# The status of Elk during the Mesolithic

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# Section V : Exotic, Prestige and Luxury trade

## *THE STATUS OF ELK DURING THE MESOLITHIC*

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### *Summary*

*The distribution of elk remains during the Mesolithic suggests a genuine geographical disparity in elk population densities probably due to more or less favourable ecological conditions. In northern and north-eastern Europe the high proportion of elk bones in faunal assemblages suggests that elk was an economic ressource from Alleröd until Atlantic times. Elk remains are almost absent from the archaeological record of western Europe. Furthermore at those sites where elk is a scarce species, only certain squeletal parts, such as teeth and foot bones, tend to be found. Several kinds of explanation are presented, some involving the mode of acquisition of the remains (hunting or exchange of elk products) and the possible symbolic status of elk. There is strong evidence for the elk symbolic status within the latest mesolithic societies of northern Europe. This suggests that we should adopt a more open research strategy when considering earlier periods when there is less clearcut evidence for elk symbolism.*



### *Key Words*

*Elk, Mesolithic, Europe, Symbolism, Exchanges*



### *Résumé*

*Le statut de l'Elan durant le Mésolithique.*

*La distribution des restes d'élan pendant le Mésolithique suggère une forte disparité géographique, probablement redevable de conditions écologiques plus ou moins favorables. Tandis que dans l'Europe du Nord et du Nord-Est, l'élan est une ressource économique importante depuis l'Alleröd jusqu'à l'Atlantique, il est quasi absent des sites archéologiques d'Europe de l'Ouest durant cette même période. Là où l'élan est rare, seuls certains des os de son squelette comme les phalanges ou les dents sont généralement retrouvés. Plusieurs types d'explication peuvent être proposés, notamment sur le mode d'acquisition (animal chassé ou produits échangés) et sur l'éventuel statut symbolique de cet animal. Dans les sociétés du Mésolithique récent du Nord de l'Europe, le statut symbolique de l'élan peut être mis en évidence. Pour les phases anciennes du Mésolithique où la lecture symbolique est moins évidente et moins directe une stratégie de recherche très ouverte est alors nécessaire pour raisonner sur les observations.*



### *Mots clés*

*Elan, Mésolithique, Europe, Symbolisme, Echanges*


## Introduction

The recent finds of a small number of elk remains, including a pendant, from a mesolithic site in the east of France (Rochedane), led us to consider the significance of scarce remains of this species (those where they contribute less than 1% of the bone remains) in the archaeological record for the mesolithic period.

The first problem is to know whether or not elk bones reflect a local presence of the species or whether, in some cases, the elk remains have a non local origin with some skeletal parts having been circulated between communities.

The evidence used to address this issue is both ecological and archaeological, the latter including the representation of the different skeletal parts.

Secondly, archaeological contextual data are considered as they suggest that elk may have had not only a dietary importance but also a symbolic value in some mesolithic societies.

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## The spatial distribution of Elk : quantitative data

The mesolithic period is defined here in its broadest chronological sense : a period between the end of the final Palaeolithic, 12,000 years ago, and the advent of the agro-pastoral economies. This latter occured at different times in the various regions of Europe, with the latest mesolithic societies of the northern countries surviving until 3,000 BC.

Over this period, there is a genuine disparity between those area where elk remains are predominant in faunal assemblages and those where elk remains are very scarce.

During the Mesolithic, four main geographic areas can be distinguished (fig. 1 ; tab. 1).

Area 1 consists of the Baltic republics and Bielorussia. Elk is predominant in faunal assemblages throughout the whole period, comprising between 50 and 90 percent of the number of identified specimens.

Area 2 consists of the Scandinavian countries, and also Great Britain during the Preboreal. Elk is less abundant, its remains comprising a maximum of 30 percent of the faunal remains. Elk is most abundant at the begining of the period up until the Boreal and at the inland sites, where terrestrial mammals were exploited.

Area 3 lies to the south of areas 1 & 2, and includes Great Britain (except during the Preboreal), northern and eastern France, Switzerland, and all areas to the north of a line running through northern Italy and the Carpathians to the north of Crimea. In this area, elk remains are found occasionnally but never exceed 3 per cent of the total. Elk remains are most common in the early and middle parts of the period.

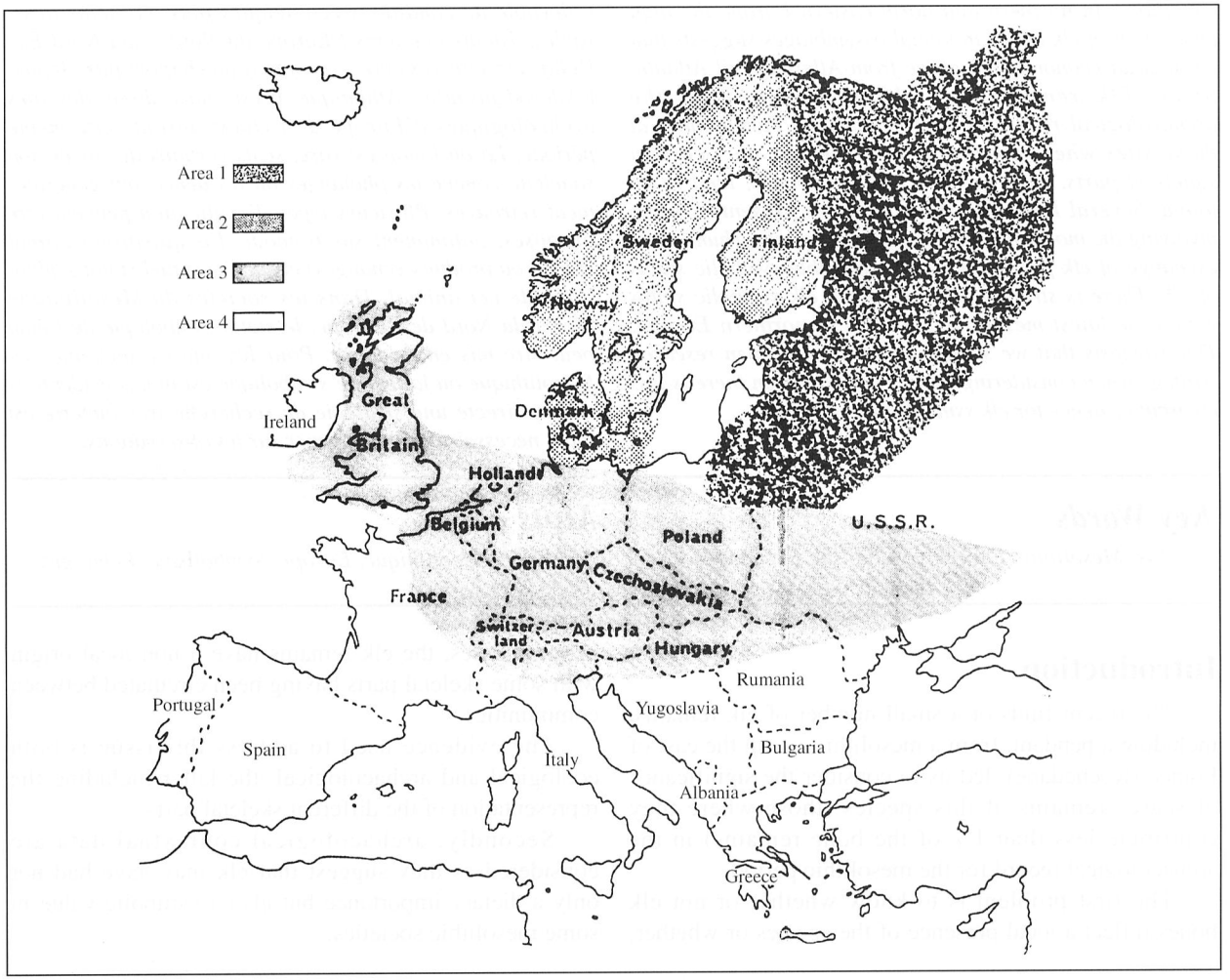


**Fig. 1** : Distribution of the frequencies of elk remains (% NISP of the principal mammals) during the Mesolithic in Europe (10,000-3,000 bc). (after various authors).

Area 4 includes all the rest of Europe, south of area 3. Elk is almost never recorded as present in archaeological faunal assemblages.

The geographical and chronological variations in the frequencies of elk remains can be related to the evolution of climatic and vegetational zones and their influence on the migrations of elk populations.

During the Mesolithic, Europe was undergoing a gradual warming, as the ice sheets retreated, that lasted until the fourth millenium bc.

The general process of recovery from cold steppe to forest began earlier in the south than in the north of Europe with northern areas retarded in comparison to central and western Europe.

The succession of landscapes can be viewed as a gradual transition begining with a very open pine forest during the Alleröd (9,800-8,800 bc), shifting to a closed hazel forest during the Boreal (6,800-5,500 bc), and to a denser mixed oak forest, almost without undergrowth, at the end of the mesolithic period, during the Atlantic.

These environmental changes led to a reduction in the extent of habitats that were suitable for elk populations, probably very early in the southern area, and from the Boreal times onwards in the other areas.

The favoured habitats of elk are sparse humid forest and boggy areas. They feed on the shoots and leaves of birch and willow and on aquatic plants. The closed landscape of the mixed oak forest of the Atlantic period in northern areas provided a much less suitable environnment.

Thus, with the beginning of climatic warming around 9,800 bc, elk started to migrate from south-west of France, northern Italy, and Rumania where they had formerly lived. Their migrations seem to have been along the Danube valley to the Rhine and Rhône valleys through the Belfort region and Burgundy (DELPECH, 1989, 18).

Rochedane (Doubs, France) for example, is on this route and here almost all the elk remains are from the very early Mesolithic (tab. 1). However, elk is known to have been found in some places in Switzerland up until the Middle Ages (CHAIX & DESSE, 1981, 140), suggesting that favourable habitats still existed at this late period in some areas.

At sites in Central Europe elk remains are also recorded in the early Mesolithic, providing further evidence for their migrations (tab. 1) (SZMCZYCK, 1983 ; TOPAL and VÖRÖS, 1984).

The scarcity of elk remains in area 3 suggests two possibilities. Either elk was present, but was rarely hunted, or the density of elk populations was very low.

In area 2, as the landscape became more densely forested, the proportions of elk remains in faunal assemblages decreased (DEGERBOL, 1964, 81-2). This decline is seen later (around 6,000 bc) in the northern parts of Scandinavia than in the southern ones (CULLBERG, 1980 ; LARSSON, 1980). On the Zealand island (east of Denmark), elk disappears at the beginning of the Atlantic, around 5,500 bc, and red deer, roe deer and wild boar become the common game animals.

Ecological data show that variations in the proportions of elk remains in faunal assemblages can be explained by variations in density of elk in space and in time, elk density being very low compared with other ungulates (ZVELEBIL, 1981, appendix 3 ; PRICE, 1980, 229, tab. 5).

In the case of area 3 the suggestion that small animal populations were isolated in certain regions must be evaluated with regard to the frequency of occurence of the different skeletal parts, and the contextual data.

## The nature of the remains : qualitative data

In the assemblages containing very few elk remains the skeletal parts which are represented are almost always phalanges and teeth, and occasionally fragments of metapodials (tab. 2).

The first possible explanation of this phenomenon is that there was local hunting but selective transport of bones to another location. The presence of head and foot bones in these assemblages could have resulted from the removal of these skeletal elements from the kill site to the residential camp. Some ethnographic observations have shown that the proportion of the skeletal elements moved any distance varies inversely with carcass size. Thus to minimize the costs of transport, the long bones of the largest carcasses are stripped of flesh and abandonned at the kill site (O'CONNELL and HAWKES, 1988).

However, in this case, the particular skeletal composition found does not seem to indicate this kind of kill site or butchering site pattern. If there were selective transport, why bringing back skeletal parts of low nutritional value and high load ?

The second possibility is that elk remains were of non local origin and non nutritional value. This view is supported by the presence of elk incisors including one made into pendant, in contemporaneous early levels of

| Site | Skeletal part | MNI | Period |
|---|---|---|---|
| TAÏ* | 1 incisor | 1 | Alleröd |
| CAMPALOU* | 8 incisors + 4 canines<br>1 incisor, 1 fragment of metatarsal,<br>1 third phalanx of a lateral finger | 2 | Alleröd |
| ROCHEDANE<br>B | 1 incisor, 1 perforated and decorated incisor, 1 fragment of maxilla. | 2 | Alleröd |
| A2 | 1 first phalanx of a lateral finger | 1 | Boreal ? |
| SCHÖTZ 7 | 1 first phalanx, 2 fragments of metatarsal | | Atlantic |
| BENUSSI | 2 phalanges | | Atlantic ? |

**Table. 2** : Details of the elk remains found at some sites in Area 3 (see fig. 1).
* data from F. Delpech, personnal communication.
MNI : Minimum Number of Individuals

three sites in France (Rochedane, Taï and Campalou) (tab. 2). At Rochedane in level B, two incisors were recovered, one unworked, the other with a perforation on the root and transverse parallel lines decorating its convex face.

Since ornamental objects are the kind of objects that may be involved in exchange networks, and since elk seems to have been a scarce species in this area at that time, the possibility of an exotic origin for the bones must be considered.

The most likely sources of elk bones, should be those areas where elk is abundant, areas 1 or 2.

However, there is, to our knowledge, no parallel for the decorated incisor, in Europe, suggesting that any movement of elk remains was in the unworked state, perhaps to be transformed later on, at the site. This could explain the presence of the other unworked incisor found with the pendant at Rochedane, and the presence of unworked teeth at the other contemporaneous sites.

During the Mesolithic examples of long distance movement of sea shells are known (PRICE, 1987 : 289). But, in this example the foreign provenance of the shells cannot be doubted, whereas this is much more difficult to establish for the elk teeth.

Only elk teeth pendants recovered from the Danish cemetery of Vedbaeck on the island of Zealand are clearly recognizable as exotic items, probably from Sweden, because elk was exinct in Zealand at the time (PRICE, 1985).

At Rochedane, the teeth were not found in graves, and they were associated with a fragment of upper maxilla. It seems rather unlikely that complete head would have been exchanged since it was a fragile and perishable item, unless the skull and the mandible had been exchanged as a hunting trophy, once the flesh had decayed.

Finally, the association of incisors and canines with fragments of maxilla and foot bones, is more in agreement with a view that the elk bones were acquired, and, in the case of the Rochedane pendant, worked locally than with one that the items had a non-local origin. However, all these skeletal parts - front teeth, maxilla and foot bones - could have had a special value, due to a status held by the elk itself.

We do not have enough data to explore this hypothesis, but we can further investigate the possible symbolic status of elk.

## The status of elk : symbolic information

The best data come from the northern areas (areas 1 and 2) during the Boreal period when elk was clearly an important economic resource.

Several categories of information are revelant in recognizing both that there is a symbolism associated with the elk and that there is also a peculiar symbolic paradigm emerging from the data.

Elk remains are found in the settlements as well as in the cemeteries, but in some cases, the graves associated with a settlement (for example at Vedbaek-Bogebakken in Denmark) contained elk teeth pendants although no elk remains were found amongst the faunal remains from the settlement (BRINCH PETERSEN, 1973 : 87). This suggests that certain remains were deliberately selected for inclusion in graves.

The particuliar skeletal parts of elk found in mortuary contexts are interesting. They consist mainly of perforated elk teeth. One unworked tooth was found in association with perforated teeth in a grave of a woman and a child at Skateholm I (Sweden) (grave n°6), a site belonging to a middle phase of the Ertebolle culture (LARSSON, 1990 : 372), and unworked fragments of elk jaws, joints and phalanges were found in a ritual pit at Popovo (Karelia, URSS) (OSHIB-KINA, 1990 : 412). Here the archaeological context of the finds suggests that in some societies, certain skeletal parts such as teeth and foot bones had a symbolic value.

The symbolic treatment of the carcasses of hunted animals is also revealed by finds of late Preboreal (7,660 - 7,590 bc) at two Danish bog sites, Skottemarke and Favrbo. The deposition of the bones bearing unusual patterns of breakage (particularly the breaking off of the spine of the scapula) has been regarded as a type of ritual or hunting magic (MOHL, 1978).

The other interesting characteristic of the symbolic aspect lies in the fact that all the artifactual representations of elk emphasize one particular part of the body of the animal, the head.

These include a sculpture in amber, woodden skis with a sculpted elk head and an ornemental knife with an elk head (tab. 3).

The artefacts and the numerous pendants of elk teeth, suggests the structure of a code. This code gives us one important piece of information, that elk had a symbolic status and special values were associated with some of its bones.

To demonstrate that the elk has a symbolic status is one thing, but to understand the nature of the status is another. A code can organize information and enlighten the social context (SPERBER, 1974) but since each society elaborates its own code, there can be no general answers.

Elk could be a clanic symbol, or elk could be associated with chamanism, or with individual or group prestige. Since prestige has a social value, the systematic analysis of the distribution of elk effigies and elk remains among the different graves of a cemetery or among the sites of an area should be profitable in the evaluation of this dimension. This field of research has begun to be explored and has suggested the existence of a social differentiation in the late mesolithic societies of northern Europe (O'SHEA and ZVELEBIL, 1984). In these late societies the bestiary of the graves is far richer than in earlier periods (although they could merely have become more visible). The quantities of elk pendants found at Oleniy Ostrov (URSS)(tab. 3) requires us to consider the manner in which those squeletal elements were obtained and thus the structure of the acquisition and-or redistribution involved.

The main questions that emerge from diachronical analyses is why the phenomenon appears so late in the mesolithic period and why only in certain mesolithic societies ?

## Conclusion

This consideration of the occurence of elk remains touches on several important archaeological questions. We must attempt to evaluate the status of those species whose remains are scarce, and include only certain skeletal parts. We must also be aware of the possible symbolic status of animals in prehistoric societies despite the difficulty of finding relevant criterias of analysis to attest it or understand it.

By taking a rather large time scale, it has been possible to show that the two aspects of the problem could be independant (elk symbolism appears where elk is common in the environment and abundant in the diet).

When dealing with ordinary material such as bone (versus ivory for instance), it is not easy to find relevant criterias to attest the movement of animal products. Bone is not in itself a precious material unless the animal has a special status. Scarcity of a species could have been a reason to keep and work certain bones of a hunted individual or to acquire certain bone items through exchange. In the areas where the species was abundant, specially in societies where there is evidence of vertical differentiation, the possible movements of elk products could rather be viewed as the result of interaction between the members of a group, such as redistribution from one or several social centres to the rest of the group.

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| Site | % NISP[2] | | Period | Culture | Reference |
|---|---|---|---|---|---|
| **USSR** | | | | | |
| Kunda (Estonia) | | 92 | Boreal | Kunda | Kozlowski, 1989 |
| Mirnoe (Ukrainia) | | 0 | Boreal | Kukrek | Kozlowski, 1989 |
| Narva I-III (Estonia) | | 50* | Atlantic | Kunda | Kozlowski, 1989 |
| Pulli (Estonia) | | 92* | PreBoreal | Kunda | Kozlowski, 1989 |
| Zatsenye (Bielorussia) | | 50* | Bor.- Atl. | | Kozlowski, 1989 |
| Zienieki II (Latvia) | | 51* | Boreal | Kunda | Kozlowski, 1989 |
| Fat'ma (Crimea) 3-4 | | 0 | Boreal | | Kozlowski, 1989 |
| **FINLAND** | | | | | |
| Inland sites | | + | | Maglemose | Broadbendt, 1989 |
| **NORWAY** | | | | | |
| Viste (Stavanger) | | 8 | Boreal-Atl. | | Ingrelid, 1978 |
| **SWEDEN** | | | | | |
| Agerod I H+C (Scania) | | 6 | Boreal | Maglemose | |
| Agerod I D+B (Scania) | | 4 | Bor-Atl. | Maglemose | Jarman, 1972 |
| Agerod V(Scania) | | 8 | Atlantic | Kongemose | Jarman, 1972 |
| Heden (Vasterbotten) | | 8 | Atlantic | Ertebolle | Broadbent, 1978 |
| Lundfors A (Vasterbotten) | | <1 | Atlantic | Maglemose | Broadbent, 1989 |
| Skateholm II (Scania) | | 0 | | | Larsson, 1989 |
| Tjikkitrask (Lappland) | | 91 | Atlantic | | Broadbent, 1978 |
| **DANEMARK** | | | | | |
| Aamolle | | 0 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Bromme | | + | Allerod | Bromme | |
| Dyrrholmen | | 3 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Ertebolle (Jutland) | | <1 | Atlantic | Ertebolle | Jarman, 1972 |
| Faarevejle | | 0 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Hallebygaard | | 0 | Atlantic | Ertebolle | Jarman, 1972 |
| Hesselbjergaard | | 9 | Boreal | Maglemose | Bay Petersen, 1978 |
| Homegaard * | | + | Boreal | Maglemose | Bay Petersen, 1978 |
| Kildegaard | | 0 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Klinteso | | 0 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Maglemose | | 23 | Boreal | Maglemose | |
| Meilgaard (Jutland) | | 0 | Atlantic | Ertebolle | Bailey, 1978 |
| Norslund | | <1 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Svaerdborg (Zealand) | | 22 | Boreal | Maglemose | Bay Petersen, 1978 |
| Tingbjergaard | | 6 | Atlantic | Ertebolle | Bay Petersen, 1978 |
| Vinde Hesinge | | 28 | Boreal | Maglemose | Bay Petersen, 1978 |
| **GREAT BRITAIN** | | | | | |
| Cushendum | | 0 | | | Jarman, 1972 |
| Glenarm | | 0 | | | Jarman, 1972 |
| Mother Grundy's Parlour | | 0 | | | Jarman, 1972 |
| Oban | | 0 | | | Jarman, 1972 |
| Oronsay | | 0 | | | Grison& *al.*, 1987 |
| Star Carr | | 23 | PreBoreal | Maglemose | Legge & *al.*, 1988 |
| Tatcham (Berkshire) | | 1 | PreBor.-Bor. | Maglemose | Wymer, 1962 |
| Westward Ho ! | | 0 | Atlantic | | Jarman, 1972 |
| **FRANCE** | | | | | |
| Campalou (Drôme) | 2 | + | Alleröd | Azilian | Delpech, n.p. |
| Chataillon (Doubs) | | 0 | Boreal-Atl. | | Petrequin & *al.*, 1983 |
| Chateauneuf | | | | | |
| (Bouches du Rhône) | 7-8 | 0 | Boreal | | Jarman, 1972 |
| Chazelles (Ardèche) | VIIIb | 0 | Alleröd | Azilian | Thévenin, 1982 |
| Colombier | 3 | 0 | Alleröd | Azilian | |
| (Ardèche) | 2 | 0 | Alleröd | Azilian | |
| | 1 | 0 | Alleröd | Azilian | |
| Cornille (Bouches du Rhône) | | 0 | | | |
| Couffin I (Isère) | F7-F4 | 0 | Boreal | | Thévenin, 1982 |
| | F3-F1 | 0 | Atlantic | | |
| Cuzoul de Gramat | I | 0 | | Sauveterrian | Lacam, 1944 |
| (Vaucluse) | II | 0 | | Tardenoisian | |
| Dumas (Ardèche) | 8-7 | 0 | Alleröd | Azilian | Combier, 1977 |
| | 6-5 | 0 | Azilian | | |
| Escabasse (Lot) | | 0 | | | Astre, 1966 |
| Gramari (Vaucluse) | 5 | 0 | Dryas III | Sauveterroid | Poulain, 1971 |
| | 3c | 0 | PreBoreal | Sauveterroid | Poulain, 1971 |
| | 3b | 0 | Boreal | Sauveterroid | Poulain, 1971 |
| La Balme-de-Thuy | 8A | 0 | Dryas III | Azilian | Ginestet & *al.*, 1984 |
| (Haute-Savoie) | 7A | 0 | PreBoreal | Azilian | Ginestet & *al.*, 1987 |
| | 6 | 0 | Boreal | Sauveterrian | Martin & *al.*, 1984 |
| La Faurélie (Dordogne) | 2-3 | 0 | PreBoreal | Azilian | Thévenin, 1982 |
| La Roche aux Gours (Doubs) | | 0 | Azilian | | Piningre & *al.*, 1976 |
| Mannlefelsen I (Haut-Rhin) | S-H | 0 | D.III-Atl. | Azilian-"Méso. de transition" | Thévenin, 1982 |
| Oullins (Ardèche) | 13 | 0 | Dryas III | Azilian | Combier, 1967 |

| Site | % NISP[2] | | Period | Culture | Reference |
|---|---|---|---|---|---|
| Pagès (Lot) | | 0 | Dryas III ? | Azilian | Niederlander & *al.*, 1956 |
| Pégourié (Lot) | 7-4 | 0 | Alleröd ? | Azilian | Thévenin, 1982 |
| Pont d'Ambon (Dordogne) | 3b | 0 | Dryas III | Azilian | Delpech, 1979 |
| Poeymau | 7 | 0 | | Azilian | Thévenin, 1982 |
| (Pyrénées At.) | 6 | 0 | Dryas III | ? | |
| | 5-3 | 0 | PreBor.-Bor. | Arudien | |
| Rochedane (Doubs) | B | <1 | Alleröd | Azilian | Thévenin, 1982 |
| | A4 | 0 | PreBoreal | Post-azilian | |
| | A3 | 0 | | | |
| | A2 | <1 | | | |
| Rhodes II ( Ariège) | F5-F7 | 0 | Alleröd | Azilian | Thévenin, 1982 |
| | F7 | 0 | Dryas III | Azilian | |
| Rochereil (Dordogne) | | + | Alleröd | Azilian | Desbrosse & *al.*, 1974 |
| Rouffignac (Dordogne) | | 0 | PreBor.-Boreal | Sauveterr.- | Delpech, 1974 |
| | 3 | 0 | PreBoreal | Tarden. | |
| Saint-Thibaud-de Couz | | | | | |
| (Savoie) | 6B1-6B2 | 0 | Alleröd | Azilian | Thévenin, 1982 |
| Tai (Drôme) | C'1 | + | Alleröd | Azilian | Delpech, n.p. |
| Tourasse | | + | | Azilian | Desbrosse & *al.*, 1974 |
| **GERMANY** | | | | | |
| Bedburg-Konigshoven | | 0 | PreBoreal | ? | Street, 1989 |
| Duvensee (Schleswig-H.) | | 0 | Boreal | Duvensee | Jarman, 1972 |
| FalkensteinHole | | 0 | Boreal-Atl. | Frühmesol.-Spätmesol | Taute, 1978 |
| Friesack | | + | PreBoreal | | Gramsch & *al.*,1989 |
| Hohen Viecheln | | | | | |
| (Mecklenburg) | | 3 | Boreal | Duvensee | Schuldt, 1961 |
| Jagerhaus-Höle | 13-6 | 0 | PreBoreal-Atl. | Frühmesol.-Spätmesol. | Taute, 1978 |
| (Kreis Tuttligen) | | | | | |
| Stellmoor (Schleswig-H.) | | + | Dryas III | Ahrensburgian | Rust, 1943 |
| Zigeunerfels | D | + | Alleröd or D.III | | Thévenin, 1982 |
| (Kreis Sigmaringen) | C | | PreBoreal | Frähestmeso-lithikum | Thévenin, 1982 |
| **SWITZERLAND** | | | | | |
| Balm unter der Fluh (Soleure) | | 0 | | Azilian ? | Stampfli, 1979 |
| Birseck Schlossfelsen | | | | | Stehlin, 1918 |
| (Bâle) | | 0 | Dryas III ? | Azilian | Thévenin, 1982 |
| Birseck Höhler Felsen | | 0 | | Azilian | Stehlin, 1918 |
| Birsmatten | H5 | 0 | PreBoreal | | Schmid, 1963 |
| (Bern) | H3-H4 | 0 | Boreal | Sauveterrian | |
| | H1-H2 | 0 | Atlantic | Tardenoisian | |
| Col des Roches | | | | Tardenoisian | |
| Höhle bei Soyhières | | 0 | | | Stehlin, 1918 |
| La Baume d'Ogens (Vaud) | | 0 | | | |
| Liesbergmulhe (Bern) | | <1 | Atlantic | | Stampfli, Ms |
| Neumülhe (Bern) | | 0 | Alleröd ? | | Thévenin, 1982 |
| Schötz 7 (Lucern) | | <1 | Atlantic | Azilian | Stampfli, 1979 |
| Tschäpperfels | | 0 | Atlantic | Tardenoisian | Stampfli, 1963 |
| **POLAND** | | | | | |
| Janislawice | | 0 | Janislawice | | Jarman, 1972 |
| **TCHECOSLOVAQUIA** | | | | | |
| Sered I (Vah) | | 0 | Boreal-Atl. | Tardenoisian | Barta, 1973 |
| **ROUMANIA** | | | | | |
| Cuina Turcului (Iron Gates) | I | 5 | D II-Alleröd | Romanello - | Bolomey, 1973 |
| | II | 2 | Dryas III | azilian- | |
| Icoana I (Iron Gates) | | 0 | | Romanello-azil. | Bolomey, 1973 |
| Erbiceni (Moldavia) | | 0 | Boreal | Tardenoisian | Paunescu, 1989 |
| Ostrovu Corbului | I-II | 0 | | Schela Cladovei | Paunescu, 1989 |
| **YUGOSLAVIA** | | | | | |
| Lepenski Vir | I | 0 | | | Bokonyi, 1972 |
| (Iron Gates) | II | 0 | | | |
| Smolin (Moravia) | | 0 | Boreal | | Valoch, 1989 |
| Vlasac (Iron Gates) | | 0 | Boreal | | Bokonyi, 1975 |
| **ITALY** | | | | | |
| Arene Candide (Liguria) | | 0 | Dryas III | | |
| Benussi (Trieste) | 8 | 0 | | Sauveterrian | Riedel, 1976 |
| | 6 | 0 | | Sauveterrian | |
| | 5 | <1 | | Carso | |
| Lonza (Pisa) | E | 0 | | Triestino | |

1 : % calculated on the principal mammals
2 : % of number of identified specimens (bone remains)
* : approximate percentages
+ : present
N.B. : at Tai the number of elk bones is 1 ; at Campalou, 12, (pers. comm. from F. Delpech)

**Tab. 1** : Percentages of elk bones from european mesolithic sites[1].

| Period | Site | Area | Context | Elk teeth unworked | Elk teeth worked | Elk raw bones | Elk artifactual representations | Local presence of elk |
|---|---|---|---|---|---|---|---|---|
| Atlantic | SJOHLMEN | 2 | settlement | | 1 perforated | | | ? |
| Atlantic | OLENIY OSTROV | 1 | cemetery | | 4273 (Gurina, 1956) | | antler sculptures of elk | very numerous |
| Atlantic | BOGEBAKKEN | 2 | cemetery | | beads of teeth | | | missing |
| Atlantic | SKATEHOLM I | 2 | grave 53 | | 4 perforated incisors | | | |
| | | | grave 6 | 1 | perforated teeth | | | scarce |
| | | | grave 21 | | bead of teeth | | | scarce |
| Atlantic | SKATEHOLM II | 2 | grave XVII | | | | | |
| Boreal | EGEMARKE | 2 | 1 lower molar | | | | sculpture of a head in amber | numerous |
| Late Boreal | AGEROD I : H | 2 | grave | | perforated incisor & canine | | | numerous |
| Boreal-Atl. | VIS I | 1 | grave | | | | woodden skis with sculpted head | very numerous |
| Boreal | NIZHNEYE | 1 | settlement | | | | knife with hilt | |
| | VERETYE I | 1 | settlement | | | | crowned with a head | very numerous |
| Boreal | POPOVO | 1 | cemetery (ritual pit) | | | jaws, joints & phalanges | | very numerous |
| Preboreal | SPIGINAS | 2 | grave 4 | | 3 perforated incisors | | | very numerous |
| Alleröd | ROCHEDANE B | 3 | settlement | 1 incisor | 1 perforated & decorated incisor | | | scarce or missing |

**Table 3** : Elk remains of symbolic value : pendants found in graves or settlements ; unworked bones associated with pendants ; bones recovered in cemeteries ; effigies of elk (after various authors).