Section III
Old world hunters and gatherers
Chasseurs et collecteurs de l'ancien monde
Jäger und Sammler der Alten Welt

INTRODUCTION TO SECTION III: SOME CRITICAL CONSIDERATIONS

Louis CHAIX*

Summary

Food acquisition in early phases of the development of human being is essentially based on predation. Scavenging, hunting, fishing and gathering are characteristic for these periods.

Problem of estimation of vegetal food is evoked. The use of isotopic analysis may be a good help in this approach.

For the faunal remains, some considerations are made about the difficulties of quantification methods, definition of an archaeological occupation, partial recovery, etc.

The study of scavenging, hunting and gathering are yet today controversial and testify of our feeble knowledge in this area.

Résumé

Introduction à la section III : quelques considérations critiques.

L'acquisition de nourriture dans les phases anciennes du développement de l'humanité se fait essentiellement par prédation. Charognage, chasse, pêche et ramassage sont les activités essentielles qui caractérisent ces périodes.

Le problème de l'estimation des ressources végétales est évoqué. Le recours aux techniques de la chimie isotopique peut permettre une avance significative dans ce domaine.

Pour la faune, on évoque les difficultés de quantification des restes osseux en termes d'alimentation, celles liées à la définition de sol d'occupation ; la récolte complète des divers vestiges par tamisage est abordée.

L'étude archéologique des sources de protéines carnées et de leur obtention, (charognage, chasse et ramassage) est à l'origine de nombreuses controverses.

Zusammenfassung

Einführung zu Sektion III : einige kritische Überlegungen.

Der Nahrungserwerb in frühen Phasen der menschlichen Entwicklung basiert im wesentlichen auf Verfolgung. Aasfressen, Jagd, Fischen und Sammeln sind für diese Perioden charakteristisch.

Eine Schätzung des Anteils vegetabilischer Nahrung gestaltet sich schwierig, hier könnten aber Isotopenanalysen eine gute Hilfe leisten, um diesem Problem näherzukommen.

Hinsichtlich der faunistischen Überreste werden verschiedene Überlegungen angestellt über die Schwierigkeiten der quantifizierenden Methoden, Definition einer archäologischen Station, vollständigen Nutzung bzw. teilweisen Erholung der Ressourcen usw.

Die Diskussion um Aasfressen, Jagen und Sammeln wird auch heute noch kontrovers geführt, sie bezeugt damit, wie wenig wir über dieses Gebiet wissen.

Key Words

Old World, Nutrition, Predation.

Mots clés

Ancien Monde, Alimentation, Prédation.

Schlüsselworte

Alte Welt, Ernährung, Verfolgung.

It is in Europe that the study of fossil man and the various aspects of his existence began. After much research, often influenced by the philosophical ideas of the period, the contemporaneity of man and extinct or now absent species was finally accepted towards the middle of the nineteenth century (Boucher de Perthes, 1860).

It took several more years before scientists proved that animal bones found at archaeological sites bore the traces of human activity testifying of hunting, fishing and breeding activities. With the work of Rütimeyer (1861), we can see the beginning of a diversification in the direction of scope of research, consequently, the first steps of the archaeozoology.

* *Dép. d'Archéozoologie, Muséum d'Histoire Naturelle, C. P. 6434, CH - 1211 Genève 6, Suisse.*

One of the areas that have received the most attention is the study of bones as a way of investigating the various methods of food acquisition. Indeed, for the human species, a diversified alimentation plays an essential role. It is the foundation of the development, the survival, the state of health, and even the future of the human societies (Wing and Brown, 1979).

The overall human population of the planet up until the present is estimated at 80 thousand millions. Of this total, 90 percent have lived by predation (scavenging, hunting, fishing, picking and gathering) while only six percent have drawn their subsistence from stock raising and agriculture, the remaining four percent being industrial actual societies. Predation has thus played a primordial role in the survival, development and spread of the human species (Lee and De Vore, 1968).

We are here at an archaeozoological congress, but I believe that one must also take account of those resources that are not of animal origin. The collection of plants could or must have played a role that was sometimes very important (Zohary and Hopf, 1988). The chemical composition and the anatomy of plants has inhibited their survival at archaeological sites. In contrast to pollen, stalks, leaves, grains and fruits are only preserved in exceptional conditions, such as at lakeside sites. In many regions of the globe, remains of vegetable foods in the antiquity are completely unknown. This presents one of the major problems for the history of human nutrition.

There is an issue in respect of the methodology, one which is also an issue for the study of animals remains, concerning the quantification of the remains in nutritional terms. What could be more rash than to wish to estimate the quantity of ears of grain that were available at the outset from a single carbonised grain of wheat? In fact, with the methods available it is unrealistic to wish to estimate the part that plants played in the diet of fossil man.

However, it is reasonable to assume that many plants were gathered and eaten, in order to obtain the nutritional elements essential for a good state of health: physiologically, the survival of human beings is not linked to a single source of nourishment. This is an undeniable evolutionary advantage, for an omnivorous diet considerably increases the food potential of any environment and allows the adaptation to a wide range of foodstuffs in different seasons and in period of shortage. Thus the balanced diet of the Meso-American populations, composed of maize, peas and cucurbitaceous plants, with addition of fish, has permitted a harmonious development over several centuries. In contrast, there are extreme cases, such that of the Eskimos, who, prior to the industrial period, lived almost exclusively on a diet of fish and sea mammals (Draper, 1977). It is clear that such a diet present dangers, and cases of hypervitaminosis A are well known amongst populations living in extreme environments, and also amongst our ancestors.

New approaches, founded upon the chemistry of stable isotopes and trace elements seem promising. Carried out on animal and human remains, the analyses can indicate the vegetable component of the diet, and in some cases can give an indication of the plant eaten. Thus it is possible to use, with great caution, the ratio Sr/ Ca and the proportion of nitrogen 15 (^{15}N) to estimate the meat component of the diet. The ratio carbon 12 (^{12}C) to carbon 13 (^{13}C) can indicate the type of plants eaten by animals or by man (Gilbert *et al.*, 1994; Sillen, 1994).

Ethnological research shows in a general way that gathering and harvesting activities fall almost exclusively within the female domain, while men are the hunters, fishers and stock raisers (White, 1985). The question as to wether or not this was the case in the past remains open.

The remains studied by archaeozoologists tell us about the exploitation ot the animal world. Here too, our view is incomplete, for various reasons. Those that seem particularly important include:

• differential preservation and excavation strategies that result in samples that are often profoundly biased in their relationship to the original population. There are many studies that demonstrate the extraordinary deficit observed between the number of preserved bones and the calculated theoretical number. In the majority of cases the loss is over eighty percent ! (Gautier, 1984; Grayson, 1984).

• strongly linked to the preceding case is the inadequacy of the methods of quantification, of which none today seem satisfactory. We can recall here the many criticisms concerning the estimation of the minimal number of individuals. These data are often use to estimate the quantity of meat available and even the number of inhabitants of a site, or the length of its occupation. In our opinion, such estimations should be considered with great circumspection, and the values stated should be seen only as relative, and indicative of an order of magnitude.

• a third problem, often underestimated, concerns the notion of an archaeological level (Shackley, 1981). In a cave, the occupation level defined by the archaeologist can in fact be the accumulation of several occupations, close in time and indistinguishable within the sediments. This results in a chronological telescoping which gives in a very general picture,

obliterating any traces of, for example, annual variations. I think that we should be more aware of this, particularly in respect of studies of seasonality (Davis, 1987).

• the last point that I should like to make here concerns the recovery of bone material and the importance of sieving. This technique, happily now becoming routine at numerous archaeological sites, permits the recovery of the remains of small animals and small bones or fragments that are difficult to find during excavation (Payne, 1975). Amongst such categories, fish in particular should be mentioned. The role of these species in the human diet may not be negligible and sieving can significantly increase their importance in a faunal assemblage. New techniques can give an excellent estimation of the protein resources that they provide (Desse, 1983; Wheeler and Jones, 1989).

Fishing must thus be included in the list of predatory activities of fossil man.

Our section, devoted to hunter-gatherers of the Old World, presents a vast panorama of activities from the Lower Pleistocene to the beginning of the Holocene, within a vast geographical area ranging from Spain to Siberia and from India to Caucasus. The titles of the papers make reference to taphonomy, scavenging, hunting and subsistence strategies, etc. Here again many problems present themselves, illustrating the feeble state of our knowledge of the methods of exploitation of wild animals in the past.

For example, scavenging has often been postulated as one of the possible ways of providing food that were available to prehistoric man, particularly in the oldest phases of his history (Potts, 1985; Blumenshine, 1986). Many arguments have been used to support this view, including: the inadequation between the large size of many of the animals (elephants, rhinoceros, hippopotames) and the size of the weapons of prehistoric man; the representation of skeletal elements and the distribution of butchery traces on the bones which has suggested that man recovered animal carcasses that had already been skinned by large carnivores; and rather convincingly, observations of the superimposition of butchery cuts over the gnaw marks of carnivores.

Recent taphonomic research, particularly in Africa, seems to show that both the large carnivores and modern hunters use strategies that include scavenging and hunting (Cruz-Uribe, 1991). But can the model that is used today, which is based on the sequence in which an animal is eaten by a carnivore, be used in every case?

The recent controversy surrounding the fauna of Abri Vaufrey in France shows that the problem is complex and that while scavenging undoubtedly existed, finding evidence for it is difficult and subject to discussion (Grayson and Delpech, 1994).

A further factor of importance concerns the extent of the area of excavation of a site, particularly for more recent periods. There may be areas where rubbish was disposed in which categories of bones elements may be found that may be missing in the "occupation layers". If such rubbish zones are not included within the area excavated, then hypotheses that postulate scavenging or butchery rather than hunting may be unsubstantiated. It is important that this aspects should always be considered.

We know that hunting has played a very important role in the search for protein from the very earliest periods, even if the estimation of its importance may have to be adjusted to take account of the role of scavenging. We can call to mind here the case of hypertrophic osteopathy observed on *Homo erectus* due to the over-consumption of fresh liver: this strongly suggest hunting as this part go off very rapidly (Walker *et al.*, 1982).

There is thus much remaining to discover concerning the strategies for the acquisition of the various game animals (Speth, 1987). Several papers tackle this subject.

Here we need only mention the existence of some of the different methods of hunting, such as following the prey, or alternatively remaining in one place and waiting for the animal. An indirect hunting strategy may involve the use of various types of trap (Testart, 1984).

There is also hunting by individuals and collective hunting. Studies of the behaviour of various species of animals have shown that collective hunting, such as that practised by hyenas, multiplies the number of animals caught by the number of hyenas (Schaller and Lowther, 1969). Collective hunting can also make it possible to capture animals that are too large and too strong to be caught by an isolated individual. It is thus possible that some of the very large species, such as elephants and others that are commonly found during the early phases of our history, could have been killed by large groups of hunters, as still happens with pygmies. This possibility weakens one of the arguments in favour of scavenging.

The attitude of the hunter to his prey can reflect opportunistic behaviour, with every animal being a possible target, while in other cases archaeozoological analysis reveals a more far-sited hunting strategy which ensure the survival of the species by sparing certain categories of the animal population (the very young, pregnant females, etc).

A detailed analysis of the bone remains can sometimes give interesting information about the behaviour of animal population and the territory exploited by the hunters. As evidence for this there are numerous examples of non-

lethal hunting injuries found on Scandinavian deer in the Mesolithic period, which indicate both the limited movements of this species and that hunting was carried out within a confined geographical area (Noe-Nygaard, 1975). There is another point that is very important in connection with hunting injuries. There have been few attempts made to correlate the study of the lithic and the faunal assemblages from archaeological sites. The study of microwear seems to offer a new opening to a better understanding of the function of weapons and tools (Keeley, 1980).

Finally, an approach that has developed in recent years and which is vital to a better understanding of those societies that concern us here is the estimation of the seasons during which hunting and fishing took place. Without forgetting the bias introduced by the chronological telescoping of occupations, it is very interesting to be able to detect the periods of activity, particularly in the study of presumed nomadic populations. In some cases, the function of sites can also be determined (Davis, 1987; Gordon, 1991). There are very good examples resulting from Scandinavian research, where the complementarity of land and sea has been demonstrated in relation to winter and summer activities, which are themselves dependent on the biology of species. Complemented by isotopic studies, such research has significantly advanced our understanding of the life of Mesolithic hunters-gatherers (Zvelebil, 1992).

It is to be regretted that none of the papers within this section discuss the picking activities of man. In addition to the gathering of plants, some populations have collected small animals, amongst which land and sea molluscs are the most common (Bailey, 1983). At some periods, particularly during the Epipaleolithic and the Mesolithic, a number of European sites testify to this practice. Recent research has suggested that these animals are a secondary resource and that the picture of a starved Mesolithic, reduced to eating only molluscs, is a false one (Binford, 1968; Bridault, 1994).

To conclude, the contributions to this section, through their chronological and geographic variety, and through the diversity of their approaches, from taphonomy, through hunting in the Lower Pleistocene to the Mesolithic, to the beginning of the domestication of the wolf, will bring much new information on the exploitation by man of the animal world in an environment over which his mastery is gradually affirmed over the millennia until its advanced control today.

Bibliography

BAILEY G. N., 1978.– Shell middens as indicators of postglacial economies : a territorial perspective. *In* : P. Mellars, ed., *The early postglacial settlement of northern Europe*. London : Duckworth, p. 37-63.

BINFORD L., 1968.– Post. Pleistocene adaptations. *In* : S. R. Binford and L. R. Binford eds., *New perspectives in archaeology*. Chicago : Chicago University Press ed., p. 313-341.

BLUMENSHINE R. J., 1986.– Carcass consumption sequences and the archaeological distinction of scavenging and hunting. *Journal of Human Evolution*, 15 : 639-659.

BOUCHER de PERTHES J., 1860.– *De l'Homme antédiluvien et de ses œuvres*. Paris.

BRIDAULT A., 1994.– Les économies de chasse épipaléolithiques et mésolithiques dans le nord et l'est de la France : nouvelles analyses. *Anthropozoologica*, 19 : 55- 67.

CRUZ-URIBE K., 1991.– Distinguishing hyena from hominid bone accumulation. *Journal of Field Archaeology*, 18 : 467-486.

DAVIS S. J. M., 1987.– *The archaeology of animals*. London : B. T. Batsford, 224 p.

DESSE J., 1983.– L'ichtyofaune des sites archéologiques. *Les Nouvelles de l'Archéologie*, 11: 35-37.

DRAPER H. H., 1977.– The aboriginal Eskimo diet in modern perspective. *American Anthropologist*, 79 : 309-316.

GAUTIER A., 1984.– How do I count you, let me count the ways ? Problems of archaeozoological quantification. *In* : C. Grigson and J. Clutton-brock eds., *Animals and Archaeology. BAR International Series*, 227 : 237-252.

GILBERT C., SEALLY J. and SILLEN A., 1994.– An investigation of barium, calcium and strontium as paleodietary indicators in the Southwestern Cape, South Africa. *Journal of Archaeological Science*, 21 (2) : 173-184.

GORDON B. C., 1991.– Archaeological seasonality using incremental structures in teeth. An annotated bibliography. *Zooarchaeological Research News*, Special Publication, 151 p.

GRAYSON D. K., 1984.– *Quantitative zooarchaeology. Topics in the analysis of archaeological faunas*. Orlando : Academic Press, 202 p.

GRAYSON D. K. and DELPECH F., 1994.– The evidence for Middle Paleolithic scavenging from couche VIII, Grotte Vaufrey (Dordogne, France). *Journal of Archaeological Science*, 21 (3) : p. 359-376.

KEELEY L. H., 1980.– *Experimental determination of stone tools uses ; a microwear analysis*. Chicago and London : University of Chicago Press, 212 p.

LEE R. B. and DE VORE I., 1968.– Problems in the study of hunters and gatherers. *In* : R. B. Lee and I. De Vore eds., *Man the Hunter*. Chicago : Aldine, p. 3 -12.

NOE-NYGAARD N., 1975.– Bone injuries caused by human weapons in Mesolithic Denmark. *In* : A. T. Clason ed., *Archaeozoological studies*. Amsterdam, Oxford : North-Holland Publishing Company, p. 151-159.

PAYNE S., 1975.– Partial recovery and sample bias. *In* : A. T. Clason ed., *Archaeozoological studies*. Amsterdam, Oxford : North-Holland Publishing Company, p. 7-17.

POTTS R., 1985.– L'homme, ce charognard. *La Recherche*, 16 (166) : 685-686.

RÜTIMEYER L., 1861.– *Die Fauna der Pfahlbauten der Schweiz. Untersuchungen über die Geschichte der wilden und der Haus-Säugethiere von Mittel Europa*. Basel : Bahnmaiers, 248 p.

SCHALLER G. B. and LOWTHER G. R., 1969.– The relevance of carnivore behaviour to the study of early hominids. *Southwestern Journal of Anthropology*, 25 : 307-341.

SHACKLEY M., 1981.– *Environmental archaeology*. London : Allen and Unwin, 213 p.

SILLEN A., 1994.– L'alimentation des hommes préhistoriques. *La Recherche,* 25 (264) : 384-390.

SPETH J. D., 1987.– Les stratégies alimentaires des chasseurs-cueilleurs. *La Recherche*, 18 (190) : 894-903.

TESTART A., 1984.– La classification des méthodes de chasse. *Techniques et Culture,* 3 : 119-128.

WALKER A., ZIMMERMAN M. R. and LEAKEY R. E. F., 1982.– A possible case of hypervitaminosis A in *Homo erectus*. *Nature*, 296 : 249-250.

WHEELER A. and JONES A. K. G., 1989.– *Fishes*. Cambridge, New-York : Cambridge University Press, 210 p.

WHITE N., 1985.– Sex differences in Australian Aboriginal subsistence : possible implications for the biology of hunters-gatherers. *In* : J. Ghesquiere *et al.* eds., *Human sexual dimorphism*. London : Taylor & Francis.

WING E. S. and BROWN A. B., 1979.– *Paleonutrition. Method and theory in Prehistoric foodways*. New-York, London : Academic Press, 202 p.

ZOHARY D. and HOPF M., 1988.– *Domestication of plants in the Old World*. Oxford : Oxford Science Publication, 249 p.

ZVELEBIL M., 1992.– Les chasseurs pêcheurs de la Scandinavie préhistorique. *La Recherche*, 23 (246) : 982-990.