**Erika Gál**

# ANIMALS AT THE DAWN OF METALLURGY IN SOUTH-WESTERN HUNGARY

## RELATIONSHIPS BETWEEN PEOPLE AND ANIMALS IN SOUTHERN TRANSDANUBIA DURING THE LATE COPPER TO MIDDLE BRONZE AGES

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Cover illustration
Skulls of wild boar, cattle and lesser mole rat (photos by Erika Gál)



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# Introduction

Archaeozoological information concerning the Late Copper and Early Bronze Ages in southern Transdanubia are still rather limited. In contrast to the Great Hungarian Plain, where 19th-century river regulations, large-scale tillage and motorway constructions have exposed numerous sites from these prehistoric periods, in largely hilly southern Transdanubia mostly recent excavations and research into environmental history (Fábián 2014; Horváth 2014; Zatykó *et al.* 2007) have begun directing attention to economic conditions and social hierarchies characteristic of these time periods. Changes in the structure of horizontal settlements show the emergence of centers indicative of the socio-economic dynamics resulting from the development of metallurgy, long distance trade and increasing overall mobility.

Fundamental changes from the Copper to the Bronze Age and the transition between various cultures raise similar questions. How much are the changes recorded in ceramic style, metallurgy and mortuary tradition reflected in the modes of food production, bone manufacturing as well as in changing relationships between humans and animals? Are these changes markers of new collective identities? Is it possible to draw general conclusions for these periods and how much variability can be explained by climatic and other environmental conditions? It is just as important to understand how much of the change may have been culturally driven, caused more by social developments rather than shifts in the local environment.

Bronze Age was a term introduced by Christian J. Thomsen (1836) as part of the *Three-Age System*, based on the newly introduced raw material of artifacts: stone, bronze and iron. This evolutionary model became the basis of prehistoric relative chronologies. Originally Bronze Age meant that objects either in copper or bronze were being produced during this period. As the use of copper frequently preceded the invention of bronze, John Evans (1881) distinguished between a transitional Copper Age and the Bronze Age proper, still within Thomsen's three-age system.

While the nuanced technological difference in producing a new, sophisticated copper alloy, bronze, had revolutionary long term implications, it had no immediate effect in the rural backwaters of southern Transdanubia. Although none of the sites under discussion here revealed metal finds, their relative chronologies could be fine-tuned on the basis of Copper and Bronze Age ceramic styles. This time of overall transition can be detected in a number of correlates in material culture, including changes in animal exploitation.

Thanks to preventive excavations carried out along the designated path of the M7 motorway at the beginning of this century, for the first time quantities of animal bone were accumulated in this region whose identification and analysis has been greatly decelerated by the lack of a steady source for post-excavational funding. The thorough evaluation and publication of these valuable results is lagging even farther behind. This is why it should be considered particularly lucky that detailed studies could already be carried out at the Late Copper Age sites of Balatonkeresztúr-Réti-dűlő and Balatonőszöd-Temetői-dűlő during the recent years (Fábián – Serlegi 2009; Gál 2014a; Horváth 2014; Nagy 2014, Serlegi *et al.* 2012; Vörös 2014). Additional results gained by the study of animal bone assemblages from the Early Bronze Age sites of Kaposújlak-Várdomb and Paks-Gyapa during my own project (granted by the Hungarian Scientific Research Fund, OTKA PD 71965) between 2008–2011 have also been continuously published (Gál 2009a; Gál 2011; Gál 2014b; Gál 2015a; Gál 2016; Gál – Kulcsár 2012).

The recent project (granted by the Hungarian Scientific Research Fund, OTKA NF 104792), was aimed at the thorough study of animal bones from a number of Copper and Bronze Age settlements excavated between 1999 and 2007. A special emphasis was laid on cooperation with the excavating archaeologists. However, except for two sites, the detailed archaeological study of settlements is still in progress, to be published in the near future. Those forthcoming monographs will help further interpreting the archaeozoological results in the present work. Extensive studies on the settlement and find materials concerning the EBA localities at Dombóvár-Tesco and Paks-Gyapa have recently been described in a major article and a master thesis respectively (Szabó – Gál 2013; Péró 2016).

## Methods

The animal remains available for study were collected by hand only, wet sieving or dry screening were not applied during these excavations. The animal bones were mostly studied using morphology-based standard archaeozoological methods following international protocols. This includes the identification of bones and building of individual databases for each assemblage. These databases contain information on the species, skeletal part, side, bone fragmentation and size range, and the age of the animal for each fragment. The weight of the remains was also recorded in the case of five assemblages where the bones were not covered by exogenous limestone concretions precluding the use of this method. Additionally, bone measurements were collected using the internationally accepted standard (von den Driesch 1976).

Withers height estimates are given when the appropriate bone(part) was preserved in full length. The methods developed by Matolcsi (1970) and Nobis (1954) were followed in estimating the stature and sex of cattle. The withers heights of sheep, pig and dog were calculated using the coefficients developed by Teichert (1975; 1969) and Koudelka (1885). The stature and metapodial slenderness index of horse were estimated following the methods by Kiesewalter (1888), Brauner (1916) and Vitt (1952).

The analysis of age at death followed the method developed by Terry P. O'Connor that focuses on the dental eruption and attrition in mandible on the one hand, and the fusion of epiphyses on the other (O'Connor 1989: 174; 1991: 248–254; 2003: 165–170). The latter method is based on the sequence of fusion of long bone epiphyses in the skeleton of each species. Although the different points representing the percent of fused epiphyses in the remains of killed animals are connected on the epiphyseal fusion curve, in reality these data represent the structure of the assemblage deposited at the site, rather than the mortality profile of a single animal group, as the bones often derive from several populations. Consequently, in contrast to traditionally used kill-off curves the data may produce an upturn of the curve in the intermediate and late fusing bone groups (O'Connor 2003: 166). In small samples of ageable bone, this phenomenon may also be influenced by random bias.

The anatomical distribution of bones was studied according to Kretzoi's (1968) grouping of skeletal parts from prehistoric sites. Notes regarding taphonomic characteristics (human modification, burning, etc.) and bone pathologies were also systematically recorded.

Tools made from hard animal tissues such as antler, bone and various teeth (including boar tusk) were categorized according to two methods. Detailed typology followed the work by Jörg Schibler, completed on the prehistoric lake dwelling of Twann in Switzerland (Schibler 1981). The other grouping according to the manufacturing continuum was elaborated by Alice M. Choyke. This classification is based on the multiple criteria of raw material selection (species and skeletal part), the degree of manufacturing as well as the extent of use and curation. At one extreme, the raw materials of Class I artifacts are carefully selected. They are thoughtfully planned and considerable labor is invested in their manufacture. Many of them serve a definite purpose and show clear marks of extensive use as well as curation, usually interpreted as a sign of relatively great utilitarian value. Class II or *ad hoc* tools on the other end of the manufacturing continuum were usually produced in a short time from casually picked up butchery refuse or food remains. In their case, both the selection of raw material and manufacturing are inconsistent and such tools typically do not show marks of curation (Choyke 1997). Most worked animal remains can be seen as being in-between these extremes but closer to one end than the other.

Digital photographs were taken of the most important animal remains, such as horn core types, skulls, skeletal parts of rarely occurring species (e.g. brown bear, wild cat and rodents), tools and bone pathology.

Radiocarbon dating was carried out by the Isotoptech Public Limited Company, successor of the Hertelendi Laboratory of Environmental Studies (Institute of Nuclear Research of the Hungarian Academy of Sciences, Debrecen) in order to determine the absolute age of certain bones (*Appendix 1*). Preference was given to rarely occurring horse remains and to artifacts found in reliable stratigraphic positions as they offer dates for the archaeological context, as well as the animal identified and the style of bone working. Samples from the dated horse remains were also handed over to the Laboratory of Archaeogenetics of the Institute of Archaeology, Research Centre for the Humanities, Hungarian Academy of Sciences for aDNA analyses to be accomplished in the future, following the publication of this volume.

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