

## Actualité scientifique/Scientific news

### Résumé de thèse/Thesis abstract

HÖLTKEMEIER S. 2016. — *Animal exploitation during the 4<sup>th</sup> millennium BC in central Germany: the Wallendorf and Salzmünde sites in their regional context* [in French: *L'exploitation animale au IV<sup>e</sup> millénaire avant notre ère en Allemagne centrale: les sites de Wallendorf et Salzmünde dans leur contexte régional*]. Doctoral thesis, Université Paris 1 Panthéon-Sorbonne, Paris, 842 p.

From the end of the 5<sup>th</sup> to the beginning of the 3<sup>rd</sup> millennium cal BC, north-central Europe is occupied by the vast Funnel Beaker culture complex. In the Mittelbe-Saale region, its southern group is composed by the Baalberge to Bernburg cultural groups, followed by the Globular Amphora culture. With its fertile soils, rivers, salt springs and pasture-land, the environment here was ideal for the agro-pastoral activities of Neolithic communities.

In the course of the 4<sup>th</sup> millennium cal BC, the climate deteriorates and major transformations of technical, economic, social and ideological nature lead to the emergence of inegalitarian societies with new specializations. Food production improves as a result of higher yields, adaptation to local ecological conditions and the extension of exchange networks. New technologies are introduced for transport and working fields. Domestic horses are present on certain sites. These changes are reflected in the symbolic sphere, with domestic animals playing an important role.

In order to address the question of animal exploitation in this region and study its development between 4200 and 2800 cal BC, well-established and effective methods were applied. The approach is multi-thematic, including not only species determination, counts (number, weight, minimum number of individual animals, minimum number of skeletal parts, and so), osteometry (withers height, index of gracility, logarithm size index), gender distinction, slaughter age estimations and paleopathology, but also reconstruction of the life-stories of bones, carcass processing and preparation for consumption, through taphonomy and spatial analyses to determine where different activities took place. The scales of analysis are intra-site and inter-site. Unpublished faunal remains from two ditched enclosures – Wallendorf “Hutberg” (c. 3700-2930 cal BC) and Salzmünde “Schiepzig” (c. 3400-3000 cal. BC) – are studied and then compared to 29 published assemblages. In total, over 33 000 animal remains are analysed.

This holistic approach has three main objectives. The first is to make a detailed characterization of the technical sub-system of exploitation of animal resources. Next, man-animal

relationships are explored within the various cultural groups. This leads finally to a regional synthesis, integrating all aspects of animal exploitation in the Mittelbe-Saale region and its development through the period 4200-2800 cal BC.

At Wallendorf, the faunal remains (NR = 1648) come from 44 features, most of which are pits. The assemblage includes some complete bones (18%), bones with butchery marks (9%), fractured bones (32%) and burnt bones (13%). There are three concentrations of animal bones, indicating zones near the place meat was eaten. The faunal remains from Salzmünde (NR = 8141) come from 120 features, mostly pits, where the bones are less fragmented than in the graves. The assemblage includes some complete bones (17%), bones with flint marks (3%), fractured bones (30%) and burnt bones (18%). The bones are unevenly distributed in the excavated areas. On both sites, bones had been left in the open air for varying lengths of time and 3% of bones show traces of gnawing by animals.

In the study region, the meat food economy is based on stock-raising and cattle (*Bos taurus* Linnaeus, 1758) are the principal source of animal-derived products. From Baalberge to Bernburg, caprines (*Ovis aries* Linnaeus, 1758/*Capra hircus* Linnaeus, 1758), mainly represented by sheep (*Ovis aries*), are the second most important exploited species. At the end of the period, pigs (*Sus domesticus* Erxleben, 1777) increase in importance. Dogs (*Canis familiaris* Linnaeus, 1758) and horses (*Equus caballus* Linnaeus, 1758) are quite rare. There is variety of birds and fish, the former used for manufacturing tools and the latter playing a role in burial rites. Shell-collecting and game-hunting are practiced in different biotopes. A few sites which stand out from the others in terms of hunting, collecting and fishing are probably specialized sites or hunting camps.

Cattle and sheep are raised for mixed exploitation, although some sites are apparently more specialized. For example, meat exploitation predominates at Quenstedt, Krautheim is more involved in dairy products, and at Salzmünde cattle are used for traction and sheep for textiles. Bulls are castrated to provide a large supply of tender meat and/or docile individuals for traction. At least during the Bernburg period, rams are also castrated for meat and/or textile exploitation. Pigs are raised to provide a supply of tender meat. On a few sites, dog and horse meat are also eaten. On a number of sites, pathologi-

cal deformations were observed on bovine bones, reflecting skeletal stress. The three main domestic species show some dental anomalies, and bone fractures were observed for cattle, caprines, pigs and dogs.

Since their domestication, cattle have decreased in size and their withers height varies from 106 cm for a cow to 142 cm for an ox. The mean size of cattle increases during the 4<sup>th</sup> millennium cal BC due to a higher number of castrated bulls in the herds. Sheep morphology is less variable because the size varies between 60,2 cm and 64 cm. Hybridization between pig and local wild boar (*Sus scrofa* Linnaeus, 1758) is unlikely, as both can clearly be distinguished, with a lower withers height for pigs (69,8-84,6 cm) than for boars (97,1-104,8 cm). Pig size decreases through time, probably due to selection of more profitable individuals. Dogs look proportionally like wolves (*Canis lupus* Linnaeus, 1758), but their average withers height of 42 cm is significantly smaller. The height of horses varies from 125,9 cm (Halle Dölauer Heide) to 133,6 cm (Großobringen).

Wallendorf and Salzmünde provide the most detailed evidence for carcass processing. In general, the *chaîne opératoire* of butchery is rather classical, but the cut patterns vary from one species to another and from one site to the other. This can be related to differences between animal size and site function.

Observed recurrences give some indication of symbolic practices. Deposition of animal parts is attested since the Baalberge. Burials of complete animals are known at least from the Salzmünde cultural group and continue as late as the Globular Amphora culture. Cattle are the most common species in these burials, but there are also dog, sheep, pig and some wild animals, such as red deer (*Cervus elaphus* Linnaeus, 1758) and fox (*Vulpes vulpes* Linnaeus, 1758). This evidence can mostly be seen as intentional deposits in a funerary context. Fire and destruction play a role in funeral rites, as at Salzmünde.

In conclusion, the combination of various archaeozoological methods broadens our knowledge about relationships between Neolithic people and the animal world, through a period of change in the 4<sup>th</sup> millennium cal BC, in a region where farming is the prime source of cultural wealth.

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