TANGLED POINTS CULTURES IN EUROPE
ECONOMY AND SEASONALITY IN THE AHRENSBURGIAN

INTRODUCTION

The Ahrensburgian is traditionally dated to the Younger Dryas stadial (11,000–10,000 BP) and, on the evidence of the rich faunal assemblage from Stellmoor, to the north of Hamburg (Rust 1943), was defined as a specialized culture of "reindeer hunters". Beginning with observations of recent circumpolar hunter-gatherer peoples with a specialized reindeer-hunting economy and on knowledge of the often extreme migration patterns of reindeer and caribou at the present day (vid. Burch 1972; Parker 1972), the question of seasonal migration of man and reindeer during the Ahrensburgian was soon raised. In studying this problem, it can be assumed that Pleistocene reindeer herds also carried out two annual migrations (Bahn 1977; Weniger 1982).

Based on earlier studies of the Stellmoor assemblage, it has long been assumed that the southern area of occurrence of the Ahrensburgian – the northern part of the Upland Zone – was a region of winter; perhaps sporadic, occupation (Rust 1943, 235; Täute 1970, 369). A comparable model of human and reindeer migration was postulated for the Rhineland, Belgium and the Netherlands into the 1980's (Arts 1988; Arts & Deeben 1981; Van Noort & Wouters 1987). Already previous to this, however, a new examination of the Stellmoor material, and in particular the antler, by D. A. Sturdy (1975) had already established that Stellmoor was occupied primarily in autumn (vid. Bokelmann 1979; Grønnnow 1987). At this period, the reindeer migrate to their winter range. During this migration, reindeer arriving from the south were intercepted by hunters, probably on an annual basis, at the narrow passage of the Ahrensburg tunnel valley (Bokelmann 1991, Bratlund 1990; 1991). Where, then, were the summer feeding grounds of the reindeer?

Fig. 1. Location of the three investigated Ahrensburgian sites in Belgium, Rhineland and Westphalia
ECONOMY AND SEASONALITY IN THE AHRENSBURGIAN

THE UPLAND ZONE ARCHAEOLOGICAL EVIDENCE

As early as 1902, an Ahrensburgian settlement layer was discovered and excavated at the entrance of the Grotte de Remouchamps, a cave in the Belgian Ardennes to the south of Lige. The investigations of E. Rahir (1921) therefore represent the earliest excavation of Ahrensburgian material anywhere. Together with stone tools typical of these last Central European reindeer hunters (among which, alongside tanged points, the large number of simple microlithic points is particularly striking), were excavated features such as hearths and what was probably the only (unfortunately disturbed) burial of this period. Finds of Tertiary molluscs demonstrate contact with the Paris Basin, some 200 km to the west. With the assemblage were also discovered remains of the hunted fauna. New excavations by M. Dewez between 1969–1970 (Dewez et al. 1974) increased the size of the assemblage. Two radiocarbon dates suggest that the site was occupied towards the end of the Younger Dryas stadial (Dewez 1974, 98; Charles 1993, 60).

The next important site is the “Hohler Stein” near Kallenhardt in Westphalia. Traces of lateglacial settlement were discovered here in 1927 and investigated between 1928 and 1934 by E. Henneble and J. Andree (vid. Taute 1968, 53–58 with older bibliography). Excavation uncovered numerous stone artefacts of the Ahrensburg culture, together with a large faunal assemblage (see below). The investigations in the “Hohler Stein” thus took place before those of the subsequently discovered site of Stellmoor (1934–1936); the undisputedly important results of the latter investigation have since become much better known.

In 1977 rescue excavations were carried out at the “Kartstein”, a travertine massif in the northern Eifel, some 60 km southwest of Cologne. It was here possible to investigate approximately 34 m² of a rich Ahrensburgian cul-
ultural layer below an abri (Löhr 1978). The importance of this material does not lie in the lithic assemblage (which comprised little more than three tanged points and four simple microlithic points, fig. 2), but rather in the exceptionally rich fauna. Apart from species preyed upon by man, were found innumerable faunal remains which had been incorporated into the layer by other means (vid. table). These are, above all, bones of the willow grouse (*Lagopus lagopus*) and the ptarmigan (*Lagopus mutus*), which entered the layer in regurgitated raptor pellets (Baales 1989; 1992a).

The same process is responsible for the accumulation of what is nothing less than a “rodent earth” of small mammal remains, which gives an interesting insight into the climate of the northern Eifel during the Younger Dryas (Rabenstein 1991). For example, it was possible to identify Norway lemming (*Lemmus lemmus*) and collared lemming (*Dicrostonyx torquatus*) alongside the steppe pika (*Ochotona pusilla*), species which, at the present day, are found in completely different biotopes.

The Kartstein and the two sites previously mentioned are, with the exception of Stellmoor, the only ones to have yielded faunal remains unquestionably associated with artefacts of the Ahrensburgian. Analysis of the assemblages provides an impression of the economic basis of these lateglacial hunter-gatherers and information on the seasonal migrations of human groups in north-central Europe some 11,000 years ago (Baales 1992b).

**THE ECONOMIC BASIS**

In Remouchamps, in the “Hohler Stein” and at the Kartstein the large mammal assemblage is dominated by fragments of bone, teeth and antler of reindeer (*Rangifer tarandus*) of all age groups. This fact, together with the presence of characteristic butchering marks on the bones, is evidence that at all three sites reindeer was the most intensively hunted species. All parts of the skeleton are represented at the three sites, which suggests that, in each case, the actual kill sites were located at not great distance. At the Kartstein, the small excavated area alone provided evidence (incisor teeth) for at least 17 individuals. At the “Hohler Stein”, postcranial material (*metatarsus*) suggests that the number of butchered reindeer is of the magnitude of 20-40 individuals.

The number of cutmarked bones recognized at the Kartstein is only small, due to poor preservation of bone surfaces. Nevertheless, several specimens were found, which demonstrate the method of butchering at that time and can be compared with recent observations of butchery (Binford 1981). The presence of cutmarks on the soles of third phalanges is surprising (fig. 3.3). Similar traces on phalanges of reindeer are unknown to the author. Comparable marks have
Fig. 4. Cutmarks and impact fractures on fragments of humerus, tibia and metatarsus (from the top to the bottom) in the “Hohler Stein” reindeer material (n = number of individuals)
been described on Magdalenian horse bone, in which context their presence has been seen as deriving from the removal of the horn sheaths of the hooves (Berke 1989a; 1989b).

Cutmarks are present in quantity and in a good state of preservation on the reindeer bone from the “Hohler Stein”, Westphalia (fig. 4). Unfortunately, in this assemblage the epiphyses of limb bones are rare, so that cutmarks are found exclusively on shaft fragments. The information of these finds can, however, be complemented by material from Remouchamps, where, for example, cutmarks on the calcaneum and astragalus show the method of dismembering the hind limb (fig. 3.2, 4). All these traces demonstrate the good anatomical knowledge of the Ahrensburgian reindeer hunters and their skill in butchering their prey.

In addition to cutmarks due to the jointing and filleting of the carcass, it is also possible to identify impact fractures (fig. 4). These are evidence for marrow smashing of bone. Bone marrow was an important and nutritive addition to the diet. The largest number of impact fractures can be recognized on the material from the “Hohler Stein”, where they show the systematic breakage of all parts of the skeleton. Even the mandibles (fig. 3.1) and, in some cases the phalanges (which each contain only a minute quantity of marrow), were smashed open.

The Kartstein assemblage allows the recognition of a further stage of butchering: the extraction of bone grease. This process, in which the fat content of bones and, in particular, of the cancellous articular ends of limb bones, is extracted by boiling, is well known from ethnographic sources (e.g. Delpech & Rigaud 1974) and described in detail by L.R. Binford (1978, 157–165). Production of bone grease can be only indirectly demonstrated at the Kartstein, on the evidence of the extremely small size of the majority of intensively smashed, recovered bone fragments (fig. 5). Equally small bone fragments recovered on North American “bison kill-sites” were similarly interpreted by D. Leechman (1951) as evidence for bone-grease production. By the addition of berries and dried meat, bone grease was transformed by the Prairie Indians into a long-lasting and nutritive foodstuff, pemmican.

At all three sites, animal species other than reindeer can be recognized as the prey of man, although, to judge by the number of specimens identified, their importance was minor. At both Remouchamps and at the Kartstein a small rate of horse (Equus sp. cf. przewalski) is present, while at Remouchamps the chamois (Rupicapra rupicapra) and grouse/ptarmigan (Lagopus sp.) were also hunted. Cutmarks are present on the bones of the latter two species. In the case of the “Hohler Stein”, the frequently quoted species list contains species which, after a critical examination of the original material, can no longer be considered to belong to the Ahrensburgian level. It is evident that contamination of the assemblage by both younger and older elements has taken place. This is
partly due to the methods of excavation employed (the Ahrensburgian faunal list frequently contains identical species to the overlying Iron-Age levels; Andree 1932), but also a result of the difficult situation, in which the presence of large roof-fall blocks prevented a clear separation of the excavated layers.

The same is equally true for the majority of bone tools assigned to the Ahrensburgian level. They are, in part, manufactured from bones of species not present at the time of the lateglacial occupation (e.g. roe deer). Nevertheless, it can be noted here that a hitherto unknown bone tool was recognized by the author in the “Hohler Stein” assemblage. It is manufactured on a split proximal fragment of reindeer metacarpus (length: 12.5 cm). The distal end is pointed (fig. 6) and clearly rounded, with a polished appearance. The unpolished appearance of the remaining edges suggests that the polish derives from use of the piece as an awl. In summary, the Ahrensburgian groups, whose material culture and butchering waste have been found in cave sites of the northern Upland Zone were also reindeer hunters. Reindeer dominates the large mammal faunal spectrum. It is certain that migrating reindeer herds were hunted at favourable locations close to the cave sites; the slaughtered animals were brought back to the camp, either intact or after primary dismemberment and there exhaustively butchered. At which season did this activity occur?

**SEASONALITY OF HUNTING – A MODEL**

An intensive analysis of reindeer remains at the three examined sites provided the answer to the question of seasonality. Finds of teeth and antler are of particular interest in this context. The reindeer is the only representative of the large cervid family in which both males and females carry antler. Whereas bulls develop large antlers, which are shed in early winter after the rut, the much smaller antlers of fe-
males and calves (which often grow a small antler – the "Spieß" = spike – in the first year of life) are not shed until the spring.

In all three studied assemblages – but in particular at the "Hohler Stein" (fig. 7.1) – numerous antlers of females and calves are present. These are mainly shed antlers, but skull and antler fragments of hunted animals are also present. The latter have certain features of bone resorption at the junction of antler and pedicle which show that they would soon have been shed, had the animals not first been killed by Ahrensburgian hunters. Among these finds are also the "Spie" of a calf from the Kartstein (fig. 8) and a female antler from Remouchamps. These antlers already provide firm evidence that reindeer – and, consequently, also Ahrensburgian hunters – were present at the sites in question during the spring.

This conclusion is supported by finds of reindeer teeth. Of especial value is the replacement of the milk teeth by the permanent dentition, which has been studied in particular detail for recent populations of reindeer (caribou) calves in northern Canada (Miller 1974). Comparison with tooth material from the three Ahrensburgian sites shows that hunted reindeer calves were almost exactly one and two years of age at death (fig. 7.2); at the present day calves are born in spring (from late April to early June). Both these results and those of other studies on reindeer teeth (analysis of annual cement increments at the Kartstein [Kierdorf 1992] and at Remouchamps [Gordon 1988, 215]) confirm spring as the time of occupation. The following conclusions can be drawn:

At the end of the winter, which the reindeer herds had spent on the North European Plain (which, 11,000 years ago, also included the dry southern North Sea Basin between Denmark and England), the small, scattered groups of reindeer assembled to form large herds. At the beginning of spring, these herds migrated south to the Upland Zone of the Eifel, Ardennes and Westphalian Highlands, where, once again in scattered groups, they spent the summer (fig. 9). The cooler and windier uplands reduced annoyance by summer insect parasites, in particular for the newly born calves. Observation of recent reindeer and caribou herds shows that higher-lying cooler regions are particularly sought out. At the same time, there was an abundance of new plant growth on the summer range, so that the reindeer could accumulate rich fat reserves for the next winter. Evidence for a winter presence on the North European Plain are both the autumn hunting camp at Stellmoor and numerous finds of skulls and antlers of reindeer bulls, which also died in late autumn, from submarine sediments of the coast of Denmark (Degerbøl & Krog 1959). Additionally, a plant species identified from the Danish Younger Dryas is evidence for shallow snow cover in winter (Degerbøl 1964). This is relevant because reindeer avoid deep snow cover, which causes them difficulty in feeding. Taken together, these indications and complementary seasonal information from the Upland Zone lead to the described model.

The migrating reindeer herds probably used the same routes into the Upland Zone repeatedly, or at least, followed closely located passes, usually broad river- and stream-beds. These routes were known to the Ahrensburgian hunters. The hunters and their families would have moved ahead of the reindeer herds, in order to intercept them ("head'em off at the pass" – strategy), since they were not able to follow the herds directly (vid. Burch 1972). Their camps were located close to valley "bottlenecks", which can be seen especially in the case of the "Hohler Stein" and the Kartstein (fig. 9). Since reindeer enter such "bottlenecks" only reluctantly, it is probable that the entire group of women, children and old people drove the animals into them, to a point...
at which hunters were already waiting – the perfect ambush! The experienced hunters were thus enabled to kill a large number of animals in a very short time. In this way, the exhausted winter supplies could be restocked and, after only a few days, the hunters and their families moved on.

Towards the end of the summer, which the reindeer had spent in the Upland Zone, large herds again reformed and migrated to the north. Once more, they were awaited by the human groups which had gone before them; for these it was now necessary to secure adequate provisions for the approaching winter. An example for such an autumn hunting station is Stellmoor, close to Hamburg, to which reference has already been made. It is, however, probable that the complementary autumn hunting sites of the “Rhineland” Ahrensburgian group (represented by the Kartstein and Remouchamps), will have been in the Netherlands, where many Ahrensburgian sites are known, none of which have, unfortunately, yielded faunal remains.

The reindeer can be regarded as a “walking larder”, from which the Ahrensburgian groups helped themselves, above all, at two specific seasons. The price of this abundance was the necessity to adapt to the extreme mobility of their prey. It is known, for example, from North American Indians and Inuit, that the dog can be an important aid in the transport of material. At the Kartstein, a number of phalanges were recovered, whose morphology very probably allows their identification as domestic dog (Baales 1992c). Since the dog is known both from the earlier Magdalenian (Nobis 1986) and the succeeding early Mesolithic (Street 1991), a record for the Ahrensburgian need occasion no surprise. It is possible that the dog was also a hunting aid and served as a substitute nutritional source, possibly in times of shortage. The latter use is conceiv-

Fig. 9. General model of the spring migration of reindeer herds from their winter range in the northern part of Europe to their summer range in the Upland zone and detail of the situation in the Kartstein region, where reindeer herds used NE-SW oriented valleys to reach the Upland Zone of the Eifel. An artificial obstruction or perhaps other individuals of the hunters’ tribe forced the herds to the location where hunters were already waiting.
able since, as is known from recent groups of specialized reindeer hunters, it can sometimes happen that the reindeer use a different migration route, or do not appear at all, so that the human group suffers famine (Binford 1991, 73pp).

THE UPLAND ZONE AS AHRENSBURGIAN TERRITORY

In the proposed model, the northern Upland Zone (Ardennes, Eifel, Lorraine, Westphalian Highlands, Hessian Highlands, Harz etc.) played an important role for both reindeer and humans during the Younger Dryas. This region, in which research into the Ahrensburgian culture began, can, in consequence, no longer be regarded as one into which people of the Ahrensburgian culture wandered, more or less, “by chance”. This region was an integral part of the annual migration cycle of the reindeer herds, both as calving grounds and as summer pasturage for the accumulation of necessary fat reserves. The Ahrensburgian groups were able to exploit this situation by intercepting and hunting the migrating herds. That this must have been the case at many more than the three described sites, is shown by a recent distribution map of Upland Zone (= above 100 m contour) Ahrensburgian sites (fig. 10). Striking are, for example, concentrations in the north-south oriented valleys of the Weser and Leine, which can probably be interpreted as showing migration routes of reindeer and humans. Unfortunately, faunal remains have so far only been recovered from the three sites treated by this paper. The most southerly finds which
ECONOMY AND SEASONALITY IN THE AHRENSBURGIAN

can, to date, be attributed to the Ahrensburgian culture are tanged points of Ahrensburg type from Luxembourg and Lorraine and from the Palatinate (Spier, Lamesch & Grisse 1985; Blouet 1986; Cziesla 1992). These possibly derive from isolated hunting episodes aimed at reindeer living in small groups on their summer feeding grounds.

Table: Animal species identified in the Ahrensburgian level at the Kartstein

<table>
<thead>
<tr>
<th>Mammalia</th>
<th>Gyrfalcon</th>
<th>Falco rusticolus</th>
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</thead>
<tbody>
<tr>
<td>Reindeer</td>
<td>Rangifer tarandus</td>
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<tr>
<td>Bovid (?)</td>
<td>Bos sp.</td>
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<tr>
<td>Horse</td>
<td>Equus cf. przewalski</td>
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<tr>
<td>Ibex ?</td>
<td>Capra ibex</td>
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<tr>
<td>Wolf</td>
<td>Canis lupus</td>
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<tr>
<td>Dog ?</td>
<td>Canis familiaris</td>
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<td>Redfox</td>
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<tr>
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<tr>
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<tr>
<td>Eagle</td>
<td>Glaucidia sp.</td>
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Economy and seasonality in the Ahrensburgian


