

Preferred Mammals and Seasonal Hunt by Early Man

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1. Introduction

It is now generally recognised that the activity known as hunting by man is a complex adaptation to a faunal assemblage as well as to the variable structure of the environment. Several factors indicate that the environment is the major influence of the relative abundance of species available for exploitation. This may be true for variables such as the depth of snow cover, changes in vegetation and temperature. The result is that the structure of the animal community changes through time and this is reflected in the hunting strategies of the Palaeolithic hunters. The variation in carnivore representation and the relative proportions of the large herbivores speak more for the opportunities provided by local topography and the role of a site in the local settlement system rather than for the hunters supplying the archaeologist with an exact faunal imitation of the animal community (Gamble, 1979, 1984).

Some of the problems concerned with generalising about Palaeolithic exploitation strategies can be seen in the traditional comments upon the nature of European Palaeolithic adaptations. These have largely ignored the wider ecological perspective and sought comparisons that are based upon classifications of the excavated evidence. They refer to the animals exploited and characterise hunting activity by the most abundant species that are present in a level, site or chronological period. Hence, we find cave bear, reindeer, mammoth and horse hunters. Such labels do not tell us very much about hunting activity except the rather obvious fact that the hunters had some degree of success in killing prey. The over-abundance of certain species, e.g. reindeer and mammoth, has led to descriptions of specialised economies although such a description is not used in an ecological sense. Of more interest are a number of regional diachronic studies where changes in the

prey populations have been analysed (Gamble, 1979: 35).

In Europe, and in the recent territory of Poland as well, several sites are known with large numbers of mammal bones in which remains of one species make the majority of the bone material. Those are, e.g. mammoth, reindeer, horse, bison or boss, and among carnivores cave bear and arctic fox.

The purpose of this paper is to try to show, by means of the study of some examples, why particular mammal species were preferred by hunter-gatherer groups and if a seasonal hunt could take place.

2. Mammoth hunters

The Upper Palaeolithic site Spadzista Street B (Kraków, Poland) contained a huge number of bones of large mammals. The age of this site dated by ^{14}C is about 20000 B.P. This site may be treated as a settlement of mammoth hunter-gatherer groups. The majority of the bones excavated belongs to the mammoth (about 99%). Most of the bone material consists of large bones, especially lower jaws, blade bones (scapulae and pelvis), limb bones, ribs, vertebrae, molar teeth and tusks. Besides the mammoth bones, remains of single individuals of the woolly rhinoceros, horse, reindeer, bear, wolf and arctic fox could be recognised.

While considering the faunal composition of this site one ought to keep in mind that the bone remains, on account of the overwhelming majority of mammoth bones, may have been purposefully collected there, and that the single occurring bones of the other mammals above mentioned, could have been brought there only accidentally. Thus the preference of mammoth bones over bones of other mammals is evident. In this case the mammals besides the mammoth seemed as a rule to be eliminated (Kubiak & Zakrzewska, 1974).

If we assume that the mammoth bones found on this site came from animals killed not only in order to acquire constructional elements for erecting dwelling structures (three dwellings made of mammoth bones were recognised), but also for food, we may infer that the site was inhabited for an extended period of time. This conclusion is based on the following calculation. In the conditions of the steppe-tundra, which could not provide any large quantity of food other than meat, the inhabitants of the camp required daily about two kilograms of meat per person (to cover the daily demand for about 7,000 calories). Since mammoths were practically the only game the calculation of the weight of the consumed meat must be based on the approximate weight of these animals. One mammoth of an average size could give about 1,000 kg of edible meat. Therefore, the meat of one mammoth could suffice for 10 persons for about 50 days. Since the site contained bones of at least 60 mammoths, it may be supposed that their meat would feed a group of ten during 3,000 days, i.e. 100 months, or over 8 years. This period could have been shorter if we assume that Palaeolithic man could have picked up bones of dead animals in the steppe-tundra.

The above calculation appears to be illusory, nevertheless, since the bone material for construction must have been assembled in a comparatively short period of time. On the other hand some of the parts of the skeletons would not have been carried to the site as food, e.g. mandibles, as it has been suggested in the publication from 1974 (Kozłowski *et al.*, 1974). Probably the hunters took with them from the killing place to their settlement the lower jaws together with the tongues of the slaughtered animals which they ate (Kubiak, 1980). Therefore, in order to determine the length of the period of time during which the site was inhabited, one must use primarily archaeological data. The analysis of stone inventory indicates that the proportion of tools (20%) in comparison with cores, blanks and splinters is too high for a site supposed to have been inhabited permanently for several years. Even if it would be assumed that the high proportion of hunting weapons was connected with their transport to the site together with the game, the total amount of tools is still too high in comparison with splinters, cores and blanks and in comparison with analogous camps containing habitations, e.g. in Moravia or in the Kostienki-Borsevo area.

The small number of tools for domestic use other than hunting weapons in comparison with other sites is also worthy of note. The structure of the stone inventory would suggest that the site was used only seasonally. One must also note the absence of such elements as bone artefacts and art objects, suggesting that the site did not contain the results of the full time activities of its inhabitants in all ways of life.

3. Reindeer hunter-gatherer groups

One of such a site is Raj Cave (near Kielce, Poland). According to most of the data obtained, the deposits of Raj Cave range in age from the interstadial preceding the first climatic minimum of the last glaciation (Baltic Glaciation, Würm – Layers 1–3) through the maximum phase of this minimum, with which the aeolian loess deposition is associated (Layer 9), up to the post-maximum phase (Layer 10) characterised by the rehumidification of the climate and redeposition of loess (Kowalski *et al.*, 1972 : 137).

The bone material from Raj Cave comes from layers varying in their lithological composition which have been distinguished in the sediment of the cave. The environmental changes accompanying the sedimentation of particular layers have been reconstructed on the basis of abundant faunal remains (Kowalski, 1972). In the upper cultural horizon, Layer 6, some shed antlers of the reindeer collected by man were found beside the remains of animals presumably killed by him, at the entrance to the cave. Detailed faunistic, stratigraphical and archaeological studies on Raj Cave have been published by Madeyska (1972), Kowalski (1972), Kowalski *et al.* (1972) and Kozłowski (1972), and especially the reindeer material by Czyżewska and Usnarska (1980).

Studies on teeth of the reindeer from Raj Cave indicates an adaptation to life in the tundra-forest environment; the great width of molars made it possible for this animal to crumble and grind food, which would suggest that it was rather hard, e.g. twigs and a certain amount of bark. Such food was supposedly derived from a tundra region with shrubs or even woods. In their migrations herds of reindeer probably reached the forest-tundra zone, where they found suitable climatic and ecological conditions for wintering (Degerbøl & Krog, 1959). The composition of the assemblage from Raj Cave indicates that reindeer herds

stayed in the neighbourhood of the cave in the period of spring and autumn migrations, when bucks usually form separate groups, independent of the basic herds consisting of females and juveniles.

People gathered shed antlers of females and young reindeer in Raj Cave and used them to build an enclosure of the cave (Kowalski *et al.*, 1972). Judging by the number and character of the shed antlers from Raj Cave, this region may have been a calving site of reindeer. The calving season of reindeer falls in May and at the beginning of June; the females shed their antlers several days after calving. The presence of shed antlers of females in Raj Cave (Layer 6) indicates the stay of reindeer herds in the vicinity of the cave in spring. People inhabiting the cave may have collected the shed antlers during the summer and autumn when there was no snow yet.

In Raj Cave there were found only few fragments of reindeer frontal with the pedicles and parts of the antlers and different bones of the post-cranial skeleton of the reindeer. These remains are probably remnants of the animals killed by man. People living in Raj Cave did not hunt reindeer in great numbers, but took them among other species (Czyżewska & Usnarska, 1980).

The huge number of reindeer antlers in the layers of Raj Cave is striking, a vast majority of them being shed antlers not those broken off, and therefore gathered in the tundra, not derived from killed animals. The bones and teeth of the reindeer are not the most numerous in the fauna, being exceeded by those of other large mammals such as cave bear (one of the most abundant species in Raj Cave), horse, bison or bison (Kowalski, 1972; Kowalski *et al.*, 1972).

Keeping in mind the fact that people gathered shed antlers and also the time when the reindeer were killed, it may be supposed that the cave was inhabited by people from the early spring to the beginning of the summer. However, it may well be that they also stayed in it in other seasons, e.g. in the autumn or winter, as suggested by the structure of some antler pedicles (Czyżewska & Usnarska, 1980).

The inhabitants of Raj Cave of the lower cultural horizon (Layer 4) most likely lived under the conditions of moist tundra, of the grassland or shrub type. It should, however, be emphasised that the encroachment of groups of Middle Palaeolithic people onto the area

of tundra proper in the region neighbouring on the lowlands have already been signalled from Germany, e.g. from Salzgitter-Lebenstedt (Kowalski *et al.*, 1972:137).

The site Salzgitter-Lebenstedt (N.W. German Lowlands) became known as a Middle Palaeolithic reindeer hunters' camp-site, due to a report (Kleinschmidt, 1953) which only mentions that the majority of the bone fragments belong to reindeer. Besides the animal bones and the rich content of flint tools of Upper Acheuleian type, the fragment of a Pre-Neanderthal human skull has made the site famous. The examination of the animal bone material, mainly from the 1977 excavation, as well as geological studies were carried out by Staesche (1983).

As already mentioned above, the majority of the bones excavated belongs to the reindeer (74.8%). Besides the reindeer bones, remains of mammoth (10.6%), horse (8.2%), bison (1.7%) and woolly rhinoceros (1.3%) were represented. A few bones belong to the giant deer (0.3%), wolf (0.3%), cave lion (0.1%), jerboa and unidentified fishes (less than 0.1%). However, these proportions are only valid on the basis of the numbers of bones. If one considers the bone weights, the picture changes somewhat. Thus the reindeer makes up only 26.2% of the total weight of identified bones. Mammoth increases to 39.8%, horse to 14.0% and rhinoceros to 10.7%. Staesche (1983:176, 178) did not intend in his paper to discuss the significance of bone weight and fragment number methods. However, the author stated that the proportion of weight of unidentified bones that can be allocated to large, medium and small animals does not correspond to that of the identified species as perfectly as it does when the numbers of bones are considered. But because of the relatively small unidentified portion the relate proportions of the different species based on weights is probably correct. After Staesche (*op. cit.*) it is, without doubt, the amount of flesh which the different animal species yield, that is comparable with the bone weight of the animal. Thus it must be stated, that the reindeer was not the main source of food supply of Palaeolithic man at Salzgitter-Lebenstedt.

While the hunters who specialised in reindeer hunting would have had to migrate with the reindeer herds, Salzgitter man could have lived for longer periods of time at this, presumably comfortable place. The geological

observations allow us to reconstruct the morphology of the area at the time when Palaeolithic man lived there: the valley itself was deeper and the sides of the valley were higher. In the surrounding landscape, the flat area must have been interrupted by deep-cut valleys with steep slopes like small canyons. These valleys gave shelter against cold winds and snowstorms, and they allowed some trees to grow, as we know from the excavated remains of pine, birch and willow (Schwaar, 1982). Unfortunately the bone material does not give any hint as to the season of occupation.

4. Musk ox hunters

The arctic hunting site at Umingmak in the Canadian Arctic may be a typical example of seasonal hunt of one species. The age of this site dated by ^{14}C is about 3,500 B.P. About 80 to 90 % of the bones found belong to the musk ox. The remaining part of the material comes from reindeer, arctic fox, birds and fishes. This site became known as a musk ox hunters' settlement.

The finds of the fauna show that the ecological conditions of this open tundra site were similar during the time when it was settled with those of today. The bones were excellent preserved due to the permafrost soil. The bones were probably not used for firing. This means that almost the whole bone material is preserved, which allows us an interpretation of the activity of the hunters.

An intensive hunt is demonstrated by the extensive musk ox bone material at this site. The milk dentition of 84 jaws were analysed. The results reveal a discontinuous representation of wear stages of the teeth, in that only one annual season is represented. Three groups of wear stages in the dentition of musk oxen from Umingmak could be recognised, i.e. (1) calves about 5 months old (the calving season of musk ox falls in April and at the beginning of May), (2) specimen of about 15 months, (3) musk oxen aged about 27 months. However, the lack of intermediate wear stages in the whole bone material could be stated. Thus it follows that the musk oxen were hunted only during a short hunting season and not during the entire year. From comparisons with recent farm animal wear stages of teeth a hunting season between late summer and early winter can be deduced. This verifies the assumption that many musk oxen were hunted during a short period of time in

order to stock up meat and bone marrow for the winter months (Koenigswald & Kubiak, 1979; Kubiak, 1983).

5. Conclusion

- A. The activity of mammoth, reindeer and musk ox hunters, and perhaps also horse, cave bear, arctic fox hunters was connected with:
1. the environment as the major factor influencing the relative abundance of species available for exploitation;
 2. animals hunted for particular purpose (preferred mammals in order to acquire meat, skins, bones for structures and firing);
 3. the knowledge of the hunters on:
 - a) the migration and behaviour of mammal species,
 - b) the calving season of mammals available,
 - c) specialised hunting methods.
- B. The determination of seasonal hunt may be possible by the analysis of:
1. the daily consumption of meat by the hunters;
 2. the season of migration and calving of the animals hunted;
 3. wear stages in the dentition;
 4. the evidence for the reconstruction of the activities of the hunter-gatherer groups (topographic, climatic, archaeological data).

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