ANIMAL REMAINS FROM THE LATE MEDIEVAL AND EARLY MODERN AGE CASTLE OF GRAFENDORF, LOWER AUSTRIA A PRELIMINARY REPORT

A KÉSŐ KÖZÉPKORI ÉS KORA ÚJKORI GRAFENDORF KASTÉLY (ALSÓ-AUSZTRIA) ÁLLATMARADVÁNYAI – ELŐZETES JELENTÉS

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Abstract

Excavations at the castle of Grafendorf in Stockerau, Lower Austria, 20 km NW of Vienna, revealed 2561 animal bones. The remains were found in layers and structures ranging from the late 14th to the early 16th century in time. The archaeozoological analysis in conjunction with the archaeological and historical investigations shows evidence for the high social status of the castle's owners or inhabitants on the basis of butchery marks and meat consumption habits, as well as the evidence for hunting. Further conclusions concerning the keeping and breeding of animals and the environment of the medieval castle are difficult to draw mainly due to the lack of statistically reliable quantities of data. Nevertheless hypotheses are formulated that should be subject to future investigations.

Kivonat

A stockeraui Grafendorf kastély (Alsó-Ausztria, Bécstől kb. 20 km északnyugatra) ásatása során 2561 állatmaradványt hoztak felszínre. Ezek a XIV–XVI. század közötti időszakra keltezett rétegekből és objektumokból származnak. A régészeti és történeti kutatással párhuzamosan végzett régészeti állattani vizsgálatok a kastély egykori birtokosainak és lakóinak magas társadalmi állására utalnak a csontokon ejtett vágásnyomok, a húsfogyasztási szokások és a vadászat bizonyítékainak alapján. Statisztikailag megbízható mennyiségű adatok híján a kastély környezetében tartott és tenyésztett állatokra vonatkozó további következtetéseket egyelőre nehéz levonni. Az eddigi megfigyelések azonban alkalmasak a további kutatás számára hasznosítható munkahipotézisek felállítására.

KEYWORDS: ARCHAEOZOOLOGY, LATE MIDDLE AGE, LOWER AUSTRIA, CASTLE

KULCSSZAVAK: RÉGÉSZETI ÁLLATTAN, KÉSŐKÖZÉPKOR, ALSÓ-AUSZTRIA, KASTÉLY

Introduction

Grafendorf is a part of Stockerau, a small city in Lower Austria, only about 20 km north-west of Vienna. The excavation site and its historical importance are well known since the 19th century. The first scientific investigations took place in the 1970s, when a retirement home was built and most remains of the medieval fortification were destroyed (summarized by Reichhalter et al. 2005, 374, 375). The latest excavation campaigns were conducted by E. Lauermann and F. Drost of the "Urgeschichtemuseum Niederösterreich" in 2002 and 2003, who were able to examine five different parts of the area which revealed strata from the late 14th to the early 16th century (Lauermann & Drost 2003, 2006; Lauermann 2006). A detailed chronological separation was not possible. Most of the bones were found inside the castle, in its core parts, whereas less than 100 bones are from the surrounding rampart.

A comprehensive study of the archaeological finds, the excavation results and also the historical background were prepared by R. Salzer and led to an interesting picture of the medieval castle and its inhabitants (Salzer 2012a, 2013).

Our current understanding of this archaeological site as a castle and seat of a local lordship is rooted in the fact that both extraordinary archaeological finds and historical sources provide strong evidence for that. Not only written medieval sources contain the names and the history of aristocratic families related to this site, even remains such as a mould for ceremonial bakery, a sun dial and masterpieces of arts and crafts indicate a high social status of the castle's inhabitants (Salzer 2011, Salzer 2012b, 2012c).

Furthermore, 2561 animal remains, of which 2145 were identifiable, were found and could be analysed archeozoologically.

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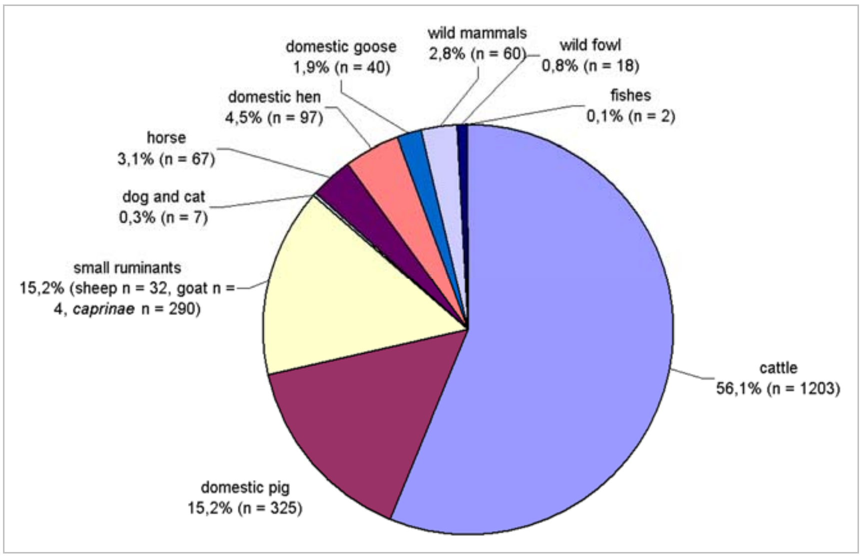

Fig. 1.: Grafendorf Castle, species distribution

1. ábra: Grafendorfi Kastély, állatfajok megoszlása

This short article is a summary of the first results of this examination, comparing the results with those of different medieval sites in Austria and Central Europe and highlighting the outstanding questions worth considering by archaeozoologists, archaeologists and historians dealing with materials of this time period in the area.

Zoological results

The bulk of animal bones originates from domestic livestock: cattle (*Bos primigenius* f. *taurus*), pig (*Sus scrofa* f. *domestica*) and small ruminants (*Caprinae*). Only a few bone specimens of horse (*Equus ferus* f. *caballus*), dog (*Canis lupus* f. *familiaris*) and cat (*Felis silvestris* f. *domestica*) were identified. A remarkably large number of bird remains was revealed during the excavation, in spite of the fact that the bones were only collected by hand. Domestic hen (*Gallus gallus* f. *domestica*) as well as domestic goose (*Anser anser* f. *domestica*) made up the majority of the bird bone record, but wildfowl such as partridge (*Perdix perdix*), crane (*Grus grus*), heron (*Ardea* spp.) and/or stork (*Ciconia* spp.) and lapwing (*Vanellus vanellus*) were also represented by single bone specimens. Wild mammals contributed 60 bones to the record, originating from red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), brown hare (*Lepus europaeus*), wolf (*Canis lupus*) and red fox (*Vulpes vulpes*). The distribution of these species and a summary of bone counts is given in **Fig. 1.**

At least in the case of cattle, small ruminants and domestic pig, age at death was assessed by means of tooth eruption and abrasion data. It can be demonstrated that there was a tendency to butcher juvenile animals showing a preference for the consumption of their meat.

Butchery, meat and bone processing – analysis of the cut marks

A first sample of about 500 animal bones was analysed by Sineád Teresa Fitzgerald and Günther Karl Kunst (Kunst & Fitzgerald 2011) with a special emphasis on the butchery, the cut and chop marks *sensu stricto*. Moreover approximately 2000 bone fragments and their butchery marks were classified in the present study according to the Butchery Mark Code published by Roel G. C. M. Lauwerier (1988) as a standardised means of analysis. On the one hand two different ways of analysis cause problems in summing up and presenting the results. But on the other hand this offers the opportunity to compare results obtained using two different methods of two samples from the same bone record. Although the latter sample is four times as large as the previously studied sub-assemblage, it shows nearly the same picture, with only minor differences in some skeletal parts of the limb or elements which are commonly under-represented (e.g. *patella* or *os centroquartale*), and thus tend to be prone to statistical bias.

It could be shown that most bone modifications resulted from blows inflicted with heavy iron blades, whereas cut marks were represented in much smaller numbers. Moreover the carcasses were not dissected and disarticulated at their weakest points (*loci minores resistentiae*, e.g. the articulations), but often chopped through in the middle of the diaphysis, e.g. in the case of the large long bones of the *stylo-* and *zygopodium*. This pattern could be observed even in the case of compact metapodial bones.

Fig. 2.: Equine metapodial modified as a sledge runner

2. ábra.: Ló metapodiumból készült szántalp

Fig. 3.: Artefact: bovine phalanx with drilled hole

3. ábra: Megmunkált csont, átfúrt szarvasmarha ujjperc

Artefacts

A first inspection of the artificially modified and worked bones brought evidence of different kinds of artefacts. An equine metapodial bone fragment showing a smoothed surface in its proximo-distal direction turned out to be a sledge runner (**Fig. 2.**), whereas some bovine phalanges with holes drilled into their proximal or distal articular ends were interpreted as gaming pieces or possibly parts of other toys (**Figs. 3.** and **4.**).

Fig. 4.: Artefact: bovine phalanx, drilled hole in the distal end

4. ábra: Megmunkált csont, disztális végén átfúrt szarvasmarha ujjperc

A cylindrical piece of red deer antler, sawed transversally at its ends and exhibiting a processed surface, also seems to have been some sort of a gaming piece. The intention behind the proximal fragment of a cattle's metatarsus, worked with a metal blade forming a point at the distal end, remains yet unclear. Moreover a transversally sawed humerus of a wolf and bird long bones stuck into each other deserve attention.

A comprehensive study and a detailed comparison with other known examples in a forthcoming report will help elucidating the exact function of these artefacts.

Outstanding questions and future perspectives

For the time being, the number of data is insufficient to draw statistically reliable conclusions due to the small size of the assemblage. Nevertheless, this bone sample raises some questions that need to be verified by future excavations and archaeozoological investigations, especially from the surrounding regions in Eastern Austria and neighbouring countries.

Wild boar – feral pork – domestic pig?

In contrast to most prehistoric or Roman Period situations in Central Europe, where possibilities to separate wild boar from domestic pig by size and osteomorphological features can be carried out the picture was more complex in this case. In several cases it turned out to be a real problem to decide whether we have to deal with the remains of wild or domestic animals. Unfortunately, most pig bones are damaged by butchery. As a consequence, only a few measurements could be taken and thus there is no opportunity for an objective, osteometric comparison with pig bones from other archaeological sites. Nevertheless, empirical data suggest evidence for exceptionally large individuals. It is just not possible to recognise a pattern or a correlation between size, age and sex, and it is obvious that there are some large animals even among the juveniles, which can at least be confirmed by the immature structure and surface of bone fragments. These bone remains thus cannot be readily attributed to groups of "large sized" or "small sized" animals, because the borders are fluent and not clear-cut. Keeping in mind the discussion concerning different forms and traditions of pig herding, management and breeding in medieval Europe, these signs may point to feral pig husbandry and a hybridisation between the domestic and wild forms.

During the early 1980s the large size range of the pigs observed at the castle of Gaiselberg (Lower Austria) was understood as a result of improved breeding and feeding conditions in riverine woodlands that offered a sufficient food supply for domestic stock (Spitzenberger 1983, 127). Recent hypotheses tend to include the possible genetic impact of wild boar as well (Bartosiewicz et al. 2010, 92). This could offer an explanation for the broad range of variation in the size of pig remains at the early modern age fortification of Bajcsa Vár in South-Western Hungary (Bartosiewicz 2005, 110). Herds of domestic pigs kept in a more-or-less feral state in the woods and wetlands around medieval settlements and castles may have attracted their wild relatives, leading to hybridisation and the introgression of wild boar genes responsible for an increase in body size. A similar situation is suspected at the Dominican monastery in Tulln, Lower Austria (personal communication by Günther Karl Kunst and Konstantina Saliari).

Only thorough statistical and osteometric analyses could provide scientific support for these hypotheses. Moreover comparisons with archaeozoological data from other archaeological sites also need to be considered in order to arrive at a profound archaeological and historical interpretation. For the time being it is impossible to either reject or confirm these ideas about medieval pig husbandry.

Modern age cattle breeds?

It is well known in archaeozoology that the appearance of new breeds of livestock may reflect economic, social or cultural changes. The criteria for or features of a potential "breed" are derived from either morphological traits of the crania or postcranial skeletons or the cumulated osteometric data gained from larger bone samples.

The interpretation of cattle remains and bone measurements from Grafendorf suffers from similar methodological problems as was discussed in relation to pig. Observations during the study can only partly be supported by the small number of measured bones, which allow only limited conclusions. On the one hand, a comparison of long bone fragments with modern cattle breed reference specimens in the collection of the Vienna Institute for Archaeological Science (VIAS) showed that cattle from Grafendorf shared more common features in size and shape with modern cattle than with the well known types of prehistoric, Roman Period or early medieval types. On the other hand, measurements of 21 proximal phalanges were suited for a simple comparison with data from other archaeological sites. The result shows that the size of Grafendorf cattle is superior to comparable contemporary sites, but not as large as single specimens might indicate. **Fig. 5.** shows the size distribution and abundance of *phalanx proximalis* specimen from different medieval sites from Austria.

Indubitably, it is necessary to keep the problems and limitations in mind relevant to the osteometric analysis of ungulate phalanges. Neither can we be sure about the position of the phalanges (body side, lateral or medial), nor if they result from fore- or hind limbs (although there are some clues: von den Driesch 1976, 86). The sex of the animals is another factor that might influence size and shape, maybe not directly reflecting sexual dimorphism, but simply as a matter of mechanical loading.

In addition single long bone measurements ("greatest length") of a radius and three metapodials can be taken into account in withers height estimations.

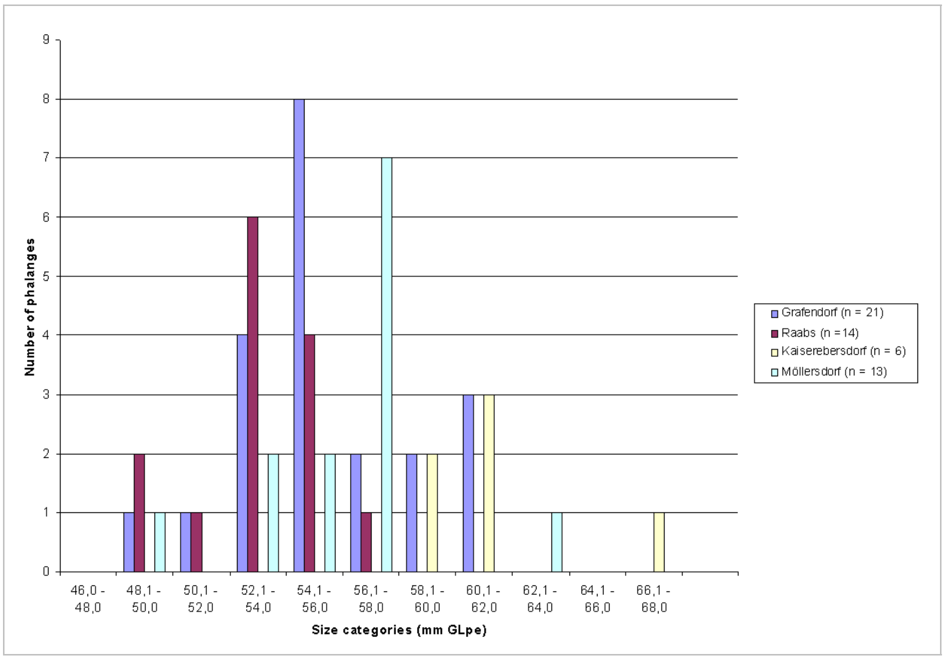

Fig. 5.: Distribution of the peripheral length of proximal phalanges in cattle

5. ábra: Szarvasmarha proximális ujjpercek perifériális hosszának megoszlása

Applying the factors developed by Matolcsi (1970, 118), a withers height of 1.34 m could be estimated for the radius (No. 175, greatest length=311.6 mm) without sexing the bone. On the other hand, sex-related factors are available for the metapodials (Matolcsi 1970, 113). For two metacarpals (No.269 greatest length=187.1 mm and No. 301 greatest length=188.4 mm) a withers height of 1.16 m with the neutral-mean-value-coefficients could be achieved. However, the assumption, that the metacarpals come from cows, lowers the results to 1.13 m and 1.14 m respectively. The third metapodium is a metatarsus (No. 400, greatest length=227.3 mm), although its length can only be estimated, because it is broken. Because of its morphological characteristics this bone can be attributed to an ox. Matolcsi (1970) does not provide data for castrated males. So there is only the neutral-mean-value-coefficient available, resulting in a withers height estimate of 1.24 m. Because of the increase in body size of castrated males, a somewhat higher value has to be expected actually.

Spitzenberger (1983, 129) used other coefficients to calculate the withers heights of the cattle from Gaiselberg (medieval/late medieval) and calculated a mean value of 1.08 m (n=15). The cattle bones from Raabs (early medieval/medieval) led to results of 1.00 m, 1.05 m, 1.12 m (two times) for cows (n=4) and approximately 1.09 m for an ox (Riedel & Pucher 2008, 166). The mean values obtained from the neighbouring castle of Sand (early medieval) are 1.06 m for cows (n=4), 1.14 m for bulls (n=3) and 1.18 m for oxen (n=5) (Pucher & Schmitzberger 1999, 359). The estimation results from Grafendorf exceed these reference data or are close to their upper limits. In the assemblage from Kaiserebersdorf (early Modern Age) mean values of approximately 1.20 m were obtained for metacarpal bones (with a range from 1.03 m min. to 1.27 m max. (n=16)). Metatarsals yielded an approximately 1.26 m withers height estimate (ranging from 1.15 m min. to 1.37 m max. (n=17); Adam & Czeika 2008, 381, 382, 392, Tab. 3). The variation of the latter results may reflect a larger statistical basis, but is also indicative of larger sized modern cattle.

At first glance, the cattle from Grafendorf appears to be “modern” in comparison with these data. But how to interpret the size gap between the divergent results? Future examinations of animal bone assemblages in Eastern Austria will need to exclude the aforementioned biasing factors to prove the hypothesis of large cattle emerging at the dawn of the Modern Age and search for its reasons.

Environment and landscape?

In contrast to prehistoric periods, medieval times offer the opportunity to connect archaeological investigations with historic sources, which was a main aim of the research carried out at Grafendorf (Salzer 2012a). From this point of view, especially more complex questions, such as the relations between human activity and the natural environment, are worth addressing. Zooarchaeology can contribute a small but substantial part to this field of inquiry.

Therefore the bones of wild mammals, wild fowl and fish are in the focus of interest. But whereas animals such as red deer, hare, wolf, red fox and wild boar are less suited as indicators of past environmental conditions on a small time scale (only decades or at most centuries, unlike Ice Age faunas), birds and fish can contribute more accurate information to our understanding of past local ecosystems. They are more closely bound to seasonal conditions and local circumstances, showing more reliable patterns of habitat use.

There are also concerns about excavation techniques such as flotation and sieving used in retrieving even the smallest botanical or zoological remains. In case of zooarchaeology, these specimen are bones of small mammals, birds, reptiles, amphibians and fishes, including scales. At the excavations in Grafendorf the bones were only collected by hand.

Of the nine bird species identified, hen and goose bones can be ascribed to domestic fowl. In two additional species no clear decision can be made: mallard (*Anas plathyrhinchos*) or domestic duck (*Anas plathyrhinchos* f. *domestica*) and stock pigeon (*Columba oenas*) or domestic pigeon (*Columba livia* f. *domestica*). In contrast, partridge, crane, heron and/or stork as well as lapwing are indisputably wild fowl. Though it is debatable which of the latter four species were breeding in the region during medieval times, their presence is linked to wetland conditions.

Archaeological finds such as lead fishnet weights (Salzer 2012b, 176), fit into the environmental picture of a castle and settlement located in the proximity of the Danube and its surrounding wetlands indicating the human exploitation of those natural resources. Nevertheless such discoveries each represent only a small mosaic piece in a far larger picture. The small assemblage of wild animal bones from Grafendorf, especially those of birds and fish simply represent only a "keyhole view" on the wild fauna and local ecological conditions in late medieval times. Broad-based scientific inquiry will be necessary to further investigate and reconstruct human impact on the ecosystems of Danube wetland areas in the form of agriculture, animal husbandry, hunting and forestry.

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