Book Reviews

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DRAUGHT CATTLE: THEIR OSTEOLOGICAL IDENTIFICATION AND HISTORY. *Annalen Zoölogische Wetenschappen / Annales Sciences Zoologiques* Vol. 281. Koninklijk Museum voor Midden-Afrika, Tervuren, België / Musée Royal de l'Afrique Centrale, Tervuren, Belgique. ISBN 90-75894-20-1. (Soft cover; 147 pp. Including 94 figures; 1200 Belgian Francs from the Publication Service, Royal Museum of Central Africa, 3080 Tervuren, Belgium). *László Bartosiewicz, Wim van Neer, & An Lentacker* with a contribution by *Marian Fabis* 1997.

Until recently the systematic investigation of osteological evidence for paleopathologies in non-human animals has languished. Studies have been scattered through the literature and buried in the reports of specific archaeozoological collections. Important work has been done, but there have been only a few attempts to systematize our understanding of morphological abnormalities in the bones of different animal forms. One outstanding problem has been matching etiology with specific osteological manifestations. This can be done only, if at all, through the detailed study of well-documented modern cases, and still, equifinality is a constant problem.

Recognizing that "Archaeozoologists usually lack a sound data-base for the description and identification of pathology" (p. 11), Bartiosiewicz *et al.* set out to rectify the situation for the extremities of draught (American: "draft") cattle. Their contribution is divided into twelve parts: 1) Introduction, 2) Material, 3) Methods, 4) Components of draught exploitation, 5) Description and interpretation of the macromorphological deformations, 6) Osteometrical analysis, 7) Internal bone structure, 8) Hoofs and shoeing, 9) Aspects relevant to culture history, 10) Conclusions, 11) Bibliography, and 12) Appendix.

The centerpiece of the monograph is Part 5 with its series of 22 illustrations (Figures 19-40) comprising 70 beautifully produced and reproduced photographs of cattle metapodials and phalanges showing differing degrees of pathological or sub-pathological deformation of those bones. The specimens depicted all come from a collection made in Rumania in the autumn and winter 1991. The extremities of 18 draught oxen were assembled from slaughter houses and transported to Belgium, where they are currently housed in the Royal Museum of Central Africa at Tervuren. Life-history information for the animals, in varying degrees of detail depending upon availability, is presented in the Appendix together with a full set of measurements for the extremities. These data, supplemented by metapodial measurements collected from skeletons of Hungarian Gray cattle and crosses housed in the Hungarian Argicultural Museum in Budapest, form the basis for the authors' study. Each of the Rumanian metapodials was evaluated for the following deformations (where possible): proximal exostosis, proximal lipping, distal exostosis, broadening of the distal epiphysis, palmar/plantar depressions, osteoarthritis at the proximal or distal end, transverse striations, fusion of the second metacarpal, and striated facet on the metacarpal. Pathologies were scored on a scale of 1 (normal) to 4 (most extreme), with the same technique used for the phalanges employing a sub-set of the deformations noted for the metapodials. On the basis of the scoring, a pathological index was calculated for each specimen, with the results being displayed as histograms and statistically manipulated for presentation in scatter plots and in tables.

At the end of Part 5, following discussion of factors affecting the degree of deformation and of spavin, the authors apply their techniques to archaeological material from a Roman site at Namur, Belgium. Here they come upon a shortcoming of their approach, namely that pathological indices can only be calculated for complete bones. This is

particularly a problem for metapodials, which usually occur fragmented in archaeofaunal collections. It would seem to this reviewer that comparing simple percentages of degree of expression of the different deformations for each skeletal part might be a way around this problem.

From qualitative scoring in Part 5, the authors move to quantitative analysis of measurement data in Part 6. Employing standard statistical and graphic approaches (discussed in Part 3), they examine age and sex related variability in cattle extremities. The relationship between the two Parts (5 and 6) lies in the effects that bone apposition due to traction stress has on element dimensions. What is not clear either in Part 3 or Part 6, however, is the degree to which extreme pathologies are reflected in the dimensions reported. Most analysts note when a dimension appears to be affected by pathology; unfortunately this was not done in the Appendix.

In addition, a further point needs to be made in relation to work on modern specimens and to Part 6 in particular. While it may be possible to identify statistical correlation between demographic attributes and bone measurements for specimens of known age and sex, to work the other way using archaeological materials is problematical. Each ancient specimen came from an individual of a particular sex and age at death. To identify the sex and age of that specimen, however, may be impossible. Instead one is often left with a cloud of points on a scatter plot, the interpretation of which is not necessarily straightforward. The importance of studies such as the current one is that they give us models that are potentially useful for interpretation of populations of archaeological data even if the demographic status of the individual specimen cannot be ascertained.

A laudable feature of the current study is the biological discussion that accompanies the data and their interpretation. Of particular value is the presentation in Part 4 that discusses the different factors that might affect the manifestation of morphological changes in extremities of draught animals (loading, harnessing, terrain, shoeing, duration and frequency of work, speed, and team size). In addition the short part (7) on internal bone structure provides important insights into the effects that traction may have on Haversian systems. The study by Marian Fabis draws on previous work carried out by Paaver and others, much of which is unknown to Western scholars because it is published in Russian or in rarely accessed Eastern European journals. At the same time, however, references to Western literature on bone microstructure and biomechanics seem dated. There is considerable scope for further research in this domain.

Draught Cattle is beautifully produced and extremely well edited. The soft cover and the binding seem durable. Even though the book is printed on glossy paper and contains a large number of excellent photographs, it is very reasonably priced. The authors are to be congratulated on the production of a fine piece of work that not only should be on the bookshelf but should be used by every archaeozoologist who studies animal bones from sites where draught cattle are likely to have been employed. This study can also serve as a model for those future studies that can be expected from members of the newly formed Veterinary Paleopathology Working Group of the International Council for Archaeozoology.

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