

“ANTLER HEADDRESSES” AND THE PREBOREAL SITE OF BEDBURG-KÖNIGSHOVEN: THE BEGINNING OF MESOLITHIC BEHAVIOUR IN THE NORTHERN EUROPEAN LOWLANDS

Abstract

Bedburg-Königshoven is the oldest Mesolithic site in the southernmost part of the Northern European Lowlands. Excavations at the site have exposed a rich spectrum of organic remains. The nature of the site as a secondary butchering camp with possible additional functions is well published, but evidence for other activities and site functions have been, thus far, in the shadow of the prominent find categories of faunal and lithic remains. Two perforated red deer (*Cervus elaphus*) crania with attached antler were recovered from this site and, due to a systematic review of the find category, are identified as so-called antler headdresses – an extremely rare type of object at Mesolithic sites. Presented in this paper is the detailed study of this find group that leads to the discussion of whether the adjacent dry-land area was the location of manufacture for at least two half-finished examples of these rare objects. The combination of this study with existing analysis of environmental and archaeological data reinforces the interpretation of Bedburg-Königshoven as a residential type site of the Early Mesolithic where a rapid adaptation to the changing environment of the Holocene is well documented.

Keywords

Antler frontlet, Antler headdress, Early Mesolithic, site function, adaptation

Introduction

The Early Mesolithic site of Bedburg-Königshoven (District Rhein-Erft-Kreis/D), was discovered in 1987 at the centre of the vast Garzweiler opencast lignite mine, and was excavated until 1988.

Artefacts were preserved in the calcareous sediments, but mining activities had already removed terrestrial sediments behind the excavated littoral zone where the centre of the settlement area had presumably been located (Street 1989a; 1991; 1993).

Data from palynological analysis (Behling 1988) and radiocarbon dates for the sediment layer containing archaeological material (KN-3999: 9780 ± 100 BP / 9176 ± 174 calBC¹; KN-3998: 9600 ± 100 BP / 8998 ± 163 calBC¹) suggest that the deposition of the Early Mesolithic finds had taken place during the middle Preboreal (Street/Baales/Weninger 1994).

¹ Calibrated with CalPal Online using the CalPal_2007_HULU calibration curve.

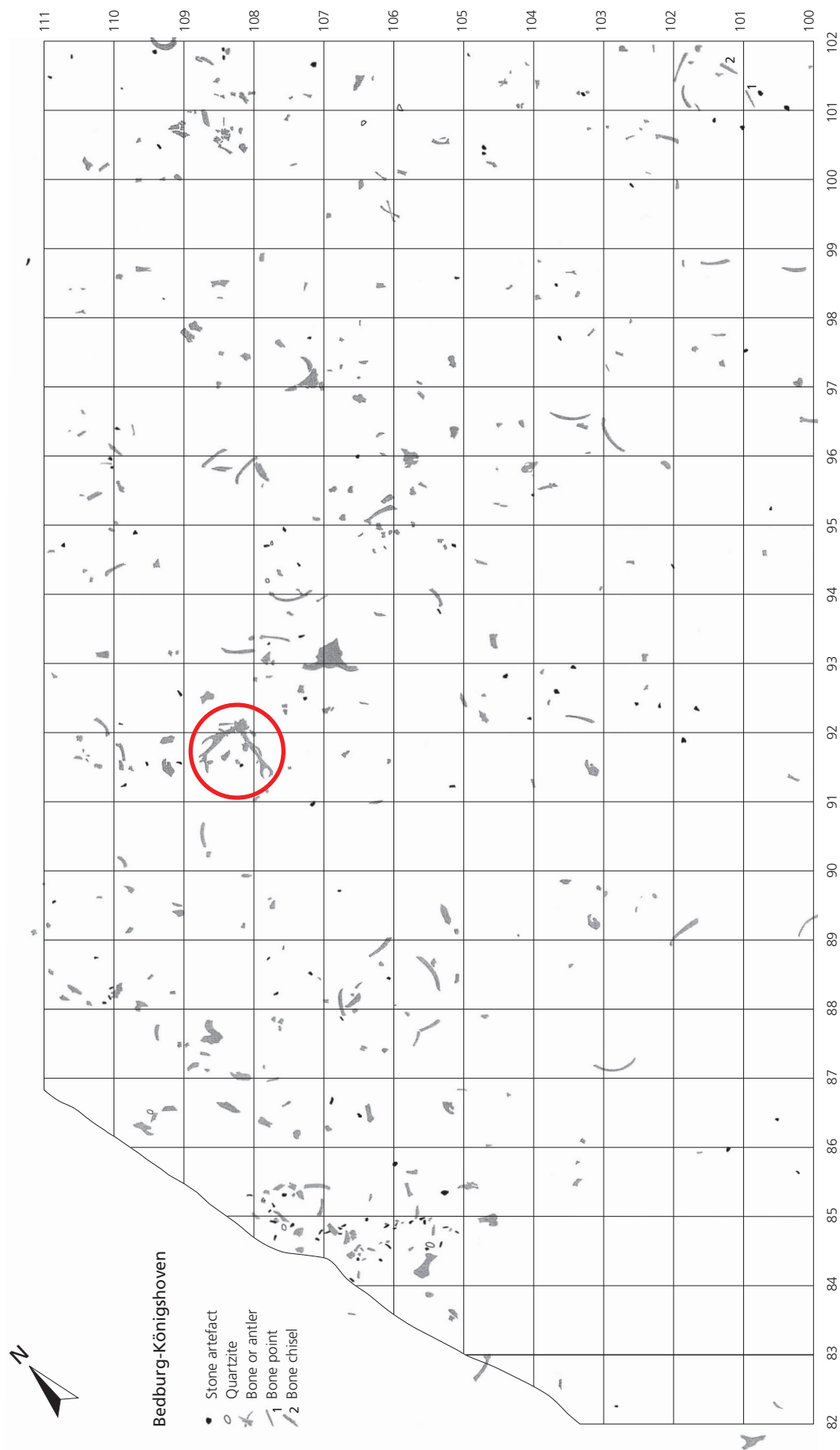


Fig. 1 Excavation plan of Bedburg-Königshoven. Frontlet 2 (E115/91-2) (circled) was found approximately 3-4 m away from the ancient shore in the North. – (Street/Wild 2015, 210 fig. 2).

The preserved part of the site (fig. 1) has been interpreted as an outcast zone, with the ancient shore line roughly parallel to the north-western edge of the excavation (Street 1989a). The faunal assemblage is dominated by discarded remains of large mammals. These show clear signs of anthropological modifications in the form of butchering marks (Street 1989a; 1990; 1993; 1999). It can be assumed that the animals had been hunted in the vicinity of the site (see Street 1989a, 41 ff. for further detail) with secondary butchering activities taking place at the transition area from dry land to open water at Bedburg-Königshoven. These activities resulted in waste material being disposed in an abandoned meander of the river Erft (Street 2020). The small lithic inventory – containing only 196 pieces of worked flint – supports this idea as it is composed of large lamellar lithic debitage and a few retouched artefacts possibly used for butchering. The assemblage is complemented by five blade and flake scrapers, three microliths and a heavy-duty pick (Street 1998) of 805 g. The tools indicate activities like hide working or the manufacturing of tools or the discard of parts of the lithic toolkit that were not used during the human occupation of the

site. Although this interpretation is not definitive, other finds suggest that the bulk of the activities (e.g. re-tooling, tool production, hide working etc.) are those carried out at a base camp and hint at a more centralist character for Bedburg-Königshoven within the broader hunter-gatherers' settlement structure.

In the absence of any butchery marks on the fish and bird remains, it has been suggested that these species are a natural 'background' fauna (Krey 1990; Street 1989a; 1990). The only exception might be a stork (*Ciconia ciconia*) whose sole *in situ* excavated bones were an articulated right wing without anthropogenic modifications. Nevertheless, articulated stork wing bones are known from other Mesolithic contexts (Street/Peters 1991; Street 1993, 196). The presence of dogs (*Canis lupus familiaris*) is quite common on Early Mesolithic sites. Cut marks on the cranium of at least one of two dogs present at Bedburg-Königshoven indicate not only their use as a hunting aid, but as a source of ritual, food and/or raw materials (Street 1989b). An upper canine of red deer with a broken out perforation, a second upper canine and an incisor of red deer with a grooved cut across the tooth's axis as well as



Fig. 2 Bone point made of a long bone of an aurochs. – (J. Vogel/LVR LandesMuseum Bonn).



Fig. 3 Bone chisel made of the radius of a red deer. – (J. Vogel/LVR LandesMuseum Bonn).

a notched canine of a wild boar (*Sus scrofa*) were also found in the littoral zone (Street 1989a, 39 ff.). These remains can be interpreted as either discarded or lost. At the easternmost part of the excavation area, approximately 10m away from the Mesolithic shore line, a pair of bone tools was found in close proximity which suggests a possible relationship. A bone point (fig. 2) made from a metapodial bone of an aurochs (*Bos primigenius*) is broken at its terminal end. A 223mm long chisel (fig. 3) made of the radius of a subadult red deer shows use-traces at its working edge. While there seems to be no reason for the discard of these two artefacts, the great distance to the Mesolithic shore line as well as the small area in which they were found might indicate intentional deposition or accidental loss (Street 1989a, 38 f.), perhaps during swimming, wading or sitting in a dugout canoe.

Going beyond the interpretations already mentioned, three microliths (found in squares 101/104, 84/105 and 95/106 see fig. 1) were distributed over a large distance within the excavation area. In a slightly younger context at Hohen Viecheln (Nordwestmecklenburg/D) at least four microliths were

perceived as deriving from a single arrow (Schuldt 1961, 103) – a scenario that is not likely to have parallels in Bedburg-Königshoven (see also Street 1993, 157). Instead it has been suggested that the microliths in the off-bank discard zone at the palaeochannel of the river Erft were accidentally or intentionally discarded with the bones, cartilage or sinews into which they had been shot. For the Final Palaeolithic (Ahrensburgian) site of Stellmoor, reindeer (*Rangifer tarandus*) remains show at least 32 hunting lesions with embedded fragments of flint point (Bratlund 1991; 1996, 23). Thus, the projectiles would probably reflect the hunting event and not any activity that had taken place at the site of Bedburg-Königshoven itself.

Another group of artefacts has not yet been incorporated into an overall interpretation of the site: two perforated antler frontlets² (fig. 4-7) – one of them the initial find at Bedburg-Königshoven (fig. 4-5) – that have only been discussed, to date, in relation to comparable artefacts and their inter-

² For these and all other objects in this paper mentioned by the authors refer to the first described 'antler frontlets' from Star Carr.



Fig. 4 Bedburg-Frontlet 1 (E115/91-1). – (J. Vogel/LVR LandesMuseum Bonn, modified by M. Wild).



Fig. 5 Bedburg-Frontlet 1 (E115/91-1): detail of the perforation on the right side. – (J. Vogel/LVR LandesMuseum Bonn, modified by M. Wild).



Fig. 6 Bedburg-Frontlet 2 (E115/91-2). – (J. Vogel/
LVR LandesMuseum Bonn, modified by M. Wild).

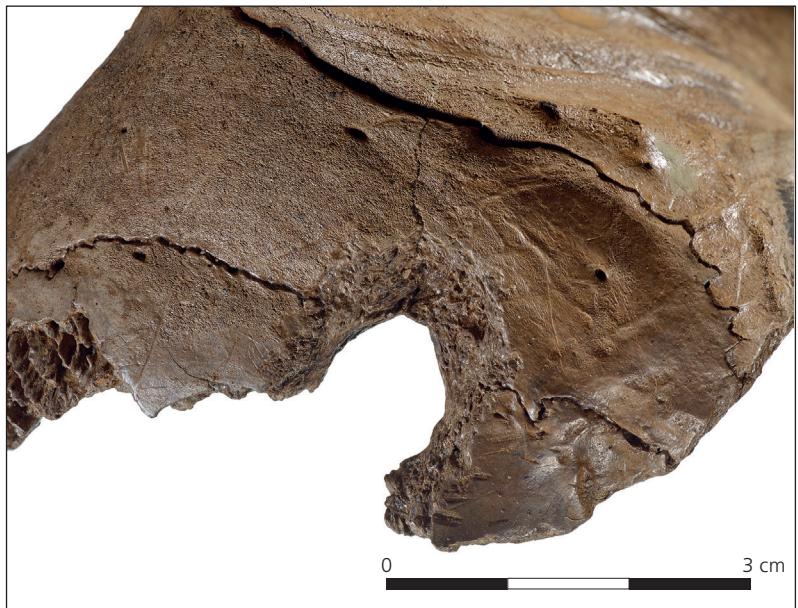


Fig. 7 Bedburg-Frontlet 2 (E115/91-2): detail of the
perforation on the right side. – (J. Vogel/LVR Landes-
Museum Bonn, modified by M. Wild).

pretation as shamanistic garb or hunting aids (Street 1989a; 1993). These circumstances were crucial to a proposed revision of the group of so-called 'Mesolithic antler frontlets' (Street/Wild 2015) leading to the question why these artefacts were discarded at Bedburg-Königshoven alongside butchery waste. Moreover, the site's function as well as its role in the surrounding settlement structure will be discussed in the light of altered survival strategies and an emerging 'Mesolithic (behavioural) package' in the Northern European Lowlands at the beginning of the Holocene.

Mesolithic antler frontlets

Since their discovery, the Bedburg-Königshoven specimens have been interpreted as antler frontlets (Street 1989a; 1993; Street/Wild 2014) comparable to similar finds from Early Mesolithic Star Carr (Borough of Scarborough/GB) originally described by Clark (Clark 1949; 1950; 1954; Walker/Godwin 1954, 59ff.). In addition to artefacts from these two sites, frontlets are mentioned from six other early Holocene contexts: Berlin-Biesdorf (State of Berlin/D) (Reinbacher 1956), Hohen Viecheln (Gehl 1961a; Schuldt 1955; 1961, 130f.), Plau (Ludwigslust-Parchim/D) (Schoknecht 1961; Knape/Brandt 2008, 106), Friesack 4 (Havelland/D) (Gramsch 1987; Pratsch 1994; 2006, 71), Bad Dürrenberg (Saalekreis/D) (Grünberg 2000, 204; 2004) and Thatcham II and V (District of West Berkshire/GB) (Overton 2014, 290ff.). In addition to these nine sites, Rust (Rust 1958, 107f.) published another skull of a reindeer with worked antler from the late Palaeolithic (Hamburgian) site of Poggenwisch (Kreis Stormarn/D). From these ten sites a total of 39 potential antler frontlets are reported, dominated by 21 from Star Carr (Clark 1954, 168ff.). The site of Friesack 4 brought a total of three (Pratsch 2006, 71), four (Pratsch 1994, 53, 90 fig. 39) or probably six specimens (B. Gramsch, *pers. comm.*) to light. For Hohen Viecheln the authors refer to one (Schuldt 1956, 120), two (Schuldt 1955, 28; 1961, 130f.) or four specimens (Pratsch 2006, 71). While Bedburg-Königshoven yielded two

possible frontlets, the remaining sites produced evidence for a maximum of one antler frontlet (Reinbacher 1956; Rust 1958, 107f.; Schoknecht 1961; Grünberg 2000, 204; Overton 2014, 290f.).

Approaching antler frontlets

As these kind of artefacts have never been described, and to further understand the characteristics and features of the two modified red deer antler frontlets from the site of Bedburg-Königshoven, the entire category had to be reviewed and compared systematically. From the total of 40 specimens, 16 from eight sites (**tab. 1**) were available for a systematic review in an approach combining zooarchaeological, morphometrical and technological data. Parameters recorded included: species, minimum age measured on the development of antler (after Wagenknecht 2000, 139f.), weight, existence of other bones as well as parts of cranium and antler, whether parts were fully or only partially preserved, intentional fractures, presence of surface modifications (cut marks) on the bones and antler, presence of anthropogenic surface modifications in general (notches, grooves, chopping marks etc.) anthropogenic perforations and their locations, and traces of different techniques used to perforate the bone. This information was supplemented by morphometrical data including the dimensions of the specimens in total length, width, and height as well as the length of beams and tines, and finally, length and width of the perforations. Three of the original specimens included in this review were not directly accessible. To gain as much data as possible all available information from casts, literature, detailed drawings and photographs were used instead (Wild 2014).

Defining and discussing antler frontlets

The results of the analyses of the recorded parameters show the antler frontlets can be divided into two major groups, antler headdresses (= Hirschgeweihkappen *sensu* Wild 2014) (**fig. 8-9**) and a group of

Tab. 1 Overview of available information about antler frontlets. Grey background: not included in the study but presented in Wild 2014. In brackets: Information available for some of the artefacts.

Site	Artefact/s	Reference	#	Artefacts	Cast	Literature	Museum	Detail drawings
Bad Dürrenberg	Rehgehörn	Grünberg 2000	1	✓	-	✓	✓	-
Bedburg-Königshoven	E115/91-1; E115/91-2	Street 1989a	2	✓	✓	✓	✓	✓
Berlin-Biesdorf	I/82/26	Reinbacher 1956	1	✓	✓	✓	✓	-
Friesack 4	K127; K245; K280; K705	Pratsch 1994	4	✓	-	✓	-	-
Friesack 4	K356; K711	B. Gramsch, pers. comm.	2	✓	-	-	-	-
Hohen Viecheln	HV 5863	Schuldt 1956	1	✓	✓	✓	-	✓
Hohen Viecheln	HV 3412	Schuldt 1961	1	✓	✓	✓	-	-
Hohen Viecheln	HV 5774; HV 6162	Pratsch 2006	2	✓	-	✓	-	-
Plau	2178g	Schoknecht 1961	1	✓	-	✓	-	-
Poggenwisch	Tanzmaske	Rust 1958	1	✓	-	✓	-	-
Star Carr	AF2	Clark 1954	1	-	✓	✓	-	-
Star Carr	AF8	Clark 1954; Street/Wild 2015	1	-	-	✓	-	✓
Star Carr	AF1-21 (exc. AF2/AF8)	Clark 1954	19	-	-	(✓)	-	-
Thatcham II	upturned red deer antler	Overton 2014	1	-	-	✓	-	-
Thatcham V	right roe deer frontlet	Overton 2014	1	-	-	✓	-	-

Tab. 2 The revision of the antler frontlets resulted in the distinction of two major groups. The presented data manifests this division.

parameter	antler headress	exploitation waste	BK: E115/91-1	BK: E115/91-2
age termination				
level of antler growth	4.67	2.13	7	6
minimum age of animal	3	2.38	3	3
weight				
in g	1137.5*	319.88	2800	2384
preservation				
<i>os frontale</i>	100 %	100 %	(✓)	(✓)
<i>os parietale</i> (sin.+dex.)	100 %	43.75 %	(✓)	(✓)
<i>os temporale</i> (sin.+dex.)	83.33 %	6.25 %	(✓)	(✓)
<i>os interparietale</i>	100 %	62.50 %	✓	(✓)
<i>os sphenoidale</i>	0 %	62.50 %	-	-
<i>os temporale</i> (sin.+dex.)	40 %	0 %	✓	✓
<i>os interparietale</i>	50 %	0 %	-	-
cut marks				
<i>os nasale</i>	50 %*	-		✓
<i>os frontale</i>	100 %	87.50 %	✓	✓
<i>os parietale</i> (sin.+dex.)	100 %	0 %	✓	✓
<i>os temporale</i> (sin.+dex.)	77.50 %	0 %*	✓	✓
<i>os interparietale</i>	66.67 %	0 %	-	✓
<i>os supraoccipitale</i>	33.33 %	0 %*		
<i>os sphenoidale</i>	-	0 %		
<i>tabula interna</i>	100 %	25 %	✓	✓
antler	100 %	66.67 %	-	
other modifications				
<i>os nasale</i>	0 %*	-		-
<i>os frontale</i>	50 %	25 %	-	-
<i>os parietale</i> (sin.+dex.)	66.67 %	0 %	✓	✓
<i>os temporale</i> (sin.+dex.)	45 %	0 %*	✓	✓
<i>os interparietale</i>	33.33 %	0 %	-	-
<i>os supraoccipitale</i>	0 %	0 %*		
<i>os sphenoidale</i>	-	0 %		
<i>tabula interna</i>	66.67 %	0 %	-	✓
antler**	100 %	25 %	-	-

(*≤ 2 specimens; **as the frontlets from Bedburg-Königshoven are supposed to be half finished products their antler has not been taken into account)

objects that resemble simple butchering and raw material exploitation waste (fig. 10). While the former group shows clear signs of modifications which are the result of motivation, finds in the latter group displayed no unambiguous intention in their actual form. The category antler headdress encompasses one specimen from Hohen Viecheln (fig. 8) and the reviewed objects from Star Carr (AF2 & AF8 [fig. 9] [Clark 1954]), the single find from Berlin-Biesdorf as well as the two deer crania from Bedburg-Königshoven (fig. 4-7) discussed in this paper. The waste group contains the reviewed material from Friesack 4, a specimen from Hohen Viecheln (fig. 10) and the half reindeer cranium from Poggenwisch³.

The entire group of analysed headdresses can be distinguished from the other frontlets by different parameters. Although the examined artefacts show a diverse range of species – elk (*Alces alces*), red deer, reindeer and roe deer (*Capreolus capreolus*) – only red deer was used for the manufacturing of antler headdresses so far. Thus, they should be called red deer antler headdresses without excluding the possibility of such an object being made of a cranium of another species. Importantly, red deer does not play a predominant role either as a food or a raw material source at each of the sites where these artefacts occur (fig. 11) (Gehl 1961b; Legge/Rowley-Conwy 1988; David 1999; Street 1999; Street/Wild 2015; Street 2020). Moreover, the Star Carr headdresses were associated with the production and hafting of antler points (Elliott/Milner 2010), while comparable bone points at Bedburg-Königshoven and Hohen Viecheln are produced from raw materials of other species (Schuldt 1956; David 1999). Apart from this, other parameters help to distinguish the different classes of object. In comparison with the antlers of the group of antler headdresses, antler

growth as a means to determine age, is noticeably lower in the waste group. This, as well as the poorer preservation of crania and antlers results in lower morphometrical values among the waste group. But while the cranium of the waste material was worked down more intensively, abiotic modifications like cut or scraping marks and impact scars are less numerous than observed in the headdress group (tab. 2). This can possibly be explained by a long term usage of antler headdresses and therefore an increase of use traces, while prompt disposal of waste can be assumed when crania and antlers were exploited solely for raw materials, resulting in fewer modifications.

Hitherto, the first success of the review is apparent in a simple classification of antler frontlets. But a much more important result of the review is the recognition that several features on the different specimens are regularly observed and thus describe a definition of antler headdresses:

- frontal, parietal and interparietal bones are always present
- antlers, frontal and parietal bones are only partially preserved
- a minimum of 75 % of the present bones of the cranium (including the antlers and the *tabula interna*) show anthropogenic modifications
- temporal, parietal and interparietal bones show a minimum of two artificial perforations and a maximum of two complete perforations
- antler beams and tines are longitudinally split and often shortened.

At present, this interpretation is the best fit for these artefacts based on common features and morphology. Additionally, the nasal bone (*os nasale*) is absent in all cases but two; for the reviewed artefacts it seems it had not been removed intentionally. Only the second specimen from Bedburg-Königshoven includes a complete nasal bone. In comparison to the other sites, Bedburg-Königshoven was the only one carefully excavated layer by layer, thus, increasing the chance of finding complete artefacts *in situ*. Therefore, the frequent loss of the nasal bone may have resulted from taphonomic factors. One has to come to the conclusion of a probable

³ Not included in this first study of antler headdresses were a handful of finds. Two artefacts from Hohen Viecheln mentioned by Pratsch (Pratsch 2006, 71) but not available for studying before 2015, and two further objects from Thatcham, described as possible antler frontlets by Overton after the completion of the first study (Overton 2014, 190 ff.). All of these objects were tested on the definition of antler headdresses (see below). They fall entirely in the group of waste material.

Tab. 3 Overview of artefacts mentioned in the text tested on the definition of a headdress *s.s.* (*sensu stricto*). 1: Presence of *os frontale*, *os parietale* and *os interparietale*; 2: *os frontale*, *os parietale* and antler only partially present; 3: 75 % of the bones of the skull (including antler and *tabula interna*) are anthropogenically modified; 4: Perforations on the caudal part (*os temporale*, *os parietale*, *os interparietale*); 5: Antler is longitudinally split and sometimes shortened. Grey background: not possible to determine because of breakage.

feature/find	BD: Roe deer antler	BK: E115/91-1	BK: E115/91-2	BB: I/82/26	F4: K127	F4: K245	F4: K280	F4: K356	F4: K705	F4: K711	HV: H.V. 5863	HV: HV 3412	HV: HV 5774	HV: HV 6162	HV: HoVi 387	PL: 2178g	PO: Mask	SC: AF2	SC: AF8	TH II: -	TH V: -
1	✓	✓	✓	✓	✓	✓	✓	✓			✓							✓	✓		
2	✓	✓	✓	✓		✓	✓				✓		✓	✓	✓	✓		✓	✓	✓	✓
3		✓	✓	✓							✓		✓		✓	✓		✓	✓		
4		✓	✓								✓							✓	✓		
5				✓							✓				✓	✓	✓	✓	✓		

BD: Bad Dürrenberg; BK: Bedburg-Königshoven; F4: Friesack 4; HV: Hohen Viecheln; PL: Plau; PO: Poggenwisch; SC: Star Carr; TH II: Thatcham II; TH V: Thatcham V

link between the loss of the nasal bone and taphonomic factors. Anyway, due to several reasons (e.g. taphonomic factors, use, stage of manufacturing) not all the specimens reviewed fit the definition of antler headdresses in its entirety (tab. 3).

The specimen from Hohen Viecheln (fig. 8) and at least the two examined frontlets from Star Carr (fig. 9) can easily be called typical headdress, while the group belonging to artefacts from Plau, Berlin-Biesdorf and Bedburg-Königshoven must be discussed further.

The red deer cranium from Plau has its inner surface (*tabula interna*) worked down to a high degree. The frontal bone is the only bone preserved and is too small for recognition of further details. In addition, there was a fire in the building where the materials were curated, which destroyed the surface of the bone (Schoknecht 1961). This makes it almost impossible to recognise and distinguish modifications and determine its status as an antler headdress.

The inner surface of the Berlin-Biesdorf specimen is worked down and smoothed. Frontal, parietal and interparietal bones are present, frontal and parietal at least partially. Antlers and pedicles have been reduced by removing the anterior surface of beams and tines but still preserving the form of the antler in its frontal aspect. Although this frontlet lacks perforations, the unusual treatment of the beams

and tines cannot be explained simply with the production of tools. The resemblance to thinned pedicles and brow tines of two reviewed antler frontlets (fig. 8-9) puts the Berlin-Biesdorf specimen into the category of antler headdresses.

Both red deer crania from Bedburg-Königshoven show minor modifications through isolated cut marks on their inner surface. Frontal, parietal and interparietal bones are present and frontal and parietal are partially preserved. On the parietal-temporal *suturæ* of both specimens a perforation was notched into the bone, however, the antlers are almost complete and show no traces of intentional modification. As the affinities in the shape of the cranium and perforations to some Star Carr frontlets are unambiguous and other analogies are yet unknown, it should be assumed that both Bedburg-Königshoven specimens are antler headdresses, even if their antlers look atypical (fig. 4, 6).

Discussing the headdresses from Bedburg-Königshoven

Already mentioned was the fact that the definition can hardly be a final and inescapable measurement but the closest possible approximation of the antler headdress (*sensu stricto*)-character. Thus, some ex-



Fig. 8 "Antler headdress" H.V. 5863 from Hohen Viecheln. – (M. Wild/LaKD Mecklenburg-Vorpommern).

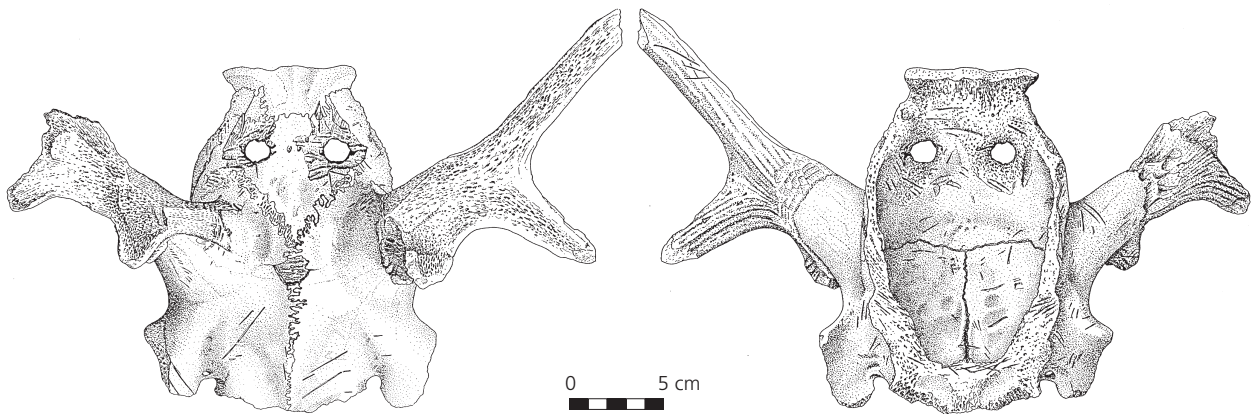


Fig. 9 "Antler headdress" AF2 Star Carr. – (Street/Wild 2015, 216 fig. 8B, 217 fig. 8E, modified by M. Wild).



Fig. 10 Possible butchering waste Hohen Viecheln: a) frontal perspective b) caudal perspective. – (M. Wild/LaKD Mecklenburg-Vorpommern).

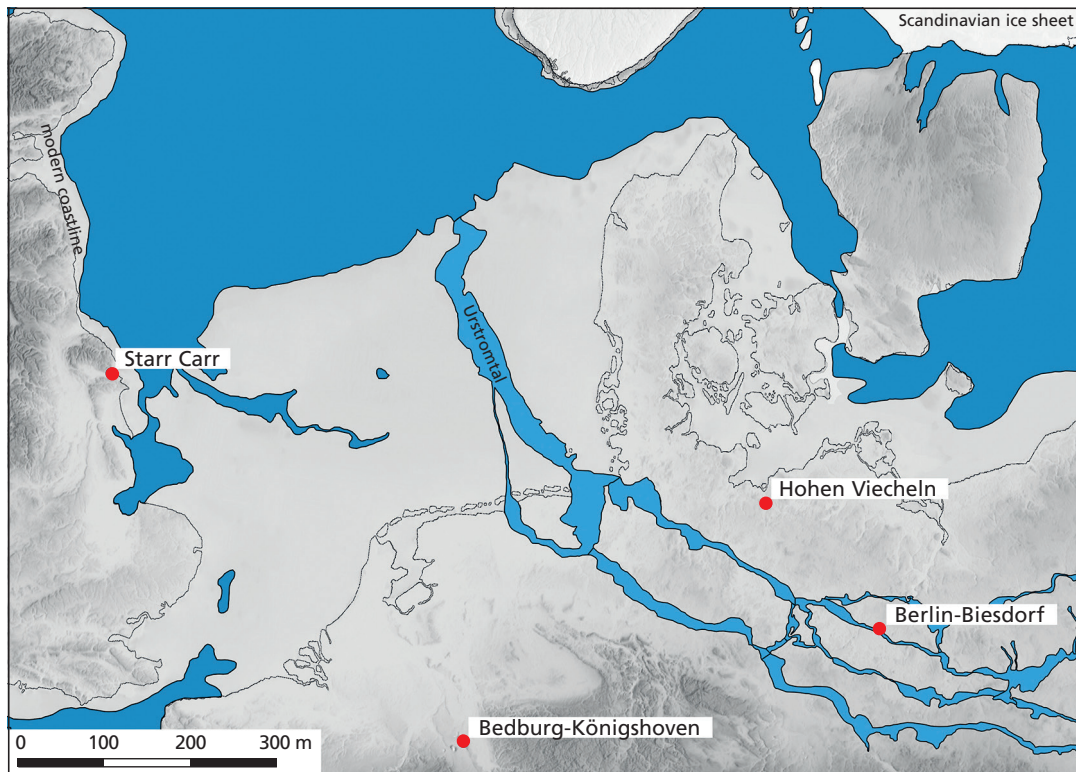


Fig. 11 Sites with headdresses. – (Background map based on Grimm 2009 [and supplemented by Groß 2014] after Björck 1995a; Björck 1995b; Björck 1996; Björck/Anonymous 1992; Boulton et al. 2001; Brooks 2006; Clarke et al. 2004; Coope et al. 1998; Ivy-Ochs et al. 2006; Lundqvist/Wohlfahrt 2001; Weaver et al. 2003, modified by M. Wild).

planations for the completeness of the antlers from Bedburg-Königshoven frontlets are conceivable:

1. Antler was not exploited as a source of raw material, and so reduction was not necessary. Indeed the small antler assemblage of Bedburg-Königshoven shows no signs of an intense exploitation for the manufacturing of points or axes as documented at other sites with antler headdresses (fig. 12) (David 1999). But the presence of four tines with clear signs of modifications and use traces (Street/Wild 2015, tab. 2) makes this hypothesis almost untenable.

2. The specimens are a subform of antler frontlets whose antlers vary from the others significantly. Although there is no argument against this explanation, Clark observed the gouging and hollowing of antlers at Star Carr (Clark 1954, 168). He saw this as a method of reducing the weight of the antlers while at the same time accentuating their shape (Clark 1954, 169). The same line of argument with

a differing result can be assumed for the Berlin-Biesdorf specimen too.

3. The work on the red deer crania was not complete. Compared with the weight of the Berlin-Biesdorf specimen (1850g) and the Hohen Viecheln frontlet (321g), the objects from Bedburg-Königshoven are strikingly heavy (2800g and 2384g). Besides the exceptional weight, the location of the frontlets at a distance of roughly 5 m from the Early Mesolithic shore line (fig. 1) suggests disposal or possible storage for later use. As both the perforations of Frontlet 2 are broken, the reason for a possible disposal seems to be clear. But as Frontlet 1 has no traces of non-intentional ancient fractures, its disposal might be doubted. Storage of the objects under water would be beneficial from two perspectives: Mesolithic people could preserve the antler frontlets from gnawing by dogs and the antler would have been water-soaked. This pre-treatment softens antler and simplifies later processing

(MacGregor 1985, 27. 63-65). When compared with other antler headdresses the low amount of cut marks, notches and other anthropogenic modifications on the surface of the Bedburg-specimens is notable (fig. 5, 7, 9). As these traces do not follow a clear pattern that points to the manufacturing of the headdresses this indicates a shorter period of life of Frontlet 1 and 2 from Bedburg-Königshoven. Furthermore, in a recently conducted experiment (Wild 2014), the author was able to show the possibility of replicating antler headdresses comparable in form to those from Bedburg-Königshoven with tool types found at this site (Street 1989a; 1998). In combination, these arguments lead to the hypothesis that the dry land at the abandoned meander of the river Erft was the place of manufacture of the laterally perforated deer crania, and that these appear to represent half-finished antler headdresses.

There is, however, still an unsolved problem to this kind of explanation since the red deer crania were found in the outcast zone at Bedburg-Königshoven. As already mentioned, the first specimen seems to be complete, calling into question whether it was discarded. On the other hand, the second specimen was not complete and its perforations were broken. With the exception of the artefact from Berlin-Biesdorf, the review of antler headdresses speaks for the presence of two symmetrically located perforations, to which a third can be added if one of the perforations had been broken. This is why a third perforation always overrides the existing symmetry. If not already broken during the manufacturing process, a frontlet with a third perforation should have been in use for a longer period of time than a frontlet with only two. This contradicts the hypothesis of half-finished products since one of the frontlets had a 'longer' use of life. A possible explanation lies in the breakage patterns of Frontlet 2. The force, necessary to crack the bone at both sides, seems to have worked simultaneously off the bone and, in the same direction, away from the antler and the frontal cranium. If Mesolithic people strung the frontlets through the perforations prior to submergence and did not tie the cord around the antlers (which would seem to be the easiest solution), they could try to lift

the object out of the water by pulling the string. If the frontlet had become deeply embedded within the fine, wet sediment, the perforations may have broken during attempts to retrieve the antler. Obviously, this explanation is hypothetical, but it would be even more hypothetical to assume that both perforations had broken simultaneously as the frontlet was worn. In this case it would be more likely that one perforation breaks, the frontlet loses its stability and falls off. Afterwards, a third perforation could be notched into the bone. This explanation still does not solve another problem. Why was Frontlet 1 left 'unbroken' in the shallow waters?

Another striking aspect is the estimated season of occupation at Bedburg-Königshoven. Street (1989a, 49) argues that unshed antlers are most common during winter, while most of the remains in Bedburg-Königshoven indicate an occupation in summer. In this case, the perforated artefacts could have been brought to the site from somewhere else instead of being produced there. A few seasonality indicators, young calves and two other individuals of aurochs as well as the cranium with attached antlers from roe deer and the remains of stork, point to the presence of Mesolithic people at the site between April and late summer (Street 1989a, 43). The yearly cycle of antler growth starts, by contrast, around April and is completed around June. Subsequently the deer starts to rub off the velvet of the antlers. Around March or April the yearly cycle ends with the casting of the antlers (Legge/Rowley-Conwy 1988, 5 fig. 2; Wagenknecht 2000, 127). Following this yearly cycle, all seasonal indicators mentioned earlier for the occupational period as well as the two unshed red deer antlers could overlap in springtime. This would push the potential starting point of Mesolithic visits at Bedburg-Königshoven to March or April with a possible continuation into the summer.

Possible functions of antler headdresses

The possible shift in the interpretation of the season of occupation of Bedburg-Königshoven does not argue against Street's interpretation of the

headdresses as hunting aids, though ethnographic analogies illustrate that these artefact types are not as realistic as one might expect (e.g. Halls 1984), especially considering that the occupation of the site occurred when red deer do not possess fully grown antlers. Since a solely functional use of the deer skulls as secular tools does not seem to show up, it might be more likely to interpret the find category as the remains of an ancient custom. Clark (1954) favoured a shamanistic interpretation of the frontlets, but other hypotheses have been postulated and seem to be equally conceivable. Connelley (2004) puts forward the idea of a much more complex worldview for Mesolithic hunter-gatherers more than just a clear distinction between profane and ritual, and places the frontlets of Star Carr into a supernatural context at a special site. This interpretation and the role of ritual have been critically reviewed by Mellars (2009), who still interprets the distribution patterns of organic artefacts and the site's character in a more pragmatic way. However, despite the intensification of discussions about Mesolithic rituals it must be clearly stated that, to date, ritual or religious customs cannot be unambiguously verified and other interpretations have been discussed in the last 65 years.

For example Pratsch (2006) seized Clark's idea that red deer crania were used as a kind of (hunting) trophy (Clark 1954, 170) and assumed this again for the alleged antler frontlets from Friesack 4. Recently, Street and Wild (2014; 2015) introduced the interpretation of a reindeer crania from the Final Palaeolithic site of Stellmoor (Kr. Stormarn/D) fixed on a rod as a static element of a hunting drive system (Bokelmann 1991). Nevertheless, the intensive modifications of the frontlets seem to exceed what would be required to display red deer crania as a kind of trophy. As the discussed phenomenon only exists in a limited area during a short period at the beginning of the Holocene, other explanations could be possible as well. The frontlets might have been identity-establishing symbols of a group of people who wanted to show their basic convictions and displayed these either on their head, as a trophy, a decoration on top of their tent, etc. In the future

more detailed use-wear investigations could illuminate the functional question of the artefact group and contribute to discussions about their exact use.

Bedburg-Königshoven: an Early Mesolithic type site?

Based on spatial analysis of faunal and lithic remains as well as archaeozoological and lithic technology studies, Bedburg-Königshoven was interpreted as a place where secondary butchering activities (Street 1989a; 1991; 1993; 2020; Street/Wild 2015), and other 'domestic' tasks had taken place (Street 1989a, 43). The site is situated at a particularly advantageous spot in the landscape. At the northernmost part of an abandoned meander, sheltered by hills in the North from the prevailing west wind, and connected with the surrounding marsh of the valley by a dry promontory (Behling 1988; Iking 1989), the place chosen by Mesolithic people offered many opportunities.

This setting with a mosaic of ecological niches supported an opportunistic style of hunting for different species inhabiting the Northern European Lowlands at the beginning of the Holocene. In one scenario, widely accepted for the Mesolithic site of Bedburg-Königshoven, a group of people used this privileged area as a central camp to which selected faunal elements of nearby hunted prey were brought (Street 1989a, 41 ff.). Re-fitting of bones over distances of more than 10 m (Street 2020) and a homogenous find layer also indicate a more ephemeral character of a short visit of people at the site. However, the assumption that the site is not the place of disposal but the area adjacent to the place of manufacture of two antler frontlets again suggests a longer stay or repeated visits over a short period as the working of the antler headdress probably begins with the end of the butchery process. Furthermore, this adds another possible activity to the already mentioned secondary butchering and further 'domestic' tasks. Therefore, antler headdress manufacture underlines the site's character as a place where different activities had been performed and it seems that the

excavated outcast zone, with its bias towards butchering waste, just reflects a highly specialised part of a camp where certain activities took place. This is supported by the observation of other contexts where loci of secondary butchering are situated in close vicinity to central camps (Lyman 1992, 247f.) where the final stages of processing (e.g. eating) takes place. Furthermore, use-wear analysis of discarded lithics from Bedburg-Königshoven would be useful as it could add more information about the activity spectrum, e.g. hide fleshing, thus possibly substantiating the claim.

Finally, extending beyond this small scale interpretation of Bedburg-Königshoven the present paper is part of the conference proceedings of the 2014 UISPP world congress session B30 'A diachronic perspective of human behavioural adaptations to interglacial lakeshore environments during the European Pleistocene to early Holocene'. Formulated in the introduction of the session the 'ultimate goal' will be to evaluate how survival strategies in similar environmental situations evolved throughout the course of our history (García-Moreno et al. 2014). As has been shown, Bedburg-Königshoven, as one of the earliest well-dated Mesolithic sites in the Northern European Lowlands, demonstrates a picture of survival strategies that are assumed to be typical for the Early Mesolithic in Northern Central Europe (Baales 1996, 338). This includes the use of dry areas in marshy environments for camps which were visited regularly over a long period (Groß 2015; 2020) as well as an opportunistic way of hunting. With this

choice, Mesolithic strategies in the developing environment are different from earlier adaptations in comparable environments, for example in the Allerød: During this period, comparable camps are conglomerations of small specialised spots distributed over a larger area of sand ridges, e.g. Rekem (Prov. Limburg/B) (De Bie/Caspar 2000).

Therefore, it is striking that with the appearance of this 'Early Mesolithic behaviour' new items, like the antler frontlets, immediately appeared, completing this somehow new package of adaptation to a more humid and densely vegetated environment. As the oldest site showing this package, Bedburg-Königshoven seems to be a pioneer for a set of human behavioural traits that was typical to a certain degree throughout the Early Mesolithic in Central and Northern Europe.

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