Bushmen already became absorbed into the herding and farming economy of Bantu-speakers in the 19th century A.D. (Sadr 2002, 2005). On the other hand, late 20th century A.D. ethnohistorical and archaeological research in the northwestern Kalahari suggested that the Ju|'hoansi living there were essentially independent of neighbouring agro-pastoral groups and that their social system was only marginally affected by the external world (Smith & Lee 1997; Smith 2001). Sadr (2005) reached a similar conclusion for the hunter-gatherers of |Xai |Xai, who seem to have maintained their traditional diet, tool kit, and other technologies well into the 20th century A.D. despite sampling new materials such as ceramics and probably receiving some domestic cattle. However, the identification of cattle at these sites is not unproblematic (Yellen 1990).

Independent of one's position in the Kalahari Debate, it cannot be denied that three decades of fieldwork starting in the early 1950s in northeastern Namibia and (north)western and central Botswana produced a vast and irreplaceable corpus of data on human inhabitation and subsistence practices in Southern African desert landscapes (e.g., Lee & DeVore 1968, 1976; Marshall 1976; Tanaka 1976; Lee 1979; Silberbauer 1981; Solway & Lee 1990; Bartram et al. 1991). For the San communities confined to the Kalahari biome, detailed accounts about subsistence ecology, nutrition, work division, demography, social life, cosmology, and other socio-cultural aspects are available. To quote Widlok (2005: 20), the 1960s and 1970s not only produced outstanding individual contributions of lasting value, also the density of research during this period provided the opportunity to pursue comparative questions and to see recurrent patterns in theoretical debates. During fieldwork, however, researchers already noted that the political developments and socio-economic changes taking place in southern Africa increasingly affected the lives of Kalahari San. Detailing these changes falls outside the scope of this paper, but it is noteworthy that in some instances, their impact was considerable. In December 2006, for example, the Botswana High Court ruled that the gov-

1 Throughout the text, the terms Bushmen and San are used synonymously, as there is no agreement among our informants or within academic circles about the "correct" term.

ernment wrongly evicted more than 1000 G||ana and G|wi San from their ancestral lands in the Central Kalahari Game Reserve in 2002, and that the evictees should be allowed to return (Dieckmann 2007a: 330).

In a way, the problems imposed on the San communities by policy makers in Botswana show parallels to the situation of the Hai||om of the 1950s living in the Etosha. Initially, the proclaiming of the Etosha Game Reserve[2] in 1907 did not profoundly affect the lives of the Hai||om, who were allowed to stay within its boundaries. However, living conditions gradually worsened over the years, for instance, due to increasing hunting restrictions aimed at the protection and long-term conservation of economically valuable big game species (see below). Nevertheless, until the mid-1940s, the Hai||om were still considered 'part and parcel' of the EGR by the Native Commissioner[3] (Dieckmann 2007a: 124ff.). In the second half of the 1940s, however, the influx of tourists grew. In the absence of an adequate infrastructure, visitors would camp near the police stations of Okaukuejo and Namutoni. Whilst visiting the water holes located close to the track from Okaukuejo to Namutoni, tourists could easily encounter Hai||om Bushmen. Reportedly, tourists brought oranges, sweets, and even clothes with them, which were given to the Hai||om in exchange for being photographed.

However, for the Hai||om, the days when they could live adjacent to the waterholes in the EGR were numbered and finally came to an end in the early 1950s. This was initiated by the South West Africa Administration which pushed for final solutions on how to deal with the various Bushmen groups. Already in 1949, a Commission for the Preservation of Bushmen had been appointed. This commission undertook official tours to investigate the 'Bushmen question' and wrote several reports with different suggestions. In its preliminary report, the commission recommended a Hai||om reserve be created near the Etosha Game Reserve. Nevertheless, in 1954, the eviction of the Hai||om from the Etosha Game Reserve was justified by the commission's report stating that their 'assimilation has proceeded too far' so that it would not be 'worthwhile to preserve the Heikum ... as Bushmen' (Schoeman n.d. b, page 6; see Widlok 1999b: 25). The commission thus withdrew its earlier recommendation (Schoeman n.d. a) and proposed that the Hai||om should be expelled. With the exception of twelve families still employed within the game reserve, all Hai||om were forced to leave. They moved either to Ovamboland or to farms south of Windhoek, where they were expected to look for work. The reason(s) for the expulsion of the Hai||om from the Etosha without any offer of compensation were not clearly expressed anywhere.

In contrast to the PhD-study conducted by U. Dieckmann (2007a) focusing on Hai||om ethnicity and identity in a historical perspective, the work in this paper deals essentially with animals and their role as a source of food and raw materials in Hai||om society prior to the establishment of the Etosha National Park. Although the Hai||om in the Etosha lived in a somewhat different environmental setting compared to the landscape exploited by the Ju|'hoansi of the Kalahari, they still faced problems in obtaining enough food due to marked seasonal variation in precipitation, which cause fluctuations in the temporal and spatial availability of plant and animal foods[4]. However, the past, as remembered by the Hai||om, was already a time when they were no longer living exclusively from hunting and gathering. In addition to the accustomed strategies, there were new ways and opportunities of making a living. Some men were engaged in temporary work on farms, and they kept some livestock to augment foraging activities (Dieckmann 2007a: 158).

Since the Hai||om had been living continuously near waterholes in the southeastern Etosha region for over a century, their presence lasted long enough for site formation processes to take place, particularly in locations with permanent water and settlement continuity. Two preconditions rendered an archaeological investigation of the settlements formerly inhabited by the Hai||om promising. Firstly, after their abandonment in the early 1950s, these sites did not witness any further human intervention. Thus, structures remained in original condition until worn down by the forces of time and nature, for instance weathering, or by activities of non-human agents, such as herds of ungulates crossing the sites on their way to and from the water holes. Secondly, since our informants spent part of their lives either at *Tsinab*, *‡Homob*, *||Nasoneb* (Rietfontein), *||Nububes, !Gobaub, Tarae |Namos* (Klein Namutoni), *‡Kharikevis* (Klein Okevi) or *!Nobib* (Ngobib) (Fig. 1), information on settlement outline, structures, activities, activity areas etc. could be collected first-hand.

While the traditional exploitation of wildlife by the Hai||om will be the focus of our study, there is another

2 In 1967, the Etosha Game Reserve (abbreviated EGR in the text) received the status of a National Park; when referring to the time after 1967, the abbreviation ENP (Etosha National Park) is used.

3 Native Affairs Ovamboland (NAO) 33/I, 14.11.1936: Native Commissioner to the Secretary for S.W.A.

4 A recent cultural heritage documentation project coordinated by U. Dieckmann and carried out by a team of scientists including social anthropologists and geographers resulted in a set of seven maps and posters detailing areas of historical, cultural, social, ecological, and environmental significance for the Hai||om of Etosha. A tourguide booklet to the Hai||om cultural heritage in the Etosha is also available now. Further products will be developed in the coming years within the frame of this project.

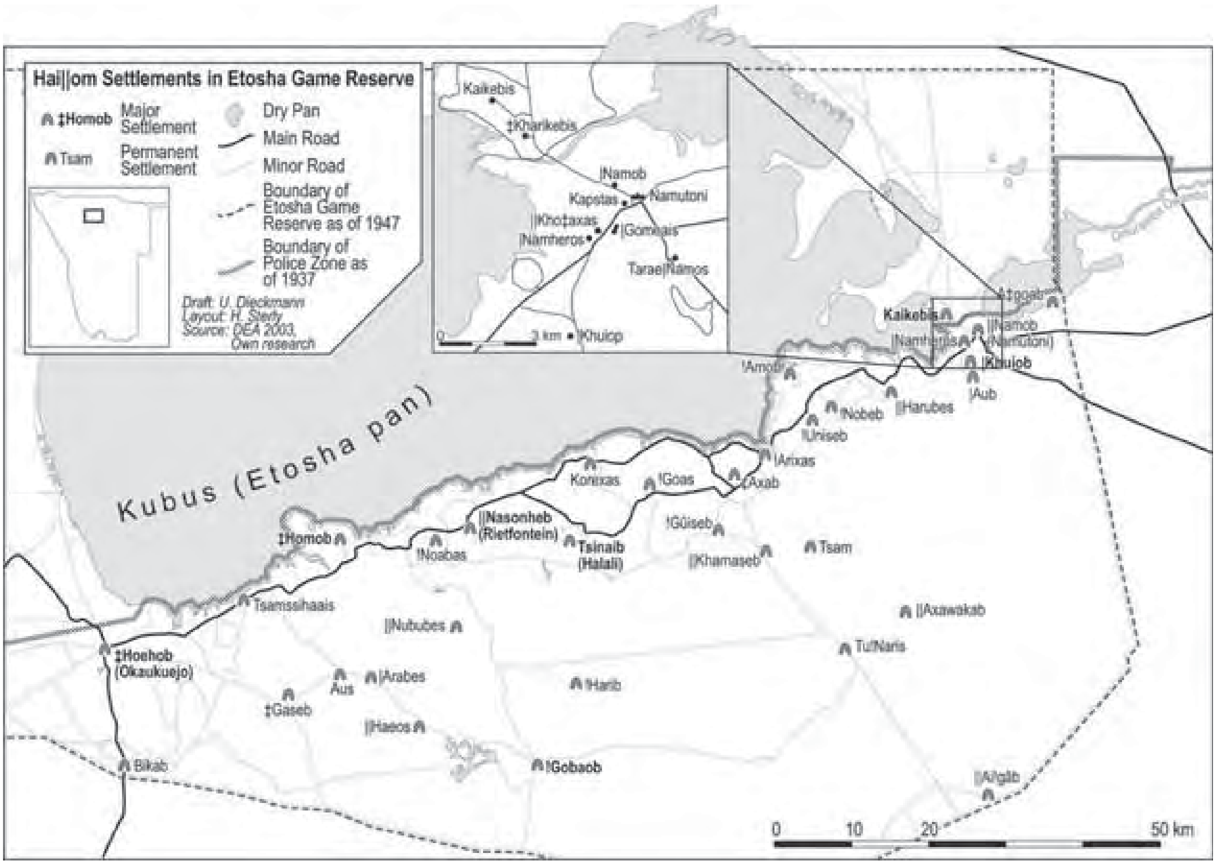

Fig. 1: Former Hai||om settlements in the Etosha National Park.

important aspect to our work. Having no "very place of their own"[5], the Hai||om, once 'part and parcel' of the Etosha, now increasingly face difficulties in their effort to safeguard and pass on their rich cultural heritage to their 21st century descendants. The way the Etosha inhabitants once procured and processed game, transported, shared, distributed, and prepared food of animal origin, modified raw materials into basic commodities etc. are essentials that shaped their cultural identity. Solely from this viewpoint do these ethnohistoric data merit recording.

Materials and Methods

This study builds on previous research conducted by U. Dieckmann (2001, 2003, 2007a, b) that took place within the framework of the Xoms |Omis Project (Etosha Heritage Project), now managed through the Legal Assistance Centre (LAC) in Windhoek. This project aimed at bringing to attention the rich cultural heritage of the Hai||om formerly inhabiting the Etosha Game Reserve, now a National Park, which in 2007 celebrated the centennial of its establishment. The collected data comprise, for example, the name, location, and meaning of places, the social organisation and way of life in former times, the bush food collected and game hunted, the family trees and life lines, and information regarding the changes which have taken place during the 20th century. First results emerging from this fieldwork, showing the seasonal mobility of hunter-gatherer groups, the availability of food resources, and the location of historical places including settlement sites, hunting stands, and waterholes have been presented in the form of maps and a tour guide booklet. However, a systematic investigation of settlement structures and material finds has so far never occurred. Through the courtesy of the Ministry of Environment and Tourism, Windhoek, permission was granted to intensify archaeological research and for the first time to carry out excavations in the Etosha National Park (Permit no. 7/2004 of the National Heritage Council for Excavation in Etosha 2004-2006, and Permit nos. 1088/2006; 1209/2007).

Research design of the study reported on in this paper comprised different steps. The starting point for our project was to conduct interviews with four respected

5 In November 2008, one farm and a portion of another farm south of the ENP were officially handed over to "the Hai||om" by the Deputy Prime Minister "so that they have a place they can call home and to restore their dignity", as Deputy Prime Minister Libertina Amathila expressed it. However, only 200 Hai||om households were registered to be resettled, most of them coming from the Outjo area.

Fig. 2: Our Hai||om informants. A: Hans Haneb (°1929 - †2006), B: Willem Dauxab (°1938 - †2008), C: Kadisen ||Khumub (°1940), D: Jakob |Uibeb (°1945 - †2007).

Hai||om elders (Fig. 2A-D). Born in the Etosha Game Reserve, they all grew up there until forced in 1954 by the colonial administration to leave their homesteads. The Hai||om elders who kindly shared their knowledge about wildlife and a range of aspects of the human-animal relationship in the Etosha with us are:

Hans Haneb (°1929 at *Tarai |Namos*, Klein Namutoni, †2006 at Oshivelo),
Willem Dauxab (°1938 at *Tsinab*, †2008 at Okaukuejo),
Kadisen ||Khumub (°1940 at *||Nasoneb*, Rietfontein), and
Jakob |Uibeb (°1945 at *‡Axab Abab*, †2007 at Okaukuejo),

After 1954, Hans Haneb was employed part of his life by the Nature Conservation department of Etosha. Willem Dauxab worked partly for Nature Conservation in Etosha, partly on farms south of the ENP. Kadisen ||Khumub was employed by Nature Conservation, mostly in the ENP, until his retirement in 2001. Jacob |Uibeb spent many years on farms near the Etosha and at Okaukuejo.

Interviewing took place during several visits of the authors in the ENP Research Camp between 2003 and 2007, the language of conversation being Afrikaans. The information recorded refers to animals and the role they played in the daily life of the Hai||om. In order to document and systemize the knowledge of the Hai||om elders relative to wildlife in former times, a questionnaire was developed. Data acquisition was not restricted to economically valuable species but extended to each taxon considered of interest by the Hai||om regardless whether a food animal or not. We thus recorded the knowledge of the four elders regarding the behaviour and biotope of the different taxa formerly present in the EGR and how they hunted (equipment, techniques), butchered, transported, and cooked these animals. Aspects of meat distribution and consumption within the community, discarding of refuse, food taboos (age, gender), and the utilisation of raw materials of animal origin for manufacturing basic commodities or for medical treatment were also documented. During interviews, we noted the Hai||om terms for toponyms, animals, anatomical structures, plants, mundane objects, etc., and these will be included in the text when necessary. From the curricula of the elders, it is clear that the oral history of animals and their exploitation has a geographical focus on the area south and south-east of the Etosha Pan, which is therefore referred to as the study area in the following text.

To verify and complete the documentation and clarify prior statements, questions were repeated on several occasions. Anatomical drawings of major game taxa, for instance of bovids, equids, giraffids, etc., showing the musculoskeletal and circulatory systems as well as the viscera were provided whilst discussing the name and role of organs and other anatomical features and the bow-hunting of these species. To detail knowledge about the way the Hai||om processed large game in former times, we purchased a female greater kudu (*Tragelaphus strepsiceros*) from a farm. The Hai||om elders dressed and butchered the animal using traditional methods. Each step of the process was documented in detail (see Yellen 1977b, for a similar approach). The kudu also served as an example to document how the Hai||om used to distribute the meat of large animals within their community in the past.

A major desideratum in ethnoarchaeological research of foraging communities is a detailed recording of the culinary end of the processing spectrum (Gifford-Gonzalez 1993: 182). In the absence of traditional settlements, however, we could not observe the overall movement of an animal carcass through the Hai||om subsistence system and document the impact that processing decisions at each stage of the way have on it. Because an *in situ* study of bone waste production and disposal and its consequences for site formation processes was not possible, documentation was limited to identifying the traces of butchering left on the kudu bones after their culinary treatment following Hai||om cooking tradition. We therefore asked the Hai||om elders to return all kudu bone debris left over following meat consumption to us. Unfortunately, recovery was far from complete. Although we were able to collect information about the intentional breakage of bones for cooking and meat and marrow consumption, some issues could not be addressed due to the incomplete nature of the sample.

In order to verify and complete the patterns recorded for the kudu, it was decided to repeat the process, this time with a zebra, also a major food animal of the Hai||om. Unfortunately, the animal intended for our control experiment was only slightly injured by the shot and managed to escape. A welcome side effect was that we finally had the opportunity to marvel at the tracking abilities of the Hai||om elders, who visibly enjoyed spooring. Unfortunately, there was no second chance to get a shot at the zebra that same day and the hunt had to be called off. Due to our tight time schedule, no further efforts could be undertaken to obtain another animal. Documenting patterning, therefore, had to be based on a single large game animal. Although it can be assumed that carcass processing followed a regular pattern applied to large game in general, the second experiment certainly would have augmented our knowledge with regards to the treatment of the different body parts, especially in light of the fact that equids possess a different anatomy.

Parallel to the recording of the Hai||om's ethnohistory of utilisation of animals in the past, it was decided to test whether aspects of their sociocultural behaviour that were likely to leave identifiable residues in the archaeological record could also be evidenced in the Etosha five decades after the Hai||om had left their homesteads. The goal of a first reconnaissance trip, undertaken in the ENP in 2003, was to visit as many sites as possible in order to judge their scientific potential. Due to the particular and tragic circumstances that led to the abandonment of the settlement area and the fact that since this event, the remnants of past human activities had not experienced any anthropogenic influence, the circumstances for archaeological work in the Etosha National Park appeared favourable. We considered an investigation applying archaeological methods advantageous mainly for two reasons. Excavations would complement and eventually enable us to test ethnohistorical information and secondly, the existing ethnohistoric sources for the study area, such as oral history, written documents or photographs would allow additional and more detailed insight into past conditions than a purely archaeological analysis of structures and finds would normally yield.

Of the over 180 localities recorded by one of the authors (U.D.), 27 were subject to primary archaeological observations. Of these, the waterhole *‡Homob* and the nearby homonymous historical settlement site were selected for documentation in further detail in 2004. After a three-dimensional recording of the topography and the archaeological features and objects, all characteristic surface finds were collected. Several distinct features (ash heaps, fireplaces) were examined in more detail subsequent to this initial documentation. During the final stage of the dig, a 24 m^2 area with the remains of two hut circles was excavated. Dig quadrants measuring a quarter of a square metre each 5 cm deep were excavated until the solid calcareous crust was reached. The contents were then sieved through a 2 mm wire mesh. Collecting the finds from the sieve was very time-consuming primarily because of the large number of extremely small glass beads. Several visits from our Hai||om informants occurred during the excavation, enabling us to interview them about settlement structure and history.

Most archaeological features examined as well as the excavation of the hut circles produced faunal remains. Permission was granted to take these to Munich for archaeozoological analysis. The identification of the specimens was carried out with the aid of reference skeletons housed at the State Collection for Anthropology and Palaeoanatomy, Munich (SAPM). Osteological parameters recorded included skeletal element, taxon, anatomical side (left/right), individual age at death, sex, bone weight (as an indicator of fragmentation), cut marks, traces of burning, and post-depositional modifications (gnawing by rodents, carnivores, etc.).

After archaeological and faunal analysis were finished, we then compared the oral history on Hai||om subsistence activities and material culture with examples from the archaeo(zoo)logical record of *‡Homob*. This kind of ethnoarchaeological approach is not new, as an historic overview illustrates (David & Kramer 2001: chap. 1)[6]. Undeniably, a major stimulus to exploring ethnographic data from contemporary hunter-gatherer contexts to create scientific models for interpreting archaeofaunal assemblages has been the approach of Binford (1978, 1981, 1984). The basic principle underlying his construct of ideas was that hunters would make rational economic choices in such a way that animal butchery and transport decisions were made with the nutritional value of the body parts in mind ("economic anatomy"). Consequently, more nutritious body parts would preferentially be transported to the place of consumption at the expense of carcass parts less rich in meat, marrow, and fat, which were left behind at the kill/butchery site. Decision making related to nutritional utility thus caused the bones of a single large carcass to end up in one or more clusters on the landscape, each characterised by a distinctive pattern in the frequency of skeletal element deposition that would also be discernible archaeologically. Working in similar environmental settings and with other taphonomic biases removed, faunal analysis could therefore be expected to reveal groups of assemblages showing similarities in element frequencies. Such situations would be indicative of similar processing and transport histories, implying parallels in subsistence organisation and human behaviour. The scientific approach by which human behaviours and organisational properties in the (distant) past are inferred from the contemporary archaeological record has been termed "middle-range theory".

The theoretical framework underlying Binford's approach and the possibility of statistically testing archaeo(zoo)logical datasets demonstrably influenced archaeological research and propelled ethnoarchaeological and -historical studies. Both the potential and weakness of this so-called actualistic approach have been debated controversially in literature, modifications and alternatives being proposed at several occasions (see David & Kramer 2001, for an overview). One major archaeozoological criticism dealt with the use of the utility indices introduced by Binford. These indices are a combined measure of the meat, marrow, and grease associated with each bone. For these indices to have real explanatory meaning, it is essential to know how accurately the utility curves one generate for a site reflect the original contents of an archaeofaunal assemblage (e.g., Lyman 1984; Grayson 1988: 123; Bartram 1993). This inevitably necessitates a thorough understanding of the accumulation and modification of anthropogenic bone assemblages including non-human factors, both before and after deposition. Good examples of the latter are the activities by carnivores. Studies subsumed under the rubric hunting-scavenging, for instance, have shown how carnivores, in reducing feeding opportunities for hominids at a carcass, will alter the condition and range of parts for hominid butchery and transport (e.g., Binford 1984; Blumenshine 1986; Blumenshine & Marean 1993). The inverse situation, i.e. carnivore feeding on the leftovers of butchery and/or meat preparation of human groups, has been observed causing significant bias in skeletal part distribution as well (e.g., Kent 1993; Hudson 1993).

Despite this and other methodological issues, arid Africa is one of the regions where the actualistic approach gained a foothold. Focusing on the spatial, temporal, and social organisation of *Homo* relative to resource exploitation, hunting success, and debris accumulation, these studies offer insight into human subsistence activities and site formation processes in arid environments, the archaeo(zoo)logical inventories resulting from these, and the behavioural signatures hidden in the material culture, with and without hindsight (e.g., Brain 1967, 1969; Yellen 1977a, b; 1991a, b; Bunn 1983, 1993; Brooks et al. 1984; Brooks & Yellen 1987; Bunn et al. 1988, 1991; O'Connell et al. 1988, 1990, 1991; Gifford-Gonzalez 1989, 1991; Bartram et al. 1991; Bartram 1993; Kent 1993; Marshall 1993; Oliver 1993; Lupo 2001; Smith 2001). Yet, it is telling that these field studies also exemplify the variability and flexibility in the acquisition and processing of commodities by human groups inhabiting arid landscapes. This implies that caution must be exercised when using the archaeo(zoo)logical record to make inferences upon human behaviour and organisational properties of past cultural systems.

At this point it should be stressed that compared to other ethnoarchaeological studies in arid Africa our work in the Etosha suffered substantial limitations. Because of the Hai||om's eviction from the EGR in 1954, oral history is the main key to our knowledge about hunting practices and the utilisation of animals in times prior to this event. This places restrictions on comparisons with work sharing similar intentions in the Kalahari, since the latter could build on extensive first-hand

6 David and Kramer (2001: 2) consider ethnoarchaeology "… neither a theory nor a method, but a research strategy embodying a range of approaches to understanding the relationships of material culture to culture as a whole, and both in the living context and as it enters the archaeological record", which exactly reflects the intention of our work.

Fig. 3: Elephants approaching the waterhole at *!Goas.*

observations. Thus, half a century after the Hai||om were forced to give up their homesteads, quantitative datasets concerning important key parameters, such as the gender-specific division of workload, food collecting *versus* hunting efforts in person-hours/days, meat and hunting returns, animal waste production and disposal, site formation processes, etc. cannot be generated anymore. Moreover, since our archaeological research in the ENP started as an *ad hoc* project with limited time and funding, it can only provide a glimpse into the settlement history and former subsistence activities in the Etosha.

Oral history of animals and their former exploitation in the Etosha

Introductory notes

Tourists visiting the Etosha National Park (ENP) are fascinated by the large herds of herbivores they come across, particularly during the dry season. Herds of African elephants (*Loxodonta africana*) numbering 25 individuals or more are a common sight (Fig. 3), whilst even much larger concentrations can be observed for springbok (*Antidorcas marsupialis*) or Burchell's zebra (*Equus burchellii*). In addition to these taxa, a variety of other medium to large-sized mammals are also attracted by the permanent waterholes (Fig. 4), such as the black rhinoceros (*Diceros bicornis*), white rhinoceros (*Ceratotherium simum*), giraffe (*Giraffa camelopardalis*), gemsbok (*Oryx gazella*), greater kudu (*Tragelaphus strepsiceros*), eland (*Taurotragus oryx*), blue wildebeest (*Connochaetes taurinus*), red hartebeest (*Alcelaphus buselaphus*), and impala (*Aepyceros melampus*) as well as predators like lion (*Panthera leo*), leopard (*Panthera pardus*), spotted hyena (*Crocuta crocuta*), and black-backed jackal (*Canis mesomelas*), to name but a few. The ENP is currently home to some 114 mammal, 340 bird, 110 reptile, 16 amphibian, and 1 fish species, totalling 581 taxa of vertebrates (source: *the**etosha**conservancy.com* – download 15.11.2009)

If the present-day situation in the ENP is taken as a starting point then it is difficult to imagine that at the time when the Hai||om inhabited the area that game density was decidedly lower and that the presence of game species was far less predictable. This is essentially due to the fact that in former times, a number of springs and pans did not contain water all year round, as was the case at *‡Kharios* or *Kokobes*. In these landscapes, hunting activities were restricted to the months

Fig. 4: Springbok, gemsbok, kudu, and zebra visiting the waterhole at *Okaukuejo*.

after the rains. Permanent settling therefore was only possible at places where drinking water was available year round, for instance at ||*Nasoneb* (Rietfontein) or Namutoni. The availability of water is also a limiting factor to animals that need to drink almost daily during the dry season. This applies, for example, to Burchell's zebra or blue wildebeest and explains the comparably higher density of these taxa near reliable sources of water. Other herbivores such as eland, greater kudu, and gemsbok have a somewhat higher tolerance to drought conditions and are not obligatory drinkers in need of daily fluid replenishment. These herbivores will cover long distances to reach waterholes, which is why their preferred habitat can be located at considerable distance from the watering hole (and hence away from human occupation).

In order to cope with seasonal fluctuations in grassland pasture in the Etosha, herds of Burchell's zebra, springbok, and blue wildebeest undertook seasonal migrations that covered considerable distances. Such annual migrations were still possible in the mid-20th century, also partly because perimeter fencing of the Game Reserve had not yet been finished. According to the Hai||om, ungulate herd migration started with the onset of the rains during November or at the beginning of December with concentrations of zebra, springbok and blue wildebeest moving from the eastern EGR to areas west of Okaukuejo, a part of the EGR traditionally not inhabited by Hai||om. Animals subsequently migrated back eastwards as the rainy season progressed, arriving in the southeastern Etosha in April at the latest. One of the maps produced in the cultural heritage documentation project mentioned earlier shows this pattern. Only a few individuals, mostly territorial males, stayed year round in the study area. The rains of course also caused other game species to disperse in the EGR as food and water became widely available. During this part of the year hunting parties or single families would leave the settlements that had permanent access to water in order to hunt and live near the seasonal pans and springs, returning again when arid conditions set in. According to Kadisen ||Khumub, more Hai||om used to live closer to the Etosha Pan at ||*Nasoneb* (Rietfontein) during winter (dry season) than in summer (rainy season), primarily because the population density of zebra, springbok, and wildebeest was higher during the dry season. Since rainfall patterns and vegetation cover governed the annual movements of the medium-sized to large grazing and browsing herbivores, larger concentrations of ungulates occurred near the Etosha Pan during herd migration. The density of medium to large-sized game appears to have been low throughout the rest of the year, with animal numbers fluctuating considerably. Thus, contrary to the impression gained today (and prior to the installation of pumping facilities in the ENP), ungulate density in the study area must have been decidedly lower and the occurrence of game far less predictable. Under such conditions, securing the survival of a human group necessitated elaborate gathering and hunting skills.

Despite its status as a Game Reserve since 1907, it should be noted that many Hai||om families living in the Etosha possessed livestock (for details see Dieckmann 2007: 153ff.). Stock-on-the-hoof was not only bought from or exchanged with the Oshivambo speaking people, the animals could also be purchased at farms or given as remuneration for reliable work. The types of livestock kept within the EGR boundaries included cattle, donkey, sheep, and goat. In 1929, for instance, the station commander of Namutoni reported that four men employed at the station and living nearby possessed 53 cattle, 15 donkeys, 27 sheep, and 237 goats. Ten years later, 98 cattle, 4 donkeys, and 204 goats were counted at the three water holes near Namutoni.

From the written reports and oral information, it is clear that nearly every community raised goats. The situation is somewhat different for cattle and donkey, which were absent at ||*Nasoneb* (Rietfontein), ||*Nububes*, *‡Homob* and *Tsinab*. Even though in the 1930s and early 1940s the colonial administration had allowed stockowners to possess 10 head of large and 50 of small livestock per person, these numbers were reduced drastically with the relocation of the foot-and-mouth disease barrier from Osohama (situated north of Namutoni) to Namutoni in 1947. Instructions issued by the colonial government allowed a maximum of five head of large and 10 head of small stock per person; they also ordered the removal of surplus animals. Thus, it had become impossible for Hai||om to keep large numbers of stock inside the EGR boundaries after 1948.

Preconditions for keeping livestock are the availability of water and adequate pasture land (cattle, sheep) and woodland (goat). Livestock could only be raised in settlements with access to a permanent water supply. Usually a single person was in charge of pasturing the stock owned by the different family groups living near a given water point. Mainly goats were kept by the site inhabitants near *‡Homob* and ||*Nasoneb* (Rietfontein). These animals lived on the leaves, buds, twigs, and fruits of trees and bushes, such as the trumpet-thorn (*Catophractes alexandri – !gabas*), purple-pod terminalia (*Terminalia pruniuides – ‡khaiab*), bitter karee (*Rhus marlothii – |khurubeb*), rough-leaved raisin (*Grewia villosa – sabiron*), bird plum (*Berchemia discolor – ‡huin*), etc. Watering of stock-on-the-hoof took place at least once a day, animals being "conditioned" to proceed straight to and from the waterhole to prevent losses caused by leopards and cheetahs. Such incidents were very rare, though, as both felids usually avoid human presence. At night, juvenile stock was kept in kraals made of stone and older animals were protected from predators by encircling them in kraals made of thorn tree branches. During pasturing, pregnant animals were more closely watched than others. In goats, usually two kids were born, occasionally three and in exceptional cases four. If births took place away from the camp, the newborns would be carried to the settlement in order to prevent jackals and other predators from killing them. Newborns were branded to mark ownership. Castration of surplus billy goats was carried out early in life. It was done by incising the scrotum to facilitate the excision of the testicles. Salt was put into the wound following the procedure to avoid infections and discourage flies. According to the Hai||om, castrated males fattened more quickly and the age of eight months was considered the ideal slaughtering age for these individuals.

However, not all families kept livestock. Willem Dauxab living at *‡Homob* told us that his family did not possess goats, but neighbouring families did. Nanny goats were particularly valued for their milk and young children were given raw milk daily. Adults preferred cooked milk. Milking took place when the animals left or entered the kraal, but the udder would not be emptied completely if the nanny goat was still lactating. Goat milk served as a substitute for mother's milk, for example, if lactation problems arose or if a child's mother had died. In the latter case, several households would cooperate to nourish the infant. Most billy goats were killed in their first year and few males reached sexual maturity. Nanny goats were kept until reproductive success ceased. If venison was not available when family or friends visited then a goat would be slaughtered for the occasion, provided a suitable animal was available. If not, an animal could be "borrowed" from a neighbouring household with the donor family being reimbursed at the next opportunity.

It can be concluded that Hai||om households were allowed to possess small herds of livestock and that these animals fulfilled basic nutritional needs. Children likely benefited most from the keeping of dairy animals, but no information is available on the nutritional status of Hai||om children prior to and after the introduction of dairy stock. However, at no time could livestock replace game as the major source of animal protein and fat.

Interestingly, techniques for the conservation of milk in the form of sour milk, yoghurt, butter, cheese, buttermilk, butter oil etc., appear to have been of no interest. Indeed, if milk turned sour, which was not intended, only adults, not children, would consume it. This contrasts markedly to subsistence practices of pastoralist communities inhabiting northern Namibia, such as the Himba. They employ various techniques to guarantee the long term preservation and storage of milk products. Such techniques ensure survival during events such as prolonged drought, which cause food shortages or bouts of contagious diseases that can seriously affect stock numbers (Casimir & Bollig 1994; Peters 2006).

Although the focus of the following discussion will be on wild animals and their exploitation in the Etosha, it does not imply that animal meat, fat, and marrow were the mainstay of Hai||om subsistence. A larger portion of the diet consisted of bush food, which covered most of the daily needs. Economically valuable plant foods included berries and other fruits such as *sabiron* (*Grewia villosa*, mallow raisin), *‡âun* (*Grewia cf. flava*, velvet raisin), *‡iiros* (*Ximenia americana*, blue sourplum), *‡huin* (*Berchemia discolor*, bird plum) as well as bulbs and corms like *!hanni* (*Cyperus fulgens*, yellow nut-grass), *uinan* (*Cyanella sp.*), and *||nuus* (*Walleria nutans*, bush potato). As Lee (1979: 205) and colleagues pointed out for the Kalahari San, hunting is a less rewarding activity than gathering in terms of overall energy returns, but on the other hand, the hunt and its products hold a central place in the life of the community where the formalised distribution of meat is always an eagerly anticipated occasion. The same holds true for the Hai||om, for whom the detailed narrations of hunting events, even when unsuccessful, were considered essential for future decision-making.

Etosha landscape and Hai||om food animals

Based on the present-day vegetation cover in the study area, *grosso modo* three biomes can be distinguished (Mendelssohn et al. 2002, 98f.), namely the *Salt Pans biome* (Fig. 5a), the *Nama Karoo biome* (Fig. 5b) and the *Tree-and-shrub Savanna biome* (see Fig. 3, in the background, and Fig. 6). Only few plant species thrive in the saltpans due to the saline conditions. The *Etosha Grass and Dwarf Shrubland* is situated adjacent to the *Salt Pans biome* and along the margins of the Etosha Pan. It is a major type of vegetation in the Etosha. Botanically speaking, it forms part of the *Nama Karoo biome*. In this sweet grassveld on limestone, the shallow depth of the relatively saline soils limits the growth of trees. The *Tree-and-shrub Savanna* biome is located next to it. It is the dominant plant cover in the study area. In this biome, the woody cover can be quite dense, with large trees growing on deep soils. According to C. le Roux et al. (1988), the main vegetation types encountered in the *Tree-and-shrub Savanna* biome of the study area are the *Mopane Treeveld*, the *Mopane, Combretum and Terminalia Bushveld*, the *Terminalia-Tamboti Forest*, the *Mopane and Marula Woodland*, the *Mixed Bushveld*, and the *Sandy Bushveld*.

The animal world observed in the different landscapes of the ENP today corresponds fairly well to the situation, as it existed a half a century ago, although with some notable exceptions. One of these is the African elephant. Actually numbering more than 2000 in the ENP, this pachyderm had been absent in the study area since the late 19th century, the last herd of elephants being killed at Klein Namutoni in 1881 (Germishuys & Staal 1979: 110f.). Estimates for the early 1950s suggest that perhaps as few as 50 individuals were left in the entire Game Reserve (Mendelsohn et al. 2002: 121). However, at that time the boundary of the EGR extended as far west as the Atlantic coast and included a considerable part of what is now known as the Skeleton Coast National Park! Covering an area of 93,240 km^2 (using the borders of 1907), it originally encompassed an area nearly four times as large as it is today (22,912 km^2; Dieckmann 2007a: Fig. 1). Hunting for ivory was no doubt the main reason for the decline of this species in 19th century northern Namibia. As might be expected, none of the Hai||om elders ever participated in a traditional elephant hunt, but Kadisen ||Khumub heard about such an event from his grandfather. He told us that hunting an elephant was akin to ‘going to war’, since it necessitated large parties of young, strong hunters willing to combine their efforts in a dangerous undertaking. Assegais were used in the hunt and wounded individuals were sometimes pursued for days if necessary. Once an animal was killed, message was spread to the hunters’ relatives to join them at the kill site. Upon their arrival, the elephant meat was processed to biltong and the dried meat carried home. The carcass was left at the kill site.

None of the Hai||om elders was acquainted either with the black or the white rhinoceros prior to the re-introduction of these perissodactyls into the EGR in the 1960s, nor is there any ancient story referring to them. This is not surprising because by 1886 no white rhino were left in the Etosha, and the only black rhino remaining had found refuge in some of the most inaccessible spots found in the park (Germishuys & Staal 1979: 110f.). According to our informants, the black rhino introduced to the EGR originated from the Kunene Region (former Kaokoland) and the white rhino from the Caprivi. Animals were released after a period of accommodation during which they were nourished on farms. Today, both rhino species occur in considerable numbers in the ENP.

Black-faced impala were (re)introduced into the Etosha as well. Based on oral tradition, it seems that impalas were still quite numerous in the Etosha earlier in the 20th century. According to the Hai||om, however, num-

Fig. 5a: The Salt Pans biome.

Fig. 5b: The Nama Karoo biome.

bers obviously declined in the course of the following decades with the species becoming increasingly rare in the 1940s. Conceivably, the situation worsened and necessitated the reintroduction of animals from the Kunene Region in the 1960s.

The Hai||om elders explained that some vertebrate taxa were absent from the study area but knew about them through story telling, while they were employed in other parts of the ENP or as labourers on adjoining farms. In this case, knowledge about the species' habitat requirements, behaviour, feeding habits, and reproduction is clearly less detailed. Good examples of this are mammal taxa associated with mountains, like the Kaokoveld rock dassie (*Procavia welwitschii*), chacma baboon (*Papio ursinus*), and mountain or Hartmann's zebra (*Equus zebra hartmanni*). According to the Hai||om elders, baboons may have been present near *Tsinab* in former times, but this remains to be confirmed. Baboons were not hunted because of their resemblance to human beings. The Kaokoveld rock dassie and Hartmann's zebra are both actually confined to the western and southwestern ENP. According to the Hai||om, Hartmann's and Burchell's zebra can be differentiated not only by the patterning of their stripes but also by the particular sound of their voices. Another large mammal known to occur in the ENP but never observed by the Hai||om is the African civet (*Civettictis civetta*). This large viverrid is to-date confined to landscapes north and northeast of the ENP (Smithers 1986: 118) and appears only an occasional visitor to the northeastern ENP. Conceivably, a distribution further south was hampered by the absence of forest and woodland biotopes and permanent water, which are essential habitat requirements of this solitary, nocturnal species.

Our attention was also drawn to the fact that several bird species described from the ENP did not live in the study area. Examples of this are the white pelican (*Pelecanus onocrotalus*), saddle-billed stork (*Ephippiorhynchus senegalensis*), African openbill stork (*Anastomus lamelligerus*), and the glossy ibis (*Plegadis falcinellus*). These four taxa occur near large water bodies, with an abundant supply of fish, amphibians, and molluscs, that are bordered by extensive reed beds, grass- and marshlands, and tall trees. The latter habitat feature is essential to the African openbill and the glossy ibis because these birds roost in colonies in trees. The absence of watercourses with lush vegetation in southeastern Etosha also explains why the three Psittacid species present in the ENP, namely Rüppell's parrot (*Poicephalus rueppellii*), Meyer's parrot (*Poicephalus meyeri*), and the peach-faced lovebird (*Agapornis roseicollis*) have never been observed in the study area.

The Hai||om elders were of course well aware of the fact that ecogeographical conditions such as topography, soil type, plant cover, and the availability of food and water determined animal species distribution. Taxa like springhare (*Pedetes capensis*), common molerat (*Cryptomys hottentotus*) or aardvark (*Orycteropus afer*), for instance, were reported to exhibit a patchy distribution in the study area because compacted sandy soils was an essential requirement to these burrowing animals. They were therefore restricted to places such as Okondeka or near Namutoni, areas frequented by the Hai||om that searched for them. Specific food demands also account for the irregular distribution of species like aardwolf (*Proteles cristatus*) and aardvark in the ENP, which live on ants and termites, or the Damara dik-dik (*Madoqua kirkii*), that feeds on leaves and shoots of selected trees and shrubs. This tiny antelope prefers woody vegetation including well-developed shrub undercover and thickets on red soils (Fig. 6). Its habitat requirements explain why those Hai||om once living near Namutoni, like Hans Haneb and Kadisen ||Khumub, were well acquainted with it. However, people living at *‡Homob*, like Willem Dauxab, never observed the species there, which can be explained by the local vegetation cover and the fact that dik-diks are known to avoid lime soils. The predominantly insectivorous bat-eared fox (*Otocyon megalotis*) is much more frequent in the Etosha Grass and Dwarf Shrubland vegetation compared to other types of vegetation in the study area. In open country it is often observed hiding under bushes of the Goosefoot family (*Salsola etoshensi, Suaeda articulata – ‡hoedi)* waiting for edible prey like insects, scorpions, and mice to wander by. According to Hai||om knowledge, eland were partial to the red (*arob*) and black (*kobab*) soils located in the southern part of the study area, for instance, near the permanent spring of *!Gobaub*, which is why hunting trips were undertaken to this waterhole. Today warthogs (*Phacochoerus aethiopicus*) are a common sight at the Okaukuejo Rest camp, yet they were not very frequent close to the Etosha Pan. Our informants describe these suids as diurnal, resting at night in holes, usually deserted aardvark holes. This type of cover is vital to their survival, affording them protection against predators and adverse climatic conditions to which they are sensitive (Smithers 1986: 148). Obviously, warthog population density was much higher (and hunting success too) in areas with sandy soils, for instance, in the bushveld near !*Gobaub*, where the species' choice food plants, including fresh green grass, rhizomes, and berries were comparably abundant.

It is noteworthy that in the 1940s and 1950s, certain species of carnivore seem to have been more abundant in the southeastern Etosha than today. According to the Hai||om elders, this applies to the cheetah (*Acinonyx jubatus*), African wild dog (*Lycaon pictus*), and serval (*Felis serval*). Their decline could perhaps be due to uncontrolled hunting and poaching in the de-

Fig. 6: Dik-dik in its favoured habitat, *Namutoni* area.

cades following the eviction of the Hai||om from the Etosha. Lions, on the other hand, seem to have been far less common in the study area in former times than they are today. Historical records illustrate that during the second half of the 19th century this species suffered under considerable hunting pressure. Thus, by the turn of the century, the lion population in the Namutoni area had been completely decimated, and it was not until 1912 that the first lion was again heard roaring near that place (Germishuys & Staal 1979: 110ff.). Protective measures and the instalment of pumping installations certainly resulted in an increase in ENP animal biomass in the second half of the 20th century. Fencing of the ENP moreover reduced the mobility of favourite prey animals, i.e. zebras and gnus. To a certain extent, these actions explain why large prides of lions are a common sight near permanent water holes today.

If the foregoing illustrates that in the 1940s and 1950s a considerable variety of small to large sized vertebrate species frequented the southeastern Etosha, it does not imply that all taxa present were considered food animals. For the Ju|'hoansi, Lee (1979: 228f., Table 8.3) proposed a classification of the animals into four groups according to their grade of edibility:

(1) Species whose meat is eagerly sought after, such as small to very large antelopes and game birds;
(2) Species that are not regularly hunted but are taken if the opportunity presents itself;
(3) Animals that are not hunted at all, although some people will eat the meat if it is offered to them; and
(4) Species that for various reasons are never eaten, because they are too small (such as lizards and mice), difficult to capture (elephants), tabooed (monkeys and hyenas) or a combination of these factors.

Table 1 shows an approximate classification of food animals of the Hai||om using a similar approach. Whereas Class 1 animals are unproblematic, problems arise assigning some animal taxa to either Class 2 or 3 because the boundaries between them overlap and distinction appears subtle. For example, the consumption of the meat of *xamanî*-animals – a collective term comprising most medium to large carnivore species – was not common practice, particularly with respect to the lion (*xam*), spotted hyena (*Crocuta crocuta – haibeb*) or brown hyena (*Hyaena brunnea* – ||*abub*). According to Hai||om belief, these three carnivores were almost human *xamanîn* and therefore considered almost equal to man. This "mutual respect" amongst living beings standing at the top of the Etosha food chain explains the

Class 1 – Taxa hunted and eaten whenever possible			
Mammals	***Birds***[1]	***Reptiles***	***Insects***
Scrub hare	Ostrich	Leopard tortoise	Mopane worm
Springhare	Helmeted guinea fowl	Monitor lizard	Termite
Porcupine	Francolin (3 spp.)	Rock python	Locust
Aardvark, antbear	Sandgrouse (2 spp.)		Bee's honey (2 spp.)
Burchell's zebra	Doves (3 spp.)		
Warthog	Hornbill (4 spp.)		
Giraffe			
Gemsbok			
Eland			
Blue wildebeest			
Greater kudu			
Springbok			
Hartebeest			
Steenbok			
Black-faced impala			
Damara dik-dik			
Common duiker			
Class 2 – Taxa hunted and eaten if the opportunity presented itself			
Pangolin	Black stork		
Aardwolf	Flamingo (2 spp.)		
Cheetah	Thick-knee (2 spp.)		
Leopard	Woodpecker (2 spp.)		
Caracal	Greater painted snipe		
African wild cat	Grey lourie		
Serval	Fly-catcher		
Black-backed jackal	Groundscraper thrush		
Bat-eared fox	Shrike (2 spp.)		
Small-spotted genet	Bare-cheeked babbler		
Honey badger	Weavers (3 spp.)		
	Waxbills (2 spp.)		
	Kalahari scrub robin		
	Southern ground hornbill		
	Yellow-breasted apalis		
	Long-billed crombec		
	Sparrow (2 spp.)		
	Sparrowlark (2 spp.)		
	Starling (2 spp.)		
	Whydah (2 spp.)		
Class 3 – Taxa eaten by some persons or age groups if the meat was available			
South African hedgehog	Kori bustard		
Bushveld elephant shrew	Korhaan (2 spp.)		
Common molerat	Ducks (3 spp.)		
Ground squirrel	Egyptian goose		
Tree squirrel			
Lion			
Brown hyena			
Spotted hyena			
Slender mongoose			
Yellow mongoose			
Suricate			

Class 4 – Taxa strictly avoided because meat consumption tabooed[2]	
Lesser bushbaby or Mohol	Secretary bird
African hunting dog	Crows (2 spp.)
Cape fox	Fork-tailed drongo
Striped polecat	Roller (3 spp.)

[1] Clutches of the following taxa were collected whenever the occasion presented itself: Ostrich, owls, grebes, flamingos, ducks, Egyptian goose, thick-knees, Kori bustard, korhaan, francolins, sandgrouses, hornbills, starlings, helmeted guinea fowl, cape crow, grey lourie.

[2] We listed only those taxa whose meat was never eaten since tabooed (see text). Numerous other vertebrate and invertebrate species were not consumed either, e.g., eagles, hawks, buzzards, vultures, kites, falcons, cranes, plovers, lapwings, owls, etc. We did not include them in Class 4 since it was not forbidden to eat them, although the Hai||om elders never observed people doing so.

Table 1: Animal taxa exploited by the Hai||om, which basically follows the classification proposed by Lee (1979: 226 and Table 8.3). Class 4 comprises the species that were strictly avoided by the Hai||om since tabooed.

marginal exploitation of large carnivores by the Hai||om. However, according to the informants they would consume the meat of hyenas in times of food shortage with most age groups participating in such a meal. None of our informants had ever eaten lion meat, but stories of Hai||om doing so exist. According to oral history, one particular family with the surname ||Oresen had the reputation of consuming and enjoying lion meat, something which apparently applied to individual men of that family. Lions must therefore be considered Class 3 animals in Table 1.

Other *xamanî*-species confined to the study area, such as the aardwolf (*Proteles cristatus – |gîb)*, cheetah (*Acinonyx jubatus – |noeb*), leopard (*Panthera pardus – ǂhuinab*), caracal (*Felis caracal – !hāb*), serval (*Leptailurus serval – |noab*), African wild cat (*Felis silvestris – |hôab*) and bat-eared fox (*Otocyon megalotis – ||ab*), did not escape human predation, though. There were, however, rules governing meat preparation (see below). Meat consumption would always be on a voluntary basis and it appears that mostly children, young hunters, and older persons took part in such meals. In this respect, it is noteworthy that in the 1940s and 1950s, Hai||om hunters pursued another carnivore species for its meat and fat, namely the black-backed jackal (*Canis mesomelas – |gaireb*). It is therefore listed as a Class 2 species here (Table 1). In the 1960s, however, the medicine men (*!gaiob*) decided that this canid was to be considered *xamanî* as well*;* it thus became a tabooed food animal.

The oral record also reveals that three other *xamanî*-species systematically escaped human predation and consumption. The most notable of these is the wild or African hunting dog (*Lycaon pictus – |narub*). The aversion of the Hai||om against this canid is rooted in its hunting and feeding behaviour. Hunting dogs did not kill their prey quickly. Instead, pack members chased their quarry until it became exhausted and could be overtaken, whereby the victim was mobbed from the rear and killed by tearing at the belly and the hind quarters until it collapsed. Wild dogs were considered 'wasteful' animals because they left large, edible parts of their prey animals untouched at the kill site. Another carnivore species that escaped predation was the small striped polecat or zorilla (*Ictonyx striatus – !urob*), a mustelid reported to produce a foul-smelling odour when threatened. Finally, the Cape fox (*Vulpes chama – !khama|gairib*) also had nothing to fear from the Hai||om.

Very small mammals, such as shrews and rodents, may not be worth hunting considering their small meat yield. This explains why Lee (1979: Table 8.3) listed them as Class 4 vertebrates. From the Hai||om elders, however, we learned that such small creatures were not disdained in the Etosha region. The main consumers were children and (old) women, but also young hunters. Hai||om boys, for example, occasionally killed small rodents and birds, particularly while practicing with their hunting weapons. Young and experienced hunters also did so, for instance, when testing the accuracy of their new bows by targeting birds, ground squirrels (*Paraxerus inauris – |ēb, haunamab*), tree squirrels (*Paraxerus cepapi – |haeseb*), and other small vertebrates.

The Hai||om ignored bats as meat animals (Class 4), but according to our informants, the neighbouring Ovambos would kill them because they considered the animal's well-developed pectoral muscles quite tasty. As was mentioned previously, primates were not killed because of their close resemblance to human beings. This also applied to the mohol or lesser bushbaby (*Galago moholi – naoede*), the only primate species occurring in the study area. The Hai||om did not hunt this nocturnal primate since its face reminded them of a young girl.

Besides mammals, certain birds were also tabooed and therefore not consumed (Table 1). The secretary bird (*Sagittarius serpentarius – khoeseb*), for instance, was considered a 'good' bird by the Hai||om: Besides walking upright as human beings do, it also feeds on (poisonous) snakes. The pied crow (*Corvus albus – !kha-*

nub) was a protected bird as well, because according to Hai||om tales, it brought back the rain after it was taken away from them by those animals 'married to the rain', meaning the elephants. The Cape crow (*Corvus capensis – gorab*), a close relative of the pied crow, was not consumed either. Another species associated with a taboo is the fork-tailed drongo (*Dicrurus adsimilis – ||gauseb*), a passeriform that announces the onset of the day. Rollers (Genus *Coracias – oo-oo||nâes*) were not killed either, because they would deliver messages, for example, if a hunter's wife was pregnant without the husband knowing so. If several men were present, the roller would even follow and circle the father in question! Other taxa that were not pursued include korhaan and all birds of prey (eagles, hawks, buzzards, vultures, kites, falcons) as well as cranes *(!kara !noro*), plovers, lapwings, and owls.

Although the aforementioned illustrates that particular bird taxa were excluded from the menu, it is nonetheless clear that the majority of the Etosha avifauna, from the small passeriforms to the large ostrich (*Struthio camelus*), did not escape human predation and that hunting pressure varied from species to species. Guinea fowl and francolins were important food species to both the Hai||om and Ju|'hoansi, whereas ducks and geese, considered Class 1 birds by Lee (1979: Table 8.3), only played a very marginal role in the diet of the Etosha inhabitants. None of our informants had ever eaten the meat of ducks or geese, which total four species in the ENP, but as children, they observed old Hai||om doing so. For most Hai||om, the kori bustard (*Ardeotis kori – !huib*) would be *sōxa*, meaning taboo, except to old men. Parallel to the situation noted for mammals, we can maintain that the Hai||om captured a large range of small to large-sized bird species for consumption, whereas the Ju|'hoansi inhabiting the Dobe area obviously abstained from hunting such creatures which they viewed as unrewarding (Lee 1979: 227ff.).

For some San communities inhabiting the Kalahari biome ostrich eggs constituted a significant contribution to the diet (Lee 1979: 232), yet Marshall (1976: 127) mentioned its avoidance by men and women from "the age of puberty till they are old enough to have had five children". To the large majority of the Hai||om, the contents of ostrich eggs were *sōxa* and therefore not consumed, except by old men, who were allowed to eat (almost) everything. Interestingly, the avoidance of this highly nutritious food only concerned ostrich eggs but not the eggs of some 40(!) other medium to large bird taxa residing in the EGR (Table 1, footnote 2). According to our informants, the entire clutch of these birds would be plundered from their nests when the opportunity arose, a fate shared by, e.g., owls, flamingos, francolins, helmeted Guinea fowl, Cape crow (but not the pied crow), and the grey lourie or go-away-bird (*Corythaixoides concolor – khoeb*). Ostrich meat was rarely consumed by the Ju|'hoansi, probably because of difficulties in hunting this fast moving species (Lee 1979: 232). The Hai||om, however, used a certain risk-free technique to kill these birds (see below) and readily consumed ostrich meat.

A few reptilian taxa were considered of dietary relevance by the Etosha's human inhabitants, namely the rock python (*Python sebae – duros*) which were consumed by some families but not others, the savanna or rock monitor (*Varanus exanthematicus – ||nareb*), and the different tortoises (*!naan*), of which the common leopard tortoise (*Geochelone pardalis*) was the largest and most economically important.

The number of invertebrate species exploited for food is limited, but some taxa were valued. The mopane worm (|*iirub*), i.e. the large edible caterpillar of the moth *Gonimbrasia belina*, was usually harvested in February/March. Once dried, it could be stored for some months. Mopane worms would burrow underground to pupate (the stage at which it undergoes complete transformation to become the adult moth) in April/May and stay there until the heavier rains started (November/December). During this stage of their life cycle, the worms are called *goms.* Mopane larvae were deliberately sought after since they are rich in fat. After the rains set in (November/December), the adult moths would fly out and deposit their eggs on the Mopane trees, which then hatched to become |*iirun*.

Following the first rains in the Etosha, termites (*anin*) would form clouds of flying insects. After a very short nuptial flight, the insects would loose their wings and disappear in the ground to nest. If in the evening people observed the termites leaving their colony, they would make a fire on the spot. Attracted by the light, the termites would stay close to the fire and could then be collected in a hole at the foot of the hill, where they landed after their wings had been burned using a torch (Widlok 1999: 94, footnote 14). The harvested termites would be dried on a shelf in a tree (||*hais*) but had to be consumed within the next two weeks prior to decay.

Swarms of locusts (*Locusta migratoria – ‡hommi*) crossing the Etosha occasionally formed a welcome addition to the diet. They were harvested like termites by burning their wings whilst the animals were resting in a tree at night. Immobilized this way, substantial amounts of locusts could be gathered, dried, and stored for later consumption.

Bee honey was another delicacy and people sometimes got access to it by observing the honey badger (*Mellivora capensis –* |*noreaib*) closely. Bee nests are found in trees and in the ground. Hai||om distinguished between the two species of bees, the *dani !habun* for the more common tree bees and *xuin* for the less frequent ground bees. Bee nests were the property of the group inhabiting the area and were marked to indicate ownership. Throughout most of southern Africa, honey guides (*Indicator* sp.) are reported to accompany or even guide ratels to bee nests (Estes 1991: 435f.), but these birds are absent from the ENP. The Hai||om, however, noted a close association between the honey badger and the groundscraper thrush (*Turdus litsitsirupa*). Up to four thrushes have been observed 'riding' on a single badger, but it is not certain whether the species is of use to locate bee nests. Because they feed primarily on invertebrates (Maclean 1985: 508), it is conceivable that the thrushes are picking out parasites and other bothersome creatures residing in the badger's thick coat. However, from the Hai||om elders we learned that this bold bird is particularly fond of larval bees, and that it will therefore accompany ratels on their raids. Once it has forced its way into the bee hive, the badger would tear apart the nest in search of combs containing larvae. The thrush, eagerly wanting its share, employed a trick strategy and would irritate the badger provoking it to the point where it would attempt to chase away the thrush. According to our informants, the bird would then come back repeatedly during the badgers brief departures and be rewarded with his prize.

In sum, the animal world of the Etosha opened up a broad range of possibilities for the hunters to procure protein, fat, and honey as well as a variety of raw materials of animal origin. For different reasons, a number of species were *sōxa* to the Hai||om and therefore avoided, but the majority of medium to large vertebrates obviously was not.

The hunter's equipment

The procurement of game by means of mobile hunting involved trips of single or small groups of persons at substantial distance from the settlement. This necessitated adequate equipment to survive in the bush. When leaving the camp for an extended hunting trip (*!hamis*), hunters usually took the following equipment with them:

(1) Bow (*khās*);
(2) Quiver (*!gurub*) and arrows (*!amooab, ‡giis, !khoreoas*)
(3) Throwing club or knobbed stick (*kiri*)
(4) Digging stick (|*kho*||*nab, kaohais)*
(5) Water bag (||*gam!gawas*)
(6) Carrying bag (|*hôagaos*)

Snares were included in the equipment as well if a hunter knew he would come across places where terrestrial birds had been observed feeding. A stick (*darab*) to carry the meat back to the camp would be fashioned *ad hoc* at the kill/butchery site.

Bow (khās)

Bows were made of the wood of a raisin shrub (*Grewia* spp. – *‡aun*) or a snot berry shrub (*Cordia* spp. – |*hâis*). In order to prevent the formation of cracks or even breakage, the wood was polished with the fat from the kneepan (*saro*||*goas*)[7] of a large antelope or zebra. The bark of the bastard umbrella thorn (*Acacia luederitzi var. luederitzii – !gûs*) could be used additionally to give the bow a reddish colour. If a bow curved too much, fat-yielding bone marrow would be applied in order to straighten the wood thus bending it back.

The belly skin of steenbok would be selected for making the bowstring (*!gae!naab*), but that of other species, for instance, greater kudu, could also be used. A strip of skin of appropriate length would be cut, twirled, and fastened to the wood, whereby more windings were needed to secure the bowstring to the upper tip compared to the lower tip. Rubbing the twirled piece of skin with bone marrow at regular intervals ensured the continuing elasticity of the bowstring.

Quiver (!gurub) and arrows (!amooab, ‡giis, !khoreoas)

A choice raw material for manufacturing quivers was the belly skin of a large ungulate, often a zebra. After cleaning, tanning, and greasing, the pelt would be transformed into a quiver by sewing it with strings made from the belly skin of steenbok, common duiker or dik-dik. The quiver (*!gurub*) contained the arrows that were ready for use, with poison already applied to some of the arrowheads. Spare shafts and arrowheads were kept separately in a carrying bag (|*hôagaos*).

Branches from *Grewia* or *Cordia* shrubs provided the raw material for crafting arrow shafts. Usually straight branches of *c*. 80-100 centimetres in length would be selected. In case of minor bending, straightening could be done by moderately heating the branches over a fire and rubbing them with the fat pad of the kneepan. Reduction and smoothing took place using a knife until the shaft reached approximately the same diameter throughout its entire length, with a slight broadening towards the tip. According to our informants, this would improve the arrow's handling characteristics and flight. The tip of the shaft had to be trimmed to fit the socket of the iron arrowhead. The back end was incised to split out the nock. Expectedly, arrow shaft length varied according to the hunter's personal experience[8]. Arrow shafts designed for hunting larger game and crafted by

7 The patellar ligament is separated from the joint capsule by a large quantity of fat, the infrapatellar fat pad (*Corpus adiposum infrapatellare*) (König & Liebich 2004: 224).

8 For the Okombambi-Tjimba, a hunter-gatherer group living in the east of the Baines Mountains near Okombambi (15 km south of the Kunene River), it was noted that the wooden arrows measured 70-75 cm and that the bow was 1.4 m long (Neuwinger 1996: 97).

Fig. 7: Fletched arrows and types of arrowheads used by the Hai||om. Details: Nock with feathers (left) and three arrowheads termed *!amooab* (left middle), *‡gîs* (right middle), and *!khoreoas* (right).

the experienced Hai||om hunter Hans Haneb exhibited lengths of 63.5 to 68.5 cm (Fig. 7).

Prior to the attachment of the arrowhead, fletching had to be finished. Experienced Hai||om hunters recommended the wing flight feathers (or *remiges*) of the *‡nuuxab*, i.e. the lappet-faced vulture (*Torgos tracheliotus*) or the white-headed vulture (*Trigonoceps occipitalis*), whereas those from *!urixab*, i.e. the Cape vulture (*Gyps coprotheres*), white-backed vulture (*Gyps africanus*) or hooded vulture (*Necrosyrtes monachus*) were considered unsuitable for this purpose. Young hunters fletched their arrows with the feathers of Guinea fowl (*Numida meleagris*), a common and important game bird in former times. Several methods existed for obtaining vulture feathers, for instance, by killing birds while the animals were scavenging a carcass. Feathers could also be collected after *‡nuuxab* had finished their meal and abandoned the carcass: Feeding vultures are known to display aggressive behaviour and feathers are often lost in scuffles over food. Another technique consisted in putting a strap around the feet of a vulture nestling and fastening them to the nest-tree. After the moult, the now fully-fledged vulture, unable to fly away, could be killed easily and the feathers (and eventually the meat) utilised.

The first step in preparing suitable wing feathers for fletching consisted of removing the feather's hollow shaft. The feather was then cut into segments of appropriate length. In the arrows made by Hans Haneb, these segments measured *c*. 6 cm ± 0.5 cm. Each segment would then be sectioned along the rachis to obtain two halves. At each end, the vane was removed, exposing the rachis over a length of 1 to 1.5 cm. The remaining middle section of the vane was subsequently trimmed into a triangular form, the highest point of it being located off-centre and closer to the nock. Fletching was done by securing the exposed feather ends of the rachis onto the shaft using sinew thread. Prior to binding, the sinews had to be softened, which was done by repeatedly kneading and tearing. To prevent the nock from splitting, strips of sinew were wrapped around the back tip (Fig. 7, below left).

Arrowheads were cut from metal objects such as for instance tin cans discarded behind by officials, army patrols, and tourists visiting the Etosha. Food rations provided to the Hai||om in the late 1940s and early 1950s were contained in tin cans. The scarcity of suitable pieces of metal and large investment of time necessary to produce arrowheads in part explains why hunters always attempted to recover arrows that had missed their target. They also searched for arrows that had gone astray because of the danger posed by arrows lying around, particularly the poison tipped points (s. below). At the base of the arrowhead, the metal was extended and shaped into a kind of socket, which was slipped directly onto the trimmed wooden shaft.

The Hai||om used three different types of arrowheads. The first type of arrow (*!amooab;* Fig. 7 below, middle left) had a head measuring *c*. 5-7 cm. *!Amooab* arrows were not poisoned and used mainly to kill mammals the size of steenbok, common duiker, springbok or warthog, usually at rather short distance and often during the hottest part of the day when animals are found resting in the shade. *!Amooab* arrows were also selected when hunters wanted to save poisoned arrows (*!khoreoas*), for example, when dogs were present that could stall game after it had been injured.

A second type of arrow, *‡gîs*, features a double-pointed arrowhead and resembles an open V (Fig. 7, below, middle right). In the Hai||om language, *‡gîs* means "two sides", but our informants refer to this type of arrow as "bone breaker". According to the elders, the V-shape, combined with the hitting power of the arrow and the twirling on its own axis could easily drill through different sorts of bony tissue at short distance, such as a rib, shoulder blade, or long bone. It was mainly used for shooting medium-sized prey, primarily steenbok and common duiker.

The third type of arrow is named *!khoreoas* and is characterised by a small pointed arrowhead (Fig. 7, below, right). These arrows are poisoned with the sap of a succulent shrub *Adenium boehmianum* (Fig. 8), which was widely distributed in the study area and referred to as *!khores* by the Hai||om. *!Khores* is a very potent poison and used for hunting a variety of medium to large game species up to the size of eland or giraffe. The milky juice stored in the plant's tuber was obtained by etching and/or through pressure. Heating the squeezed out juice over a fire was the next step, whereby boiling went on until it reached a dark, brownish syrup, which would solidify with cooling down. During this part of the process, the poison could easily be divided into smaller portions. Each hunter prepared his own poison, but in case one ran out of it, one could ask his peers to help out, either by providing the poison itself or a poisoned arrowhead.

To apply the poison to the arrowhead, the amount considered suitable was reheated until it became viscous. Once the arrowhead was coated with poison it would dry up after a short time. Another possibility was to heat an arrow head in the fire and mould the *!khores* to it (Neuwinger 1996: 96). In *!khoreoas* arrows, the head was not attached very securely to the shaft and upon hitting the prey it could fall off leaving the poisoned piece of metal in the wound. The animal's body temperature would rapidly cause the *!khores* to dissolve and enter the capillary system, enabling the chemically active ingredients to enter the main bloodstream and become effective[9]. Depending on which body part was struck by the arrow and the kind of tissue injured, the animal's size, and its body mass, an animal's state of agony might last less than a minute, but sometimes the effects would become noticeable only much later. If a major blood vessel or vital organ (heart, liver, and kidney) were struck, restlessness and convulsions would ensue with death following quickly thereafter, usually at a short distance from where the animal had been shot (see below). As the poison "reached the heart", so the Hai||om, animals would jump, stumble and fall, stand up and fall again. At this final stage, their hair coat stood on end. A final jump accompanied by a loud cry would announce the animal's exitus.

Fig. 8: *Adenium boehmianum.*

If a hunter injured himself whilst preparing his arrowhead with *!khores* or when on hunt, action had to be taken quickly. Within seconds, the injured body part had to be cut away, together with a good deal of the surrounding and underlying tissues to inhibit capillary diffusion. In doing so, one hoped to remove all or at least most of the active agents. The large wound resulting was treated with one's own urine[10]; subsequently the bark of *Grewia* was applied to it.

It is noteworthy that arrowheads were considered a personal belonging of a hunter. They were valuable objects that could be exchanged. On occasion, a hunter would injure a migrating animal, like a zebra, which then later died in an adjacent "territory". If found by the neighbouring group, it was customary to retrieve the

9 From samples brought from Namibia by Schinz, Boehm isolated a crytallised, highly toxic cardiac glycoside and named it echujine (Boehm 1889). "One sample was given to Schinz by the Bergdama, who received the poison in trade from the Tjimba-Herero. The second poison, named echuja, had been obtained from the Ovambo tribe; it consisted of the concentrated latex of *A. boehmianum*" (Neuwinger 1996: 98).

10 If applied to wounds, human urine acts as a weak disinfectant, which explains its widespread use for this purpose. In Antiquity, it was already considered to possess anti-venomous properties, explaining its application for treating bites of poisonous snakes. It is known to counteract inflammations, for instance of the eyes, and skin diseases (Konert 2002: 35).

arrowhead, supply it with new *!khores,* and return it to the rightful owner at the next opportunity.

Club or knobbed (throwing) stick (kiri)
The club or knobbed throwing stick was made from the wood of a *Grewia* spp. (*‡aus*) or buffalo thorn (*Ziziphus mucronata – ‡aros*). During a hunting trip the club was carried on a belt where it was handy. The *kiri* not only served to stun or beat a (wounded) animal to death, it was of course also a useful device to defend oneself, for example, when caught off guard by a potential danger such as a poisonous snake.

Digging stick (|khoo||naab, kaohais)
As digging sticks the Hai||om preferred the horn of a gemsbok (|*Kho*||*nab*) or a tree branch (*kaohais*), preferably the buffalo thorn (*Ziziphus mucronata – ‡aros*), Kalahari Christmas tree or bell mimosa (*Dichrostachys cinera* subsp. *africana* – |*goes*) or cork bush (*Mundulae sericea – ‡aiaxas*). They were used for digging out roots and tubers, but also for accessing animal burrows and their inhabitants (see below).

Water bag (||gam!gawas)
A container for transporting drinking water on a hunting trip (||*gam!gawas*) was made of the stomach (||*khoms*) of large ruminants, e.g., gemsbok or giraffe. After an animal or some fresh spoor had been sighted, the hunter would hang his ||*gam!gawas* in a tree, returning for a drink when necessary or to pick it up when heading back to the camp. The ||*khoms* had to be constantly kept moist; otherwise, it would fissure and become useless.

Carrying bag (|hôagaos)
When leaving the camp on a hunting trip, the hunter shouldered a leather bag containing the following items: (1) A piece of dried *!khores* enclosed in the nest of the Cape penduline tit (*Anthoscopus minutus*) or in a small pouch (*‡kharakhōs*); (2) A piece of dried kidney of black-backed jackal, which had to be ingested to vomit in case of a snakebite; (3) Spare bowstrings made of animal skin; (4) Pieces of sinews (*!gairi*||*awab*) of various lengths for fletching and making instant repairs; (5) A knife (*!khabib*) for skinning and butchering game, cutting branches and carrying out a variety of other tasks; (6) Tobacco, pipe, and fire drills, which were usually kept separate in a smaller pouch.

Care was taken when making a |*hôagaos* to select a tough, yet light and supple skin, preferably that of steenbok (*!airib, !iirib).* The belly skins of zebra, (young) gemsbok or greater kudu were also adequate. Preparation entailed a thorough cleaning of both the hair and flesh sides of the stretched skin with a specific knife (*!khabis*). Softening was done by kneading the skin (*‡nuru*), whereas tanning was accomplished by rubbing it with the ground bark of particular *Acacia* species, such as the bastard umbrella thorn (*Acacia luederitzi* var. *luederitzi – !gûs*) or the closely related false umbrella thorn (*Acacia reficiens* subsp. *reficiens – !gûs*). The bark powder was mixed with the fatty marrow of the long bones or with the suet (= the adipose capsule of the kidney) of ruminants. Such greasy additives were necessary to prevent cracking, ensuring long-term suppleness of the skin. To turn it into a bag, the leather was punched with a pointed object, for instance the horn sheath of a steenbok or dik-dik. Strings made of the thin belly skin of steenbok and other small antelopes were ideal for sewing bags and clothes.

As already mentioned, the |*hôagaos* served to store and transport a variety of useful items, be it for hunting, repairing the hunter's toolkit, butchering game, making fire or smoking. Food supplies were not taken on the trip since bush food could be gathered on the way. The spare arrowheads, shafts, bowstrings and sinews were not stored separately in the carrying bag. As already mentioned, however, the piece of dried *!khores* would be safeguarded in a small leather pouch (*‡kharakhōs*) made of an antelope scrotum, such as steenbok, common duiker, greater kudu or blue wildebeest, or in the nest of the Cape penduline tit. For storing tobacco, pipe, and fire-making equipment, the Hai||om preferred another type of pouch (|*hôagaos*) made of the skin of a springhare. Manufacturing it required skilful skinning because the springhare's coat had to be pulled over the animal's head (as is done by taxidermists today). In this way the skin would be turned inside out. After having cleaned and treated the flesh-side with natural preservative agents, the pouch was ideal for storing tobacco, because the hairy coat inside would keep this luxury article dry. Once it started to loose hair, the pouch was replaced.

Hai||om hunting in the Etosha

Although bush food collected by the women formed the mainstay of Hai||om subsistence in the Etosha, survival also depended on the luck of the hunters. As was the case in other San communities of northern Namibia and northwestern and central Botswana, male Hai||om life centred on hunting. Experienced hunters – generally the grandfathers or fathers – were in charge of training of their (grand)sons, and boys were introduced to the world of hunting quite young, first in a playful and later in a more systematic matter. Young hunters had to qualify themselves at different occasions in order to get the status of an experienced hunter (see below).

Hunting methods and strategies
Different hunting methods existed to procure game species. Bow hunting was the choice method of the Hai||om (and other San groups), especially when larger

Fig. 9: Hans Haneb "hiding" in a pit blind (*!goas*) near the waterhole of *!Gonob.*

game species were targeted. Bow and arrow allowed for selective hunting, for instance, when a herd of zebra or gemsbok were stumbled upon. On such occasions, preferentially well-nourished individuals were shot. However, the use of bow and arrow was not restricted to mobile hunting. Near the waterholes, pit blinds were installed (*!goas*) (Fig. 9) in which the hunter could hide and wait for animals that came to drink. *|Ai*, meaning waiting for game in *!goas*, required patience, because one had to stay quiet for hours, though not necessarily in a comfortable position. Understandably, settlements were generally located a few kilometres from the waterhole. Hunters would leave before sunrise waiting in the *!goas* for the animals to arrive (*!khoebe*) and stay in the blind until late in the morning. Alternatively, they could show up in the afternoon returning to the camp at night. In cold weather, they took with them a piece of smouldering wood from the camp to keep their hands warm or even made a fire in the blind (see below). Hunting success using pit blinds depended largely on whether the wind was right. Animals approaching a waterhole are very alert and any noise or scent carried to them by the wind that betrayed human presence would cause them to start and flee immediately.

Another 'inconvenience' awaiting Hai||om hiding near waterholes (and elsewhere on hunting trips) were harassing species announcing the hunter's presence, such as the alert and inquisitive grey lourie or the conspicuous African red-eyed bulbul (*Pycnonotus nigricans – abudorokhoeb*). If disturbed, the arboreal, highly vocal grey lourie would produce a loud drawn-out nasal *go-'way* or *kwè* (MacLean 1985: 325), which would not pass unnoticed to any other animal frequenting the area around the water hole. Its cry could mean the end of a hunt! Red-eyed bulbuls drink very early in the morning and if they noticed a human being, snake or other potential threat, their penetrating alarm sounds would warn other creatures approaching the waterhole. Bulbuls were therefore watched very closely and killed with bow and arrow if showing the slightest sign of disturbance.

Hunting from pit blinds did contribute to meat procurement, but our informants emphasized on more than one occasion that the bulk of meat and fat was procured by means of mobile hunting. This type of hunting presented different situations and necessitated alternative strategies. If concentrations of game like zebra had been sighted or if there were other indications that large herds of ungulates would be crossing the group's territory, the hunters could decide in favour of a driven hunt or battue (*‡hameri*). Plains were the preferred terrain to carry out such undertakings, whereby a group of hunters would flush the animals and drive them towards the waiting archer(s). The latter would let the lead animal pass – usually an experienced older, leaner individual and therefore less attractive animal – to shoot at close range one of the younger animals following his lead. The poison arrow would be released in front of the animal in order to hit it in passing. Injured individuals are said to "leave the herd" and other herd members tend to recoil because of the smell of blood. Following a strike a herd of zebra sometimes stampede, repeatedly changing direction or running in circles. Such behaviour is only characteristic of zebras and termed *!khoenî* by the Hai||om. In this situation, the animals could eventually close in on (one of) the hunters, which could then try to kill more than one individual, but this situation was perilous, since – as the Hai||om put it – the hunter could easily become the hunted himself! Sometimes hunters would run at one side of a passing herd (*‡khami*), for instance, wildebeest or zebra, and try to shoot animals while standing sidelong. The herd reacted by dispersing. In the event that a wildebeest calf became separated from its mother, the 'orphan' would sometimes follow the hunter – its new mother, the Hai||om told us mockingly – all way back to the settlement! If the calf was large enough it was killed for meat.

Hunting strategies of course complied with the terrain and vegetation cover. On the Pan or in the adjoining grass and dwarf scrubland, game species were spotted by scanning the landscape. When a herd was observed heading in a particular direction, for instance, to a waterhole, the hunter would try to get in front of it, intentionally staying down-wind all the time. Hidden behind some woody vegetation close to the trail followed by the herd, he would then quietly wait for the quarry to show up, targeting it at short distance from the front. Hunters could also lie in ambush at suitable places and near trails, waiting patiently (*||goe!nâ*) for migrating zebra, springbok or wildebeest as well as for greater kudu or hartebeest. One interesting behavioural characteristic of trekbokken and other mass concentrations of game is the loss of normal wariness during migration (Estes 1991: 82). It is probable that this behaviour did not go unnoticed. In landscapes with thicker vegetation cover, hunters would sneak up on animals (*||haba*) like zebra, springbok or steenbok that stood under the shade of trees or bushes (*som‡hâub*) seeking relief from the relentless heat of the sun. Warthogs would be shot whilst digging out tubers or eating windfall, but if the animal was not hit properly by the arrow, it would try to escape into its hole – usually an abandoned aardvark burrow, which they adjust to their requirements – necessitating laborious excavation. Browsing giraffe seldom look downward, so if a hunter was able to sneak up behind the tree where it was feeding, the likelihood of getting a well placed shot off was good. This ensured that the poison (*!khores*) would work effectively, killing the animal comparably quickly. In sum, *||haba* required some kind of plant cover, but if the woody vegetation was too dense, the chances of a successful hunt would be reduced considerably, because animals usually got wind of the hunter before he was ready to shoot.

If the hunters could not get close enough to a herd of animals without being noticed by them, a long arrow shot was attempted, which could be up to 200 m according to our informants. After its release, the poison arrow would follow a curved trajectory and eventually hit the back of an individual in a herd. Applying this hunting method (*tsaru*), vital organs were rarely struck, hence *!khores* would only unfold its deadly effect much later.

During certain times of the year, hunters would undertake seasonal trips to favourable places where game occurred in greater numbers. Such expeditions could last several months. Hunters living at Rietfontein (*||Nasoneb*), for instance, would move to hunting camps (*!hamis*) close to the Pan by May, since this was the time of the year when large herds of migratory springbok, wildebeest, and zebra would cross the area. The men would preserve meat by turning it into biltong. The women would remain at *||Nasoneb* and *||Nububes*. However, women undertook trips (*!haros*) lasting several days as well in order to gather wild plants that were only available at certain places and merely for a limited time. Elderly Hai||om (as well as the young children) stayed behind to take care of the settlement and the stock during such trips.

Poison arrows were also used to hunt ostriches and get access to the nests. Having lured away the brooding parent, the hunter would position several poisoned arrows in the nest with their points poking upward between the eggs. Upon the bird's return to brood, the arrowheads would penetrate its plumage, whereupon it would die after a couple of hours still sitting on its nest. Using this technique, both parents could be killed the same day, but the Hai||om elders agreed that this was "very nasty behaviour".

Group discussions with our informants in the Etosha clearly showed that the majority of the Hai||om preferred not taking dogs on hunting trips. They were of the opinion that hunting with dogs (*!aub*) was not a very respectable undertaking. It was said that only "lazy" men preferred hunting with them. According to the Hai||om, dogs were valuable when pursuing species like hare, porcupine, black-backed jackal, aardwolf, aardvark, warthog or gemsbok, but that the animals were useless for other game. Once a larger quarry such as gemsbok was stalled, the hunters had to act quickly to avoid the dogs being injured. Larger game was finished off with the assegai and smaller species clubbed to death with the *kiri*. *!Aub* also complicated matters with respect to the ownership of the bag. As a rule, the kill was the property of the owner of the dog that had stalled the game, but this was not necessarily the hunter himself, since the dog may have been borrowed. If the prey was cornered by a pack of dogs with more than one owner, the meat was shared between them. Of course, hunting with someone else's dog(s) could become a problem if an animal was wounded or if it died, necessitating adequate reimbursement. This explains why hunters preferred to raise and use their own dogs. Hunting with dogs was *de facto* not permitted in the EGR, which is why a complete ban on this domesticate was introduced in 1930. Obviously, this ban was never enforced before the Hai||om's eviction in 1954 (Dieckmann 2007a: 150).

The *kiri,* the throwing stick or club, was an important device in mobile hunting. It was used to finish off game that had been injured by arrows, cornered by dogs or captured with other hunting devices such as snares. It could also be thrown at a variety of animals up to the size of a steenbok or common duiker that were taken aback. If a stunned animal tried to escape, the hunter would retrieve his club and pursue the prey whilst trying to strike it repeatedly until it was knocked out.

The Hai||om of the southeastern Etosha also practised snaring. This non-selective hunting method was employed for capturing birds and small game. Guinea fowl, for instance, followed regular tracks and if people observed them feeding on tree gum they would put up snares (*!nuin*) baited with pea-sized balls of acacia gum near these feeding spots.

Conceivably, the largest variety of bird and mammal species was obtained with the slingshot, a device introduced into the Etosha around 1940 through contacts with the white people, since its manufacturing required the rubber inner tube of tires. Storks, doves, francolins, thick-knees, woodpeckers, sandgrouses, korhaan, snipes, louries, flycatchers, scimitar-bills, wood hoopoes, hornbills, thrushes, weavers, finches, crombecs, sparrows, starlings, and whydahs as well as small mammals were knocked unconscious or at least immobilised if hit using slingshots.

Obtaining valued food species that were hiding in burrows during the daytime necessitated other techniques. One possibility consisted in suffocating animals. If a porcupine had been observed entering a burrow or if the animal's presence was betrayed by its tracks in front of the entrance, the hunter(s) would block up all burrow entrances and ventilation openings and make a fire near the main entrance. The smouldering charcoal would then be placed inside the main burrow well beyond the entrance opening. The latter was then sealed off and the subterranean system of tunnels and its chambers would slowly fill with smoke. Essentially nocturnal, porcupines usually rest during the day and these animals would therefore be caught by surprise during their sleep. Having closed all entrances tightly, the Hai||om were sure that the animal was securely trapped, because they knew it could not dig well enough to get out[11]. The next morning, the hunters would open up the different entrances and aerate the burrow well for at least one hour before going inside. Crawling inside was a risky undertaking, though, because the distance between the entrance area and the main chamber could easily be 5 to 6 m. To minimise the risk of being injured and to ensure a safe return, the debris (stones, bones) lying around in the entrance area and in the main burrow had to be carefully removed together with the loose sediment in order to widen the burrow. The hunter would then enter the burrow by crawling on his stomach while holding a long wooden stick in front of him. Upon reaching the main chamber, which was large enough for a man to sit, the pole would be used to poke the porcupine to check its status. If the animal was only dizzy or unconscious, the hunter would kill it by beating it to death with the *kiri*. By holding the animal's front legs while creeping backwards, it was possible to pull porcupines out of their burrow without the spines and quills erecting.

As mentioned previously, crawling into burrows was a risky matter, and the informants had heard of cases where hunters had gotten stuck or had problems finding their way out again. Sometimes people died from asphyxiation due to the lack of oxygen in the burrow. One also had to make sure that the burrow was indeed occupied by a porcupine and not by another species, for instance, a ratel or a leopard. At the age of eight, for example, Kadisen ||Khumub and his friends noticed porcupine spoor near the entrance of an abandoned aardvark burrow, but upon approaching the entrance, they heard strange noises, making them believe that a leopard rather than a porcupine was hiding inside. Back in the camp, they informed the experienced hunters about their finding, who immediately set out to check the situation. From their observations, the hunters concluded that a porcupine occupied the burrow, whereupon they proceeded as described above.

Since snakes like the black mamba (*Dendroaspis polylepis*) or the puff adder (*Bitis arietans*) also seek shelter in deserted aardvark holes, extreme care had to be taken when inspecting a burrow. According to the Hai||om, these reptiles are not susceptible to smoke inhalation and will therefore readily strike when cornered.

11 Smithers (1986: 187) noted that in the Southern African Subregion, porcupines will modify antbear holes to fit their own requirements, by excavation with their front claws, but they do not appear to dig their own burrows as they do in East Africa.

Aardvarks could not be captured by suffocation because upon entering their burrow they immediately close the entrance behind them with soil using their powerful tail. The use of smouldering charcoal did not help much either, because aardvarks are powerful diggers and capable of sealing off a newly tunnelled section of the burrow from the old one quite rapidly. Following this animal into its shelter was impractical because of the considerable extension and depth of the burrow system (> 6m), consisting of numerous chambers and entrances. It was also dangerous because of the clouds of fine dust kicked up by the animal during burrowing. Nonetheless, if a hunter had detected an aardvark spoor he would immediately start tracking to find out where it was hiding. If hunters arrived in time to see the animal entering its burrow they would attempt to injure its tail with an assegai or a knife. This would greatly impair its ability to seal off the burrow. By listening carefully to the underground noises, it even was possible to gauge the direction and depth of the aardvark's movements. Since digging would be slow and laborious in compact soils, movement took place in a horizontal rather than vertical direction. In this situation, the hunters could intercept the animal by digging a hole above it and kill it with the assegai. However, this was not a viable option in most cases, and Hai||om hunters would wait for nightfall when aardvarks usually emerge from their burrows in search of ants and termites. According to Hans Haneb, lying in ambush had to be done at some distance from the entrance, because before the aardvark appeared, a large fly (*|gînab)* would leave the burrow and swirl around in order to inquire whether a potential danger was lurking outside. If the fly perceived no such danger, it would return inside. Because the aardvark could emerge at any moment after this and since it leaves its burrow hastily, the hunter had to be very attentive and prepared to shoot. If the animal was injured with a poison arrow near the entrance of its burrow, it would try to turn back and take refuge in it. If it managed to do so, the hunter would put his ear to the ground and listen to its movements. The approximate location where it had ceased to make a sound was marked on the surface and the hunters would go home, returning the next day to dig the animal out.

Springhare (*Pedetes capensis, ‡goob*) was another species of nutritional interest known to seek shelter in burrows during the day. The subterranean burrow of this animal can be quite complex and extend considerable distances, and often features side burrows, alternate entrances, and several escape holes. Smoking out was not considered very efficient for this large rodent. To hunt springhare, two to four hunters joined efforts. To verify if the animal occupied its burrow, the hunters used the so-called springhare probe. This is a long (2 to 3 m) device made of several sections of wood (*Grewia* spp.) that were bound together at their flattened ends with bark twine, e.g., *Grewia* spp., *Colophospermum mopane* or *Acacia* spp. A sharply pointed, hook-shaped metal wire was attached to the tip of the pole. After positioning themselves at the different entrances to prevent the animal from escaping, the men would insert their probes into the burrow. Upon contact, the probe would be jerkily twisted in order to 'hook' the animal. By twisting the pole, it could be established whether the hare was 'hooked' or not. If so, the hunter fixated the pole at the mouth of the burrow using a second stick. Judging from the length of the pole still outside the burrow, it would be clear where he had to dig. Finishing-off the springhare was done with the *kiri*.

In addition to the hunting equipment and techniques mentioned previously, some other hunting methods of less economic importance were also employed by the Hai||om. A simple but effective way to obtain squab birds, for instance flamingos, consisted in raiding bird colonies shortly after hatching. Lime-twigs prepared with tree gum served to catch another segment of the bird population, usually small passerines. Sometimes parent birds were captured during hatching. Close observation of a male hornbill feeding the brooding female would reveal the position of the nest hole. Prior to any further action, the Hai||om would carefully check if the excrements at the foot of the tree were still moist, in order to make sure that the hole was indeed occupied by the female bird and/or her young, and not by a snake, for instance, a black mamba. Female hornbills are known to plaster themselves up in the tree hole leaving only a small aperture for feeding purposes. In order to catch the hatching bird, the hunter would stick his finger into the small opening, whereupon the bird would react instinctively by biting. He would then grasp the hornbill's beak and keep it firmly closed whilst enlarging the tree opening with his other hand, pulling out the mother bird as soon as possible and killing it on the spot. Eggs, usually four or five according to our informants, or nestlings were also taken home and eaten.

Another source of protein and marrow should also be mentioned, namely those animals found dead in the veld. People would be adverted to the presence of a dying animal or carcass lying around by observing vulture behaviour. If lions or hyenas had beaten them to the kill, the hunters would try to chase them off. If successful, they would remove the edible parts from the carcass. Other scavengers would then scavenge with the leftovers.

Because the Hai||om lived in a game reserve, they were not allowed to shoot animals with guns or capture them in steel traps. However, families sometimes benefited from animals killed by white people using these devices by acquiring the meat. This was the case near

‡Homob, where in the early 1950s the ranger and painter Dieter Aschenborn used to hunt large game.

Becoming a hunter

The ability to anticipate the movements of game animals prior to and after they had been shot can be considered a science in itself and the key to the "art of tracking" (Liebenberg 1990). Understanding the movements, habits, and moods of animals to ensure survival necessitated a lifelong dedication to learning, a process that began at a very young age. Hai||om boys would start handling weapons for hunting, such as bow and arrow or slingshot, from the age of six onwards. The size of these devices corresponded to the age and stature of the boy. Bow lengths varied between 30 and 45 cm in the youngest age group. The arrow shaft consisted of a blade of a certain long, hard grass, called *‡ana*, and the arrow head was a thorn from an acacia tree like the water acacia (*Acacia nebrownii* – *|nubib*) or scented thorn (*Acacia nilotica* subsp. *kraussiana* – *|oom.s*). At this stage of the boy's education, small rodents, carnivores, insectivores, and birds were considered prime targets for exercising. Trails and footprints, for instance, would betray the hiding place of ground dwelling taxa. Boys would patiently wait for prey leaving their nests to forage. Although children were not permitted to carry knives or make fires, most boys had a stash containing 'forbidden' items, such as a piece of broken glass used to gut small vertebrates. Sometimes hot coals would be 'stolen' from one of the campfires to secretly make a fire in the bush and prepare the game in the company of peers.

A young, inexperienced hunter (*‡kham||khâuaob*) was not allowed to hunt with the types of arrows adult hunters used. The young hunter's arrows were equipped with a small, simple arrow head termed *!gab*, which were easier to produce and mostly used without poison. If a young hunter was injured by accident with such an arrow, the chances of survival were good because the arrow could be removed quite easily. *!Gab* arrows served for killing small to medium game up to the size of a steenbok, springbok, common duiker or warthog. To achieve this, the hunter had to sneak up on his potential prey, often an animal standing or hiding under a bush or a tree during the midday heat. Shooting took place at short distance, whereby the impact occasionally caused the arrow shaft to break. The first game shot in this manner by a young hunter is called *||huis*.

Over the years, young hunters would gain experience and skill, but before becoming a *kai||khâuaob*, *i.e.* an experienced hunter, some 30 to 35 animals from different species had already been tracked and killed. However, if a young hunter shot an eland, he would immediately become a *kai||khâuaob*. In general, the young hunter's father was the one who decided if his son had proven to be a capable hunter, but he would always ask his peers for approval. A crucial element in the process of becoming an experienced hunter was the rite of passage (*||hora||guis),* a multi-step procedure, in which the young hunter had to demonstrate his abilities, for instance, by sneaking up on shy game, such as black-faced impala, and killing it. The ultimate test, however, involved the killing of a large game species (huntable game – *am|naen*) as follows: Together with an experienced hunter, the young hunter would set out on a hunting trip. The game animal targeted would be a female *am|naes* (eland, gemsbok, greater kudu, blue wildebeest) and her newborn. Sneaking up on the calf lying in the grass, the young hunter would grab the newborn's forelimb and twist it jerkily outwards, whereupon the calf would scream loud with pain. The hunter then killed the calf by biting the animal's throat, thereby rupturing major blood vessels. Hastening back to her hiding place, the alarmed dam then had to be killed with a single shot. Hitting either the heart or the external jugular vein with the poison arrow would be ideal, since it would knock the animal off its feet almost immediately. Upon the quarry's exitus, the young hunter would slice open the animal's abdomen and take out the liver and gall bladder. The first could be prepared on the spot, whereas the latter would be emptied and blown up (like a balloon), knotted and attached to the young hunter's head, which moreover would be covered with the fat retrieved from the abdomen. Adorned with the token of his new status, he would process the carcass (including the newborn) into comfortable packages for the return transport. The quarry's head (*dana.b*) and pelvis (*‡gaus*) were hung in a tree to be fetched up later. Upon returning, the successful hunter would leave the "young men's hut" and build his own.

The hunt (||gaures)

Preparing the hunt

Game density fluctuated considerably in the Etosha region, and factors such as the time of the year, water availability, and local weather conditions all played a role in where and what species to hunt. Moreover, depending on an animal's nutritional intake, the amount of meat and fat that it could provide varied considerably throughout the year as well. Towards the end of the dry season, for instance, most game had seriously lost condition. This was obvious by the reduction in body weight and, according to hunters, also by a severe loss of the different subcutaneous and other fat accumulations, e.g., around the kidneys. The Hai||om considered game that was in a haggard condition quite unpalatable, because their bone marrow was contained too little fat and was therefore considered inedible and the meat tasted like glue. The elders also stated that the meat of such animals putrefied very quickly, which is why hunters refrained from killing undernourished individuals, provided they had the choice. As already mentioned, hunting was an exclusively male domain. However, if Hai||om women observed vultures circling and/or descending, they would head for the carcass to collect the remaining edible parts.

We were told that an unmistakable sign for a hunter to set out soon would be a specific sensation, more precisely, a pulsation or vibration at those places on his body where lines had been drawn with the blood of large game animals killed on previous hunts. Prior to a hunting trip, as much information as possible was gathered about recent sightings and/or fresh spoor of favoured quarry on recent outings. The women were asked as well if they had sighted game on their plant food collecting trips. This way, the hunters saved time and energy while at the same time enhancing the probability of coming across valuable game. Combined with the hunter's knowledge about a species' feeding, drinking, and resting behaviour, it was possible to predict its movements and whereabouts fairly well by taking into account the time elapsed between the lead and the hunt. Experiences made during hunts of the recent and distant past also played a role in deciding the direction to set off in to and which strategy would be employed to stalk the quarry.

Once the decision was made to set out, the hunter would carefully check his tool kit, thereby ensuring the reliability of each piece of his equipment. Extreme care was taken when preparing arrowheads with *!khores*, finished arrows being cautiously secured in the quiver. The usual place to deposit the equipment would be the hunter's sleeping place.

Hunting success did not depend solely on a person's skills. Other factors, particularly the hunter's state of mind, played an important role too. However, elaborating on this topic in retrospect seems counterproductive, particularly in the absence of insider information and primary data on the individual hunter's social environment. Yet, modesty was considered an important character trait of a hunter and we were told that men that had lost their inner balance because of haughtiness would only become successful hunters again after their mental equilibrium had been restored. Different causes were invoked if a hunter failed to be successful for a longer period, for instance, the presence of a pregnant woman in the camp. To remedy this, for instance, the woman in question had to throw hot coals behind the hunters as they left the camp for a hunting trip. Unlucky hunters could also request the help of the community's medicine man (*!gaiob*). If luck returned, the pelvis of the first valuable kill was given to the *!gaiob* as remuneration.

Dreams, omens, and bewitching *(‡gâú)* were factors that influenced or helped explain fortune or failure in everyday life. To avoid the latter, successful hunters complied with a bequeathed ethic code, which governed their behaviour prior to and during hunting as well as after the game had been killed (see below). Any consumption of sweet foodstuffs, e.g., berries like *‡aun (Grewia sp.* – raisin bush), *sabiron (Grewia villosa* – rough-leaved raisin / mallow raisin) and *‡huin (Berchemia discolour* – bird plum), was not allowed the day before the hunt, because this would 'counteract' the effect of *!khores,* which is said to taste bitter. On the other hand, if a hunter came across a tortoise shortly after he left the camp, this would bring luck.

Tracking (!khoodao), stalking (||haba), and shooting (||khâu)

Following the outcome of the decision-making process, a single person or small groups of hunters would set out for the most promising leads. Depending on the situation, however, different scenarios were still possible in the field, including a change in the initial strategy in order to follow up a more promising lead as new information was gathered. Occasionally on the way to the location where valuable game was expected, hunters encountered a sought after food species, such as a pangolin. This powerful species rolls up into a ball when under stress and had to be handled with great care because of the heavy, now erected, sharp edged scales could inflict deep cuts. Pangolins could be killed either by thrusting an assegai through its back aiming to injure its head, or by setting fire to the vegetation surrounding the animal, which in trying to escape would forcibly stretch itself, enabling the hunter to hit the pangolin's over the head with his *kiri*. If it was still early in the morning the hunters might cook the animal. They would slit the belly open and remove the stomach and intestines before placing the animal in an oven pit. The animal was covered with hot coals and earth and left to bake. The meat would be done upon their return several hours later. The scales (||*khôm soros*) were scraped off before eating, and a few would be taken home for use later (see below).

As indicated previously, fresh spoor usually formed the starting point for tracking animals. The tracker's knowledge of animal behaviour was essential for interpreted the signs observed (Liebenberg 1990: 88). Soil substrate, vegetation cover, animal population density, and weather, to name only a few, all have an influence on the tracks left by animals. Thus, while it is easy to follow footprints in barren sand, tracking becomes increasingly difficult as vegetation becomes denser. In grassland environments, reading the signs of an animal's presence or movement, such as how blades of grass are bent over, is critical for determining things like the direction of travel. Visibility is limited in landscapes with stands of woody vegetation and thickets, and hunters become increasingly dependent on their tracking abilities to locate animals. Under open woodland conditions – the type of vegetation that prevails in large parts of the southeastern Etosha –, systematic tracking involving the identification of a variety of signs left by the animals, which yields detailed information necessary to determine what the animal was doing and where it was going, becomes less and less adequate and needs to be replaced by speculative tracking. Following Liebenberg (1990: 29ff.), the latter necessitates the building of *ad hoc* working hypotheses, which will be based on the initial interpretation of the signs, combined with a good knowledge of the local terrain and animal behaviour. With the conceptual reconstruction of the species' activities in his mind, the tracker will then look for signs where he expects the quarry. Under such conditions trackers identify themselves with the animal they pursue by thinking what they would do if they were that animal. This way a tracker can anticipate the whereabouts of an animal and overtake it (Liebenberg 1990: 97).

At this point, it is understood that we did not have the opportunity to accompany Hai||om on actual hunts, which is why eyewitness accounts of their tracking abilities cannot be provided. To the authors of this contribution, however, the detailed reading by our informants of the many different footprints, feeding signs, faeces, pellets, auditory signs, and scents perceived while carrying out our archaeological survey in the ENP on foot (see below) was most informative. On several occasions, the Hai||om elders' perceptiveness of the natural environment saved us from getting into serious trouble, for instance, by preventing our team from walking straight into a defecating black rhino, whose presence was obscured by thickets and high grass cover. As has been exemplified throughout the text, the knowledge of the Hai||om elders about the feeding, social, reproductive, and anti-predator behaviour of their former food and non-food animals is still impressive, despite decades of law enforced inactivity with respect to hunting! It was this kind of knowledge, though, that was essential in order to interpret the signs and track game species. Being a hunter thus meant a lifetime of learning from childhood on, complementing one's own experiences with those of fellow hunters. Relevant details of hunts from the recent and more distant past were added to their own knowledge, with past experiences being transmitted by storytelling, e.g., around the camp fire. In doing so, important information on hunting events was kept within the group's collective memory.

Once tracking and stalking had brought the hunter into shooting position or if game was approaching a hunter hiding in a pit blind, he had to decide which vital organ to target. Much depended on the distance to the prey, the kind of species he was dealing with, whether he had a clear shot, and particularly his own position vis-à-vis the animal. Signs betraying restlessness could urge the hunter to target any part of the body, especially in large animals, such as giraffe. However, if the animal was relaxed, the hunter would attempt a more precise shot in order to minimise the time elapsing between the injuring of the animal and its death, which in turn reduced the distance covered by the wounded animal.

Empirically aware of the effect of *!khores,* Hai||om hunters would target organs (or parts thereof) that play a key role in blood circulation, as exemplified for a zebra (Fig. 10). Nevertheless, where to shoot depended on the animal's position. If the animal's side was facing the hunter, either *ǂgaob* (heart), *!nais* (kidney), *|arab* ('tube below the vertebral column'),[12] *|nans* (throat)[13], or the upper neck region[14] were targeted. If in the latter case, the vertebral canal were hit, the animal would be immobilized and die almost instantaneously. Another possibility consisted of targeting *tsi||nab*, literally meaning the 'sinew of the buttocks'. If the arrow struck this tissue, the quarry would lame or "sit" on its hindquarters, so the Hai||om[15]. In case the animal would look in the direction of the hunter, he would aim at the throat (*|nans*) or the thoracic inlet[16]. If the animal was turned in the opposite direction, the hunter could try to hit *tsi||nab* or eventually *≠gáus*, whereby in the latter case the arrow had to enter the thoracic cavity through its caudal aperture[17]. Some species died rather easily, such as zebra, cheetah, caracal or dik-dik, which is why the Hai||om named them *!guri||ob*, meaning 'arrogant dead'.

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12 The major blood vessels running below the vertebral column include the descending aorta and, adjacent to it, the caudal vena cava.

13 The most important blood vessels in this body part are the paired common carotid arteries and external jugular veins. They respectively ascend and descend the neck to each side of the trachea.

14 From the drawings made in the field, hunters targeted the region of the 2nd cervical vertebra. Several larger blood vessels are located here. Moreover, between the 1st and the 2nd cervical vertebrae the vertebral arches do not fit closely, leaving an aperture, the atlanto-axial space, enabling access to the vertebral canal. Thus, if injured seriously here, the chances of surviving would almost be zero.

15 From the location of the injury indicated by the Hai||om on different anatomical drawings, the hunters obviously targeted the sciatic nerve or its stronger terminal branch, the tibial nerve. The sciatic nerve provides motor innervation to the deep gluteal, the internal obturate, the quadriceps femoris and the gemelli muscles. At the proximal third of the femur, it terminates by dividing into the tibial and common fibular nerves. The tibial nerve provides motor innervation to all muscles lying caudal of the femur and on the tibia and fibula. Damage to the sciatic or tibial nerve usually manifests itself by non-weightbearing lameness (König & Liebich 2009).

16 The thoracic inlet or cranial aperture is framed dorsally by the vertebral bodies of the thoracic vertebrae, laterally by the costal arches and ventrally by the sternum. If an arrow entered the body through this aperture, death would enter quite soon, because some vital part of the circulatory system, be it the heart, the large arteries or the cranial vena cava would be injured.

17 The arrow first had to penetrate the organs of the abdominal cavity to find its way through the caudal aperture, framed left and right by the costal arches.

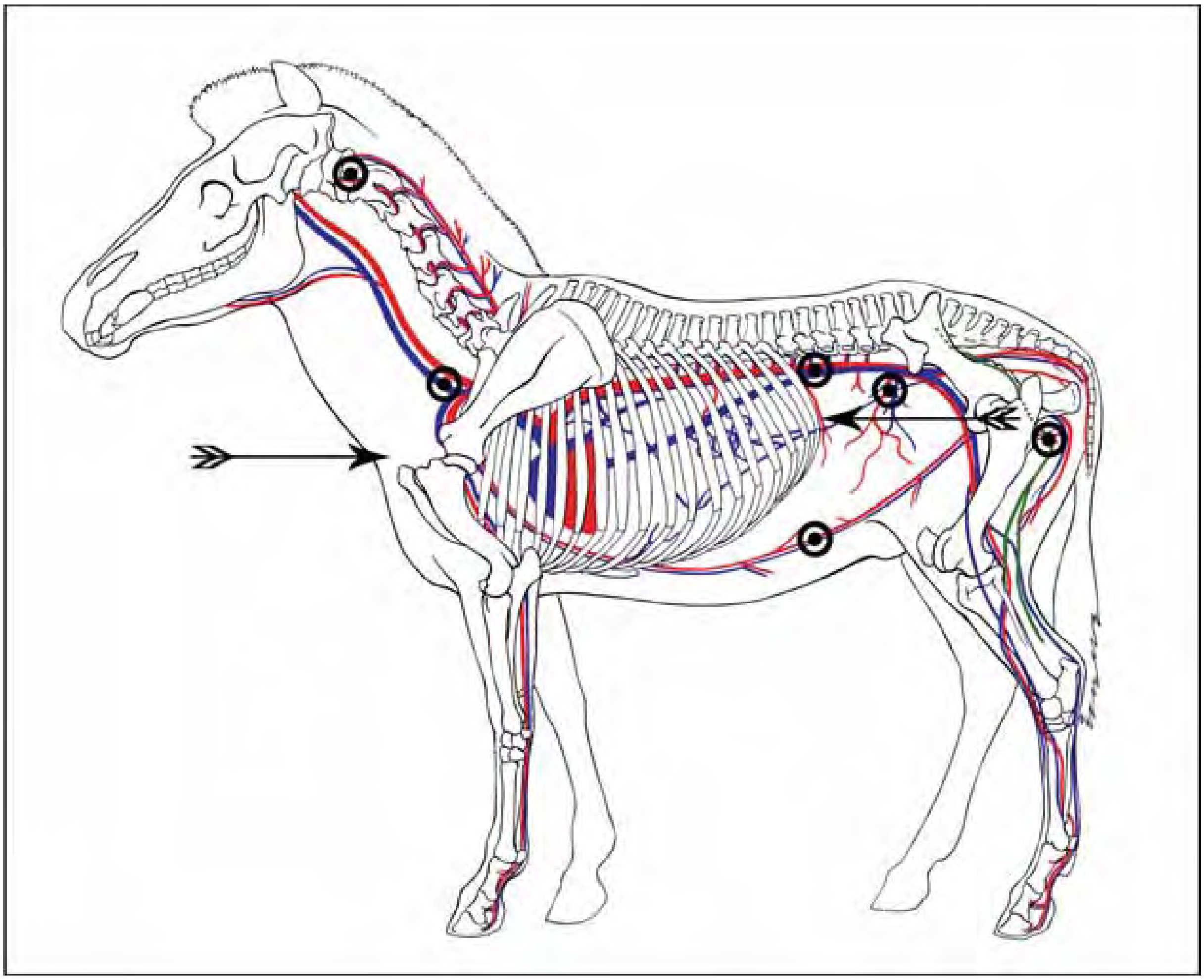

Fig. 10: Organs targeted in zebra if hunting with bow and poisoned arrows. Arrows illustrate shots entering the thoracic inlet or cranial aperture (for animals looking towards the hunter) and the caudal aperture (for animals looking in the opposite direction). The arrows and the dots (except for one) mark the preferred spots for hitting the circulatory system (red/blue) provoking a quick *exitus* of the animal. One dot marks the sciatic nerve (green). If the arrow struck this tissue, the quarry would lame or "sit" on its hindquarters and hence become easy prey.

Herbivores usually move during feeding and when weather conditions are poor. This and other factors explain why the body part targeted or in the worst case the animal itself could be missed altogether. According to the Hai||om, some species would startle and leap into action upon hearing the noise produced by the bowstring when releasing the arrow. Zebras, for example, immediately react by jumping or rolling on the ground, whereupon the arrow would go astray. During this behaviour, the animal would be 'laughing and farting', yet its confusion offered the hunter another opportunity to shoot. The ever cautious and anxious black-faced impala would also jump the moment the arrow was released, which is why Hai||om hunters usually aimed at the middle of the body in this species. This was done unless the wind was strong and the hunter stood downwind because the antelope would not hear the bowstring's noise in time to snap into movement. If more hunters participated and if the first one had missed or only injured the animal slightly, a second hunter would attempt to make the lethal shot.

Understandably, not all shots were direct hits, arrows being diverted for instance upon hitting bone, such as a rib or a vertebra. However, as was emphasized earlier, *!khores* is a potent poison and even minor injuries, for instance, to the foot, will eventually prove lethal with time. Ruminants might survive if the arrow were to penetrate the belly and get stuck in the mat, the thick mass of digesta present in the rumen[18]. Its contents consist of a large amount of partially degraded, long fibrous plant material mixed with water and saliva, and the poison becomes diluted and can not develop its full toxic potential. In equids, this would also be the case if the arrow head got caught in the ingesta of the cecum, a dead end sac of the digestive system approximately 1m in length with a capacity of up to 30 litres. Moreover, animals that had been drinking shortly before being hit were less susceptible to the effect of *!khores*. They

18 The rumen is the largest chamber of the forestomach and fills almost the entire left and a good deal of the right half of the abdomen.

would be able to cover a much larger distance before dying, which is why hunters preferred to kill animals on their way to the waterhole. Hunting trips involving several persons offered the possibility of pursuing large animals more than once, which was done for example with eland in order to prevent this tough but much esteemed food species from getting out of reach.

If the shot were on target, large game would die within short distance; otherwise, the wounded animal would break away and usually disappear out of sight. Single individuals would be easier to spoor than an animal moving in a herd. In the latter case, the hunter had to look very carefully to find the one exhibiting an 'irregular walk' caused by the poison. Animals weakened by poisoning later left the herd. Prior to tracking a wounded animal, however, one would search for the detached arrow shaft, since the traces left on it would betray which part of the body had been hit, an important piece of information for planning further action. If the arrow had penetrated a lung, the blood took on a bright red and wet appearance, even after it had dried. Lightly coloured blood on the shaft but less wet would indicate a shoulder injury, and nearly black blood was evidence for a heart injury. A buttocks wound produced less blood but eventually some fat, and a watery coating on the arrow indicated that the rumen (in bovids) or cecum (in equids) or some other part of the digestive tract had been damaged, possibly implying either a delayed exitus or survival. Traces of a fatty substance likely implied a kidney injury. Hairs sticking to the shaft were also important for identifying the body part that was injured. A combination of the type of game shot and the traces left on the detached arrow shaft would essentially dictate the hunter's next move.

In species such as gemsbok or greater kudu, tracking would usually begin in the afternoon if the animal had been shot in the morning, because these antelopes tended not to go very far, said the Hai||om. The larger eland and giraffe took more time to die and could therefore cover appreciable distances. Accordingly, tracking only made sense when it was done the day after, which would also be the case for any other large game shot in the afternoon. Contrary to other large game animals which, when wounded, would run away in any direction, the Hai||om noted that eland usually flew in a (south)eastern direction. They explained this behaviour by the eland's geographic origin, which was east of the EGR.

Returning home from his trip, the huntsman would not tell anybody that he had shot something, although other members of the party who helped search for his arrow(s) or had observed him retrieving it would of course be informed. Instead, he would ask the other men to assist him by saying, "come and help me find my arrow", knowing it was already in his quiver. He would not tell his wife either that he wounded an animal, but also she understood, as he had refrained from eating sweet foodstuffs that evening. However, the hunter preferred to track the wounded game alone if it was uncertain that he had been successful. Once the dead animal was found, he would collect tree and shrub braches to cover it (||*gau*). In order to ward off scavengers like vultures and carnivores, the hunter would position arrows around the kill, and then leave to get his fellow hunters. Signalling a successful hunt was also done by blowing on a horn from a springbok (||*gawib, !nonib, ‡nanib*).

The kill occasionally exhibited certain unusual features on its outer appearance or where it finally fell and died. In common duiker (*Sylvicapra grimmia* – |*nâos*), for instance, the males have short, straight horns, whereas the females are hornless. However, Hai||om hunters explained that they sometimes shot females possessing horns, a feature discovered upon arrival at the site of death. Such individuals were left untouched since the hunters considered them *soxaxus,* literally meaning "a taboo thing". Another case narrated by our informants concerned a hartebeest (||*khamab*) shot by the experienced hunter Axarob ||Oreseb, who set out the next day to follow the animal's spoor. After having lost track of it, Axarob scoured the area for signs indicating the hartebeest's whereabouts, when suddenly he observed some vultures descending behind him. Turning back on his heels he came across the kill, only to find out that the hartebeest was lying … on his own footprints. In the absence of any reasonable explanation for this phenomenon other than that the hartebeest must have been invisible when he came past the first time, Axarob decided to leave the kill without taking any of the meat because it could be soxaxus.

At the kill site

Rituals

The killing of large game (*am|naen*) such as eland, giraffe, gemsbok, greater kudu, blue wildebeest, hartebeest, and Burchell's zebra was an important event, especially for the hunter. But since this event produced a considerable quantity of available meat, fat, and raw materials it was also important for his kin and group. In such a case, a specific ritual named |*hâson* had to precede the removal of the poison arrowhead and any butchering activity. The |*hâson* ritual was carried out in silence. The first step involved an incision into the animal's auricles at the base so that the external ears could be folded downward to cover its eyes. Then the blood vessel beneath the eye[19] would be slit to let out some blood. Next, the upper tip of the bow was dipped

19 Based on anatomical drawings of large herbivores and equids, we can conclude that it was the transverse facial vein that was incised.

into the incision and a vertical line drawn with the blood on the hunter's forehead. Finally, the lower tip of the bow would be dipped into the vein as well and the blood used to draw a horizontal line across the chest and a vertical line on each of the lower legs. The *|hâson* ritual served to ensure hunting success in the future.

Now the hunter could put bow and arrow aside and start processing the carcass. As mentioned previously, *!khores* was also extremely dangerous for human beings, which is why not only the poison arrowhead but also the discoloured soft tissue surrounding it had to be removed. The latter exhibited a dark bluish to blackish colour and would be burned on the spot to avoid consumption. However, hunters sometimes deliberately left behind a poisoned piece of meat to kill jackals. Interestingly, Hai||om hunters told us that the meat of animals killed with *!khores* tasted somewhat bitter. Because of this, it was more enjoyable to eat it than the meat of the same species killed with other methods[20].

If the quarry were an eland, the hunters would proceed differently. First, they would make a fire under a tree nearby before approaching the animal. They would talk in a low voice – if at all – prior, during and after the *|hâson* ritual and when they began to dress the carcass. This was done up until they finished collecting the large amounts of fat deposited in the animal's dewlap, adjacent subcutaneous tissue, and around the heart. According to the Hai||om elders, talking in a normal voice prior and during this procedure would cause the quantity of fat to shrink.

Processing game

Skinning and dressing *am|naen* on the spot was a time-consuming procedure and clearly differed from that of small to medium-sized animals. Species such as duiker, dik-dik, steenbok, and springbok could be carried home disembowelled or *in toto.* On the other hand, hares, ground squirrels and other rodents, wild cats, aardwolves, hyenas, jackals, foxes, badgers, genets, and mongooses were usually held over fire at the kill site to singe the hair. In badgers, aardwolves, and hyenas[21], the anal pouch and glands were cut out prior to singeing; otherwise, the meat would take on the malodour of the greasy, smelly paste secreted by these animals to mark their territory. Springhare could be singed as well if its pelt was not intended for making a pouch (*|hôagaos*; see above). After singeing, the distal segments of the limbs were sectioned transversally in the carpal (forelimb) and metatarsophalangeal joints (hindlimb) and the feet discarded on the spot. Sometimes, hunters refrained from singeing game at the kill site, but gutting was done to prevent decay and functioned to reduce the carrying weight for return transport. To remove the intestine, the belly would be slit open, whereby any nutritious fatty tissue surrounding the lower alimentary canal would be pushed back in the abdominal cavity. Occasionally the stomach would be thrown away as well, for instance, in aardvark, because this organ has an unpleasant smell. In other species such as the ostrich, the hunter would pull out the stomach, empty it and slide it back into the abdominal cavity. In *xamanîn*, the liver was discarded on the spot. After gutting, the hunter could decide to take the animal back home or to cook it at the kill site.

Because their pelts were valued as a means for bartering for other goods or cash, four carnivore species, leopard, cheetah, caracal, and serval were processed differently. These felids had to be skinned carefully, which is why the hunters usually decided to take them back *in toto*.

As has been said, the processing of *am|naen* was a more time consuming procedure. Detailed insights into the traditional *modus operandi* of the Hai||om could be obtained by recording the consecutive steps involved in experimental butchering in detail. To accomplish this, a female greater kudu had been purchased on a farm south of the ENP. After being shot by the owner, the animal was processed by the Hai||om elders according to tradition. Four pocket-sized knives and a machete were used to accomplish this task, which took less than two hours.

Upon the kudu's exitus, a *c.* 15 cm lengthwise incision was made in the upper neck region to reach the right external jugular vein, which was then slit open, whereupon the animal could be bled. As will be detailed below, blood letting of *am|naen* necessitated a careful cut to avoid damaging the oesophagus and trachea. This longitudinal incision employed for bleeding an animal contrasts with the transverse cut utilised by most peoples across the world. Interestingly, the Hai||om had no problem with using the transverse cutting technique to slaughter domestic goats or cattle, but refrained from doing so in big game. The kudu was then dragged in the shade of some low trees after bleeding and leafy branches from a tree like the Mopane were deposited around the carcass. They formed a bed to spread out the

20 Occasionally even large domestic animals were killed with *!khores*. This was for instance the case with a donkey that had 'gone mad'. Obviously, the meat of this individual was much tastier than that of its relatives killed by other means.

21 In the frame of the discussion of the hyenas' anal sacs, attention also turned to the sexual dimorphism in this species. All informants agreed that it was difficult to distinguish animals of the two sexes based on the external genital organs and pointed out that only specialists can see the difference. Willem Dauxab, however, reckoned that hyena could be male and female at the same time. How surprising this may sound, this observation is correct inasmuch as in spotted hyenas, the genitalia are identically masculine in both sexes until puberty. Thus, immature, unmated females have male-looking genitalia until they come in oestrous; then the female urogenital opening will widen and the nipples enlarge. If males reach sexual maturity, the scrotum becomes hairless and black (Matthews 1939).

Fig. 11: Kudu butchering experiment. Skinning of the animal starts with a longitudinal cut extending from the neck region across the sternum and abdomen. From this mid-line cut, four others radiated across the extremities.

animal's skin that served as a spread upon which meat could be laid without getting contaminated with soil dirt and dust during butchering.

Skinning began ventrally with a longitudinal mid-line cut (Fig. 11). It extended from the neck region between the mandibular arches across the sternum and abdomen to the udder between the first pair of teats. From this lengthwise cut, four others radiated. The first two took their origin near the cranial end of the sternum (or manubrium), one to the left and the other to the right forelimb, both running craniodorsally until reaching the interdigital space. The two other cuts started in the udder region and followed the plantar side of the left and right hind limb, ending at the interdigital space as well. Starting from the ventral mid-line, skinning proceeded by pulling and pushing (using one's fist) the skin in the direction of the extremities until reaching the fetlock joint, i.e. the articulation between the phalanges and the metacarpus (forelimb) and metatarsus (hind limb), respectively.

Now the left carpal joints would be cut twice transversely, first between the proximal and distal row of carpal bones and then between the latter and the metacarpal bone, liberating its proximal end. Next, the tissue retaining the fetlock joint would be sectioned, whereupon the marrow-filled metacarpus (cannon bone – *!ub*) could be removed[22]. This procedure would be repeated for the right forelimb. The toe bones and hooves remained in place. Attention now turned to the hind limbs, whereby a single transverse cut immediately below the distal row of tarsal bones separated the proximal metatarsus in the tarsal joint. By sectioning the left and right fetlock joints, the metatarsals could be removed without being damaged, leaving the toe bones and hooves in place.

Pieces of skin still adhering would now be separated from the underlying tissues, whereupon the kudu's hide could be unfolded onto the Mopane branches. The dressing of the carcass could then begin. Interestingly, if an animal had been shot from the left, which was also the case in our experiment, Hai||om hunters would dress the right side first, and *vice versa*.

22 In our experiment, the fetlock joints were not sectioned as would have been the case usually, since it was not intended to prepare the contents of the metapodials at the butchery site. Instead, they were taken home intact to prepare the contents there.

The first step consisted in the removal of |*goab*, comprising most of the cutaneous and deeper musculature covering the right costal arch (broadest muscle of the back, ventral serrate muscle). Once detached, |*goab* would be placed in a small tree nearby. Each time a body part was cut free, this procedure was repeated.

After the removal of |*goab*, the sectioning of the superficial and deeper pectoral muscles and the brachiocephalic muscle could be performed. It was followed by a cut through the point of attachment of the triceps muscle near the caudal margin of the scapula. If the shoulder joint was sectioned at this point, the kudu's right extremity (from the humerus down to the hooves) could be easily detached. However, instead of cutting all the soft tissues connecting the shoulder blade with the humerus, only those located medially would be sectioned. Thus, still attached to the body by the lateral soft tissues of the shoulder (including parts of the omotransverse, trapezius and deltoid muscles and most of the supraspinatus, infraspinatus, and minor teres muscles), one of the hunters would now bend the forelimb outwards while pulling with force. This caused the lateral soft tissues to detach from the outer surface of the shoulder blade, starting with those located near the shoulder joint and continuing upward until reaching the cartilaginous top of the shoulder blade. The right forelimb with the lateral muscles of the shoulder still attached (Fig. 12) would then be hung in a tree, ready for return transport to the camp, where further portioning would take place.

Fig. 12: Kudu butchering experiment. Removal of left forelimb together with the lateral muscles of the shoulder but without the blade. Note that the metacarpal (*!ub*) has already been separated from the distal carpal row, but that sectioning of the fetlock joint was not performed yet, because it had been decided to take back *!ub* intact to the camp in order to prepare the marrow there.

In a next step, the isolated right shoulder (||*gara.b*) would be separated from the body by cutting through the girdle and cephalic muscles connecting it to the trunk and neck. Attention would then be given to the right hind extremity, where in a first step *‡gu*, comprising the soft tissues situated at the caudal part of the thigh and essentially composed of the hamstring muscles (gluteobiceps, semitendinosus, semimembranosus), would be removed (Fig. 13).

Fig. 13: Kudu butchering experiment. Separating the hamstring muscles (*‡gu*) from the rest of the thigh.

Having placed *‡gu* in a tree, the Hai||om proceeded by removing the strip of muscles and associated spinal ligaments from the right side of the vertebral column, more precisely along the spinous processes of the last thoracic and all lumbar vertebrae (|*hama.s*) (Fig. 14). As such, the longissimus muscle forms the bulk of this piece of meat. As the Latin term implies, it is the longest muscle strand of the body, extending over the entire length of the back and neck and composed of longitudinal muscle tissue crossing several consecutive vertebrae.

The next step involved opening the abdominal cavity employing a single cut stretching from the caudal border of the sternum to the udder. The digestive, urinary, and internal genital organs could then be accessed. First, the large, four-chambered stomach was removed. This necessitated tearing through the oesophagus near the cardiac opening. The carcass was then tilted so that the rumen (||*khom.s*) and adjacent reticulum (*mûdigis*), the omasum (||*khanis, ‡gui!nabes*), abomasum (|*arab*), and parts of the intestine with the pancreas attached would slide out. After the tissues (ligaments, bile duct)

Fig. 14: Kudu butchering experiment. Removal of the strand of muscles (|*hama.s*) located along the spinous processes of the last thoracic and lumbar vertebrae, together with the spinal ligament.

connecting the liver (*âis*) with the alimentary canal had been sectioned and the sphincter and adjoining subcutaneous tissue surrounding the anus cut circularly, the entire intestine could be taken out. The contents of the digestive system could now be emptied. In our experiment, this was done at the end of the butchering.

Jointing continued with a circular incision targeting the acetabular rim of the pelvic bone in order to access the coxofemoral articulation, more precisely the head of the right femur. This necessitated the sectioning of the different muscles and other tissues connecting the upper hind limb with the pelvis and the trunk, such as the iliopsoas, gluteal, sartorius, gracilis, and adductor muscles. By cutting through the different connecting tissues and the intracapsular ligament, the femur head would be detached from the acetabulum and the right hind limb removed.

At the right thoracic wall the intercostal soft tissues between the 4th and the 5th rib were cut dorsoventrally from the vertebral column to the sternum[23]. Beginning at the 5th rib, the right costal arch was then divided in an upper and a lower segment. This was achieved by cutting craniocaudally through the costal cartilage of the 5th to 13th ribs just beneath the costochondral junction[24]. As such, the ventral (cartilaginous) parts of ribs 5 to 13 as well as all of the first four ribs would remain attached to the sternum. To disconnect the latter from the vertebral column, the Hai||om would cut through the ribs below the costal joints, the part which allows the knife to move through most easily. In this way, the costal articular surfaces of the right first four ribs would remain connected to the vertebral column and the rest of their bony as well as all of the cartilaginous parts would stay attached to the sternum. By pulling the bony (upper) segment of ribs 5 to 13 abruptly in an upward direction, the articular ends of the right costal arch would become disarticulated from the corresponding vertebrae. The upper right thoracic wall (*hai|ara.b*) was then set free by sectioning all remaining connecting tissues.

All aforementioned steps were necessary prior to the most complicated procedure, the removal of *‡gaob*, when the traditional dressing *am|naen* method was used. *‡Gaob* represents a 'convolute of organs' that had to be removed *in toto* belonging to the digestive (tongue, oesophagus, liver), respiratory (larynx, trachea, lungs), urinary (kidneys), cardiovascular (heart, blood vessels) and immune (lymph vessels and nodes, spleen, eventually thymus) systems[25]. The first step involved making a deep cut that followed the medial border of each mandibular half. This was done in order to reach the tongue, which could then be lifted to access the adjacent tissues and organs, more precisely the oesophagus (*do.m*), the trachea, and the blood and lymph vessels attached to the alimentary and respiratory tubes. By carefully cutting the ventral neck musculature in a median plane, exposure and removal of the digestive, respiratory, circulatory and lymphatic organs could be achieved (Fig. 15). However, progress was slow because the fragile structures had to remain intact. Upon reaching the thoracic cavity, the upper part of *‡gaob* had to be slid into the thorax via the thoracic inlet, conceivably the most critical moment when excising *‡gaob.* To avoid rupturing the major cervical and thoracic blood vessels, the heart (*‡gao‡ara.s*) and left and right lung (*sō.gu*) had to first be pulled back carefully, together with the spleen (*‡nubi.s, ‡nanu.b*) and the part of the liver remaining (if any), whereupon the aforementioned organs could be

23 From the interviews, we learned that the sectioning of the intercostal space was done between either the 3rd and the 4th or the 4th and the 5th rib. The latter was the case in our experiment.

24 Each rib consists of a bony dorsal part (*Os costale*) and a cartilaginous ventral part (*Cartilago costalis*), which meet in the costochondral junction. The bone parts articulate with the vertebrae, whereas the costal cartilage articulates with the sternum.

25 To a certain extent, *‡gaob* is synonomous to *pluck*, following entries in dictionaries stating that the tongue and the cranial part of the alimentary canal remain attached to the heart, lungs, and liver. However, the kidneys are never part of the pluck, which is in contrast to *‡gaob*.

Fig. 15: Kudu butchering experiment. Initial stage of the removal of *‡gaob*, a convolute of organs of the digestive, respiratory, urinary, cardiovascular, and immune system, which had to be removed *in toto.*

pushed into the thoracic cavity. Having achieved this, attention turned to the kidneys, which were carefully lifted to avoid a rupturing of the blood vessels connecting them with the rest of the circulatory system. Disconnecting the kidney (*!nai.di*) from the rest of the urinary system was achieved by cutting the ureter close to the renal hilus. Having thus 'assembled' all organs with their adhesive tissues and membranes, *‡gaob* could be lifted, 'folded' together, and carried away in a single piece. Prior to transportation to the camp, the gall bladder (*tsaba.b*) would usually be thrown away (Fig. 16), except when the animal was the first big game kill of a young hunter (see above).

Fig. 16: Kudu butchering experiment. Removal of the gall bladder prior to the transportation of *‡gaob.*

With the removal of *‡gaob*, a considerable amount of blood had accumulated in the abdominal cavity. Because blood is used for preparing certain meat dishes, it would be collected by draining it via the pelvic outlet and scooping it into the cleaned abomasum.

With the abdominal and pelvic cavities now being almost completely empty (except for some parts of the genital and urinary system), focus now turned toward the animal's left side. As has been already detailed for the right extremities, the consecutive steps included the


Fig. 17a and b: Kudu butchering experiment. Pieces of meat deposited in shrubs prior to transportation.

cutting of the (sub)cutaneous and deeper muscles covering the left costal arch, followed by the removal of the left forelimb with the still attached lateral muscles of the scapula, and finally by the shoulder blade itself. As to the left hind limb, *‡gu* would be removed first, followed by *!oms*. The latter corresponds to the ventral part of the abdominal wall. Since this particular animal was a female, *!oms* also comprised the suspensor apparatus of the mammary glands and the udder. These pieces were placed in trees once they were cut free.

Having removed *!oms*, the left hind limb would be detached in the hip joint, followed by the separation of the pelvis from the sacrum and vertebral column. The latter was done by chopping the left and right osseous body of the ilium with a machete. Once the ilia were chopped off, the rest of the pelvis could be removed with large parts of the gluteus and psoas muscles and other tissues still attached.

The Hai||om then proceeded by removing the strip of muscles and associated spinal ligaments from the left side of the vertebral column (*|hama.s*). Subsequently, the left costal arch would be divided proceeding as outlined for the right costal arch. After the removal of the left thoracic wall, focus turned to the sternum. Detaching the latter from the carcass only necessitated the separation of the left first four ribs from the vertebral column; they were cut through just beneath their articular surfaces. The sternum was then placed in a tree.

The only body parts remaining *in situ* at this point were the head (*dana.b*) and the vertebral column. Prior to separating the head from the neck (*!ao.s*), which was done by sectioning the atlantooccipital joint, the muscles at the left and right side of the neck (*|nans*) would be cut away and the nuchal ligament, the origin of which is at the occipital region of the skull and extends to the spinous processes of the first thoracic vertebra, sectioned. Once the head had been removed, the vertebral column was divided into two segments of nearly equal length. The first comprised all cervical and about eight thoracic vertebrae, the second was made up of the rest of the thoracic and all lumbar vertebrae, and the sacrum and tail.

The whole carcass was effectively reduced to pieces small enough to carry for return transport (Fig. 17a and b). The skin was also folded together for transport. Still at the kill site, the four-chambered stomach was separated from the intestine. In this experiment, the latter was thrown away at the kill site, but this appears not always to have been the case, especially, as Willem Dauxab told us, when people were very hungry. Finally, the ruminoreticular compartment of the stomach would be slit open and its vegetable fibre contents discarded. The emptied rumen and reticulum as well as the intact omasum and abomasum (containing the animal's blood) would be taken back to the camp.

The procedure described above applied to all ruminating *am|naen*, i.e. eland, gemsbok, greater kudu, blue wildebeest, hartebeest, and giraffe, with some minor variations. For example, the horns of adult male greater kudu might be discarded at the kill site if the camp was too far away. Because of their enormous body mass, a larger group of people (possibly including women and children) was necessary to dress animals such as adult giraffe and eland[26]. More people were also necessary in order to transport the butchered animal back to camp in time. In giraffe, only one side of the animal could be skinned and the thick, heavy skin had to be cut into pieces on the spot to render it transportable. Chunks of meat could be laid out on the pieces of skin until they were ready to be carried back to the camp. Upon leaving the kill site, the (still heavy) pieces of skin were hung in a tree to dry and picked up later. If they were still somewhat moist and not too dry, they could be prepared for human consumption weeks later. This was done to ensure food during periods of shortage. The skin was prepared by first cooking in boiling water and then pounding.

The butchering of Burchell's zebra proceeded in more or less the same fashion as in ruminating *am|naen*, with minor variations due to equine anatomy. It suffices to say that the alimentary canal in equids has but a single-chambered stomach and that there is no gall bladder.

Animal fat and biltong

From oral history we know that fat was the most valued animal product. Because the location of fat accumulations (*Panniculus adiposum*) in the subcutis and in other parts of the body varies from species to species, the method employed for dressing depended on the animal being butchered. Fat functions as an energy reservoir in animals, and the quantity of fat stored in the different organs fluctuates considerably throughout the year. The abdominal cavity, however, usually yielded several kinds of tissues rich in fat. Certain taxa exhibited a type of subcutaneous fat deposit that was highly valued by the Hai||om. Examples of this are the accumulation of fat in the nuchal region underneath the mane (*|gare.s*) in zebra, the pad of fat located on both sides of the vertebral spinous processes in porcupines, the skin covering the osseous parts of the left and right costal arches in aardvarks, the belly skin between the last pair of ribs and the groin in warthogs, and the fat in the dewlap (*oros*) of gemsbok and eland. Successful hunters were entitled to a piece of fat at the kill site (see below).

In ruminating *am|naen*, (male) eland in particular could provide large quantities (> 20 litres) of fat. Most of it is located in the dewlap and adjacent subcutis of the breast (*‡haru*) and around the heart (*‡gaoais*). In eland, the stomach (*|hâub*) and the kidneys are surrounded by an appreciable amount of fat, the suet being *a priori* reserved for the hunters (see below). Given its overall dietary value for the community, much care was taken to collect all of the *‡haru* and *‡gaoais*. To avoid any quarrelling over fat, the Hai||om would first liquefy it and then wait until it had solidified before portioning it. This procedure could take up to two days, but in the end, all families and persons received an equal amount. Hai||om families sometimes re-melted their share of fat and poured it into metal bins. This storage method allowed fat to be preserved for months.

Other large ruminants could provide usable amounts of fat as well, whereby the Hai||om elders explicitly mentioned differences in fat quality between species: The fat of blue wildebeest and hartebeest, for instance, hardened quickly, and eating too much of it was said to cause sickness which was described as a 'burning in the breast'[27]. This could be counteracted by eating bush food or drinking milk; soon thereafter, the patient would get diarrhoea. The fat of greater kudu and eland was less problematic in this respect, and Burchell's zebra provided the best quality of fat because it remained oily. Its particular taste, however, made it unsuitable for preparing meat dishes other than zebra. This was not the case with the fat of greater kudu and eland, which could be used to prepare any kind of meat including that of zebra. The consumption of too much zebra fat seldom caused stomach problems, however, it did result in diarrhoea, unfortunately without advance warning!

Biltong could be produced directly at the kill site, particularly in the case of large animals which involved problems with return transport logistics. Because of their large size, eland and giraffe would usually be tracked the day after being shot, because of the time delay for the poison to take effect. Help could therefore be organised by going back to the camp or signalling the need for assistance by calling with a springbok horn. Drying meat on the spot would be an option too if two or more animals had been killed at the same time. We were informed by the Hai||om elders about such events, which usually coincided with the animal migration period. Biltong was made by cutting strips of meat and drying them overnight in a tree at the butchery site. The neck and thorax were the choice parts, but other meaty parts would be treated the same way if necessary. The cold time of the year was the preferred season for making biltong. Although not fully air-dried by the next day, the reduction in weight that had occurred overnight was considerable and allowed it to be transported back to the camp. At least two more days were

26 The mass recorded in 18 adult male giraffe from Eastern Transvaal varied between 973 and 1395 kg, with a mean of *c.* 1192 kg, and in 18 adult female giraffe between 703 and 950 kg, with an average of *c.* 830 kg (Smithers 1983: 592). Average mass in adult male eland is 500-600 kg, in female eland 340-445 kg (Estes 1991: 188).

27 Conceivably, heartburn is meant here.

needed for the meat to dry completely. Such meat had to be pounded prior to consumption to soften it, a task for women or young men.

This of course does not imply that biltong could not be produced in the camp as well. Any meat surplus could be turned into biltong for later consumption. The dried belly skin of animals such as zebra or giraffe, for example, could serve as a source of food in case of protein scarcity. However, according to our informants, the meat of species including aardvark, porcupine, warthog, springhare, duiker, steenbok, and springbok would never or only rarely be dried.

The hunter's meal

A meal at the kill site usually followed a successful hunt. It could be prepared after the animal was butchered or in case of *am|naen*, while the animal was dressed. Following the Hai||om tradition, the meal essentially consisted of the animal's liver roasted together with a nice portion of fat, which was cut and prepared together with the liver. In valuable game, the hunter's meal would be rounded off by basting the roasted liver with the fatty marrow extracted from the four metapodials (*!ub*) and, in case of zebra, also of the marrow filling the mandibular canal (*!nanis*). Eventually the metapodials were taken back to the camp for marrow consumption at the *!hais*.

Sometimes smaller game species were killed at the onset of a hunting trip. Hunters would then decide whether to prepare it on the spot and eat it later the same day or collect it on their way back. Cooking at the kill site was done in a pit, lined and covered with hot coals. The meat would be ready upon the hunter's return a couple of hours later. Small-sized animals would be prepared *in toto* after singeing the hair and eviscerating it (see above), and medium-sized animals were dressed and selected body parts prepared on site. A choice part of an animal was its head, for instance, that of a warthog, the meat of which was considered a delicacy by the Hai||om.

Since the dressing of giraffe and eland necessitated the presence of larger hunting parties at the kill site, it also implied the sharing of meat and fat during meals. When women and adolescents were helping out, they would also get some of the food usually reserved for the hunters. At home, however, some of these food items would be *sōxa,* i.e. forbidden for them to eat (see below). Sometimes parties spend the night at the kill site to make biltong. Men on the one hand and women and adolescents on the other would gather around separate campfires and prepare their own meals. The next day(s), the hunting party would take the meat, the skin, and the marrow-yielding bones back to the camp. The latter were cracked at the *!hais* for marrow extraction.

Return transport

Depending on the size of the game, return transport would be organised differently. A single person could carry small and medium sized animals, probably with a maximum weight of around 40-50 kg, which is about what male springbok weigh. Exceptionally strong hunters were able to carry heavier animals over a short distance, like male cheetah or leopard that weigh up to 60 kg. Sometimes young men wanted to show off their strength by carrying very heavy loads or bigger animals alone. However, this was not very smart because people would make them carry even more the next time.

As mentioned before, carnivores like medium-sized cats were sometimes taken back to the camp *in toto* because their pelts required careful skinning. The animal was carried with the heavy portion of the body resting on the man's shoulders and the head and forelimbs dangling down on one side and the hind limbs on the other. In small to medium sized antelopes, the Hai||om 'locked' the animal's feet prior to transportation. First, the carpometacarpal joints would be sectioned transversally, enabling the left and right fore feet to be bent down, without detaching them from the upper extremity. Then the common plantar calcaneal tendon of the hind feet would be slit longitudinally near the heel (*!guru.b*), whereupon the fore feet could be inserted through the slit until the cut joints caused the extremities to hook. Fixed this way, the animal would stay largely in place on the way back to the camp.

Body parts of *am|naen* as well as their sun-dried meat were transported using a carrying stick (*darab*). These devices were cut and fashioned *ad hoc* at the kill site. The bark was eventually removed, so that it could be rested comfortably on the hunter's shoulder during the return journey. Meat packages would be hung or draped over each end of the stick to ensure a balanced load. According to the Hai||om elders, one possibility would be to secure the head (*dana.b*), breast (||*khai.b*), loin, and hind limbs at the rear part and the costal arches, *ǂgaob* (see above), pelvis and forelimbs at the front end of *darab*. In an attempt to distribute the weight more evenly across both shoulders a second stick would be angled downward behind the other shoulder and placed under the carrying stick. If the hunting party comprised more people, the load would be divided up between them. At least two carriers were needed for some taxa smaller than *am|naen* but still of considerable weight. In aardvark, for instance, a transverse cut separating the thoracal and the lumbar region would be made after singeing and gutting. Head, thorax, and forelimbs would be carried by the first hunter and the loins, hind limbs, and tail by the second.

As a rule, Hai||om hunters carried their load into the camp from the west and headed straight to the *!hais*, the experienced hunters' kitchen. However, if a carnivore would be *xamanî* (see above), it was not allowed to be brought into the settlement proper. The meat load would then be deposited at the foot of a distinctive tree marking the western edge of the camp.

At the camp

Dressing and portioning of animals

Hunters usually singed and/or eviscerated small to medium-sized taxa prior to transporting the kill back to camp. Certain antelopes (steenbok, duiker, and springbok) or *xamanîn,* i.e. those possessing valuable furs (leopard, cheetah, serval, and caracal) were often transported back home *in toto.* Having deposited the game animal at the *!hais* (as in antelopes) or under the tree (as in *xamanîn*), other people would take over the skinning and processing work, whilst the hunter himself would take a rest. With *xamanî* species*,* care was taken not to damage the long bones as it was believed that this would cause bad luck. Removing the extremities therefore implied careful cutting through the joints. As already mentioned, gutting of *xamanîn* usually took place at the kill site, except in taxa valued for their furs. Bowels, *‡gaob*, and liver of *xamanîn* were always discarded. Unlike the liver of herbivores or omnivores, the Hai||om refrained from eating this organ in canids, felids, and hyenids, not only because of its bad taste but also because they were convinced that it would provoke a change in colour of the skin of those who ate it.

Some parts of *am|naen* that had been carried back in one piece still needed further processing. This secondary butchering included the separation of the upper from the lower forelimb in the elbow joint, of the upper from the lower hind limb in the knee joint, and of *|hama.s*, which is the spinal ligament from the lateral group of muscles including the longissimus muscle. The latter was necessary prior to cooking, because the Hai||om considered the spinal ligament ideal for fletching their arrows (see above). The meat was then portioned for preparation, which included chopping if the meat was boiled so that it would fit into the cooking vessel.

If game had been stalked and/or killed using dogs (*!aob*), the quarry would also be brought to the *!hais*, unless it was *xamanî*. Portioning would proceed as in other species, however, with two particularities. First, it was *sōxa* (taboo) to damage the pelvis (*‡gaus*) during butchering, hence, care was taken to keep the coxal bones intact. After meat consumption, these bones would be hung in a tree until they fell off on their own. Second, the chest (*||khaîb*) would not be cut into pieces, otherwise the dog would be unlucky during future hunts.

Rules and social taboos (sōxa) related to meat distribution and consumption

Meat consumption was not subject to many restrictions at the kill site (see above), yet the situation at the camp was very different. Here, social customs dictated the distribution modus of the meat, in particular that of *am|naen*, the 'huntable game'. Amongst other things, this modus followed a set of rules related to the sex and age of the consumers. An exception to this was the meat of *xamanîn.* These animals would be prepared collectively at the fireplace near the *xamanî* tree at the western edge of the camp, and the meat and fat shared between all community members willing to participate in such a meal.

The distribution of the meat of *am|naen* followed patterns that differed according to the status of the hunter, i.e. young or adult, and the hunting method applied to kill the quarry. Usually, the meat was divided up at the *!hais* and subsequently distributed. The hunters handed over the women's share halfway between the *!hais* and the huts. The mode of meat distribution detailed below refers to *am|naen,* killed with *!khores* by an experienced hunter (*kai||khâuaob*).

(1) The ***hunter*** himself received two pieces of meat from the side of the body hit by his arrow, i.e. the shoulder (*||gara.b*) and the hind upper part the thoracic wall containing the bony ribs (*hai|arab*). Besides, he got the pelvis (*‡gaus*) with surrounding tissues, such as the gluteal muscles (*tsûibe*), but without the ventral musculature (*|hâonidi*). The hunter's meat would be prepared at the fireplace in front of his hut.

(2) The ***hunter's wife*** was entitled to the meat overlying the left and right costal arches (*|goab*) and the left and right hamstring muscles (*‡gû*). Preparation would take place at home.

(3) The ***hunter's sister*** got the rumen (*||khom.s*), the reticulum (*mûdikis*), the omasum (*||khani.s, ‡gui!nabes*), the tarsus, and the fore and hind lower feet, comprising the digits (*|khunus*) and hooves (*ae.s*). This dish would be prepared at home by cooking and the refuse mainly discarded near the fireplace.

(4) The ***children of the hunter's sister*** *(son or daughter)* received the neck (*!ao.s*) and the cranial segment of the thoracic vertebrae (*|khao.b*). Preparation would take place at home.

(5) The ***women's*** share consisted of the shoulder (*||garab*) and the upper hind part of the costal arch (*hai|ara.b*) from the uninjured body side. In addition, they received the meat from each side of the neck (*|nans*) as well as the left and right upper fore- (*||hannes*) and hindlimbs (*tî‡amai.s*). However, the long bones in these meat parts (humeri, femora) had to be returned to the *!hais,*

because the bone marrow was reserved for the experienced hunters. The women also received the mesentery (*kâo|hōb*), the spleen (*‡nanub*), and the kidneys (*!naidi*), which traditionally would be cooked together. Meat preparation took place at home.

(6) The ***young hunters*** (*‡kham||khâuaogu*) received *!oms, i.e.* the ventral abdominal wall. In female animals, *!oms* also comprised the suspensor apparatus of the mammary glands and the udder. In males, the genital organs could be part of *!oms* as well. Meat preparation took place at a separate fire a short distance from the *!hais*. The young hunters could also partake in the meat dish at their respective homes.

(7) The share of the ***old ex-hunters*** (*||gâuai||goegu*), who were no longer able to hunt *am|naen*, consisted of the brain and the sublumbal muscles[28]. In female animals that were carrying young, they were also given the foetus.

(8) The ***experienced hunters*** (*kai||khâuaugu*) received a considerable share of the *am|naen*. It consisted of the head (*dana.b*), a large part of the thorax (*||khais*, i.e. sternum, ribs 1 to 4, together with the ventral cartilaginous parts of ribs 5 to 13), the left and right longissimus and associated muscles (*|hama.s*), the left and right lower forelimb (*‡hâb*) with the carpus (*||goa.s*), the dewlap (*oro.b*; if not consumed at the kill site), the marrow (*‡gae.b*) of the upper hind limbs (*tîn‡amai*), the nuchal fat (*|gare.s*; particularly in the case of zebra), the abomasum (*|ara.b*), the caudal half of the vertebral column (*hurib!*; *kau!gâs*, i.e. from the last thoracic vertebrae to the tail) with the rump fat (*are!gâs*), the left and right lower hind limb (*!hai.s*), the left and right abdominal wall (*||khaunis*), and the *‡gaob* (without the spleen and the kidneys, since this was reserved for the women). The experienced hunters' food would be cooked at the *!hais*. This did not exclude the possibility of having other pieces of meat at home, though.

(9) The ***headman*** (*gaob*) of the group received a bit of each piece of meat the experienced hunters received. He also got the abomasum. At the *!hais*, the *gaob* would cook his meat in a separate pot, which was positioned beneath the bigger pot of the hunters. The *gaob* also had the privilege of tasting the prepared meat before the others were allowed to eat, a custom termed *tsaa-am*. The headman could store his food (*sōais*) in his cooking pot for a couple of days, which is why he would hang it in a tree. However, children sometimes stole from his pot while their mothers were elsewhere collecting bush food[29].

(10) The ***medicine man*** (*!gaiob*) sometimes got rewarded for advising community members, for instance, unfortunate hunters. If luck in hunting returned, they would reward the *!gaiob* by presenting him the pelvis (*‡gaus*) of the first large kill. The medicine man would never eat his share together with the other men.

This illustrates that the distribution and hence consumption of meat and fat was rule-based. However, these rules varied according to the animal species (*am|naen, xamanîn*, others), the age and/or sex of the consumers, or the way the quarry had been hunted (bow and (poison) arrow, dogs) and by whom (young, experienced, old hunters). Detailing all possible variants lays ouside the scope of this paper, but some particularities are worthy of noting. The meat and fat of some species was reserved exclusively for old people (men and women) including that of the pangolin (*||khommi*) and kori bustard (*!huib*). They were also the only persons that consumed ostrich eggs. The meat of the savanna monitor (*||nareb*) and tortoise (*!naab*) would be eaten exclusively by infants or old people. For reasons of health, nursing mothers refrained from eating eland meat to avoid that their children acquired a chronic cough. They avoided consumption of roasted kudu or warthog meat as well because milk production would otherwise cease. The contents of the marrow-yielding long bones, particularly of radius-ulna (*‡hâb*) and tibia (*!hais*), were *sōxa* for most group members except for the experienced hunters. The same applied to the head of eland, giraffe, greater kudu, and gemsbok, whereas it was not prohibited eating *dana.b* from hartebeest, blue wildebeest, warthog or zebra.

As to the role of hunting methods relative to food avoidance, if dogs would had been employed in hunting (*!aob*), the quarry's head as well as its pelvis, which had to remain undamaged (s. above), would be *sōxa*. If the Hai||om killed game with the assegai, head and pelvis would be *sōxa*.

The status of the hunter, i.e. young or experienced, also played a decisive role in how meat was distributed. For instance, if a young hunter shot his first big animal, he himself would receive a rib (*||hau|arab*) as a reward. The whole group shared the rest of the meat, except for the marrow yielding bones, which as usual, were reserved for the experienced hunters. The second large kill of a young hunter was shared differently, with the women receiving the neck (*!aos*) and the left and right shoulder blade (*||garagu*), and the remainder being consumed at the *!hais*.

28 These muscles are located ventrally of the transverse processes of the lumbar vertebrae.

29 This happened for instance at *‡Homob*, where Magdalena ||Khumus and Elsie ||Oreses once tried to steal some food, whereupon the *gaob* – Petrus Gaikaob ||Khumub – chased them with his *kiri*. At ||*Nububes*, Nater and Zacharias |Nuaiseb took away the *sōais* of old |Nuaiseb, as Kadisen ||Khumub told us.

Food preparation and bone waste

Meat preparation would take place at the fireplaces in front of the huts of the individual households or at the respective cooking fires of the young, experienced, and old hunters. Different members of the community regularly checked the fireplaces to ensure that these fires burned continuously. Near the huts, food preparation was taken care of by the women. At the hunters' fireplaces, members of the respective age groups were evidently responsible for cooking, although hunters could also eat meat at home if they chose to do so.

Meat would be prepared by boiling or roasting, depending on the species and body part. Boiled meat was a favoured dish, also because of the gravy. If necessary, the meat broth could be enriched by adding marrow to it. According to the elders, the Hai||om were already acquainted with cooking utensils at the end of the 19th century A.D. These utensils represent import goods. Apart from cooking in pots, roasting was also practised. It was preferred for preparing choice pieces. The meat was either placed directly in the hot coals of an open fire or oven pit. Specific parts like the head of a large antelope or warthog were put in it and covered with hot coals.

Interestingly, prior to the introduction of cooking vessels or when cooking pots were not available, most of the meat would be prepared in an oven pit. Small animals were prepared *in toto* (after gutting). For the meat of *am|naen*, people would first put a mixture of meat pieces rich and poor in fat on a piece of skin. They would then add salt to the meat, fold the skin together and sewed its ends to secure its contents. The wrapped meat (resembling a football, so our informants) would be placed in an oven pit. Thus, in those days when the Hai||om still were not acquainted with cooking utensils, meat preparation mainly took place in oven pits.

Our informants also explained that *‡khoms* was the dish favoured by the experienced hunters. The meat of the back (*|hamas*) was boiled and then pounded using a common lower grindstone and mano. The hunters then added long bone (like metapodials) marrow, which is very rich in fat, to this mashed meat in order to soften it. Each participant got an equal share of *‡khoms* in his bowl, to which a piece of the caudal backbone with meat (*!hurib*) and part of the abomasum were added. The latter had been prepared like a sausage by turning it over the fire.

There were only a few rules for meat preparation. The hunter's wife, for instance, was not to use salt when cooking *|goab* (the meat covering the left and right costal arches), yet salt could be added when preparing any other piece of meat. When cooking *xamanîn*, the marrow filled long bones had to remain intact. This is why the Hai||om cooked the animal's extremities *in toto*, whereas the rest of the carcass would be portioned to fit the cooking pot. This meant that only one side of an extremity at a time was prepared when larger *xamanîn* were cooked. The piece was turned over until thoroughly cooked, upon which the meat would be put on leaves near the cooking spot. Those who wanted could dunk their piece of meat in the greasy soup (*‡hom*). The head of *xamanîn* could either be cooked or roasted.

According to the Hai||om elders, waste disposal occurred close to the respective fireplaces, i.e. the place of consumption. If too much debris accumulated it would be collected and dumped somewhere nearby. It was obligatory to dispose of *xamanîn* leftovers near the *xamanî* tree. Because they were either lying on the ground or just barely covered with dirt, the refuse of such meals, mostly bones, were consumed or carried off by dogs and other scavengers such as jackals a short time after deposition.

Since our informants no longer lived in a traditional setting but resided in spatially separated dwellings in a village location (with no *!hais*), any recording of the topographical distribution of the bone waste of meals lying around is not applicable to the pattern of waste disposal in former Hai||om camps. Nevertheless, processing of meat packages into pot-sized pieces and cooking practices inevitably leaves traces on the bones. To document their patterning, we asked the Hai||om elders to return the kudu bones (including the tiniest fragments) to us after meat consumption. Because the kudu was slaughtered towards the end of our 2004 field season, all osseous remains from meals had to be collected from the different households and buried in the soil. Upon our return in 2005, a substantial part of the kudu skeleton could be recovered, but unfortunately, the skull, the cervical and first thoracic vertebrae, much of the metapodials, and all phalanges were not returned. Recovery was far from perfect, yet we could still collect some information about the intentional breakage of bones for cooking purposes, but more research is necessary to confirm our findings.

From the kudu's head, only the left and right mandible halves were available for analysis. Each of these had been chopped twice: in front of the second premolar and behind the third molar. These cuts provided access to the fatty, marrow-like contents of the mandible. As to the vertebral column, transverse cutting and chopping (with a machete or a small axe) of the intervertebral space produced portions comprising up to two vertebrae. In some instances, the caudal articular surface of a vertebral body would be hit or even chopped away, exposing the spongy bone inside, but this seems accidentally. In contrast, the spinal process of the thoracic and the transverse processes of the lumbar vertebrae were systematically removed. The last lumbar vertebra, however, remained connected with the sacrum. After being separated from the pelvic bone, they would be cleaved sagitally and the two halves portioned by transverse cuts. Lengthwise splitting and transverse cutting was also employed to reduce the size of the sternum.

Treatment of the ribs involved different steps. The flattened ventral ends were reduced into pot-sized pieces measuring about 10-13 cm. The square-like dorsal ends (without articular heads since they had been broken off or cut through during removal of the left and right costal arch), however, had been cut into smaller segments measuring 4-7 cm, thus exposing the bone's spongy tissue at the point of cutting. In addition, the dorsal parts of the first ribs would be split lengthwise exposing the spongy bone over its entire length.

With respect to the flat bones of the postcranial skeleton, the blade of the scapula was separated from the articular head. The latter was split and the blade reduced into several pieces. The left and right hipbone was separated at the ischiadic symphysis and cut up in the acetabulum, separating the three elements forming the coxal bone (ilium, pubis, ischium). The large, flattened ischium was then chopped into several pieces.

Carpals and tarsals including the calcaneus usually remained complete, except for the tali, which were slightly damaged during disarticulation of the ankle joints.

The extraction of marrow in all long bones containing this highly valued food preceded any further step. Although the metapodials were split lengthwise through the proximal and distal heads (and usually left at the kill/butchery site, but not in our experiment), most other long bones were deliberately broken in the mid-shaft region. The proximal head of the humerus was chopped lengthwise into two or three fragments and the portion at mid-shaft was reduced to few smaller pieces. The distal third of the humerus comprising the articulation was not processed further and remained intact. After having separated the olecranon from both the ulnar shaft and the radius with a blow just above the radio-ulnar joint, the shaft of the ulna was chopped into pieces. Marrow extraction in the radius essentially produced two halves and a few small fragments from the middle of the diaphysis. As such, the proximal and distal heads of the radius remained intact. The proximal and distal femur heads were separated from the diaphysis at their base and split lengthwise into two or three pieces. The remaining part of the femur diaphysis was chopped into several smaller fragments. In the tibia, a crosswise cut about eight centimeters from the distal end separated the distal articulation from the rest of the bone. No further treatment of the distal head took place. The tibia's proximal head, on the other hand, was chopped from the shaft below its base and subsequently split lengthwise twice or three times. The remaining diaphysis was then reduced to smaller fragments.

Because our observations are based on the incomplete skeleton of a single kudu, they only give an idea of how skeletal elements were reduced into pot-sized pieces following Hai||om custom. These preliminary results illustrate how the cuts effectuated on fresh bone and help understand how mandibles, vertebrae, ribs, flat bones, carpals, tarsals, and marrow-yielding bones were processed. Although more work is necessary to establish whether these findings are characteristic of the normal situation or not, the *modus operandi* described discloses the Hai||om's main intention during carcass process, namely, optimizing the extraction of fat, minerals, and other nutrients present in the different kinds of spongy bone tissue. If our assumption is correct, patterns of bone breakage might not have been that variable after all.

Raw materials of animal origin and their daily use

Hunted primarily for dietary reasons, the procurement of game animals also served in the acquisition of a broad spectrum of other basic commodities. Good examples of this are the skins of the different species hunted. They were used for making a variety of items, but priority was given according to needs. During food shortages, hides of species such as zebra or giraffe would not be turned into leather but simply cut into strips, stored in a dry place, and used as food.

The processing of animal skins for making clothes, bags or other items of daily use was a multi-step procedure, which was already described earlier for the carrying bag. Based on their experience relative to the material properties of the skins of the different species, the Hai||om would select those of steenbok, springbok, duiker or dik-dik to produce loincloths for women (*!gobas*) and men (*!guus*). They considered springbok skins ideal for making a baby-sling (||*hanib*) or women's top (*ana|khaab*). The skin of blue wildebeest, giraffe and the skin covering the lower part of zebra legs provided suitable raw material for manufacturing sandals (|*khapun*). Bowstrings were made from long strips of belly skin taken from antelope such as steenbok, greater kudu or blue wildebeest. These were then twirled up before fastening them to the bow. Blankets were made from hartebeest skin (||*khama‡nams*). Kudu skins served as sleeping carpets. Strings made of steenbok and duiker skins provided excellent material for sewing all kinds of leather items such as quivers or the carrying bags for women (||*khobes*) and men (|*hôagaos*). The Hai||om preferred using the belly skin of a zebra for manufacturing quivers. As mentioned above, leather pouches could be fashioned from (parts of) the skin of different animal species, for example, that of springhare for storing tobacco. According to Hans Haneb, the Hai||om living at Namutoni manufactured hats from aardwolf pelts.

Other primary materials, such as sinews, horn sheaths, and porcupine quills played a role in daily life as well, as the following examples illustrate. The long sinews of the back of large antelopes, zebras or giraffes were selected for fletching arrows and securing the nock. This durable tissue also served for stringing necklaces and bracelets. When cut properly porcupine quills produced 'black and white' beads for personal adornment. Ancient photographs show Hai||om women carrying strings of ostrich beads, but it is not entirely clear, if these had been manufactured locally (see also below). The (pointed) horn sheath of steenbok served as an awl for perforating skins before sewing them to clothes or bags, whereas those of hartebeest and wildebeest were fashioned into spoons. Springbok horn was used to make wind instruments in order to signal a successful hunt or potential danger.

Certain substances of animal origin played a role for personal hygiene and medical treatment. It should be noted that in most folk medicines around the world, animals and their products play a minor role in the pharmacopoeia compared to plants, and the Hai||om are no exception to this. Most therapeutic measures of the Hai||om are plant based, yet they informed us about particular uses and treatments involving products of animal origin. It is hardly surprising that fat and bone marrow served to keep the skin smooth. Rubbing one's hands together after a meat dish would suffice to achieve this. Treatment of wounds or blisters from burns involved the removal of the damaged skin and a careful rubbing of the spot with the fat of a savanna monitor. This would be stored in a separate tin. In case it was not readily available, the Hai||om would burn the floral stalk of *Aloe* sp. and apply the black ash onto the burns. If a person was bitten by a venomous snake quick action was critical. In the absence of antidotes, measures aimed at attenuating and delaying the effects of the poison by administering an emetic substance, which was kept ready to hand. On hunting trips, a piece of dried kidney from the black-backed jackal served this purpose and provoked severe vomiting shortly after ingestion. In the camp, the main ingredient of the remedy (and at the same time carrier substance) would be the fat of blue wildebeest. To this substance the tooth of a black mamba (*Dendoaspis polylepis*) or another snake and the tag and dried kidney of a slender mongoose (*Galerella sanguinea*) were added. One fingertip of the mixture on the patient's tongue would quickly provoke severe nausea. Vomiting lasted about ten minutes and would help evacuate the snake's poison from the patient's body, so the Hai||om[30]. The same substance rubbed onto the upper lip or underneath the nose resulted in an improvement of a person's general condition, particularly in the case of gastro-intestinal problems or impairment.

Scales (||*khom soros*) of the pangolin (||*khommi*) served to treat different health problems. Inhaling the fume of a smouldering scale would help against colds by loosening phlegm in the respiratory tract and the nasal passage, and also helped to relieve headaches. Strictly speaking, this therapeutic measure would not restore health, but brought about an abatement of symptoms. Chippings of pangolin scales mixed with water would help as well. In case of respiratory problems in newborns, the Hai||om would administer a bit of pangolin scale powder orally, which had a therapeutic effect.

The excrements of the exclusively insectivorous aardwolf (*Proteles cristatus* – |*gîb*) dissolved in water could be used for cleaning the body. Administered in form of a potion or by means of burning and inhaling the smoke offered relief to ailing persons. A piece of the anal sac from an aardwolf wrapped in cloth or in a leather pouch and hung around the neck of children or attached to their carrying bag would protect them against insects and other creatures.

Finally, talisman and amulets made of particular parts of animals formed part of the daily life in the Etosha as well, as the following examples illustrate. Infants would carry skin pieces of greater kudu, eland, and warthog around their necks before starting to walk, ensuring prosperity and a good health. To protect them against disease, they received a pendant with a fragment of a pangolin scale, but this had to be done prior to the child's first illness, otherwise it would not work. The skin and spines of a South African hedgehog (*Atelerix frontalis* – *dáo taoros*, ||*khû!noas*) brought its owner luck, e.g. plenty of meat, a wife, etc., since the species would only be found 'by lucky ones'. Hedgehog spines attached to one's hat served as a lucky charm. Others would affix the animal's skin (or parts thereof) to the entrance door or roof of their hut. The nose of a hyena meant good luck as well, and people kept a dried piece of it in their medicine box. An ill fated person rubbed his face with it. The excrements of aardwolf thrown into the fire would offer protection against enchanters and sorcerers.

30 Similar treatments of snakebites have a long tradition in folk medicine. They follow the principle of contrasts (*Contraria contrariis curantur*), meaning that the opposite is cured applying the opposite. The mongoose is a most successful enemy of venomous snakes in nature and from this viewpoint, treating a person with some mongoose body part would give an anti-venomous property to the emetic substance.

Archaeology and archaeozoology in the ENP

Research background

Data relating the social and ecological history of the Etosha National Park collected and compiled by U. Dieckmann between 2000 and 2008 within the framework of the "Xoms |Omis (Etosha Heritage) Project" and the ACACIA Collaborative Research Centre (SFB 386, University of Cologne) has proved an invaluable source for the development of a complex space-time-model of the historical use of a landscape (Dieckmann 2001, 2003, 2007a,b). Main sources of data are comprised of interviews held with Hai||om informants whose homesteads were located in the area until 1954. The analysis and verification of this same information, i.e. factors such as settlement structures and material culture by means of archaeological investigations emerged as a most desirable measure. Consequently, a first archaeological reconnaissance trip to the Etosha National Park area was undertaken in 2003 and served to verify the scientific potential of the settlement remains. It also showed that an investigation using archaeological methods would be extremely advantageous (Vogelsang 2005). Due to the particular and tragic circumstances, i.e. the forced abandonment of the settlement area, and the fact that since this event, the settlement remains have not experienced any anthropogenic influence, they seemed to represent a largely undisturbed "snapshot" of an entire settlement area. From the more than 180 localities recorded by U. Dieckmann, 21 have been subject to primary archaeological investigations in 2004 and 2005[31]. The waterhole *‡Homob* and the nearby historical settlement site of the same name were selected for documentation in further detail in 2004 and are therefore the focus of our archaeological research.

Direct observation of an ongoing community permits correlating activities and even patterns of social organisation with material by-products that may be preserved in the archaeological record. Such an approach can serve as a starting point, where the 'answers' are already known, and provides a degree of control that is impossible to achieve in a strictly archaeological situation. In such a controlled context, data, per se, have a great and practical value, also because the pitfall of circular reasoning is avoided, since no pretence of objectively derived living patterns from their material remains need be made (Yellen 1977a: 11f.). With respect to large game, the *chaîne opératoire* from their primary butchering at the kill site until the disposal of bone refuse helps explore and understand the factors that led to bone assemblage characteristics at Bushmen camp sites (e.g., Yellen 1977b, Bartram 1993). Unfortunately, for reasons already outlined, the 'ethnographic present' of the Hai||om cannot be documented anymore. Nevertheless, since carcass treatment followed certain patterns, oral history could – at least theoretically – allow for predictions relative to taxonomic composition and skeletal part frequencies in their former occupations, such as primary butchery sites, base camps or special-purpose locations including seasonal hunting camps, where emphasis would have been on the production of sun-dried meat. Studies conducted in the Kalahari have shown, however, that the archaeozoological record did not reveal unequivocal faunal patterning in the distinct types of occupation. One major reason for this was the fact that, according to the situation, the process of primary butchering, which was intended to produce manageable pieces for return transport, was followed by secondary butchering on the spot (e.g., Yellen 1977b, Bartram 1993). The extent of this additional step depended upon consensus decisions reached in the frame of an *ad hoc* evaluation of key variables, such as the size of the carcass obtained, the time of the day the carcass was recovered, the number of carriers, the distance to the base camp, etc. Thus, butchery strategies for large game were adjusted on the spot as occasion demanded, with hunters carrying home either (1) the entire carcass in minimally disarticulated units (like those in our kudu butchery experiment), (2) more extensively processed carcass parts, i.e. mainly meat and marrow-yielding bones, and (3) exclusively meat, most of it in form of sun-dried biltong. The latter two strategies aimed at reducing return transport weight. Kalahari hunters sometimes even decided to move the camp to the kill site[32].

According to Yellen (1977b), the Ju|'hoansi always carried the clean marrow bones back to the camp, independent of the strategy chosen. From an (ethno)archaeological viewpoint, this would imply that between kill sites where biltong had or had not been made, there would be very little, if any, difference in material culture. Bartram (1993: 121f.), on the other hand, observed that once Kua hunters had decided to produce biltong, the marrow bones exposed during de-fleshing would be cracked and eaten at the kill site instead of being transported unbroken back to the campsite. The resulting fragments were discarded at the breakage location, leaving a pile of epiphyseal and limb shaft fragments

31 The archaeological work in the Etosha National Park area started as an *ad hoc* project, it was neither expected to take place nor systematically planned. For this reason, archaeological investigations were limited, which is why the results only present a grab sample of the cultural heritage of the ENP.

32 For the Kua of the central Kalahari, for instance, Bartram (1993) mentions the first two transport strategies for gemsbok, the third strategy for eland, gemsbok, and kudu, and the last strategy (moving of the camp) for giraffe only.

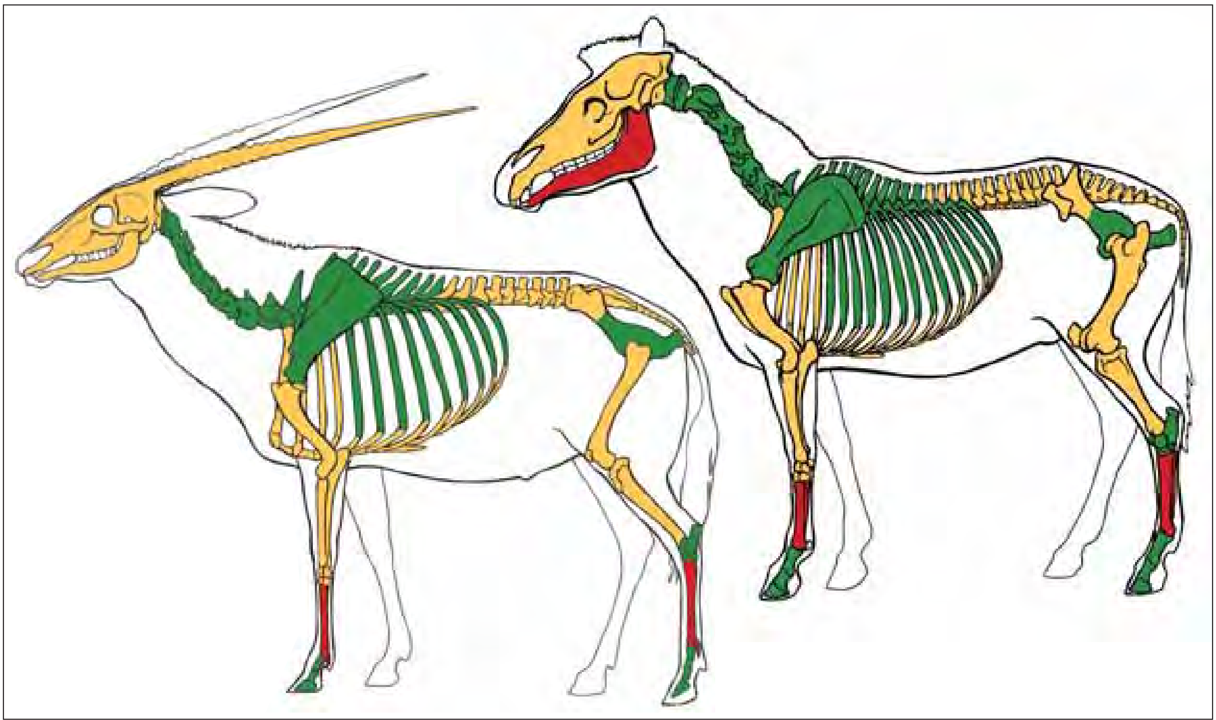

Fig. 18: Hypothetical distribution of gemsbok (a) and zebra (b) bones at the kill/butchery site (red), the nuclear household space (green), and the experienced hunters' cooking area (yellow).

discarded next to the (stone) anvil on which they were cracked. Hence, biltong production and subsequent marrow cracking had profound effects on the composition of bone assemblages from large game in Kua settlements, as large amounts of de-boned meat were transported to their campsites. These examples from the northwestern and eastern Kalahari illustrate that within a single type of occupation, species composition and skeletal part frequencies might show considerable variation. For the Hai||om, a comparable degree of behavioural flexibility vis-à-vis the butchering of large game can also be assumed, implying that in their archaeological residues, noticeable variation in faunal inventories excavated from identical occupations can be expected as well. Verifying this assumption necessitates a series of archaeological excavations in different locations of the ENP. As already indicated, this was not possible within the framework of our project.

Another interesting aspect of ethnoarchaeological work in arid southern Africa has been the search for activity areas in hunter-gatherer camps based on the topographic distribution of cultural remains, such as artefacts or animal bones (see also discussion). Interestingly, the unique distribution modus for *am|naen* and the bone refuse resulting from food preparation at the different fireplaces in a Hai||om camp may provide one rare occasion for distinguishing the individual household space from the area where the *!hais*, the kitchen and fireplace of the experienced hunters, was located archaeozoologically. Based on the oral information provided by the Hai||om elders, it is at least theoretically possible to postulate a model for recognising the two kinds of activity areas mentioned in Hai||om base camps archaeo(zoo)logically (Fig. 18). In the faunal record, the individual household would be characterised by bone accumulations dominated by fragmented ribs, shoulder blades, coxal bones, neck and thoracic vertebrae, tarsals, and foot bones. Circumstantial evidence for the *!hais* would come from bone assemblages with a clear dominance of fragments stemming from skulls, mandibles, teeth, marrow-yielding long bones, ribs, lumbar vertebrae, and metapodials.

Were it not for the oral history, the consumption of meat from aardwolfs, cheetahs, leopards, caracals, servals, hyenas, jackals, and other medium to large carnivores could have passed almost completely unnoticed to the archaeo(zoo)logist, because preparation and consumption of *xamanîn* took place at the settlement's western outskirts, i.e. in an area usually not considered for excavation since it lacks surface structures. Conversely, it can be hypothesized that osseous remains of *xamanîn* – since prepared elsewhere – must be absent from the central settlement area, where the huts, fireplaces, and kraals are located.

Archaeological survey

The restricted access to the ENP due to its status as a national park as well as the tight time schedule of this *ad hoc* project did not permit systematic surveys of large areas of the ENP. For this reason, mainly historical locations that were already known to our informants were visited. The recorded sites comprise long-term settlement sites, seasonal camps for specialised activities, hunting stands, waterholes, and graves. Access to most of the sites was done on foot, sometimes over considerable distances. In this way, it was possible to survey for further historical and archaeological sites. However, with the exception of some single stone artefacts and potsherds, no new sites were discovered. Scatterings of historical finds on the surface, and also Late Stone Age (LSA) stone artefacts, pottery, and ostrich eggshell beads proved a regular feature, but only near natural waterholes. Unfortunately, the extremely large numbers of animals that frequent the waterholes destroyed any archaeological context that may have been present, and the informative value of these surface sites is therefore limited. Yet, our observations do confirm that some of the waterholes were already in use during the LSA period. While there appear to have been larger LSA settlement camps close to some waterholes (e.g. "Groot Okevis" and "Olifantsbad"), others were only visited in the course of hunting forays. Hence, the original age of hunting blinds, which are a characteristic feature at the larger waterholes, is difficult to determine. All blinds were still in use during historical times, but their origin might extend much further back in time.

This contribution will not go into further detail regarding the general results of our survey, but will focus instead on the analysis of the settlement site and the hunting blinds situated close to the *‡Homob* waterhole.

Archaeology of ‡Homob

The *‡Homob* area was chosen for archaeological investigations in further detail because it represents a typical topographic situation of a long-term settlement site (base camp) close to a waterhole. Furthermore, the hut circles were found to be in a good state of preservation, and a first survey yielded numerous surface finds. Oral information concerning the site was quite detailed due to the fact that one of our informants, Willem Dauxab, lived there until about the age of 16 years old.

The archaeological investigation commenced with a three-dimensional recording of the topography and the archaeological features and objects of the settlement site and of the waterhole itself. Subsequently, all characteristic surface-finds were collected. A final step involved the excavation of a 24 sq. m area with the remains of two hut circles (huts B/C) down to the solid calcareous crust.

Settlement structure

At the settlement site *‡Homob*, six larger stone circles indicate hut structures (Fig. 19). For the construction of the huts, a circular space with a diameter between two to three metres was cleared of the limestone gravel that forms the natural surface in this area. Larger boulders were placed at the edge of this circle to form a foundation, most likely for a branch and grass screen. Remains of such structures were not preserved at *‡Homob* but have been recorded at the site *Kaikevis* (Groot Okevis) in the Namutoni region. Two stone cairns (D, G) adjacent to the double-hut-structures might simply attest to surface clearance during construction work.

The stone circles are orientated on a slightly semicircular axis. Ideal-type maps of Hai||om settlements from the beginning up to the end of the last century (Fourie 1926, Lebzelter 1934, Widlok 1999a) show a stronger circular orientation. However, Widlok (1999a: 392) stresses the diversity of settlement layouts influenced by individual factors, such as the composition of a local Hai||om group. In the case of *‡Homob*, a shady place seems to be one main criterion for the preferred location of a hut, and with only one exception, all were constructed under mopane trees[33]. In two cases, stone circles share a tree and form a double hut (B/C, E/F). According to our informants, members of a nuclear family occupied these huts. The smaller appendix was built for children who had reached puberty. The hut-circle at the northwestern edge of the settlement (hut I) is in a worse state of preservation than the others. This might be indicative of an abandonment of this hut already during the occupation and the re-use of some of the foundation boulders.

The surface of the interior space of the two double huts, and probably of the partly destroyed hut as well, is virtually free of any artefacts or debris. In contrast, there is a concentration of finds in one hut (H). The ostensible absence of finds inside residential huts is in accordance with Yellens observation on a Ju|'hoansi camp site in the Dobe area (Central Kalahari): "Since few activities, other than sleeping during the day, take place inside the hut itself, these interiors contain little, if anything, in the way of debris" (Yellen 1977a: 92). However, this does not exclude exceptions to this rule, such as the accumulations of bones inside structures due to nocturnal consumption, as observed by Bartram et al. (1991: 103). The concentration of surface finds inside hut "H" might indicate a different function of this structure, which may have been used for some specialised activity.

Our informants identified a very small and totally closed stone circle (A), interpreted by us as some man-

33 The examination of growth increments of mopane trees (*Colophospermum mopane*) in Zimbabwe suggests annual ring sizes of less than 1 mm (Mushove et al. 1995), another study showed an annual growth of the tree trunk radius of 0.66 mm (O'Connor 1999). Based on these dates, the large trees at *‡Homob* might easily have an age of 200 years.

Fig. 19: *‡Homob*. Plan of the settlement site (contour line 10 cm equidistance). ***Features***: A = dog kraal; B/C, E/F, H, J = hut circles; D, G = stone cairns (ash heap and concentration of bones under D); K = cooking area of the experienced hunters (*!hais*), with ash heap and concentration of bones; L, P = fireplaces; M, N, O = ash heaps; Q = pseudo-stone circle caused by uprooted tree. ***Peculiar finds***: 1 = flint stone for lighting fire (Nr.24); 2 = iron knife blade (Nr.32); 3 = glass scraper (Nr.33); 4 = glass scraper (Nr.34); 5 = wire snare; 6 = glass scraper (Nr.36); 7 = glass scraper (Nr.31); 8 = hammerstone (Nr.29); 9 = glass scraper (39); 10 = lower grindstone (Nr.27); 11 = upper grindstone (Nr.28); 12 = (cooking) tin; 13 = meat carrying stick; 14 = lower grindstone; 15 = glass core, 2 glass scrapers; 16 = bullet casing; 17 = metal earring; 18 = saw blade; 19 = iron axe blade; 20 = metal plate; 21 = glass core, glass scraper; 22 = hammerstone; 23 = tin toy (car); 24 = glass core (Nr.47); 25 = glass core (Nr.45), glass "knife" (Nr.46); 26 = bullet casing; 27 = concentration of ostrich eggshell fragments.

Fig. 20: The waterhole of *‡Homob.*

ner of storage structure, as a “dog kraal”. The remains of a larger kraal for keeping young goats[34], still visible in 1974, have since been destroyed by elephants, said the Hai||om.

The waterhole *‡Homob* lies just 600 metres west of the settlement site (Fig. 20). In fact, our informants distinguished between two adjacent waterholes: one for the animals and one for human use (drinking water). There is one closed stone circle and one half-circle on the eastern side of the larger waterhole (Fig. 21). A much frequented animal trail runs between two hunting blinds (*!goas*). Their location in relation to the waterhole is determined by the main wind direction which blows from the east, and the structures would certainly not have been used simultaneously (the hunters would shoot in each other’s direction), but were manned depending on the prevailing wind direction. Because northeasterly winds prevailed throughout the year, the more solid construction was used most of the time, especially in winter, when the highest wind speeds occur (Engert 1997: 117). The semi-circular windbreak was only used occasionally when the wind was blowing from a southerly direction. Small amounts of ashy sediment were found inside the closed structure. Small fireplaces, made in a pit, are a regular feature of Hai||om hunting blinds in the ENP. This corresponds to observations on Ju|’hoansi hunting blinds by Brooks (1984: 44f.). According to the Hai||om elders, the fire was not extinguished until game approached. Besides warming the waiting hunters, the blaze also served to keep lions away.

Finds

There were no finds associated with the hunting blinds. However, there is only a thin layer of sediment upon the solid calcareous crust near the *‡Homob* waterhole and this has been trampled and kicked up by animals.

By contrast, the settlement area yielded numerous surface finds (Fig. 19). The most frequent artefact observed fall into the category of glass artefacts (N = 48, total weight = 643.9 g). Besides unmodified pieces of broken glass, there are glass flakes, cores and retouched tools (Fig. 22). The raw materials are vintage beer and syrup bottles (an inscription identified one as an Oros bottle that was bottled around 1948). The relatively thick bottoms of the beer bottles were especially preferred as core material for the production of flakes. However, even these pieces permit only the production of small and thin

34 A large stone circle marked the goat kraal at the settlement site *||Nububes*, but there were no signs of such a structure at *‡Homob*.

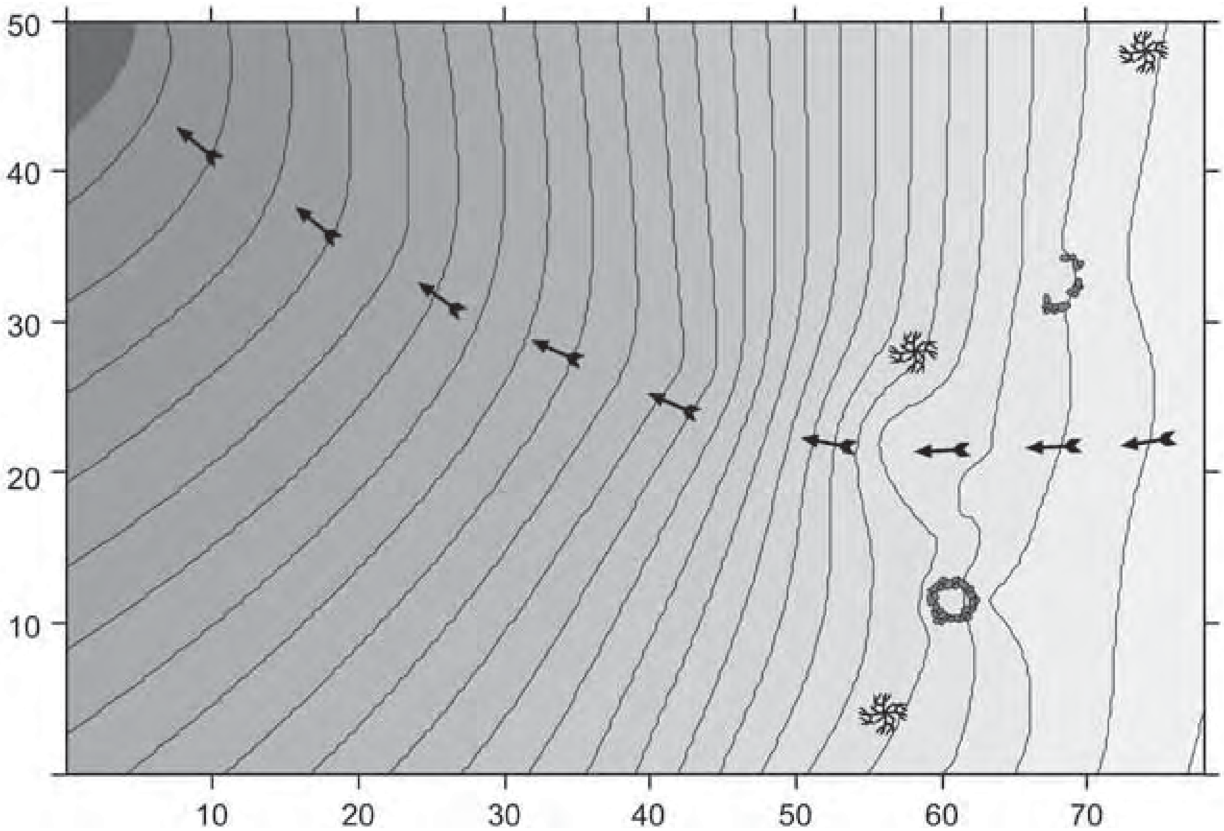

Fig. 21: Plan of the waterhole of *‡Homob.* with location of the two hunting blinds and the animal trail indicated by arrows (contour line 20 cm equidistance).

yet extremely sharp transversal flakes. According to our informants, these glass flakes were used in ritual scarification for the purpose of curative treatment.

Larger pieces of broken glass had sometimes been modified by a steep retouch that forms a concave working edge. These tools resemble Late Stone Age scrapers, but there actual use was not known to our informants.

The second most frequent artefact category are metal finds (N = 21, total weight = 556.9 g). Special finds are an iron axe blade, a spearhead, a tin toy car and a metal badge, a so-called "native pass token" with the inscription "Bethanien Pass 1471" (the piece had been photographed during our first visit but had "vanished" when we revisited the site a year later). Tins were used as containers, but also as raw material for the production of tools, such as arrowheads, and many pieces exhibited traces of cutting. Beer bottle crown caps were perforated, most probably for the use as dancing rattles. Bullet casings were modified by removing the bottom. Two nested bullet casings were most probably used as a smoking pipe (tube pipe), as known from ethnographic observations (e.g., Silberbauer 1981: 231); other pieces might have been used as ornaments.

Stone artefacts (N = 6, total weight = 1055.3 g) are comparatively rare. There is one fragment of a lower grindstone (or mortar), one fragment of an upper grindstone (or mano) and two hammerstones made of quartzitic rocks. The only chert artefacts are two splintered pieces that, according to our informants, were flint stones for lighting fires.

Potsherds are extremely rare with only six fragments from a single thick-walled cooking pot (mean thickness = 10 mm) that were all found close to hut circle B/C.

A concentration of 127 small, unmodified ostrich eggshell fragments was found, however, a connection with the human settlement is questionable. The only beads of the surface collection are two glass beads. This is surprising as our informants mentioned that ostrich eggshell beads were exchanged with Oshiwambo people living further to the northeast. Furthermore, the photos of the Denver expedition dating back to 1925/26 suggest that ostrich eggshell beads were an integral part of Hai||om jewellery at that time.

Although the distribution of surface finds shows a concentration near the hut circles B/C, overall the number of artefacts is too small to identify any activity areas. Only the explanations provided by our informants permitted the identification of a wooden stick as a meat carrying stick and the location of the "experienced hunter's kitchen area" (*!hais*). The only other finds in

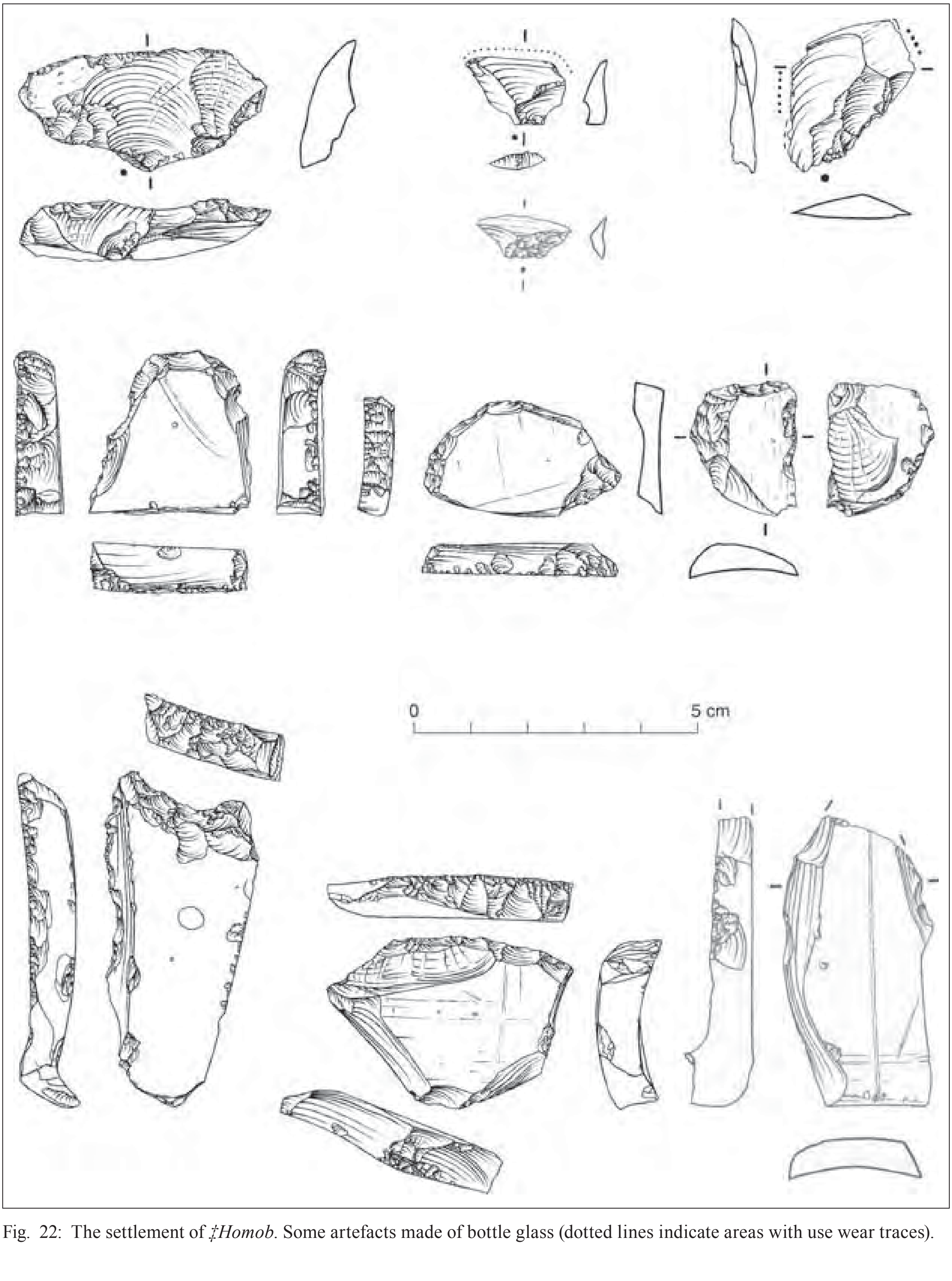

Fig. 22: The settlement of *ǂHomob*. Some artefacts made of bottle glass (dotted lines indicate areas with use wear traces).

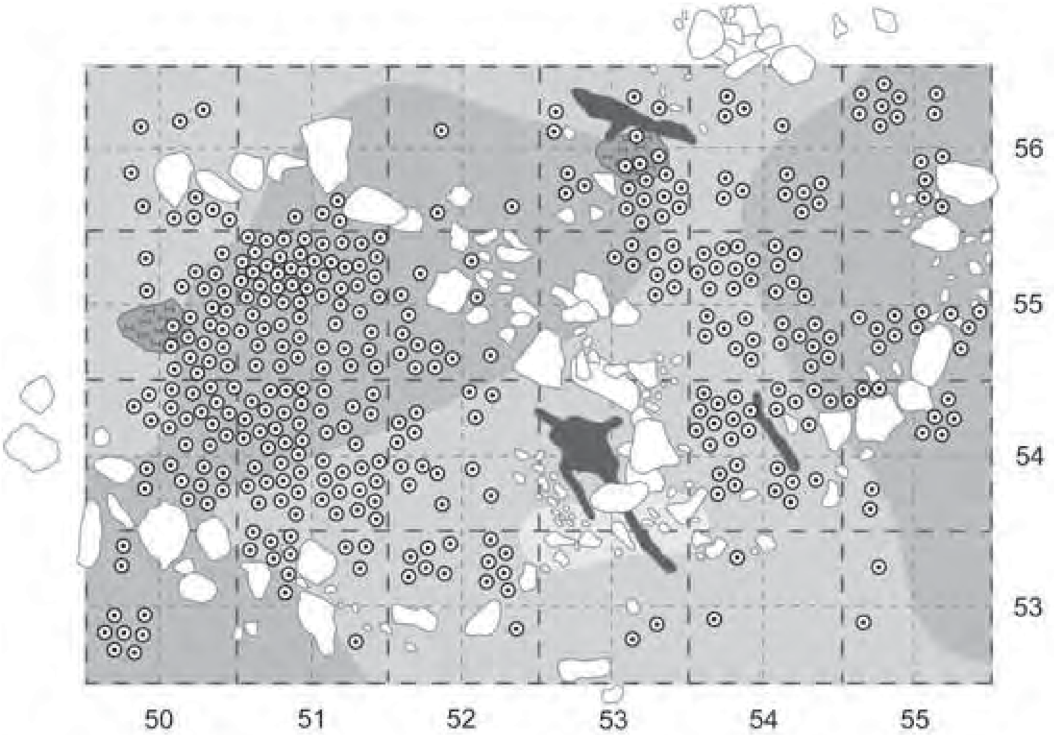

Fig. 23: The settlement of *‡Homob*. Stone circles B/C. Distribution of glass beads.

this area were a large lower grindstone fragment and a tin that had been used for cooking. A small test-pit yielded an ash accumulation with numerous bones that was invisible on the surface.

Excavation of the hut circles B/C

Hut circles B/C were chosen for excavation due to the concentration of surface finds near but outside of the circles. An area of 24 sq. metres was divided into a grid of quarter squares. After levelling the surface, the loose surface sediment of each quarter square metre was removed. All sediment was sieved in three stages with mesh widths of 10, 5, and 2 mm. All finds were separated by material (glass, metal, stone, pottery, bone, charcoal and other botanical macro-remains) during the excavation process. The solid calcareous crust was already reached in the second step of the excavation, since the total thickness of sediment never exceeded five centimetres. Despite the thin sedimentary cover, a large number of artefacts were recovered that had been overlooked during surface collection including 375 (!) glass beads (Fig. 23), mainly in blue (N = 116), white (N = 82), and green colour (N = 80). Less common colours are yellow (N = 43), orange (N = 30) and red (N = 24). The majority of these beads is extremely small (1 mm) or small (2-3 mm). Only single pieces are larger than 5 mm. The concentration of glass beads inside the hut circles is conspicuous. Other glass artefacts were also found inside the huts, but they were clearly concentrated outside, where a cluster of 91 flakes, cores, chips, and 3 retouched scrapers next to a fireplace at the frontcourt of hut B indicates a knapping spot (Fig. 24). The distribution of metal artefacts is less clear, but inside hut C they are rare and limited to areas close to the walls (Fig. 25). Furthermore, metal finds inside the huts are mainly special finds, such as six perforated crown caps, a jaw's harp, an iron awl, and an iron hook. Two concentrations of arrowhead fragments and metal pieces with cut marks suggest the repair of arrows outside the huts in squares 54/56 and 55/53. Stone artefacts, flint stones for the lighting of fires, and their spalls were found mainly inside hut B (Fig. 26). In addition, 97 potsherds, all belonging to a single cooking pot, were found exclusively inside and behind the southern wall of hut B. The distribution of finds indicates an interpretation of hut C as a sleeping shelter, whereas structure B seems to be a working space, possibly a cooking shelter in the form of a windbreak. However, fireplaces were arranged in front of the entrance of the stone circles in both cases [35].

Archaeozoology of ‡Homob

The state of preservation of bones on the surface is very poor. Thus, a superficial accrual did not produce much bone material. The most conspicuous find recovered was the nearly complete horncore of a gemsbok. It was collected in an area identified by the informants as the

35 This is also the typical location of fireplaces in the map of !*Gai≠nas* drawn by Widlok in 1991 (Widlok 1999a: Fig. 1).

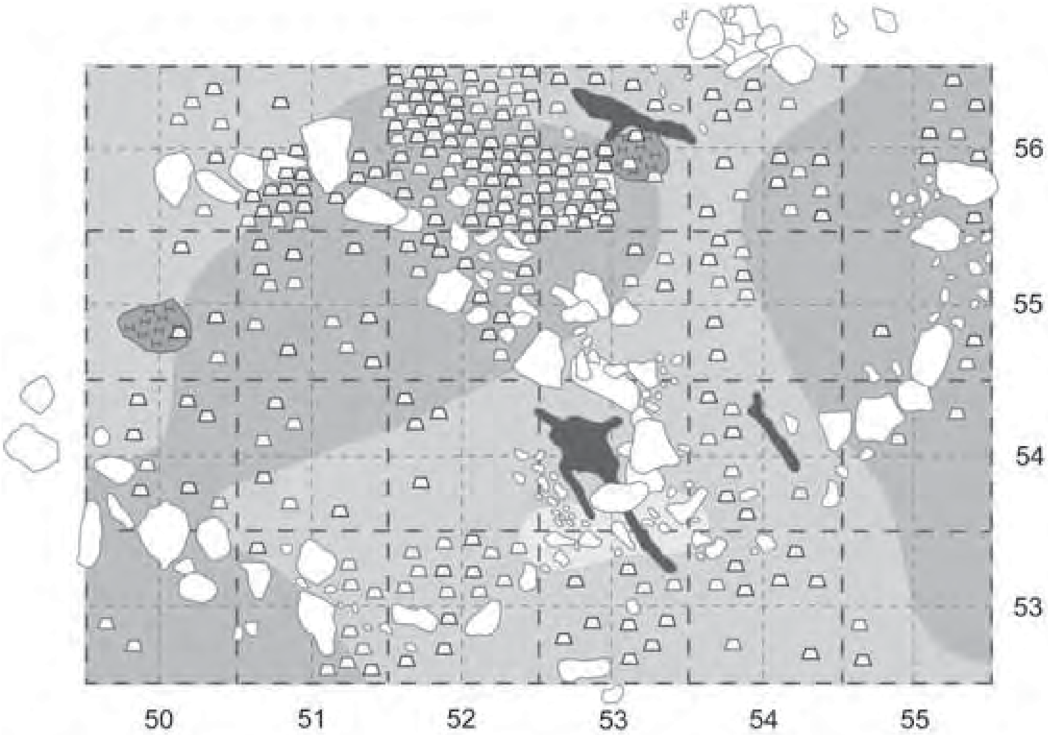

Fig. 24: The settlement of *‡Homob*. Stone circles B/C. Distribution of glass artefacts.

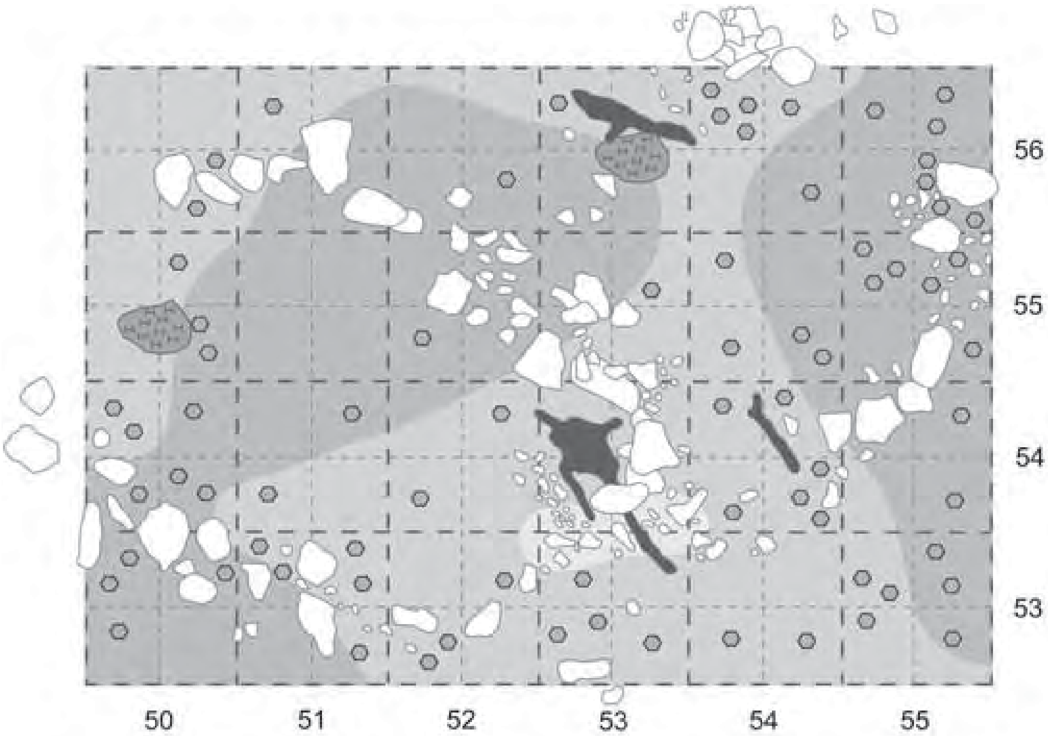

Fig. 25: The settlement of *‡Homob*. Stone circles B/C. Distribution of metal artefacts.

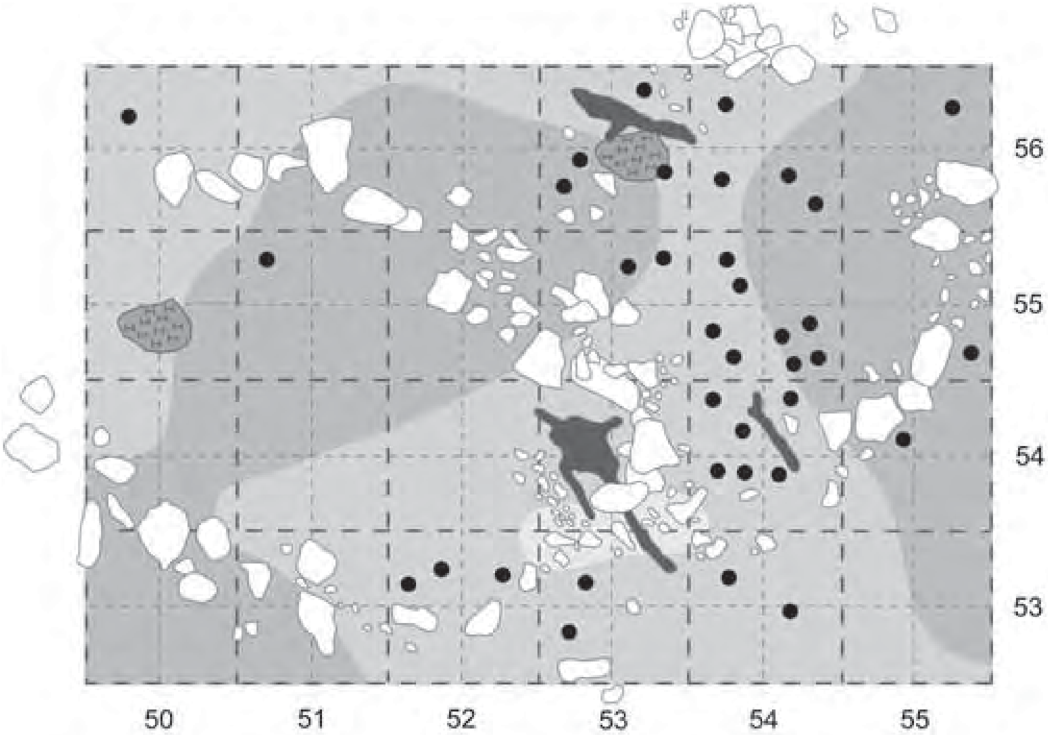

Fig. 26: The settlement of *‡Homob*. Stone circles B/C. Distribution of stone artefacts.

!hais, the men's mutual fireplace. According to Willem Dauxab, this horncore had served as a digging stick.

Bone preservation was much better in the calcareous soil. Larger samples were obtained from two types of archaeological features (Fig. 19), namely hearths (features L, P) and ash heaps (features M, N, O). According to the Hai||om elders, feature L was the fireplace of the household living in hut circles B/C[36]. Feature K corresponded to the area designated as the men's kitchen. *In situ* fireplaces differ from ash dumps by the thin layer of baked sediment present at their base. In some cases, calcrete blocks enclosed the hearth, forming the support for cooking pots. Fireplaces were usually cleared when too much waste had accumulated, and the mixture of ash, charcoal, and bones being dumped short distance away. From which fireplace the debris collected in the ash heaps M, N, and O exactly originated could not be ascertained. A special feature of *‡Homob* was the ash heap under stone cairn D. It is not clear, however, if the association of this ash concentration with the stone cairn was intentional or not.

During archaeological fieldwork, feature K initially had been divided into two subunits, separated by a fallen mopane tree. It was this tree that in the 1940s and 1950s provided shade to the hunters sitting at the *!hais*. Since we are dealing with a single functional unit, the two subsamples from feature K have been merged.

Animal bones were collected both in the ash heaps and in a scatter around the fireplaces of the *!hais* and in the hut circles B/C (Fig. 27). The degree of fragmentation of the latter assemblage is particularly high (1.0 g/fragment). This can best be explained by cleaning activities and human trampling of the leftovers of meat consumption discarded near the fire place. The ash heaps M, N, and O as well as the *!hais* produced bone and tooth fragments of larger average size (6.2 g/fragment). Bone specimens exhibiting traces of burning are comparably rare. They represent *c.* 2% of the total bone assemblage and originate exclusively from the hut circles B/C[37]. The effects of fire on these fragments likely occurred after their disposal, and they do not mirror cooking practices.

The mammalian assemblage collected at *‡Homob* totals 721 bone fragments. As is usually the case in open-air sites in arid environments, the bulk of this material

36 Anthracological analysis of charcoal from this fireplace evidenced four different taxa: *Colophospermum mopane, Combretum imberbe, Terminalia prunioides* and *Acacia* spp. All these taxa are available in the vicinity of the settlement. The dominance of *Acacia* spp. and *Terminalia prunioides* points to a selection of preferred firewoods. For the Himba people of the Kaokoland region *Terminalia prunioides* is the favourite wood for roasting meat (pers. comm. B. Eichhorn).

37 The mostly unidentified, burnt specimens (n = 14) were collected in the following excavation areas: 46/55a, Pos. 150, 1 fragm.; 50/54b, Pos. 65, 2 fragm.; 52/56d, Pos. 55, 3 fragm.; 53/56b, Pos. 93, 1 rib fragment of a medium-sized bovid and 2 unidentified fragments; 53/56c, Pos. 94, 1 fragm.; 53/56d, Pos. 95, 2 fragm.; 54/55b, Pos. 109, 1 fragm.; and 54/56a, Pos. 96, 1 fragm.

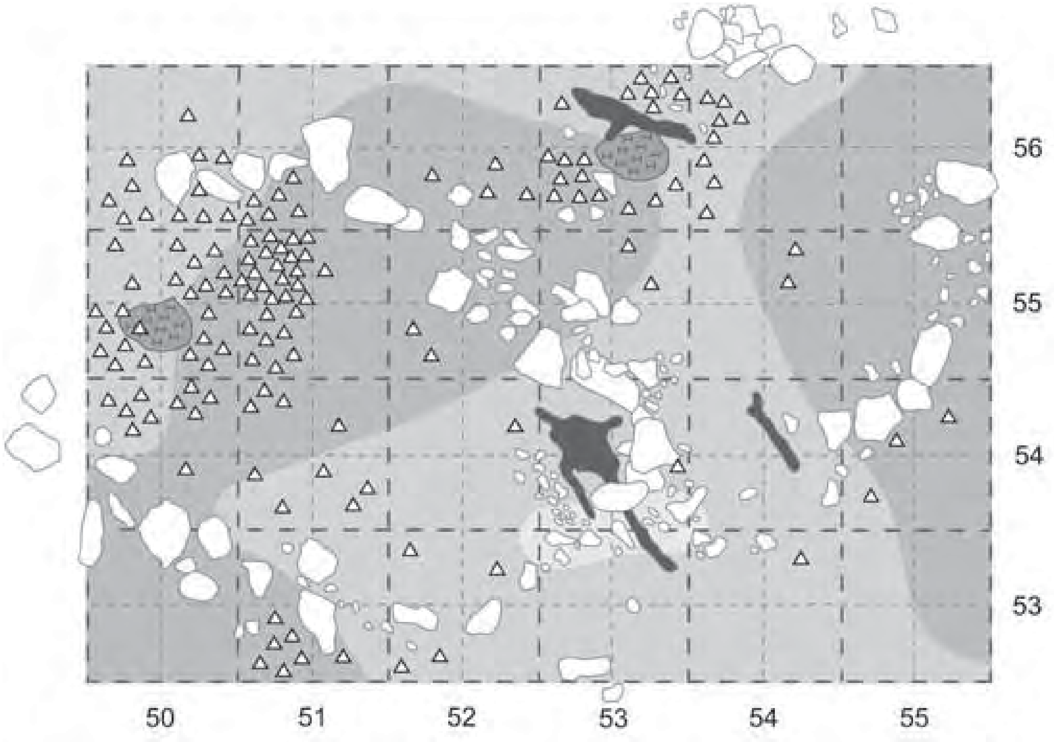

Fig. 27: The settlement of *‡Homob.* Stone circles B/C. Distribution of bone fragments.

could not be identified. Thus, only 140 (= 19.2%) specimens could be assigned to the family or higher taxonomic level (Table 2). They pertain to at least five mammalian taxa, all of them wild. This is surprising because we know that the site inhabitants raised dogs and goats and had kraals for them (s. above). Moreover, unequivocal traces of bone gnawing by dogs have not been found. Thus, without the information of the Hai//om elders, domestic animals would have remained invisible to the eyes of the archaeo(zoo)logists!

In the mammalian assemblage, gemsbok is the dominant species (Table 2). In addition, we identified Burchell's zebra, greater kudu, springbok, and the bat-eared fox. This species' repertory is not coincidental, considering *‡Homob*'s proximity to the Etosha Pan and the fact that the site catchment area included landscapes dominated by *Etosha Grass and Dwarf Shrubland,* i.e. the preferred habitat of gemsbok, zebra, springbok, and bat-eared fox, as well as *Tree-and-shrub Savanna*, where kudus felt at home.

To these mammal remains, we can add two unidentified bird bone fragments, one of which has been worked, and an unmodified ostrich eggshell fragment. Elsewhere, a concentration of 127 unmodified ostrich eggshell fragments had been collected (s. above). However, the presence of these fragments does not definitely imply the utilisation of ostrich eggs by the site inhabitants. Neither the archaeological context nor the fragments themselves provide conclusive evidence for whether ostrich eggs served as a source of protein or as a raw material for producing beads or other commodities.

The *‡Homob* archaeofauna also contained twelve shells from at least two species of landsnail. None of these gastropod shells showed any modification other than natural. One of the snails obviously perished during aestivation, its mouth opening still being sealed with the dried, calcified epiphragm, an adaptation that prevents loss of water during periods of intense heat. The overall good state of preservation (with traces of colouration) of these shells suggests that they colonised the site after the Hai||om had abandoned it.

Discussion

The principal focus of the work reported here is on former wildlife exploitation in the Etosha Game Reserve. For reasons presented earlier, our study of Hai||om hunting practices and food procurement prior to 1954 cannot be compared with the vast body of data that exists regarding the role wild animals played in the subsistence ecology of the San inhabiting the Kalahari. Nonetheless, a cross-cultural comparison reveals that the information published on the importance of animals for Kalahari foraging groups not only shows clear parallels with the results emanating from our work, but also interesting cultural specifics that merit particular attention. One of the obvious differences is that since the 1920s, the milk and meat of small livestock already

Location	Hut circles B/C	Feature L	Feature M	Feature N	Feature O	Feature K	Feature P	Totals
Taxon/Function	***Habitation***	***Fireplace***	***Ash heap***	***Ash heap***	***Ash heap***	***!hais***	***Fireplace***	
Bat-eared fox, *Otocyon megalotis*	-	-	-	-	1	-	1	2
Burchell's zebra, *Equus burchellii*	-	1	3	-	2	-	3	9
Springbok, *Antidorcas marsupialis*	-	-	2	-	1	-	-	3
Medium bovids	8	-	-	-	-	1	1	10
Gemsbok, *Oryx gazella*	-	-	1	2	1	10+1[1]	3	18
Greater kudu, *Tragelaphus strepsiceros*	-	-	1	-	1	-	-	2
Large bovids	25	-	3	3	3	43	19	96
Total identified specimens	33	1	10	5	9	55	27	140
Total unidentified specimens	116	-	60	3	20	182	200	581
Total assemblage	149	1	70	8	29	237	227	721

[1]Gemsbok horn core fragment (*c.* 40 cm) used as a digging stick in former times.

Table 2: Taxonomic composition and Number of Identified Specimens (NISP) of the mammal remains recovered from the different archaeological features at *‡Homob.*

played a significant role in the nutrition of the Hai||om of the Etosha, whereas the Kalahari foraging groups studied by Steyn (1971), Marshall (1976), Tanaka (1976), Lee (1979), and Silberbauer (1981) seem not to have relied upon stock on the hoof until the 1960s. The Dobe Ju|'hoansi, for instance, first kept goats in 1969, and from then on until the end of the 1980s the dependence on goat and cattle meat has tended to increase (Yellen 1990). Since hunting provided most of the meat for the San foraging groups inhabiting the Kalahari and the Etosha, the role of livestock will not be addressed further here.

Ethnohistorical evidence

Ecological setting and taxonomic composition

The Kalahari savanna and bushland vegetation type characterises large parts of northern Namibia and northwestern, western, and central Botswana. Throughout this biome, plant and animal communities exhibit close similarities, which explains why foraging groups inhabiting the Kalahari and the Etosha share a number of socio-cultural adaptations related to food procurement. Foodstuffs of animal origin were less important than vegetable foods in Kalahari subsistence, a scenario that also holds true in the Etosha. Since gathering provided the nutritional basis of foraging groups in (semi-)arid southwestern Africa – estimates of the overall energy contribution range between 60 and 80% – the availability of consumable plants and water represents the decisive factor for the whereabouts of hunter-gatherer bands. The day-to-day prediction of where the different species of large ungulates were located – the major source of protein and fat for all San groups considered here – was the source of more difficulties. This was primarily because of their limited numbers, large home ranges, uneven distributions, and seasonal movements. Nonetheless, even if in terms of energy returns hunting is a less rewarding activity than gathering, the hunt and its products hold a central place in the life of the camp and in the community (Lee 1979: 205).

Differences in local ecological setting were influential for the evolution of cultural adaptations particular to each group and account for the variation observed in the mode of life of the respective San communities. Thus, as Tanaka (1976) indicated, although subsistence activities in the central Kalahari and the Dobe areas show many similarities, they differ from each other because the Okwa Valley landscape exploited by the G||ana is much drier than the Dobe area and has no standing water at all except for a few days after heavy rains. Therefore, plant foods are not nearly as abundant or of as high a quality as they are in the Dobe area and people cannot stay for long periods in one place. To survive, the G||ana had to be highly mobile, migrating at short intervals of one to several weeks and over a large area to reach the next place with consumable food plants. Under such conditions, it is not surprising that the time and effort spent in procuring food was higher than in ecologically more favourable landscapes. Tanaka (1976: 115) calculated that the G||ana had to invest approximately twice the amount of effort that the Ju|'hoansi spent in obtaining their food, i.e. four to five hours *versus* two to three hours per day. Similar information on food collecting time and effort is not available for the Hai||om, but group mobility was conceivably lower compared to that in the central Kalahari, since the Hai||om could reside near permanent waterholes during the hot dry season.

Expectedly, local ecological setting and vegetation both influenced animal taxonomic composition and species abundance in the Kalahari savanna and bushland. From the inventories compiled for the northwestern (Marshall 1976: 128f.; Lee 1979, Table 8.3), western (Steyn 1971: 294f.), central (Tanaka 1976: 119, Appendix Table 4.B; Silberbauer 1981: 205, Table 9), and eastern Kalahari (Bartram et al. 1991) as well as for the Etosha (Table 1), we conclude that in all regions, gemsbok, greater kudu, blue wildebeest, hartebeest, eland, and giraffe (if present) were important food animals. The non-migratory steenbok, duiker, aardvark, springhare, porcupine, and warthog were also valued because these taxa were huntable year round.

Specific to the Etosha is the fact that impala and particularly zebra and springbok contributed significantly to the diet of its former human inhabitants. Springbok was also economically important in the central Kalahari (Silberbauer 1981: 205, Table 9), but not in the Nyae Nyae and Dobe areas, since they were absent there. Impala did not frequent the Nyae Nyae area or the central Kalahari. It was, however, an occasional seasonal migrant to the Dobe area, as was Burchell's zebra, which was encountered in groups numbering twelve or less. Understandably, the contribution of impala and zebra to the diet of the Ju|'hoansi was negligible (Lee 1979: 229, Table 8.3, footnote; Hitchcock et al. 1996). Ju|'hoansi hunters explained that they refrained from hunting zebra because its meat smelled bad, but Lee considered its scarcity the more likely reason (Lee 1979: 233). It could not be determined why the G|wi did not hunt zebra (Silberbauer 1981: 293).

In contrast to the Etosha, Nyae Nyae, and central and eastern Kalahari landscapes, the Dobe area witnessed the presence of three other edible ungulate taxa, namely roan antelope (*Hippotragus equinus*), African buffalo (*Syncerus caffer*), and the African elephant (*Loxodonta africana*). The low population density of roan antelope in the Dobe area, a species that is either solitary or observed in small groups of less than five animals (Hitchcock et al. 1996), explains its minor role as a food species (Lee 1979: 230f., Table 8.5). The imposing and dangerous African buffalo, which can be found alone or moving in small groups of eight animals or less during the rains or in early winter, was seldom hunted by the Ju|'hoansi. From Lee's recordings (1979: 231, Table 8.5) it can be seen that less buffalo were killed by men than lion or leopard. The Ju|'hoansi generally agreed that it is a mean, cunning animal with tremendous endurance and fighting potential and if they stalked it into a thicket – a typical tactic of buffaloes, especially when wounded –, the animal would end up stalking the hunter and attacking him[38]. A similar reluctance to hunting African buffalo has been noted in the central Kalahari (Silberbauer 1981: 293). Elephants were occasionally observed in the Dobe area, but in comparison to the areas to the north and east that had more reliable water sources where herds may number well over one hundred individuals, the low concentration and erratic appearance of these seasonal migrants was striking (Hitchcock et al. 1996). When Lee was conducting his fieldwork in the 1960s, none of the Ju|'hoansi living there had ever killed an elephant or even participated in hunting one, but there were oral records of such events in the recent past. One of Lee's informants had heard from his father about such an elephant hunt. His narrative shows that an elephant drive involved many hunters and that it started with setting fire on one side and the hunters with their dogs coming in from the other. "The dogs worry it, then when it raises its ears the people threw in their spears one after another" (Lee 1979: 234). According to Lee (*ibid.*), such drives may have been beyond the organisational capabilities of the Ju|'hoansi of the 1960s. To a certain extent, the situation in the northwestern Kalahari is reminiscent of the Etosha (see above).

Naming and classifying animals

As has been described for the Kalahari San, the Hai||om of the Etosha also used specific names to designate small to large sized mammals (live weight > 200 g) that were important to them because of their food value, frequency, proximity, contribution or threat to their survival, their remarkable behaviour, habits, and appearance. Small taxa of low economic interest, for instance, shrews, bats or rodents, and those with poorly known ecologies due to their more secret mode of life, e.g., nocturnal, fossorial or arboreal, were not necessarily designated with specific names. In such cases, several taxa could be grouped under a single term, such as animals occupying similar habitats. Thus, the Hai||om term *háiduru*, meaning "tree mice", referred to different arboreal rodent species like the woodland dormouse (*Graphiurus murinus*) and the tree mouse (*Thallomys paeduclus*).

38 Their observations fit well those of experienced trophy hunters.

The naming of species of birds and reptiles followed similar principles, but their altogether lower economic importance compared to that of mammals seems to be expressed by the paucity of specific names. Thus, important food birds and very common species or taxa displaying unusual behaviour would receive specific names. Yet, many birds were given derived names. Silberbauer (1981: 69f.) noted that in the G|wi language, the latter can be onomatopoeic (i.e. echoic of the bird's call) or descriptive of some aspect of the bird's behaviour, or a combination of both habit and sound. Our informants explained that this is also the case in Hai||om language.

For the G|wi of the central Kalahari, Silberbauer noticed the extent and uniformity of knowledge about the ecological requirements, behaviour, physiology, and anatomy of mammals as well as the fact that its systematic nature progressively declined in relation to birds and reptiles, and lastly in relation to invertebrates (Silberbauer 1981: 65ff., 76f.). Moreover, since mammals featured more prominently in conversation and had a higher priority in environmental description, the author reckoned that the G|wi considered mammals closer to man compared to the other vertebrate classes. From our interviews with the elders, we conclude that Hai||om knowledge about animals and their life cycles decreased from mammals to invertebrates as well. The most detailed accounts revolved around economically valued food animals and their predators.

According to the Hai||om elders, human beings stood at the top of the food chain. They shared this position in the trophic web with the lion. In Hai||om opinion, hunters and lions were more or less on equal terms and maintained a 'mutual respect for each other'. For this and other (in our eyes perhaps more obvious reasons), lions were usually left alone. Even in the face of acute danger, hunters would seek to avoid a confrontation with these formidable adversaries (see also Lee 1979: 234f.; Silberbauer 1981: 55f.). However, if they came across lions feeding on a fresh kill, they would compete over the meat and try to drive the lions off in order to get the unspoiled portions of the carcass (Silberbauer 1981: 216).

Food species

A comparison of the faunal species exploited for food by the San inhabiting the different parts of the Kalahari and the Etosha reveals many parallels. As mentioned previously, this meets expectations since the large majority of vertebrate taxa exploited for meat and fat are well adapted to the Kalahari savanna and bushland and hence widely distributed. Throughout northern Namibia and (north)western and central Botswana, six large herbivores (> 125 kg live weight) were systematically pursued, namely hartebeest, wildebeest, kudu, gemsbok, eland, and giraffe (if present) (Steyn 1971: 294; Marshall 1976: 128; Tanaka 1976: 111, Table 4.4; Lee 1979: 228f., Table 8.3; Silberbauer 1981: 205, Table 9; Bartram et al. 1991: 83, Table 1; our Table 1). We should add two food species to these taxa that were hunted only in certain parts of the area, namely the roan antelope in the Dobe area and Burchell's zebra in the Etosha. Together these herbivores provided most of the animal protein, fat, and raw materials for the Kalahari and Etosha Bushmen.

For the Dobe area, Lee (1979: 243) estimated about two to three large kills per hunter per year, but added with reservation that this rate could be exaggerated if compared to the hunting success of the San living in areas like |Xai |Xai (Ngamiland, NW Botswana). For the latter group, the rate of killing of large game was only 0.6 animal per man per year (Wilmsen 1976, quoted by Lee 1979: 243). Consequently, the proportion of returns from game sources could differ markedly between San groups. Given the risk and complexity of hunting in the Kalahari, it should therefore come as no surprise that San hunters considered themselves fortunate if they killed and recovered 20 to 30 large animals in their lifetimes (Hitchcock & Bleed 1997). Unfortunately, data on relative hunting success are not available for the Etosha, but it can be hypothesized that the overall situation may not have been very different from that prevailing in the Kalahari.

Of course, hunting success varied from species to species and through time and space. Lee (1979: 231f.) recorded that not a single giraffe had been killed during his three years of fieldwork in the Dobe area. Silberbauer (1981: 204ff.) noted that in the nearly waterless central Kalahari, taxonomic composition and species abundance varied greatly depending on the amount of precipitation. For the same band of San, Tanaka (1976: 111; Table 4.4) recorded a much smaller number of kills compared to Silberbauer (1981: 6, 204ff., Table 9). Tanaka's observations covered the period between September 1967 to March 1968 when the central Kalahari had been subjected to nearly a decade of drought, whereas Silberbauer's fieldwork, also conducted during a protracted drought period, had commenced toward the end of a decade of above-normal rainfall. Although the mobility of bands was higher in the latter environment than in the northwestern Kalahari or in the Etosha, all foraging groups considered here had witnessed periods of annual meat shortage, particularly during the hottest months when large herbivores were widely dispersed or had even left a group's territory because they were migratory. Therefore, smaller-sized prey animals and stock on the hoof (if available) were essential to bridge over such periods. Interestingly, as Hitchcock and Bleed (1997) noted earlier, the use of dogs and horses as hunting aids since the 1970s definitely enhanced the effectiveness of large game hunting in the Kalahari. Hunting with dogs particularly increased hunting success for gemsbok: unlike most antelopes, this species does not flee but will stand and fight.

Medium-sized mammals (30 to 125 kg live weight) of economic importance were warthog, springbok, impala, and aardvark. Expectedly, their contribution to the human diet also differed regionally. Springbok, for instance, was of basic economic interest to the Nharo, G|wi and Hai||om, but not to the Ju|'hoansi, which is explained by the species' low population density in the Nyae Nyae and Dobe areas. Impala was an essential food species in the Etosha, but was considered to be of no food value in the northwestern Kalahari where the species was largely absent (e.g. Lee 1979: 229, Table 8.3, footnote). On the other hand, Lee (1979: 227) reported that in the Dobe area, warthog (> 70 kg live weight) was the most frequently killed larger game, which was not the case anywhere else. Given the widespread use of dogs as hunting aids in the Dobe area, the high incidence of warthog kills can be related to this practice (see also Lee 1979: 266f.).

Four smaller-sized species (< 30 kg) were valued especially throughout the Kalahari savanna and bushland, namely steenbok, common duiker, porcupine, and springhare. These species show a high degree of philopatry, making their presence more predictable than that of the larger herbivores, which disperse after the rains or undertake migrations in the dry season. Since occupying perennially home areas (steenbok, common duiker) or inhabiting conspicuous burrows (porcupine, springhare), these taxa represented a valued source of meat at times when other game was scarce (e.g., Silberbauer 1981: 205, Table 9). Apart from these taxa, pangolins, hares, honey badgers, foxes, aardwolves, and wild cats were hunted at every opportunity.

Bird species systematically caught for food by Kalahari and Etosha foraging groups comprise Guinea fowl, kori bustard, hornbill, and the different species of korhaan and francolin. Obviously the consumption of ostrich meat was not everyone's cup of tea (Marshall 1976: 127), but many G|wi, Ju|'hoansi (Nyae Nyae), Nharo, and Hai||om would partake in such dish, particularly in times of protein shortage. All San communities collected ostrich eggs, but certain age groups avoided their contents (see above). Lee (1979: 228, Table 8.3) noted the occasional consumption of different species of dove, sandgrouse, waxbill, and quail by most Ju|'hoansi as well as ostrich and stork by some members of the Dobe group.

Reptiles readily consumed by the inhabitants of the Kalahari savanna and bushland included python and tortoises. If available, the Ju|'hoansi and Hai||om would also enjoy the meat of the savanna monitor, a species missing from the central and eastern Kalahari (Branch 1988: 172). Although present in the western Kalahari, the Nharo refrained from hunting monitor (Steyn 1971: 296). Some G|wi, G||ana, and Ju|'hoansi would cook snake species other than the python, e.g., the puff adder *Bitis arietans* (Lee 1979: 227, Table 8.3; Tanaka 1976: 119, Table 4.B). A difference in opinion was found amongst Nharo regarding the eating of snakes. A group in the east regarded species like the puff adder as edible because of its 'fatness'. In contrast, other Nharo groups thought snakes had a bad smell and therefore did not eat them at all (Steyn 1971: 297). For all groups, tortoises were important, particularly for the G|wi and G||ana, who took large numbers home during the summer and autumn months (e.g., Silberbauer 1981: 205, 216).

All Kalahari San groups had at least one amphibian taxon that stood on the menu (Hitchcock et al. 1996: 167, Table 3), usually a frog or bullfrog species. These animals were found at the pans after good rains. In years of drought, however, only a few were observed and sometimes none at all.

Invertebrate species also played a marginal role in the diet of the G|wi, G||ana, Ju|'hoansi, and Hai||om. Apart from bee honey, which was sought after year-round by everyone, the collecting of termites, locusts, and caterpillars apparently represented singular, sporadic events. Correspondingly, the period of exploitation of invertebrates was quite brief and only a few taxa were available all year-round. One such organism is a type of edible ant collected by the G|wi (Silberbauer 1981: 217).

The aforementioned illustrates that the Kalahari and Etosha foraging groups exploited a broad range of animals. Tanaka (1976: 119, Table 4.B), for example, listed 48 vertebrate food species utilized by central Kalahari foragers. Lee (1979: 226f.) mentioned that from a total of *c.* 173 species of vertebrates – 58 mammals, 90 birds, 23 reptiles, and 2 amphibians – evidenced in the Dobe area, up to 70 were eaten by the Ju|'hoansi. About 30 of these were mammals, which nearly equals the number of food mammal species mentioned for the central Kalahari. However, as Lee (1979: 227) has indicated it is worth noting that the lizards, snakes, and rodents attributed to the Ju|'hoansi diet in the literature by other researchers (e.g., Service 1966) are not eaten by the Ju|'hoansi of the Dobe area. The Dobe people get plenty of meat from the more attractive large species and so have no need to bother with such 'unrewarding small creatures'. Marshall (1976: 126f.) commented on the fact that shrews, bats, gerbils, foxes, polecats, genets, wild cats, birds, snakes, and insects, common in the Nyae Nyae area, were discounted as food animals as follows: "Perhaps if hunger were more acute than it is, the Ju|'hoansi would catch and eat some of the creatures to which they are at present indifferent". She also mentioned that rats and mice used to be eaten in the Nyae Nyae area, but that "… a doctor at Runtu early in 1952 had given a message that had passed from Bushman to Bushman saying that rodents transferred diseases and should therefore not be eaten".

According to our informants, the situation of the Hai||om differed from that described in the literature for the Ju|'hoansi, Nharo, G|wi, G||ana, and Kua. Although there is ample overlap in the spectrum of animals procured for food in the Etosha and the Kalahari, oral history strongly suggests that the Hai||om could not afford to pass over small taxa such as shrews, mice, rats, squirrels or carnivores as food. If the occasion presented itself, even medium to large carnivores including caracal, serval, leopard, cheetah, aardwolf, brown and spotted hyena would also be killed, skinned, cooked, and eaten. Another characteristic distinguishing Hai||om food procurement from the practices described for the Kalahari is the high intensity of hunting fowl. According to our informants, some 50 avian taxa stood on the menu as well (Table 1). Thus, taken together with the mammals and reptiles, at least 90 vertebrate taxa were actively pursued for food in the Etosha. In addition, the clutches from about 40 bird taxa were also systematically collected (Table 1, footnote 1). This is a much larger variety of species than that recorded for Kalahari foraging groups (Steyn 1971: 295ff.; Marshall 1976: 128ff.; Lee 1979: 475ff., Appendix C; Tanaka 1974, Table 4.B).

Hitchcock and co-workers (1996: 167, Table 3) presented an overview of faunal species exploited by both foragers and food producers in northeastern Namibia and Botswana. Based on their comparative data, they concluded that the Dobe Ju|'hoansi tended to exploit more faunal species than did other groups in the western and central Kalahari Desert. At the same time, however, these San groups would utilise fewer faunal species than the Kua in the eastern Kalahari and the Tyua, who are sedentary food producers and part-time foragers in the northeastern Kalahari. The group that exploited the highest diversity of taxa was the Tlokwa, one of the eight Tswana tribes, who are sedentary agro-pastoralists and wage earners residing in and around the Botswana capital of Gaborone in southeastern Botswana. A comparatively high proportion of insect taxa (N = 19) characterises the Tlokwa diet.

We complemented the overview by Hitchcock et al. (1996) with our data. Table 3 illustrates the number of animal species and their products ex-

Region	Etosha	NW Kalahari		W Kalahari	SW Kalahari	Central Kalahari		E Kalahari	NE Kalahari	SW Botswana
Ethnic group/ Food category	***Hai||om***	***Nyae Nyae Ju|'hoansi***	***Dobe Ju|'hoansi***	***Nharo***	***!Xo***	***G|wi***	***G||ana***	***Kua***	***Tyua***	***Tlokwa***
Mammals[1]	39	17	31	20	26	14+	33	35	52	31
Birds	52	8	26	4	9	7	7	8	18	48+
Bird eggs	40+	1	1	1	4	1	1	3	7	13
Reptiles	3	7	9	2	3	7	7	5	7	3
Amphibians	0	1	1	1	1	1	1	1	2	0
Fishes	0	0	0	0	0	0	0	0	3	1+
Insects[2]	5	7	11	1	6	2	?	5	8	19
Totals (– eggs)	99	40	78	28	45	19+	48+	54	90	105
Totals (+ eggs)	139+	41	79	29	49	20+	49+	57	97	105+

[1] The category "Mammals" also includes those species consumed occasionally or on an individual basis.
[2] The category "Insects" includes the species' larvae as well as bee honey.

Table 3: Comparative data on faunal species exploited for food by foragers and food producers in Southern Africa. Based on data published for the Nyae Nyae Ju|'hoansi by Marshall (1976: 128 f.), for the Dobe Ju|'hoansi by Lee (1979: 228 f., Table 8.3), for the Nharo by Steyn (1971: 294 ff.), for the G|wi by Silberbauer (1981: 205, Table 9), for the G||ana by Tanaka (1976: 119, Table 4.B), for the Tlokwa by Grivetti (1979: 246 f., Table I), and for the !Xõ, Kua, and Tyua by Hitchcock et al. (1996: 167, Table 3).

ploited for food in the Kalahari and in the Etosha. Obviously, the Hai||om exploited more animal taxa than any other group, a subsistence strategy for which we offer several tentative explanations.

Since taxonomic diversity is higher in the Etosha (*c.* 571 taxa) than in the Kalahari (*c.* 200 taxa), it can be hypothesized that this difference acts as the most influential factor for the variability observed in the Hai||om diet. However, most species exploited for food in the Etosha are also found in the Kalahari (or in some cases closely related species), especially in the somewhat more humid northern part. Difficulties arise when invoking species diversity as a main reason to explain the substantial amount of time and energy invested by the Hai||om in obtaining food animals that Kalahari San groups considered unrewarding.

Because the Hai||om had been living in a game reserve since 1907, it must be considered whether the laws and regulations imposed by the colonial administration affected their food procurement strategies through the course of time. As such, Hai||om hunting was not perceived as a threat for wildlife at the time the Etosha was proclaimed a game reserve. Prohibition of hunting in the EGR only applied to hunting with guns, not to the use of bows and arrows. At the beginning of the South African period (1915-1946), elephant, rhino, buffalo, giraffe, and zebra were declared 'royal' game and hence became taboo for hunters, but again these regulations did not apply to the Bushmen hunting with bow and arrow within the reserve[39]. Because the "… game of the pan was on the increase, even after making liberal allowance to the Bushmen there"[40], Hai||om hunting was still not regarded as a problem in the 1920 and 1930s. In the late 1920s, however, they were not allowed to kill 'protected' game, i.e. giraffe, kudu, eland, impala, and bat-eared fox anymore[41]. At that time, hunting with dogs was already prohibited as well, but the only way to stop this practice was to introduce a ban on these animals. Although declared in 1930, this ban was not completely enforced before the Hai||om's final eviction in 1954. Nonetheless, experienced Hai||om hunters disdained the practice of using dogs as hunting companions. Of course, violators of all these regulations could not be effectively pursued, simply because some Hai||om settlements were very difficult to access for the police (Dieckmann 2007a: 151f.). Towards the end of the 1940s, legislation became even more stringent. Thus in 1948, the station commander of Namutoni promulgated that the Bushmen were also hunting game such as gemsbok, eland, giraffe, etc. He therefore asked to be informed, whether "there was any agreement between the Administration and the bushmen to the species they are privileged to shoot, or whether they are allowed to shoot any kind of game in the reserve, including royal and protected game"[42]. There had of course never been any exception for Hai||om to shoot protected game and in the reply to the station commander, it was stated that the Hai||om were only allowed to hunt wildebeest and zebra. It was also specified that "… action, under the Game Law, will be taken against them if they continue to shoot other species of Game …"[43]. This additional regulation not only underscored previous legislation but also imposed additional constraints on Hai||om meat procurement because from that point on, only two large game species could be hunted legally! Even if the issue of enforcing these laws remained, they likely had an effect on daily life. This applied not only for the Hai||om living in camps located near police stations but also for the communities located elsewhere in the EGR, simply because the means of control by officials improved over the years. This indicates that the relative importance of 'unrewarding creatures' in the Hai||om diet might indeed reflect a behavioural response to increasing stress over acquisition of other foods of animal origin.

Our informants repeatedly stated that overall game density in the Etosha was not very high in the 1940s and 1950s. Therefore, the animal biomass available in relation to the total human population is another factor that must be considered with respect to the Hai||om exploitation of a broad spectrum of faunal resources. Unfortunately, no reliable data could be found on game numbers and their annual distribution in the southern Etosha prior to the 1970s, nor was it possible to find exact figures on the number of Hai||om living in the game reserve (Dieckmann 2007a: 146). Indeed, the monthly and annual reports written by people responsible for the different areas (e.g., Namutoni or Okaukuejo) also included land outside the game reserve. The accounts given were based entirely on estimates, since the officers lacked detailed knowledge on the Hai||om living in their areas, a fact which they often mentioned in their reports. Conceivably, the only "complete" accounts for the game reserve can be found in the annual reports of Major Hahn, native commissioner of Ovam-

39 During the South African period, however, elephants were largely absent in the Etosha and buffaloes not indigenous in this part of Namibia. Rhinos were rare and not eaten by local people. Of the two other 'royal' species, zebras were of particular importance as food to the Hai||om, who continued hunting these equids well into the 1940s (Dieckmann 2007a: 119).

40 N(ative)A(ffairs) O(vamboland) 33/1, Magistrate Grootfontein to the Secretary, 24.8.1936.

41 NAO 33/1, Officer in charge, Native Affairs, Ovamboland to the Post Commander, SWAP, Namutoni, 17.9.1928.

42 South West Africa Administration (SWAA) A511/1, 16.2.1948, Station Commander, Namutoni to native Commissioner, Ovamboland.

43 SWAA A511/1, 23.2.1948, 24.3.1948, correspondence of the Secretary of the Native Commissioner, Ovamboland.

boland. In 1942, an estimated maximum of 770 Hai||om were living in the EGR (Dieckmann 2007a: 146, Table 4.2). The total number of Hai||om that lived in the game reserve over the years must have ranged between a few hundred to a thousand individuals. Lebzelter (1934: 83) even estimated that 1,500 Hai||om lived around Etosha Pan in the 1920s. Although no clear trends can be identified, numbers certainly fluctuated in response to the prevailing economic circumstances, such as the need for labour on surrounding farms, the time of year, and in particular the seasonal availability of wild foods that attracted more people (Dieckmann 2007a: 146). The question as to whether a correlation between the broad dietary spectrum recorded and population density existed cannot be answered based on our data set.

As mentioned previously, the Hai||om were allowed to keep a restricted number of livestock. As the elders recalled, livestock was a principal back-up resource in case hunting failed to provide enough meat (Dieckmann 2007a: 157). However, with the removal of the foot-and-mouth disease barrier to Namutoni in July 1947, a further restriction was imposed on those Bushmen living within the boundaries of the EGR. Stockowners were no longer allowed to possess more than five head of large stock (instead of ten) and ten head of small stock (instead of fifty) each, and any surplus stock had to be removed. The accumulation of large numbers of stock thus became impossible (Dieckmann 2007: 187f.).

In conclusion, any *a posteriori* attempt at explaining why small creatures were important in Hai||om subsistence likely will be fraught with problems due to oversimplification. Cause and effect are difficult to disentangle in this situation, simply because we still do not precisely know what the Hai||om diet in the Etosha was comprised of prior to the influence of the colonial administration. Thus, if the animal food spectrum during the 19th century was already as diverse as the ethnohistoric record implies for the 1940s and 1950s, other reasons than the aforementioned must be invoked. Archaeological investigations could shed light on this issue, but this requires a long cultural sequence with sufficient resolution, which might be problematic to find in the Etosha.

Hunting equipment

Parallels between the hunting equipment of the Hai||om and that used by Kalahari foraging groups are obvious (e.g., Steyn 1971: 297; Marshall 1976: 145ff.; Lee 1979: 129ff.; Tanaka 1976: 102; Silberbauer 1981: 206ff.; Bartram et al. 1991; Hitchcock et al. 1996; Bartram 1997; Hitchcock & Bleed 1997). G|wi, Ju|'hoansi, Kua, Hai||om all used (1) bow and arrow for hunting all kinds of game, (2) rope snares for trapping small antelopes, small and medium carnivores, and terrestrial birds, (3) pole and hook to hold springhares in their burrows prior to digging down to the animals, (4) clubs to knock animals unconscious or kill wounded prey, and (5) iron-tipped spears to finish off quarries that were weakened by the arrow poison or had been stalked by dogs.

From the descriptions provided by the Hai||om elders, we conclude that equipment like rope snares, springhare probes, and clubs did not show marked cultural differences with their equivalents used in the Kalahari. To catch gallinaceous birds and mammals up to the size of steenbok or duiker, for example, all groups used snares made of plant ropes or sinew and set up with a spring mechanism. The snare bait for birds in both the Kalahari and Etosha was a ball of *Acacia* gum (Silberbauer 1981: 213). The Ju|'hoansi also baited snares with pea-sized, edible bulbs (Lee 1979: 215). The springhare probe utilised by San foraging groups consisted of a metal barb lashed to the end of a long pole made from stalks of *Grewia* spp. Prior to the introduction of suitable metal objects, hooks made from steenbok horn served as barbs in the Kalahari (Silberbauer 1981: 215). Clubs were carved from *Grewia* wood. Details about the manufacturing of spears by the Hai||om are missing in our recordings, but these weapons conceivably resembled – at least from a functional viewpoint – those crafted by the Kalahari San.

Significant cultural differences between Hai||om and Kalahari San hunting equipment concern two devices, the slingshot and the bow-and-arrow complex. As to the slingshot, our informants recalled that it came into use in the Etosha around 1940. This device was most effective for hunting small to medium birds and its introduction might even have had an immediate bearing on the high diversity of small creatures consumed by the Hai||om (s. above). In this respect, it is noteworthy that when anthropologists carried out their research in the 1950s and 1960s, none of the foraging groups of the Kalahari appeared acquainted with this hunting device.

The Ju|'hoansi, Nharo, G|wi, G||ana, Kua, and Hai||om all preferred the wood of the raisin bush *Grewia flava* for making bows, but other *Grewia* species could be use as well. The bows of most Kalahari foraging groups are relatively small and light, averaging about 1 m in length (Marshall 1976: 145; Lee 1979: 140, Fig. 5.5e; Bartram 1997). They had an easy pull of about 9 kg (Lee 1979: 129; Silberbauer 1981: 206; Bartram 1997). Bowstrings were preferably made of long, twined strips of sinew from the back muscles of eland, or from gemsbok and kudu (Lee 1979: 129; Silberbauer 1981: 206; Bartram 1997), or of large herbivore leg tendons, preferably those of giraffe (Marshall 1976: 145). In contrast, bows manufactured by the hunter Hans Haneb following Hai||om tradition measured *c.* 120 cm in length. They were clearly larger and heavier than their Kalahari equivalents, with pulls surpassing 10 kg. Bowstrings were made of twirled strips of eland, gemsbok, or kudu belly skin instead of sinew.

Major differences also existed between the arrows. Those produced by the G|wi, G||ana, Kua, and Ju|'hoansi were composed of four parts, an arrowhead, sleeve, link shaft, and main shaft. Total arrow lengths varied mainly between 45 and 60 cm (Marshall 1976: 145; Lee 1979: 129ff. and Fig. 5.5a-g; Silberbauer 1981: 207; Bartram 1997). Hunters preferred perennial grasses, more precisely, the common reed (*Phragmites australis*), bluestem (*Andropogon gayanus*) or panicgrass (*Panicum* sp.), for constructing the main shaft (Marshall 1976: 145; Lee 1979: 129; Silberbauer 1981: 207). With a diameter of *c.* 6-7 mm (Marshall 1976: 146), these 35 to 50 cm hollow shafts weighed very little. Wands of *Grewia flava* were sometimes used as a substitute for this preferred main-shaft material (Silberbauer 1981: 207; Bartram 1997). The link shaft, a *c.* 5 cm spindle of hard wood or bone cut from the humerus or femur of giraffe, gemsbok or kudu, connected the main shaft with the sleeve. The latter, a short section of reed, was fitted over the point of the link shaft and over the shank of the arrowhead. Sleeve and arrowhead were glued with the gum of an acacia tree (Marshall 1976: 147) or the silver cluster-leaf, *Terminalia sericea* (Silberbauer 1981: 205). The link shaft allowed the main shaft to come away from the arrowhead once the quarry had been struck. Lee (1979: 133) noted, however, that prior to the 20th century A.D., the arrowhead and link shaft still formed a single unit carved of bone, implying a two part arrow design. We did not find references to whether the four part arrow system used by the Kalahari San was a local development or a technical innovation introduced from outside.

Hai||om hunters still used two part arrows to hunt large game in the 1940s and 1950s. Instead of hollow reeds or culms of perennial grasses, *Grewia* wood was their preferred material for carving arrow shafts. Finished shafts crafted by the experienced Hai||om hunter Hans Haneb and designed for hunting large game exhibited lengths of 63.5 to 68.5 cm and a diameter varying between 7.0 and 8.5 mm. The length of the main shaft obviously depended on the kind of arrowhead attached, since finished arrows measured *c.* 70.0 ± 1.5 cm. Apart from being longer and heavier than their Kalahari equivalents, Etosha arrows were fletched with four feathers, giving the arrow greater stability and better guidance during flight, thereby increasing accuracy. The arrows of Kalahari hunters were not fletched (Marshall 1976: 145ff.; Lee 1979: 129, 133; Silberbauer 1981: 207). However, San informants maintain that the lack of fletching does not reduce the accuracy of the arrow (Hitchcock & Bleed 1997: 348), a view shared by Silberbauer (1981: *ibid.*). The Hai||om, on the other hand, were convinced that fletching increased the efficiency of their weapon, which is why they did not spare efforts obtaining the required vulture feathers.

As late as the 1960s, arrow points made of bone, wood, porcupine quill, stone or glass were still in use in the Kalahari, and there are examples of arrow tips made of combinations of materials, e.g., wood and stone. A preferred type of bone for use in arrow head manufacture is that of the ostrich (Hitchcock & Bleed 1997). Blunt wooden-tipped arrows would be employed in bird hunting and arrows tipped with barbed points of bone and metal for mammals. Interestingly, at the time Lee and Marshall were carrying out fieldwork, the! Kung already preferred metal to bone (Marshall 1976: 146), also because of its better penetrating power compared to bone points (Lee 1979: 133; Silberbauer 1981: 207). Thus, although they could produce exquisite barbed bone points like the G|wi, the Ju|'hoansi no longer bothered to do so. Fencing wire was the major source of raw material for manufacturing arrowheads in the Kalahari where it constituted a valued exchange commodity (Silberbauer 1981: 207).

A most interesting aspect of Ju|'hoansi subsistence strategy is the intense exchange of arrows between hunters, for instance, between kin categories like brothers-in-law. By circulating his arrows amongst the hunting group, a hunter was entitled to a part of each kill made with his property. Thus, if someone killed an antelope with an exchanged arrow, he had to share the carcass with his trading partner if the latter happened to be in the camp. If the arrow giver was elsewhere, the hunter saved a portion of biltong for him. This trading of arrows strengthened the bonds between men. Women too could own arrows and trade them with men, thus becoming owners of meat (Lee 1979: 247). We are not aware of such a practice in the Etosha in former times.

In the Etosha, the tradition of manufacturing arrowheads from raw materials other than metal had already disappeared by the 1940s. The rather easy access to metal objects enjoyed by the Hai||om can be explained by the permanent presence of government representatives at the police stations and the growing numbers of tourists, who would discard all kinds of waste while travelling through the EGR. Hai||om employed on farms could also have introduced pieces of wire for this purpose. Apart from the simple, barbless arrow points to which poison could be applied, they manufactured two other types of arrowheads used for hunting small to medium-sized animals (Fig. 7), namely large, broad arrowheads and V-shaped "bone-breaker" arrowheads (*‡gîs*). The design of the latter is particularly intriguing, as a fast rotation of the arrow's axis was essential to its effectiveness. Literature on hunting equipment of Kalahari foraging groups did not reveal parallels (see also below). This raises the question of the origin of

‡gîs. Did it represent an autochthonous development or did it arrive by transfer of technology?

Another characteristic distinguishing the Kalahari from the Etosha bow-and-arrow complex is the origin of the arrow poison. As has been explained above, the Hai||om used the condensed, milky sap from the tuber of the shrub *Adenium boehmianum*, today an uncommon sight and a plant species with a limited distribution in northern Namibia and southern Angola. The Kalahari San obtained arrow poison from the larvae and pupae of the chrysomelid beetles *Diamphidia nigro-ornata (= Diamphidia simplex)*, *Diamphidia vittatipennis*, and *Polyclada flexuosa* (Koch 1958; Marshall 1976: 147f.; Lee 1979: 134; Silberbauer 1981: 207; Bartram 1997). *Diamphidia* feed exclusively on the leaves of corkwood bushes, *Commiphora* spp., and *Polyclada* on the leaves of the marula nut tree, *Sclerocarya birrea*. Marshall observed that the Ju|'hoansi of the Nyae Nyae area mixed beetle larvae poison with toxic plant substances, such as the baked and powdered seed pods of a rare tree named *!gaowa* (Marshall 1976: 151f.). The method of poison extraction from the pupae and further preparatory steps are detailed in the works of Marshall (1976), Lee (1979), and Silberbauer (1981).

The freshly extracted arrow poisons of both the Kalahari San and the Hai||om are highly toxic and fast acting. According to the Ju|'hoansi and G|wi, once it entered the bloodstream the beetle poison would cause convulsions and paralysis (Marshall 1976: 152; Silberbauer 1981: 208). Chemical analysis of the contents of chrysomelid pupae revealed that the toxic substance is a polypeptide termed diamphotoxin, which is known to block neuromuscular function. Experiments showed that it causes local paralysis, rapid disruption of cardiac rhythm, and intravascular haemolysis (Breyer-Brandwijk 1937; de la Harpe et al. 1983). A well-placed arrow can kill a gemsbok or kudu in six to 24 hours (Lee 1979: 135).

According to our informants, *!Khores* caused wariness, restlessness, convulsions, respiratory, and cardiac problems, and animals could be observed jumping, stumbling, and falling, with their hair standing up. Pharmacologically, the toxin evidenced in the *Adenium* tuber juice is a cardiac glycoside. The symptoms observed under laboratory conditions correspond to the above description, i.e. restlessness, severe convulsions, and dyspnoea, with death resulting from cardiac arrest (Boehm 1889; Shaw et al. 1963; Neuwinger 1996: 98ff.). Kaokoland hunters using *Adenium boehmianum* reckon two to twelve hours for larger animals to die, depending on the body part hit. This fits with the experiences described by the Hai||om elders. Reliable statements from Namibian farmers confirm that the time between a well-placed shot and death for springbok is generally one hour or less, for kudu, gemsbok, and hartebeest two to three hours, and for eland four to five hours. A wildebeest shot in the foot in the evening was found dead the next morning, a kudu bull hit in the liver fell down within 100 m, and an eland shot this way with *!khores* died within 500 m (Gaerdes 1966; Neuwinger 1996: 98).

Diamphidia larvae can only be collected over a period of several months beginning at the first part of the rainy season. The motivation for Kua hunters to move their camp was in part to be near known stands of *Commiphora* bushes where larvae could be collected. During this time, arrows were repainted with fresh poison, thus restoring the toxicity to a strength that was lethal even to the largest of game (Bartram 1997: 337). Data collected amongst the Kua in the eastern Kalahari also indicated that the potency of an arrow poisoned with the contents of chrysomelid pupae was initially very high, but that the poison's toxicity declined in the late dry season. After one year, it apparently had become completely harmless. Hunters attempted to alleviate this problem by combining other kinds of poison, like that of venomous snakes and spiders, together with the beetle larvae (Hitchcock & Bleed 1997). Ju|'hoansi hunters tried to overcome the seasonal unavailability of beetle poison by carrying living pupae in their hunting kit with them. Wrapped in a piece of cloth or leather, the poison could be extracted when needed. It should be noted that *Diamphidia* larvae were not available at all during droughts and extremely wet years.

Compared to the beetle poison, the plant poison *!khores* remained potent for a much longer time. A good illustration of this is the dried specimen of *Adenium* arrow poison (Pretoria Museum no. 3787) collected in Ovamboland in 1921 and tested some 35 years later (Shaw et al. 1956). A less than 0.01 gram sample of this museum specimen was left overnight in 2 ml of 0.85% NaCl to liquefy it. An adult mouse that was given a subcutaneous injection of 0.25 ml of this solution died within seven minutes (for details see Neuwinger 1996: 98f.). The characteristic of dried *!khores* to remain highly toxic for a long time was also known to the Hai||om elders. This prolonged toxicity made Etosha hunters largely independent of the annual cycle of *Adenium boehmianum*.

Preparing an arrow for poison differed too. Whereas the Hai||om applied *!khores* onto the arrowhead, Kalahari hunters would dab theirs onto the shaft of the arrowhead, leaving the tip without poison to minimise the risk of accident (Silberbauer 1981: 207). Sometimes, Ju|'hoansi hunters would even wrap the shank behind the arrow point with strands of moistened sinew and glue these with gum, whereupon the wrapping would be coated with poison, since the poison adheres better to the sinew than to the bare shank (Marshall

1976: 147; Lee 1979: 134). Eventually more than one layer of poison would be applied (Marshall 1976: 151).

If the quality of the poison and its effective delivery can be considered the key to hunting success for large game in the Kalahari and the Etosha, the respective designs of the bows and arrows implied that the handling characteristics of these devices may have differed. Since Kalahari equipment was lighter with a rather small momentum and impact energy, they were only effective as a short-range weapon. Kalahari hunters therefore sneaked in as close as possible before a shot was attempted, usually within 10 to 30 metres of the quarry (Silberbauer 1981: 206; Bartram 1997; Hitchcock & Bleed 1997). This distance obviously reflected the accurate range of their bows, even if a well taut one could carry an arrow beyond the 100 m mark (Silberbauer 1981: 206f.). The larger, more powerful bows and the heavier, fletched arrows used by the Hai||om might imply a wider range of accuracy and more importantly, significantly higher impact energy. With a pull exceeding 10 kg, the bows were able to deliver arrows with significant stopping power, particularly if released at short distance. Since the arrow had no link shaft, this higher impact energy was essential to ensure that the wounded animal could not easily remove or brush off the arrowhead. The Hai||om said that fletching increased the arrow's flight accuracy and caused it to rotate, which is a prerequisite for using the V-shaped "bone-breaker" arrowheads. Since the weight at its draw surpassed that of the Kalahari bows, this might provide an explanation for why thicker, more durable antelope skin was used for making bowstrings instead of strands of sinew. According to our informants, arrows could travel up to 200 m, suggesting that Hai||om bows were probably still efficient beyond a range of 25 metres, but this assumption requires experimental verification.

To better understand the effectiveness of bow-hunting in the central Kalahari, Bartram (1997) compared Kua bow-and-arrow technology and bow-hunting strategies with those of the Hadza, a foraging society inhabiting the rugged, granite uplands southeast of Lake Eyasi in northern Tanzania. The Hadza hunting kit consists of a large, powerful bow measuring 2.0-2.25 m, which clearly is much larger than the devices used by the foraging groups of the Kalahari or Etosha. Different categories of arrows exist, but all are fletched (Woodburn 1970: 17ff.). The longest ones exhibit simple wooden tips. They are used to hunt birds and small game and are usually fletched with the feathers of Guinea fowl. Impala and smaller-sized game are hunted with metal-tipped arrows with broad, heavy points. Poisoned arrows are used to kill large game and can be of several types, i.e. single or double barbed. Fletching on poisoned arrows is made from vulture feathers. The Hadza use link shafts carved from *Grewia* wood. The sap of *Adenium* is one of the two plant sources of Hadza arrow poison. It is extracted similar to the way the Hai||om did. In sum, the bow-and-arrow complex of the Hadza exhibits considerable similarity to that used by the former inhabitants of the Etosha.

Although the powerful Hadza bows, with pulls of as much as 60 kg, delivered arrows with real stopping power, it is the efficient delivery of the poison that is the principal concern in the design and use of this equipment (Bartram 1997). However, habitat characteristics dictate hunting strategies, which is why Bartram attributes significant importance to types of vegetation cover in order to explain the observed differences between Hadza and Kua bow-and-arrow hunting. In the eastern Kalahari habitat, in which the Kua hunt, the landscape is open and there is little cover. Hunters consequently need to go long distances when sneaking up quarry, and frequently are forced to crawl. This makes using a light, small bow hunting gear advantageous. Powerful Hadza-style bows and arrows might allow greater shot distance and better penetration, but would certainly be difficult to conceal during stalking in an open habitat. However, in the thick cover and hilly landscapes of Hadzaland, this is not a critical factor. Following Bartram's line of argument, design and functionality of Hai||om bows would thus represent a cultural adaptation to the diverse natural landscape of the Etosha, where sparsely vegetated, open areas alternate with areas of thick bush cover and woody vegetation. The fact remains, though, that the most important variable involved in hunting success is not the equipment, but the hunter's tracking skills, i.e. the knowledge essential to locate the prey prior to and after the animal had been shot.

Game procurement

Kalahari San ethological knowledge of animal behaviour was sufficiently accurate in order to render it an efficient aid in planning hunting tactics, in anticipating the actions of food species and dangerous taxa, and in interpreting the connotations of relationships between species (Silberbauer 1981: 65ff., 76f.). There is little doubt that this appraisal also applied to the Hai||om community inhabiting the Etosha in former times. As our records show (see above), the information provided by the Hai||om elders shows a remarkable degree of detail relative to habitat requirements, and the feeding, social, and reproductive behaviour of relevant food taxa including carnivores, and the interdependency between soil type, topography, plant cover, and the distribution of a given species in the study area. They understood the relationship between the presence of a taxon and the natural landscape and could apply this knowledge in order to deduce the whereabouts of their food species.

The basics of tracking and stalking and how Kalahari San weighed the different variables prior to decision-making in a given situation have been detailed more than once (e.g., Lee 1979: 212ff.; Lieberberg 1991). Although such eyewitness accounts are missing for the Etosha, it is a fact that several elderly Hai||om (including our informants) had an excellent reputation as trackers, which is why the Etosha Ecological Institute deployed them. Willem Dauxab, for instance, was charged explicitly with the training of younger staff. It can therefore be safely assumed that Hai||om hunters were skilled trackers.

Kalahari foraging groups depended on several hunting methods for meat procurement, but pursuit carried out on foot, in which the hunter had the equipment necessary to kill a large variety of vertebrate species with him, provided most of the meat. Observations in the field and oral history confirm that hunting with bow and (poisoned) arrow involving single persons, pairs or small groups of hunters was the primary contributor to meat procurement (e.g., Marshall 1976: 128; Tanaka 1976; Yellen 1977b; Brooks 1978; Crowell & Hitchcock 1978; Lee 1979: 207ff., 214ff.; Silberbauer 1981: 206ff.; Wilmsen 1989, Bartram 1993; Heinz 1994; Kent 1996). As Hitchcock and Bleed (1997) pointed out for the Kalahari biome, the effectiveness of bow and poisoned arrow hunting varied depending on the season, the toxicity of the poison, the amount of cover available, and the presence of predators and scavengers other than human beings. These factors seem relevant for bow-hunting in the Etosha in former times as well.

Poisoned arrows were the method of choice to kill large game for the Ju|'hoansi, Nharo, G|wi, G||ana, Kua, and Hai||om. Since the poison took some time to overpower the wounded animal, the hunter(s) would withdraw from the place of action and wait quietly in the shade of a tree or return to the camp for a break and, depending on the species, resume tracking after some time had elapsed. This break served several purposes. Besides giving the poison time to take effect, the animal was more likely to settle down and rest after its initial flight reaction, and not run further, thereby extending the distance the trackers would need to cover. It also provided the hunter the opportunity to take a rest and communicate with his peers (if he wished to do so) and arrange for a party to track, butcher, and transport the animal (Bartram et al. 1991: 100). When hunting in pairs, one person could follow the wounded animal, while the other returned to camp to obtain assistance. Based on Hai||om oral history, there was no fundamental difference between pursuit hunting in the Etosha and the way Kalahari hunters operated.

Near saltpans, watering and feeding areas, and heavily frequented trails to these landscape features, the Ju|'hoansi, Kua, and Hai||om would practice ambush hunting from places of concealment, usually blinds. The latter were simple structures, i.e. shallow circular depressions about 1 to 2 m in diameter surrounded by small stones or brush walls (Hitchcock et al., 1996; Fig. 9). According to Yellen (1977a), the age of blinds in the Dobe area is considerable, and this appears to be the case in the Etosha as well (see above). Evidently, hunting from blinds did not require tracking, since hunters quietly waited for the quarry to approach, enabling them to get close to prey and reduce search time. The Hai||om practised ambush hunting at sunset, sundown or at night during the full moon. However, it should be noted that they considered this strategy quite ineffective compared to pursuit hunting, given the overall low number of kills resulting from it. Data obtained on ambush hunting among Ju|'hoansi and Kua confirm this assessment (Crowell & Hitchcock 1978; Lee 1979: 211; Parks 1992). Kalahari informants explain this by the fact that even though game animals may be hit with poisoned arrows, they may not be recovered since predators and scavengers often reach them before the hunters do (Hitchcock & Bleed 1997).

In pursuit hunting, Kalahari and Etosha hunters obtained small and medium-sized animals by bow-shooting, by knocking them down with a throwing club and then beating them to death, or by chasing and running them down (eventually with dogs) and finishing them off with spears, clubs or digging sticks. Although Lee (1979: 214) remarked that the untreated iron-tipped arrows of the Ju|'hoansi had considerable knockdown power for small game like steenbok or duiker, he also noted the use of poisoned arrows for killing these antelopes, although he had the impression that Kalahari hunters regarded this as a form of overkill. The Hai||om obviously felt this way too, as our informants explained to us. Etosha hunters could, however, refrain from using poison because of their heavier bows and arrows, and *‡gîs* in particular. "Bone-breaker" arrows not only had knockdown power but also caused a shock effect because of the painful wounds it produced, making the prey an easy victim once the arrow had found its mark.

In the Kalahari and Etosha, larger herbivores dispersed and/or migrated during the hottest months of the year in search of adequate pasture elsewhere. During this season, weather conditions were not conducive to the daylong exertion of bow-and-arrow hunting, which is why hunters took to snaring game instead (e.g., Silberbauer 1981: 214). As Lee (1979: 207f.) pointed out, snaring is a modest, time-consuming technique, which usually has a relatively low meat return per man-hour. He also noted that older hunters in particular practised snaring, because this technique maximised knowledge and experience while making minimum demands on eyesight, endurance, speed, and energy reserves. For young boys, it was part of their training towards becoming experienced hunters, because it necessitated close observation of animal behaviour and advanced knowledge of spoor. G|wi, Ju|'hoansi , Kua, and Hai||om reported that mainly ground birds, such as helmeted Guinea fowl, francolin, and korhaan, as well as mammals up to the size of steenbok and duiker were taken in snares. Despite the fairly sizeable numbers of animals killed this way, the overall edible yield of the taxa caught with snares was not very high (e.g., Lee 1979: 208f., 214, Table 8.1), which explains their modest contribution to the diet of the Kalahari and Etosha San.

Since steenbok and duiker do not readily migrate, some Kalahari groups relied heavily on them as a source of meat after other game had migrated (Steyn 1971: 295; Tanaka 1976: 111, Table 4.4; Silberbauer 1981: 205, Table 9; Bartram et al. 1991: 99). The modal monthly totals of animals killed by an 80-member ≠Xade band comprising 16 active hunters illustrate this well (Silberbauer 1981: 205, Table 9). Thus, in the Okwa Valley, steenbok and duiker were the only bovids killed during the hottest part of the dry season, which lasts from September to November. During this period, the Kua would also employ the physically demanding method of running down prey. If fresh, promising spoor were found, the hunters would pursue their quarry relentlessly, keeping it on the move even if it was not always in sight. Such tenacious pursuit eventually caused the animal to collapse from pain induced by the intense heat of the sand, as well as from its inability to lie down in the shade and ruminate. When the hunters caught up with the incapacitated animal, it was clubbed with digging sticks or killed with spears (Bartram et al. 1991: 99f.; Hitchcock & Bleed 1997). Attracting warthog, steenbok, duiker and other grazing taxa could be achieved by setting vast areas of old vegetation afire to encourage new growth. This practice has been described for the Ju|'hoansi.

Ju|'hoansi, Nharo, G|wi, G||ana, Kua, and Hai||om considered mammals like springhare, porcupine, aardvark, and pangolin of dietary value as well. Whenever these animals were encountered in the open, they would be speared or clubbed. These taxa are essentially nocturnal and spend most of the daytime in subterranean holes. Porcupines and pangolins usually occupy burrows originally dug by aardvarks, as do warthogs, which will go underground when in danger. Digging down to animals sleeping or hiding in their burrows and finishing them off with clubs or spears was the method of choice in case the ground was not too hard or the burrow too deep. The Kua would use springhare poles to impale porcupines resting underground (Bartram et al. 1991: 99). If excavating were considered too arduous a task, smoking the animal out into the open would be the preferred strategy of the Ju|'hoansi (Lee 1979: 215f.) and the Hai||om. This method does not seem to have been used by the Nharo, G|wi, G||ana or Kua (Steyn 1971: 306; Tanaka 1976: 102; Silberbauer 1981: 214f.; Bartram et al. 1991: 99). Animals breaking out of their hiding place were killed with spears or poisoned arrows. However, if the prey remained underground because it had asphyxiated or was unconscious, the hunter had to enter the burrow and drag it out. Such undertakings were risky and necessitated precautions like airing out the hole (see above). Aardvark in particular could be dangerous in these situations because the species reacted to the penetrating smoke by burrowing deeper and sealing off parts of the subterranean passages with earth. Smoking out aardvarks was not necessarily effective and entering its burrow sometimes ended with painful confrontations between the hunted and the hunter, as is evidenced by the scars left by their claws on the faces and shoulders of Ju|'hoansi hunters (Lee 1979: 216).

With throwing clubs and springhare probes (used by all San communities) as well as slingshots (known to the Hai||om only), a variety of vertebrates the size of springhare (< 3.5 kg) or smaller could be taken. Although these methods are effective, the low average weight of the taxa caught this way explains their modest contribution to the community's overall meat supply.

Most San groups living in northern Namibia and (north) western and central Botswana already possessed dogs in the early 1970s. Parental stock must have been introduced in the past from elsewhere, for instance, by trade with neighbouring Bantu-speaking peoples, but for the moment, the antiquity of the dog's introduction into San economies is not well known. Archaeozoological evidence is not always helpful in this respect, as is illustrated by the analysis of faunal remains from 16 Ju|'hoansi camps in the Dobe area (Yellen 1977a, Appendix B) and from the Hai||om base camp *‡Homob*. None of these assemblages produced a single dog bone or specimens of other species with tooth marks. However, hunting with the aid of dogs was a common practice in the northwestern Kalahari (Lee 1979: 142) and dogs were kept at *‡Homob* according to our informants. Interestingly, dogs were barely tolerated in the nuclear household areas in Kua camps, and it must be questioned whether this was also the case in settlements elsewhere in the Kalahari and in the Etosha. Since dogs usually are infested with ectoparasites and other bothersome creatures, personal and family hygiene seems a likely explanation for keeping them away from living and sleeping quarters. Dogs nevertheless were allowed to scavenge the rubbish areas adjacent to hearths or near butchery spots, and would take their prizes to a shady location near the camp perimeter to chew them in peace (Bartram et al. 1991: 103). In sum, the archaeological features analysed by Yellen (1977a) and in the frame of this study were obviously not the places where dogs regularly enjoyed the leftovers of human meals.

Although dogs played a role as hunting companions in the Kalahari biome in the 1960s and 1970s, the intensity of their use varied regionally. In the 1950s, for example, dogs were not a significant hunting factor for the Ju|'hoansi living in the Nyae Nyae area (Marshall 1957), whereas a decade later, Lee (1979: 142) already observed their widespread use by the Ju|'hoansi in the Dobe area. During his fieldwork in the Okwa Valley in the late 1960s and early 1970s, Tanaka (1976) noticed that when dogs were available, warthog, antelopes, and small carnivores would be pursued with their help and the cornered quarry killed with spears. Silberbauer, who conducted research in the same area prior to 1965, did not mention dogs at all as hunting aids: "The hunter's techniques include, in order of frequency of use, shooting with bow and poisoned arrow, snaring, catching springhares by means of barbed probes thrust into warrens, running down, spearing, clubbing, and meat robbing" (Silberbauer 1981: 206). He mentioned, however, that when the decade-long drought broke in the late sixties, there was a rush of Tswana and Kgalagari pastoralists and their herds into the central Kalahari. Previously held back by the long drought and hence desperate for new grazing because their stock had exhausted the pasture within reach of established wells and boreholes, the cattlemen took advantage of the good rains, dispossessing many Bushman bands of their territories (Silberbauer 1981: 1).

If hunting with dogs was still a secondary strategy in the central Kalahari in the 1960s and early 1970s, it had become the major means of obtaining wild animals two decades later (Ikeya 1994). Kua hunters, for instance, utilised them for flushing out and chasing steenboks, duikers, bat-eared foxes, porcupines, and aardwolves (Bartram et al. 1991: 99, 103). Dogs also facilitated the use of spears in hunting, as these could be employed after they had chased the animals down and cornered them (Hitchcock & Bleed 1997). Hunting with dogs is probably the main reason why subsistence hunters in the Kalahari kill(ed) gemsbok so frequently. Spear hunting also had the advantage of killing game quickly so that tracking wounded – and potentially losing – quarry was not a problem. Spear hunting appears to be somewhat more productive than bow and arrow hunting, as it needs less training and knowledge of plants and animals. It is also considered a more efficient means of getting meat since it did not require extensive inputs of labour in following wounded animals on foot. This explains why the use of bow and arrow in hunting declined since the 1970s in favour of spear hunting with the aid of dogs (Hitchcock & Bleed 1997). Since the 1980s, the Kalahari San have begun hunting from horse- or donkey-back. Mounted hunting is especially effective for capturing giraffes, eland, and other large ungulates (e.g., Osaki 1984; Wilmsen 1989: 230f.; Ikeya 1994). Donkeys were also important for transporting large skinned mammals back to the camp (Ikeya 1994).

Dogs, donkeys, and horses were probably already known to the Hai||om decades before Kalahari foraging groups became well acquainted with these domesticates. However, donkeys were absent in most of the EGR and only a few animals were kept by the Hai||om living near the waterholes at Namutoni (Dieckmann 2007a: 153f., 187f.). The elders also explained that in the 1940s and 1950s, bow-and-arrow hunting without the aid of dogs was the essential means of procuring meat in the EGR. This relates to government regulations and the ban on dogs declared in 1930 (s. above). In fact, the use of dogs as hunting aids (*!aub*) was not held in high esteem by Hai||om hunters. This is in marked contrast to the aforementioned Kalahari foraging groups, for whom we could not find any indication of disapproval. Not only that, ≠Toma, one of the main hunters of the Dobe camp, stated that if "… you don't have dogs, you don't even bother to hunt warthog" (Lee 1979: 143f.). In retrospect, the negative attitude of the Hai||om vis-à-vis *!aub* might be a consequence of the ban imposed by the SWA administration.

San foraging groups confined to arid southwestern Africa did not disdain animal carcasses as a source of meat that were found in the veld. For instance, hunters could have been beaten to the kill site by lions, hyenas, wild dogs, jackals or leopards if a poisoned arrow had wounded an animal during the night. When coming across lions with their fresh kills, however, competition over meat would take place (Steyn 1971: 297; Lee 1979: 221; Silberbauer 1981: 216). Having closely observed their food rivals feeding until satiety, the hunters would then try to drive them away by rushing up and chasing them off, subsequently helping themselves to the unspoiled portions of the carcass. The trick lied in correctly judging the moment: if they approached too early, the lions would attack, and if they waited too long until the lions were sated and lazy, they would stand and defend their kill rather than run (Lee 1979: 221; Silberbauer 1981: 216). If people found an animal that had died from unknown causes and provided decay was not too far advanced, all edible parts would be collected and carried home. The foregoing observations also apply to the former inhabitants of the Etosha, as the Hai||om elders explained to us. Interestingly, the Ju|'hoansi considered it good fortune to make such a carcass find, and one of their prayers to the gods asks that the hunters or the women, when they are out gathering, be led to find such easily procured meat (Marshall 1976: 127f.).

Based on literature and oral history, it can be postulated that men of all ages were encouraged to procure meat for their community, but some hunters were clearly more successful than others. This did not severely affect their social status, though, since the correct demeanour for the successful San hunter would be modesty and understatement, which is why other members of his group strove towards levelling potentially arrogant behaviour. Questions and answers dealing with the outcome of a hunting trip were often characterised by a careful choice of words negotiating the obstacle (see also Lee 1979: 244ff.). Arriving home from a successful warthog hunt, for example, two Ju|'hoansi hunters would tell relatives that they had seen nothing. Nonetheless, as their animal was already dead, they enjoyed a hearty meal of wildebeest meat from a kill of the previous day (Lee 1979: 224). If a Hai||om hunter asked his peers to assist him in searching for his arrow upon his return to the camp, the invitation would hint to hunting success. Moreover, since the owner of the arrow would refrain from eating dried berries or other sweets that evening – these foodstuffs would counteract the effect of the *Adenium* poison –, his wife would know as well. If, on the other hand, a hunter was down on his luck, his modest attitude (suppressing the envy of the others) would ensure the support of peers and relatives. If everything else failed, he could address the community's medicine man (*!gaiob*) for advice.

Despite the continuous need to procure enough animal protein and fat to nourish the group, one cause of concern of Hai||om hunters was the shooting of more animals than the immediate, short-term needs required. Such behaviour was strongly disapproved of in Hai||om community, since it was believed that it would impinge upon future hunting success and endanger group survival. A similar attitude has also been noted in other San peoples (e.g., Silberbauer 1981: 6, 233).

Kill site activities

We could not find an explicit mentioning in the works of Steyn (1971), Marshall (1976), Tanaka (1976), Lee (1979), Silberbauer (1981), Bartram et al. (1991) or others, of a peculiar ceremony performed after a successful big game kill for the San peoples inhabiting the Kalahari. It thus seems as if the Nharo, G|wi, G||ana, Kua, and Ju|'hoansi did not have a parallel to the Hai||om *|hâson* ritual described above. All San communities, however, held ceremonies for young hunters that had killed their first big game. The Ju|'hoansi even performed separate ceremonies for the first large male and female animal killed. During the latter rites, experienced hunters would apply cuts and tattoos to the young hunter's chest, back, and arms and rub a magic substance into his body (Marshall 1976: 130; Lee 1979: 238f.). In Ju|'hoansi, for instance, a hunter's status would be signalled by the position and number of scarifications. As has been mentioned above, the Hai||om too had a rite of passage for the young hunter, but without scarification and tattooing.

The ethnographic literature dealing with Kalahari foraging groups and Hai||om oral history indicates that activities at the kill/butchery site varied according to the circumstances. The size of the quarry and the kill-to-camp distance were decisive factors for how to handle the carcass. The availability of water and food resources near the spot where the animal had died, the number of carriers available, the time of the day, the weather conditions, etc., influenced decision-making as well.

Turning to the size of the prey, animals up to duiker size were usually carried back *in toto,* if necessary gutted, even if they had been killed a considerable distance from the hunter's homestead. If the camp were nearby, strong hunters would shoulder even heavier animals like springbok. Carrying home animals surpassing 50-60 kilograms required a minimum of two persons. If the quarry did not die too far away from the camp, a Hai||om hunter could call for assistance with his springbok horn. This way, he immediately could start processing the animal.

Prior to transport, Hai||om hunters singed small to medium animals other than antelopes on the spot if their skins were of no economic value and then eviscerated them. According to the literature, singeing was not practised by Kalahari foraging groups. If the prey was an aardwolf, a hyena or other carnivore, the Hai||om hunters removed the anal sacs as well; otherwise, the meat would be spoiled by its contents during cooking. Exceptions to this *modus operandi* were the serval, caracal, leopard, and cheetah, and occasionally springhare, which the Hai||om took back *in toto.* Skinned carefully, the Hai||om exchanged felid pelts for precious goods, like tobacco. Conceivably, Kalahari hunters proceeded similarly. As already mentioned, the springhare coat turned inside out served as a tobacco pouch in the Etosha.

If dealing with larger game, the preferred strategy was to process the carcass into manageable, carrying-size packages for return transport to the camp. As size and distance to the camp increased or the number of carriers decreased, secondary butchery had to take place. In this case, hunters would reduce the meat packages to strips (biltong) and dry them on the spot. Proceeding this way, their initial weight would be reduced by 60%, enabling two men to take back the meat of a large antelope (e.g., Lee 1979: 223). Finally, the moving of the camp itself to the butchery site when a very large species (eland, giraffe) was killed was an option during the rainy season, especially if plans already existed to shift the camp to the area of the kill site because of good water availability.

In the Kalahari and Etosha, knives were mainly used for butchering large carcasses into carrying-size packages. In this respect, "finesse rather than force" was the rule for the primary butchering of the freshly killed animal at the kill/butchery site (Yellen 1977b: 281). To cut through bone, however, an adze, hatchet or similar tool was needed. The Ju|'hoansi, for instance, used an adze to separate the game's head from the neck or to free rib packages, thereby leaving the dorsal articulations of the ribs attached to the vertebral column. In our kudu butchering experiment, portioning of the vertebral column and separating the pelvis from the sacrum (s. above) was done with a machete.

Yellen (1977b), who observed and recorded the butchering of kudu and wildebeest at several occasions in detail, provided the best description of Ju|'hoansi butchery practices. If Yellen's description and our kudu butchering experiment can be considered more or less representative for the Kalahari and Etosha communities, parallels as well as cultural specifics emerge. Since a species' gross anatomy governs its dressing, cross-cultural parallels can be expected. While this is true for a number of steps, a close comparison of both approaches revealed alternative ways of carcass processing. The removal of the forelimbs, for instance, was either done with the shoulder blade attached (Ju|'hoansi; Yellen 1977b: 281) or without this bony element (Hai||om; see above). The two groups also processed the thorax and vertebral column in a completely different manner. The Ju|'hoansi would remove the head from the vertebral column together with the first two vertebrae with the meat still adhering to it. In a next step, approximately the upper ten vertebrae (i.e. five cervical and about five thoracic) were cut in one segment and split lengthwise. Finally, the remainder of the vertebral column would be smashed both longitudinally and horizontally with an axe, using enough force to shatter the individual vertebrae whilst taking care to maintain the integrity of the whole. The result then was a single pliable package that could easily be transported on a carrying pole (Yellen 1977b: 284). The Hai||om separated the head from the vertebral column at the atlanto-occipital joint and divided the vertebral column into two parts of almost equal length by a transverse cut in the middle of the thoracic vertebral segment. Further portioning would be done in the camp by reducing these meat packages into pot-sized pieces. Probably the most culturally specific feature of Hai||om carcass dressing was the *in toto* removal of *‡gaob* (see above), for which we could not find an analogue in southern African ethnographic literature. Without detailing this issue further, we can conclude that the Ju|'hoansi and Hai||om had different, culture specific ways for processing large animals. Both methods resulted in carrying-size packages that were suitable for transportation back to the camp and for on-site distribution to close relatives and other members of the group. As has been detailed above, the Hai||om also employed slightly different techniques for the butchering of medium to large carnivores, livestock, and game hunted with dogs.

During the dressing of quarry, it was the hunter's prerogative to enjoy choice parts at the kill site. A widespread custom in San communities in the Kalahari and the Etosha was the consumption of the liver, which was roasted over coals on the spot (Yellen 1977b; Silberbauer 1981: 218; Bartram et al. 1991: 101). In the case of big game, the animal's metapodials were sometimes heated and gently split by lengthwise blows in a proximo-distal direction. This allowed the bone marrow to be extracted from the metapodial halves, which was then eaten together with the liver. The latter practice was not obligatory and hunters could just as well decide to take the metapodials home intact. Depending on the number of people that had to be nourished at the butchery site and the type of animal killed, other parts could be prepared as well. Hai||om hunters, for instance, gladly choose parts high in fat content, such as the fat pad underneath the mane of a zebra or the fatty marrow in the horizontal part of its mandible. The Hai||om elders explained to us that this gave the hunters the necessary strength for their return journey. Cumbersome body parts like the head of a large bovine or a warthog could be prepared on the spot in an oven pit, particularly if the distance to the camp were considerable. Conceivably, Kalahari hunters had similar habits and explanations for consuming high-energy choice parts at the butchery/kill site. Dogs accompanying Kua hunters on their trips received part of the innards as a reward for their efforts, including the heart, lungs, kidneys, and intestines in steenbok and duiker (Bartram et al. 1991: 101)

To deal with very large animals such as eland and giraffe, San groups organised large hunting parties comprising women and children if necessary. Sometimes, the occupants of the base camp even decided to move their residence to the butchery site. In giraffe or eland, several return trips might be necessary before all edible parts had been carried back to the camp. If parts of the carcass were left behind to be collected the next day, they would be bundled and hung in trees or covered with thorny tree branches. The Kua even constructed robust, brush-covered tree platforms to store carcass parts or butchered packages. Such platforms would be placed out of reach of all but the most persistent of scavengers (Bartram et al. 1991: 101).

Apart from the scattered pieces of charcoal used to cook the liver and other body parts and the bone refuse associated with meat preparation, Kalahari and Etosha hunters only left a few undesirable animal parts at the butchery site following primary butchering. This included the gall bladder, the contents of the digestive tract, and the horns of large bovines (e.g., Yellen 1977a: 78), except for those of gemsbok, which the Hai||om gladly used as digging sticks. However, depending on the distance to the base camp, processing decisions and handling of large carcasses could be modified. When the animal was recovered at some distance of the camp, the primary butchery was followed by additional steps aiming at the production of biltong, including the filleting of meat off the bones. Conceivably, Hai||om hunters proceeded in a similar rational way, but eyewitness accounts are lacking.

Interestingly, if biltong production took place, Ju|'hoansi hunters always carried the clean, intact marrow-containing bones home (Yellen 1977b: 285). Consequently, there would be very little, if any, difference between butchery sites with only primary butchering activities and those where they had made biltong. Kua hunters, on the other hand, would systematically crack these bones and consume the marrow on the spot whilst cutting the meat in strips. Thus, unless adhering to transported meat, fragments of marrow-yielding bones were discarded at the filleting location, implying that under such circumstances, much of the animal's skeleton was abandoned at the butchery site (Bartram et al. 1991: 101f.).

Meat sharing practices

In contrast to gatherers who can confidently predict the measure of daily success in food acquisition, hunters have far less control over the size of their daily return. There are marked differences among men with respect to their hunting achievements as well (e.g., Lee 1979: 231, Table 8.5). Because some hunters bag more than their household could ever possibly eat before the meat spoils and others come home empty-handed, meat is an obvious exchange medium (Silberbauer 1981: 233). Expectedly, the meat of small animals was shared by only a few people, usually the hunter's own family and/or some close relatives. In big game species, however, custom required the sharing of meat and fat with community members and visitors.

For the Kalahari foraging groups, few formal arrangements governing the distribution of portions of a butchered carcass have been described in the literature, the division of the spoils being a matter of finding an acceptable compromise between the needs of all the people a hunter felt obliged to give meat to. A rule of thumb for allocating ownership of a kill was that the owner of the arrow (point) that caused the animal's death was also the owner of the meat and hence responsible for its distribution. If the successful hunter was also the owner of the arrow, his share comprised about half of the meat and other useful portions, and his hunting partner received the rest. If the arrow had been borrowed, the hunter either handed over the whole carcass for distribution or made a gift of half of his own share to the owner of the arrow. The latter would return portions about equal to what they would have kept for themselves, had they not presented the carcass to him, to the hunter and his partner (Silberbauer 1981: 233). During initial distribution, meat was given as a joint, i.e. with the bone still inside, unless it had been cut in strips of biltong at the butchery site. An individual only had a direct claim to a portion of meat if he had carried it back to the camp. After the hunters and carriers had received their share (e.g., Lee 1979: 224, Table 8.2), secondary distribution took place, whereby close kinship was a main factor dictating the pattern (for details see Marshall 1976: 298ff.; Yellen 1977b: 287ff.; Silberbauer 1981: 234ff.). Finally, many of the beneficiaries subsequently divided their portion and passed on smaller amounts of raw meat to other camp members. Upon this third step, almost all households in the camp had received at least something of the kill. The procedure described only involved raw meat, as cooked meat would normally not be shared outside the household.

For the G|wi, Silberbauer (1981: 233f.) mentions a second mode of distribution, the men's feast. The hunter alone or in concert with his hunting partner (or, sometimes, including the arrow lender), announced a feast and issued invitations. In the afternoon of the day after the kill, a fire was made outside the host's shelter and the invited men gathered to cook pieces of meat. After they had eaten for a couple of hours, their wives and dependent children, returning from their bush food-collecting trip, would drift to the fringe of the gathering. Each invitee was then given a portion of raw meat, which he passed on to his wife or sent home with a child.

In his account of a first buck ceremony, Lee (1979: 238f.) reported on the cooking of meat including the portions reserved exclusively for the "older men", meaning hunters over 35 years old. These "older men's" portions would be cooked in a separate pot, whereby the right to participate in the meal was according to age and not hunting accomplishments. These portions consisted of the shoulders, belly, and several parts of the intestines. Lee (1979: 240) furthermore noted that these parts were reserved for the "older men" in all animals killed, not just in those prepared in a first buck ceremony. Yellen (1977b), on the other hand, only mentioned the practice of giving selected body parts of large animals to specific individuals. The "owner" (*n!ori kau*) of the area, for example, received the quarry's head. For the Nharo, Steyn (1971: 309) noted that from a large buck, "a foreleg goes to the successful hunter's parents if they live with the group, while his brother receives a hindleg. His parents-in-law get a hind leg and part of a foreleg. The heart, liver, and head go to the hunter's grandparents. If they do not live in the group, he keeps these for himself. Normally he also keeps the spine". Nonetheless, in all these Kalahari communities, each large kill was considered a specific case, and the relationships between families who happened to compose a group at that moment as well as family size both had to be taken into account. Rules therefore were extremely flexible (Steyn 1971: 309; Yellen 1977b: 285ff.). In sum, the typical pattern emerging for large animals is that meat moved from the hunters and carriers upward through the kinship network to parents and in-laws, and then outward and downward again, the most important consideration being that everyone got a fair share, however small.

This appraisal differs from the modus of distribution disclosed by the interviews with the Hai||om elders. In the Etosha, large game meat appears to have been systematically distributed starting from the experienced hunters' kitchen (and not from the successful hunter's household), and with joints of meat being handed over by the hunters to the different beneficiaries at some distance of the *!hais*. Perhaps in the 1940s and 1950s, the distribution of *am|naen* was more flexible than was revealed to us by oral history, but the fact that a rather sophisticated set of rules appears to have been applied suggests that the scope might not have been that large. On the other hand, any beneficiary was free to decide with whom to share her/his portion, and it appears that everyone from the camp, as well as some occasional visitors, in the end enjoyed some of the meat from each large kill.

It should be noted that the body parts consumed at the *!hais* had the larger energy yield because of their higher fat content. As mentioned previously, animal fat was valued over meat, and some organs yielded appreciable amounts of it. Fat in the marrow of long bones, nuchal pad in zebras, and in the dewlap (*oros*) of gemsbok etc., usually ended up on the men's plates. The fact that our informants had fond recollections of animals they considered especially rich in fat underscores its significance in the diet of the Hai||om. In this respect, parallels with Kalahari groups become obvious (Yellen 1977b: 293).

Food taboos

In every community, there are individuals that will not eat certain foodstuffs because of personal preferences. There were, however, also cases and situations, where custom explicitly required their avoidance. Factors including species, age, and body part of the animal, and the sex and age of the consumer all played a role (e.g., Steyn 1971: 295f.). A detailed discussion on this matter for all Kalahari foraging groups falls out of the scope of this paper. However, some food avoidances appear to have been quite widespread, for example, in the Kalahari and Etosha, people usually refrained from eating diurnal and nocturnal birds of prey, bats, and primates, the latter partly because of their close resemblance to man. There was also considerable reluctance to hunt and boil the meat of large carnivores, particularly lion and hyena, but cases of people doing so have been recorded from different parts of the study area. The Nharo, for instance, consider the meat of large carnivores utterly undesirable, and often mock their southern neighbours, the !Xõ, by referring to them as lion and hyena eaters (Steyn 1971: 296).

Canids appear to have been an ambiguous group of animals as well. At least two members of this family were more or less systematically hunted by the Nharo, G|wi, G||ana, Ju|'hoansi, and Hai||om, namely the bat-eared fox and the black-backed jackal. The Hai||om, however, avoided the Cape fox (see above), a species consumed by the G||ana (Tanaka 1976: 119, Table 4.B). The fact that the Nharo, G|wi, G||ana, Ju|'hoansi, and Hai||om all refrained from killing the African hunting dog *Lycaon pictus* (Steyn 1971: 296; Tanaka 1976: 119, Table 4.B; Lee 1979, 229, Table 8.3) suggests a particular status for this taxon. The main reason why the Hai||om ignored this large canid was that they detested the species' hunting and feeding behaviour (see above). Whether the same explanation holds for the origin of the taboo against the hunting and eating of wild dogs in the Kalahari San communities could not be ascertained.

In the Hai||om community, situational taboos existed regarding butchering, preparation, and consumption of the meat, fat, and marrow of eland, giraffe, gemsbok, greater kudu, hartebeest, blue wildebeest, and zebra. In this respect, the way the quarry had been tracked (spooring, dogs) and killed (bow and arrow, spear, club) as well as the location where meat preparation and consumption took place (butchering site, temporary camp, base camp) all played a decisive role. As has been detailed above, specific body parts of *am|naen* would be reserved for the experienced, active hunters if consumption took place at the base camp. No doubt, the fact that they prepared their meat themselves minimised the risk that other members of the group got some of it. In other San communities, however, it was observed that the use of pots for cooking meat enhanced the danger of mixing tabooed parts, which could easily result from an imperfect cleaning of cooking utensils that were shared within the community by men and women (Marks 1976: 125; Lee 1979: 247). This could be problematic, because if the women ate (part of) the "men's portion", it was believed that hunting success would drop to zero (Lee 1979: 247).

Preparation of animal foods and bone waste

All the meat and eventually the skin of large game was prepared and eaten, except for the meaty parts surrounding the arrow wounds, which were cut out and thrown away or burnt at the butchery site. A cross-cultural comparison of meat preparation by Kalahari foraging groups and Hai||om reveals that the principal methods for preparing meat were boiling and roasting. The first method not only made the meat tender but also allowed the extraction of the fat, minerals and other nutrients stored in the soft and hard tissues that were otherwise inaccessible. Bone marrow, a main source of animal fat, could be eaten raw or cooked and was sometimes added to a meat stew to enrich the gravy. Biltong could be eaten raw, roasted in hot ashes or boiled.

None of the Hai||om elders experienced a time when pots were not available for cooking meat, an observation that can be extended to the Ju|'hoansi. However, Hai||om oral history revealed that prior to the introduction of cooking utensils, meat portions would be wrapped in a piece of animal skin and cooked in oven pits. How the final butchering procedures looked like before cooking pots came in use cannot be ascertained anymore, but it can be presumed they were considerably altered by the introduction of such utensils (Yellen 1977b: 291). The cooking pots used in the Kalahari and the Etosha were not locally manufactured and represented goods imported from neighbouring areas of Bantu or other cultural traditions.

Although a good deal of the carcass was cooked by boiling, eventually after some of the meat had been removed for making biltong, roasting was the choice method under particular conditions or for certain dishes or species. As already mentioned, it was customary for the Nharo, Ju|'hoansi, G|wi, Kua or Hai||om to roast the liver and other choice parts, such as the metapodials or slabs of ribs at the butchering site. At the base camp, the Ju|'hoansi would only place pieces of dried skin, biltong strips, and the animal's feet directly in the coals. Alternatively, the latter could be roasted in an oven pit, which was a widespread custom for cooking a large animal's head (e.g., Yellen 1977b: 291ff.). This corresponds well to the roasting practices in the central Kalahari (Silberbauer 1981: 217ff.), whereby the G|wi would ground the roasted pieces of uncured skin into powder to eat them. In addition, they usually roasted the kidneys and the udder on an open fire. Steyn (1971: 284) recorded that small(er) animals were baked *in toto* in hot ashes of a large fire that has been made in a trench, for instance porcupines or jackals.

Cooking practices in the Etosha in the 1940s and 1950s closely resembled the situation in the Kalahari in the 1960s. In base camps, boiling was the main method, but on hunting trips or when preparing a large animal's head or a smaller species *in toto*, roasting was the first choice.

It is noteworthy here that groups like the Ju|'hoansi, Kua, and Hai||om savoured a sort of culinary delight, which consisted of finely pounded meat paste, to which freshly cooked marrow had been added. During the kudu butchering experiment we not only could watch the Hai||om elders preparing *‡khoms* but had also the pleasure to enjoy this fine dish. To make this meat paste, the Ju|'hoansi would roast fresh biltong on a bed of coals, whereas the Hai||om would take fresh meat from the animal's back (*|hama.s*) and boil it before pounding.

As pointed out earlier, situational circumstances made it impossible for us to get a closer look at the culinary end of the processing spectrum. Indeed, in absence of modern traditional Hai||om settlements, the overall movement of animal bodies through the subsistence system and the impact on processing decisions at every stage of it could not be documented. We agree with Yellen (1977b: 294) and others that the way most bones are broken reflects the way meat was prepared for consumption, and it is this latter variable, rather than any kind of hunting technique, which is reflected most clearly in the observed patterning of faunal remains.

Our analysis of the traces left on the modern kudu bones resulting from meat processing and cooking according to Hai||om tradition did not disclose in all steps the breakage of the different skeletal elements in full detail. Yet, even if our documentation of the cut and chop marks is incomplete because parts are missing (s. above), one aspect that clearly emerges is that butchering aimed at maximising nutritional yield. An illustration of this is the systematic lengthwise splitting of the articular heads of long bones and the dorsal ends of the larger cranial ribs done to expose the inner spongy bone tissue. Processed this way, the fat, minerals, and other nutrients stored inside the ribs could be extracted much more efficiently during boiling, which had the added effect of producing a rich broth.

It is noteworthy that the butchering patterns observed by us on a selection of kudu bones reveal parallels to the description provided by Yellen (1977b: 294ff.) for Ju|'hoansi butchering practices. His findings are based on the broken and discarded bones of two adult kudu and two adult wildebeest at the Dobe camp. In this controlled experiment, carcass treatment showed marked similarities between the two taxa, implying that butchering followed a consistent pattern independent of the species, although occasionally with cross-species differences (Yellen 1977b: 294ff., Tables 14.2ff.). The Ju|'hoansi, for example, would usually split the distal end of the humerus in wildebeest because this part contained marrow. They however did not bother to do so in kudu, since this antelope's distal humerus hardly yields any marrow at all. In the same species, the distal head of the radius also remained complete, whereas the articular ends of the remaining marrow-yielding long bones were usually split lengthwise before cooking, except for the metapodials, which were split longitudinally *in toto*. Given the parallels to our findings (see above), it seems as if in the Kalahari and Etosha, the long bones of large game were treated in comparable ways, whereby certain steps in the process likely emanated from a similar consideration, namely maximising nutritional yield.

Raw materials of animal origin

It is hardly surprising that the Kalahari and Etosha foraging groups had similar commodities manufactured from animal raw materials. Skins of antelopes, for instance, were modified into cloths, satchels, sandals, pouches, belts, thongs, bracelets, necklaces, carpets, blankets, etc. (Steyn 1971: 287ff.; Marshall 1976: 413; Yellen 1977b; Lee 1979, 124f.; Silberbauer 1981: 223ff.). It is interesting that in many instances people selected the same raw material, e.g., the supple steenbok skin for making cloths, for producing comparable objects.

Raw hides had to be cured prior to processing. In a first step, they were pegged out, hair side down, to dry them in the sun. This drying stage took place outside the central settlement area, since it took a good deal of space and was likely to attract insects and carnivores. Using a knife or an adze, the skins were scraped clean of blood, fat, and other kinds of adhering tissue. The skin was subsequently moistened using vegetable juices (and eventually human urine) and then kneaded repeatedly until soft enough to manufacture the end product the tanner had in mind. Decay was prevented by vegetable tanning using the bark of selected trees rich in tannin, such as acacias, and/or by applying one's own urine or rubbing the skin with fatty substances, for instance, a mixture of fat and brains of antelopes (Silberbauer 1981: 224). Keeping the leather soft required regular care and it was rubbed with plant substances such as the red bark of the kiaat tree (*Pterocarpus angolensis*) (Lee 1977: 276).

Pieces of sinew, preferably of large antelopes or giraffe, served for sewing leatherwork, fastening objects, producing strings for bows and musical instruments, stringing beads, manufacturing snares, etc. Horn sheaths of larger antelopes were fashioned into spoons. Tortoise shells served as food, medicine or cosmetic containers. Herbivore stomachs were chosen for transporting water or blood (Lee 1979: 122). Another interesting parallel is the widespread use of the nests of the Cape penduline tit as pouches. The Hai||om collected these nests for safeguarding pieces of dried arrow poison, while the Ju|'hoansi used them as tobacco pouches (Marshall 1976: 413f.).

Expectedly, a number of items reflect local tradition and manufacture. Water containers made of ostrich eggshell, for instance, were widely used in the Kalahari but barely by the Hai||om, who already had tin cans in the 1940s and 1950s. Ostrich eggshell beadwork also appears less important in the Etosha region compared to the Kalahari. Hai||om hunters were probably the only Bushmen using strips of hide (instead of sinew) for making bowstrings and zebra skin for fashioning arrow quivers. Their use of springbok horns to announce successful hunts or potential dangers or of springhare coat for fashioning tobacco pouches seem culturally specific as well.

Equipment typical for Kalahari foraging groups (and absent in the Etosha) is the carrying net (e.g., Steyn 1971: 311). Sinews of the back of gemsbok or kudu are first made into twine by rolling them over on the thigh. These lengths of twine are then knotted together in a geometric hammock-shaped pattern that, when extended to its full size, forms a net 100 cm long and 40 cm across (Lee 1979: 127). These nets were used for carrying ostrich eggshells and bags with possessions and dried meat when migrating (Steyn 1971: 311).

The Ju|'hoansi also manufactured carrying cases for spare metal arrowheads by cutting a tubular segment near the tip of the horn sheath of a gemsbok and furnishing it with detachable leather covers fitting over each end. Slivers of gemsbok horn also served to fashion small ritual bows and arrows (Marshall 1976: 152; 413f.; Yellen 1977b: 290f.). Oracle disks made of leather and used for divining purposes seem particular to the Ju|'hoansi. They also manufactured porcupine quills into arrow points or used them as hair ornaments. The Hai||om, on the other hand, cut the quills into 'black and white' beads for making bracelets or necklaces for the women.

It is noteworthy, though, that the 20th century A.D. Kalahari San specifically selected animal bone for manufacturing implements of daily use (Marshall 1976: 151, 413; Yellen 1977b: 290; Lee 1979: 76, 133; Silberbauer 1981: 206f.). For mixing arrow poison, the Ju|'hoansi utilised little bone dishes as cups, such as the distal articulation with the glenoid cavity of the shoulder blade or the socket of the knee joint of a large antelope. They also modified tibia shaft fragments of gemsbok (in absence of the heavier, stronger giraffe bone) into arrow link shafts and fashioned the hollowed section of a radius shaft, preferably of goats, into smoking pipes. The Ju|'hoansi, G||ana, and G|wi still made arrowheads of bone in the 1960s, but a shift in favour of metal arrowheads was already observed in the Kalahari in the 1960s and 1970s (Marshall 1976: 146; Yellen 1977b: 291; Lee 1979: 76; Silberbauer 1981: 206f.). Two decades earlier, the Hai||om already hunted exclusively with the more durable and sharper edged iron points made of fencing wire and other metal objects.

The excavation at ‡Homob

Archaeology of ‡Homob

The excavation of the hut circles B/C sheds new light on the functional interpretation of stone circles based on artefact densities (q.v. Parson 2004, 2005; Jacobson 2005). Thus, the almost complete absence of artefacts and debris inside living spaces is, at least in the case of *‡Homob*, only a superficial impression in the truest sense of the word. However, the density is relatively low inside hut circle C, which was most probably used primarily as a sleeping shelter. The relatively high density of cultural material inside the attached hut circle B apparently indicates a different function of this structure. The nature of the finds, such as sherds of a cooking pot and flint stones for lighting fires, points to its use as cooking shelter. On the other hand, the location of the only fireplace in front of the shelter contradicts this interpretation, as well as the explanation provided by the Hai||om elders. In the case of hut circle B, the structure was identified by our informants as a sleeping shelter and they were even able to name the person who had slept there. In other cases, an activity area was also not discernable based solely on surface artefacts and their distribution, and a further excavation is required (e.g., the men's kitchen).

Furthermore, even the functional interpretation of single artefacts is a complex matter. For example, the use of a simple wooden stick as a meat-carrying pole is not recognizable to the archaeologist, as is the use of glass flakes for cutting medical scars. In other cases, preconceptions about the function of artefact categories affect the inferences that are drawn from their occurrence in a site assemblage. In southern Africa, it is generally supposed that lower and upper grindstones were used for processing plant foods and, to a lesser extent, for grinding ochre. According to our informants, grindstones were multi-task tools and one main function was the preparation of meat. Not only dried meat and dried innards were pounded when they were very hard, but also fresh meat would be cooked at the men's kitchen and then pounded to a thready paste. Mixing this paste with the marrow from long bones produced *‡khoms* (see above). This ethnographic observation strongly suggests that meat pounding may also have played a significant role in the prehistoric use of grindstones in southern Africa.

No doubt, the material culture of the inhabitants of *‡Homob* reflects a time of radical change and societal upheaval. The Hai||om were certainly not an isolated hunter-gatherer group that persisted in a "prehistoric" way of life. Even if flint stones were still used for lighting fires, bottle glass already substituted stones in the production of sharp flakes and retouched tools, such as scrapers. Arrowheads were made of metal instead of stones or bone, glass beads replaced ostrich eggshell beads and tins were the common form of container. Pottery seems to be an exceptional item at *‡Homob,* but the picture may be somewhat blurred, since the site inhabitants took most of their personal belongings with them after they were forced to leave the Etosha.

Whereas dancing rattles, which are strung around the dancer's calves to enforce the rhythm of the women's clapping, were made of moth cocoons in the central Kalahari in the 1960s (Silberbauer 1981: 228), drilled beer bottle crown caps serve this purpose at *‡Homob* (see Widlok 1999b: 240). It seems that traditional rituals were still practised in the Etosha in the 1940s and early 1950s, while the material culture had changed earlier than in the more remote parts of the Kalahari region.

The pre-colonial trading networks, which to a certain degree had also undergone continuous change, were partly replaced by colonial trading networks that provided a wide range of new goods. Growing numbers of tourists from the 1940s onwards helped to further increase the amount of 'exotic' materials brought into the Etosha. The Hai||om showed a high degree of flexibility (Guenther 1996: 85) by exploiting new materials and by incorporating them into their culture. However, we must bear in mind that the whole process was taking place within a field of unequal power relations. Although the appearance of new materials (sometimes easier to manufacture, modify, use, etc.) might have been welcomed in many cases, the regulations imposed by the colonial government that affected a hunting-and-gathering lifestyle (see above) reinforced this development and did not really leave the former hunter-gatherers any choice other than to adapt.

The example of *‡Homob* further suggests that the materials were obtained from a variety of sources and that integration into their own material culture took place at different points in time. Pottery most probably arrived by trade with Oshiwambo speaking people living north of the Etosha, a trade connection that already existed in pre-colonial times. Some of the glass bottles stemmed from the German colonial era, i.e. before 1915, as the informants indicated. The same holds true for the metal badge or "Eingeborenenpass". Other metal items included parts of tins that once contained food rations, which the Hai||om were supplied with from the late 1940s onwards.

The contents of beer and syrup bottles might have been consumed when working at the police stations or on farms close to the Etosha, i.e. strategies that accompanied the hunting and gathering from Etosha's initial time as a game reserve in 1907 until the eviction of the Hai||om in 1954. However, the containers might also have been collected at the police stations as rubbish or were part of the waste left by visiting tourists. Indeed, further research would be beneficial to trace more exactly the origins of the various materials recovered at *‡Homob.*

Archaeozoology of ‡Homob

If the taxonomic composition and the relative frequencies of the species identified in the faunal assemblage are representative in terms of meat consumption, it can be concluded that 'valuable game' provided the bulk of animal protein and fat for the Hai||om living at *‡Homob.* As such, small and medium-sized taxa are poorly represented in the archaeofauna studied. Since recovery bias against skeletal elements of the latter during excavation can be excluded as a possible cause for this, our findings seem to indicate that the contribution of small to medium-sized taxa to the Hai||om diet might not have been very important at this location. This appears contradictory to the role our informants assigned to small and medium animals in former times. However, as we have mentioned earlier, it was near *‡Homob* that Dieter Aschenborn, the famous Namibian painter and game warden in Okaukuejo between 1952 and 1954 used to hunt large game, occasionally provisioning the site inhabitants with *am|naen*. Thus, to some extent, Aschenborn's hunting activities could help explaining the comparably high relative frequency of bone remains of large game in the archaeofauna studied. Besides, another phenomenon needs consideration as well. As we could observe during fieldwork, aggregations of zebra, springbok, and other herbivores crossed the *‡Homob* settlement area on their way to and from the homonymous water hole. Trampling, therefore, may have affected the composition of the bone debris embedded in the top soil as well, causing differential destruction of smaller, less compact bone elements at the advantage of heavier elements, mainly of large-sized animals. Moreover, smaller bones may have been consumed whole by dogs, which were kept at the site until it had to be abandoned, and other scavengers. To gain insight into the taxonomic composition recorded at *‡Homob* as well as the dietary contribution of small to medium animals, it would be very desirable to have similar datasets from other base camps in the study area.

As has been described above, nuclear areas including huts and associated hearths as well as other features (e.g., ash dumps) could be recognised archaeologically, but in some cases, the information provided by the Hai||om elders was essential to understanding their function, e.g., the dog kraal (Fig. 19, Feature A). During the survey, we also found a carrying pole and a digging stick made of gemsbok horn near a tree that recently had fallen over. According to our informants, this was the place where in former times, the experienced hunters used to cook their food and discard the leftovers of their meals. It can therefore be safely assumed that the bone refuse recovered from this area and in the hut circles B/C represents *de facto* refuse *sensu* Schiffer (1972). Interestingly, a comparison of the faunal remains from these two contexts reveals some quantitative and qualitative differences.

Considering species composition, for example, one notes that remains of bovids the size of springbok or impala represent some 25% (N = 9) of the identified assemblage in the hut circles B/C (Table 2), whereas the bone sample from the *!hais* produced but a single fragment of this group size (= 1.9%) *versus* 54 from large bovids. Even if the consumption of larger game by the occupants of hut circles B/C might be quantitatively underestimated, since most refuse of such meals would have been removed selectively from the fireplace and entrance area during cleaning, the discrepancy noted suggests that medium-sized antelopes were more frequently butchered and prepared in individual households than in the men's kitchen.

An analysis of the traces resulting from the processing of meat on the bone into pot-size pieces shows parallels to the pattern described for the modern kudu skeleton. Despite the fact that in our sample, post-depositional fragmentation is considerable, it was still possible to recognise the lengthwise splitting of complete metapodials and of long bone shafts, not only in large bovids but also in equids. Distal ribs were segmented into pieces measuring eight to 12 cm, whilst vertebral bodies exhibited traces of transverse cutting due to the sectioning of the vertebral column. Of interest as well is the fact that first phalanges were systematically split lengthwise to extract the marrow. This information was not available for the modern kudu sample since these elements could not be retrieved anymore. At *‡Homob,* articular heads of long bones from large game were split lengthwise as well, except for the distal tibia. Although in Yellen's kudu butchering experiment and in ours the proximal and distal radius were left intact because they contained little marrow, Yellen remarked that in the same bone for wildebeest, the Ju|'hoansi would systematically split both articular heads. Interestingly, the Hai||om proceeded the same way for the proximal and distal radius of gemsbok, likely for the same reason as the Ju|'hoansi did for wildebeest, namely the extraction of the nutrients present in the articulations' spongy tissue.

From studies conducted in Kalahari San camps, we know that spatial segregation of activities related to the consumption of meat is difficult to discern archaeologically. This can be explained by the wide range of factors affecting the relationship between human activities and the disposal, burial, and preservation of animal debris. One important post-depositional factor in open-air sites is the selective removal of discarded bone refuse by a variety of scavengers, including canids (dogs, jackals, foxes), hyenas, crows, porcupines, and other vertebrates (e.g., Brain 1967, 1969; Hudson 1993; Kent 1993). Another key factor affecting the composition of a faunal assemblage is the post-depositional weathering of teeth and bones (e.g., Behrensmeyer 1978). Thus, while species composition and skeletal part distribution could help specify human activities spatially, it has been noted on several occasions that archaeofaunal assemblages collected in hunter-gatherer open-air sites do not necessarily reveal consistent spatial patterning that can be interpreted in terms of activity areas. With respect to Ju|'hoansi camps, for example, Yellen (1977a: 134) concluded that "it is unfounded to assume that activities are spatially segregated or arranged by type within a single camp. Most tasks may be carried out in more than one place and in more than one social context; and, con-

Location	***hut circles B/C***		***hut circles + ash heaps M-O***		***!hais***	
Skeletal element	NISP	%	NISP	%	NISP	%
Skull and mandible	-	-	-	-	15	28.8
Neck vertebrae	-	-	1	2.8	-	-
Thoracic vertebrae	-	-	1	2.8	-	-
Lumbar vertebrae	-	-	1	2.8	3	5.9
Ribs	9	42.6	11	30.5	10	19.2
Scapula	3	14.3	3	8.3	-	-
Humerus	-	-	-	-	6	11.5
Radius	-	-	-	-	4	7.7
Ulna	-	-	1	2.8	1	1.9
Carpals	-	-	1	2.8	-	-
Metacarpus	-	-	1	2.8	1	1.9
Coxal	2	9.6	3	8.3	1	1.9
Os femoris	2	9.6	3	8.3	5	9.6
Patella	1	4.8	1	2.8	-	-
Tibia	1	4.8	3	8.3	3	5.9
Tarsals	-	-	1	2.8	-	-
Metatarsus	3	14.3	4	11.1	1	1.9
Phalanges	-	-	1	2.8	2	3.8
Total	21	100.0	36	100.0	52	100.0

Table 4: Skeletal part distribution of large bovids in the main archaeological features at *‡Homob.*

versely, in any single area, one can find the remains of many activities all jumbled together". However, although unique activities are rarely relegated to mutually exclusive areas within a camp and most may occur in more than one place, Yellen (1977a: 135) pointed out that spatial patterning of activities still can produce meaningful debris clusters. Consequently, if the contents of the latter are analysed in terms of area, richness, and the kinds of remains they contain, they might reflect the underlying social rules.

As detailed earlier, the Hai||om had a set of rules for distributing the meat of *am|naen* amongst group members (s. above). Against this background, we proposed a model for predicting differences in the distribution of skeletal remains of gemsbok, kudu, hartebeest, wildebeest, eland, and zebra in areas representing individual, nuclear households *versus* the *!hais,* viewed here as part of the communal space reserved for the experienced, active hunters. In short, bone inventories dominated by fragmented ribs, shoulder blades, coxal bones, cervical and cranial thoracic vertebrae, tarsals, and foot bones would be indicative of meat consumption by members of individual households, those with a predominance of fragments of skulls, mandibles, teeth, marrow-yielding long bones, lumbar vertebrae, and metapodials would point to the fireplace of the hunters.

An overview of the skeletal distribution in large bovids for the different archaeological features is presented in Table 4. Although sample size is small and the results obtained are statistically hardly testable, some quantitative and qualitative differences in body part representation can be observed between the inventories identified from the hut circles B/C (N = 21) and the *!hais* (N = 52). First, the complete absence of skull, mandible, and tooth fragments in the debris of the hut circles B/C *versus* their high proportion (28.8%) in the assemblage from the *!hais*. Second, the presence of scapula fragments in the hut circles B/C (14.3%) and their absence in the *!hais*. Third, a much higher proportion of fragments of marrow-yielding bones of the upper extremities at the *!hais*, particularly of humerus and radius, which are completely missing in the debris of the hut circles B/C. Finally, the significantly higher frequency of ribs in the hut circles B/C (42.6%) *versus* the men's kitchen (19.2%) meets expectations as well. Nevertheless, the high value for this skeletal element in the first assemblage may be "artificial", more precisely an artefact of trampling by the inhabitants of B/C: Even if heavily reduced in size, it is still possible to recognise bovid ribs and provide an estimate of the animal's size, e.g. small, medium, or large.

If the foregoing observations fit the skeletal distributions predicted by the meat distribution model for *am|naen*, one observation departs significantly from the proposed model, namely the comparatively high frequency of metapodials in the debris of hut circles B/C (Tables 2 and 3). Based on oral history, we know that the Hai||om hunters either discarded these elements at the butchery site after marrow consumption or decided to take them back to the *!hais* and process the marrow there. However, this does not explain the presence of these marrow-yielding bones in the debris of the huts area. One possible explanation could be the selective removal of these elements by an agent other than man, for instance by dogs, which were kept at *‡Homob.* Yet, since none of the metapodials exhibit canid tooth marks, dogs can hardly be considered the culprits. This leads us to think about another scenario: What if marrow consumption indeed had taken place in this individual household? In case *am|naen* had been killed by bow-hunting, this would be a non-compliance with the Hai||om tradition of meat distribution. However, was this also the case for the animals shot by D. Aschenborn? Could it be that under such circumstances, the group would handle the distribution and consumption of meat, fat, and marrow less restrictively?

From time to time, people cleaned their fireplaces, concentrations of ash, charcoal, and bones being disposed off nearby. Most animal remains identified from features M, N, and O belong to large bovids (Table 2). Since the skeletal part representations in these samples resemble that recorded for the hut circles B/C and taking into account their proximity to this location, it is possible that (part of) these concentrations represent secondary deposits of cooking debris produced by the inhabitants of huts B/C.

Interestingly, the fireplace in front of the hut circles B/C (feature L), the two ash concentrations nearby (features M, O) and a second fireplace north of the hut area (feature P) produced bones from at least two zebras[44]. This species is missing in the faunal assemblages from either the hut circles B/C or the *!hais.* Since the total number of identified bone specimens in the ash concentrations M and O is lower than that in the inventories from hut circles B/C or the *!hais* (Table 2)*,* sample size can hardly be invoked to explain the absence of equid bones in the latter two features. Willem Dauxab, however, remembered that (body parts of) game animals shot by D. Aschenborn were sometimes prepared in an *ad hoc* manner in the settlement and that the bone waste resulting from such 'illegal' meals was disposed of in pits to avoid trouble with officials. Whether some faunal remains found in the ash concentrations and at the fireplaces resulted from such 'illegal' hunts could not be ascertained anymore.

The remains of bat-eared fox in features O and P illustrate that carnivores also did not escape human predation at *‡Homob*. Perhaps the consumption of the meat of this small canid species is not very surprising, but the location of the bone finds in the central settlement area appears atypical. *Xamanîn* were usually cooked under a tree at the western outskirts of the settlement and the refuse of such meals discarded there. Oral history thus seems contradicted by the finds of *Otocyon* in the central settlement area. Obviously, they imply some degree of flexibility at least with respect to the (illegal) consumption of this small-sized carnivore[45].

In conclusion, if the skeletal distribution observed indeed resulted from the spatial patterning of meat preparation and consumption due to gender-related activities, the site of *‡Homob* might represent one of the rare instances where a snapshot of this social custom is still preserved fifty years later. It has been suggested in literature that this gender division was probably introduced from surrounding agro-pastoralists (Barnard & Widlok 1996), but that it had been characteristic of Hai||om settlement for some time, as it was already observed by the early ethnographers (e.g., Fourie 1926; Lebzelter 1934: 80ff.). Of course, how representative the faunal inventories and our interpretations based on them really are, is difficult to evaluate because of small sample size. It can therefore not be entirely excluded that the patterning recorded at *‡Homob* is perhaps coincidental or an artefact related to the hunting activities of D. Aschenborn, rather than a genuine reflection of traditional Hai||om meat procurement and preparation. To solve this issue and in order to unveil meat preparation and consumption practices of the more distant past, additional excavations in other Hai||om settlement places are necessary. Such complementary archaeological work would enable us not only to test the assumption of spatial patterning but also to contribute significantly to a better understanding of the Hai||om community's flexibility vis-à-vis the consumption of choice pieces in different parts of a settlement, for instance, of marrow-yielding bones of large herbivores or the meat of carnivores. If a relaxation of ancient tradition represents the key to our understanding of the findings at *‡Homob*, the uprooting of Hai||om society due to the imminent expulsion from the Etosha could offer a plausible reason for this behaviour.

44 Feature L: proximal metacarpus; Feature M: femur diaphysis, two ribs; Feature O: femur diaphysis, distal metapodial; Feature P: lumbar vertebra, femur diaphysis, distal tibia.

45 Bat-eared foxes (*Otocyon megalotis*) resemble small jackals in build and have a mass up to about 5.0 kg. Their principal food items are invertebrates, mainly insects (termites, beetles, grasshoppers, crickets) and scorpions, but they will take mice and reptiles (skinks, geckos, lizards) when they come across. The species visits termite hills and stays close to herds of antelope or zebra to feed on the insects landing on the herbivore excrements (Smithers 1983: 403ff.).

Concluding remarks

The past, as remembered by the Hai||om in the Etosha, was already a time when they were no longer living exclusively from hunting and gathering. In addition to the accustomed strategies, there were new ways and opportunities of making a living. Some men went to work temporarily on farms, and in addition to foraging, they were allowed to keep some head of livestock within the boundaries of the game reserve (Dieckmann 2007a: 158). Throughout the first half of the 20th century A.D., however, game procurement still held a central place in the subsistence of the Hai||om.

Born and raised in the Etosha, the respected elders interviewed by us represent the last generation of Hai||om that were officially entitled to hunt in the game reserve until they had reached adolescence (Willem Dauxab, Kadisen ||Khumub) or adulthood (Hans Haneb). Having been trained by experienced relatives and given the opportunity to participate in and listen to descriptions of hunts around the campfire, both recent and past, these elders bore with them part of the collective memory regarding the hunting tradition of their ancestors. Even if quantitative data sets could not be generated in the frame of this study, many characteristics of this hunting tradition, such as the kind of species pursued, the equipment and techniques used to capture the different taxa, the processing, distribution, and preparation of their meat, and the manufacturing of commodities using raw materials of animal origin could be recalled in sufficient detail by our informants, allowing for the first time a cross-cultural comparison with similar information published for Kalahari foraging groups living further to the east. The latter not only revealed clear parallels but also quite a number of cultural features that at present seem unique to the Hai||om. From this viewpoint, our study underscores once more that socio-cultural and behavioural adaptations of peoples relying on hunting and gathering in arid landscapes in southern Africa are unexpectedly diverse, not to mention the urge to document past subsistence practices whenever the occasion presents itself.

Against the background of traditional meat procurement, distribution, preparation and consumption practices, we tested whether aspects of the Hai||om's socio-cultural behaviour that are likely to leave identifiable residues in the archaeological record could also be evidenced in the Etosha half a century after the inhabitants had left their homesteads. Time constraints and limited funding enabled us to excavate only parts of a single settlement, *‡Homob,* selected because of the characteristic surface finds and firsthand accounts on the function of particular structures (e.g., hut circles, dog kraal) and areas (e.g., *!hais*) in the central settlement area. Since the 1920s, the Hai||om already lived in a region influenced by colonial interests. It is therefore not surprising that the material culture uncovered produced a mixture of traditional artefacts, such as grindstones, hammerstones, flint stones or bone that were made of materials of local origin, and items of daily use manufactured from imported goods, including glass bottles, metal tins, beer bottle crown caps or bullet casings. These finds illustrate that the Hai||om living at *‡Homob* were not an isolated hunter-gatherer group that persisted in a "prehistoric" way of life.

Several visits of our Hai||om informants accompanied the excavation, enabling us to interview them about settlement structure, former activities at the site, and artefact use. With respect to the latter, new insights were gained into the function of grindstones, which the Hai||om used also as devices for pounding meat. As to the spatial patterning of former activities at *‡Homob*, meaningful debris clusters disclosing such patterning could not be detected in the archaeological inventory, but possibly in the archaeofaunal assemblage. Indeed, the distribution of skeletal parts of animals recorded in an individual, nuclear household (hut circles B/C) *versus* the one in the area designated by the elders as the experienced hunters' kitchen likely preserved a unique snapshot of the traditional way large game meat was distributed and consumed in the Hai||om community. It also illustrates that at their communal fireplace, the experienced hunters enjoyed selected meat pieces and other choice parts of considerable energy yield, such as the much-valued bone marrow. However, in order to confirm the patterning observed in the bone debris, additional archaeo(zoo)logical work in the Etosha is necessary.

A final informative and amusing tale told by the animal bones recovered in the site of *‡Homob* regards the effectiveness of the many obstacles imposed on Hai||om hunting by the colonial administration. Indeed, with an official ban on the hunting of eland, giraffe, kudu, and bat-eared fox since the late 1920s and on other large game like gemsbok and hartebeest in the 1940s, the species composition evidenced at *‡Homob* is quite surprising. Provided the assemblage analysed dates to the final decades of Hai||om presence in the Etosha, one cannot but acknowledge that the site inhabitants showed utter contempt for the law. The taxonomic composition of the assemblage also underscores the assessment that control over space in the Etosha was still not achieved in the 1940s (Dieckmann 2007a: 166). Conceivably, the Hai||om group living at *‡Homob* benefited from the distance of their settlement to the police stations of Namutoni and Okaukuejo (Fig. 1), enabling hunters to circumvent administrative regulations and pursue proper traditions of food procurement until their expulsion from their ancestral homestead in 1954.

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