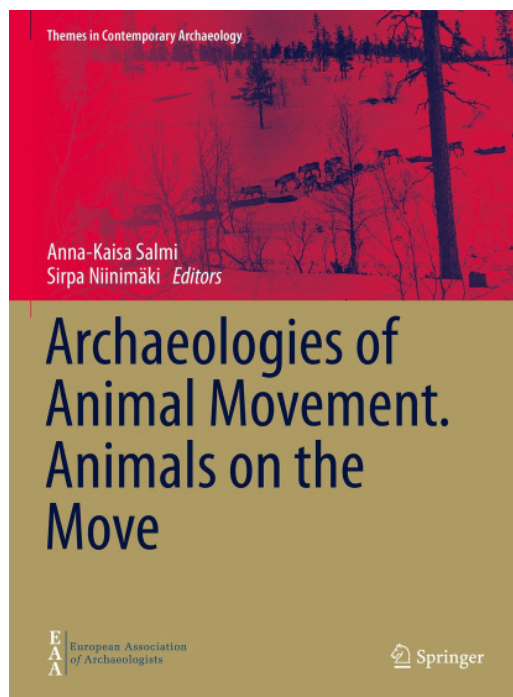


Anna-Kaisa Salmi & Sirpa Niinimäki (eds): *Archaeologies of Animal Movement. Animals on the Move. Themes in Contemporary Archaeology*. Springer, Cham 2021. ISBN 978-3-030-68744-1. 106 + vii pp.

One of the latest instalments in the European Archaeological Association-backed ‘Themes in Contemporary Archaeology’ series from Springer, this volume has its roots in a session entitled “Understanding Activity Patterns of Animals: Methods, Applications, and Human-Animal Relationships” at the 2018 EAA conference in Barcelona. As one of many zooarchaeologists who missed that conference due to a clash with the quadrennial International Council for Archaeozoology meeting in Ankara, but who would surely have attended the session given the chance, I was excited to see the volume emerge.

Animal movement is a surprisingly under-discussed topic within archaeology, as the editors – Anna-Kaisa Salmi and Sirpa Niinimäki, both of the University of Oulu – note in their helpful two-page preface. That is not to say that movements of animals at a range of scales are not the focus of a considerable amount of (zoo) archaeological research – they are, as demonstrated by the 18 papers that comprised the EAA session – but rather that it is seldom explored systematically as a topic. This is a shame, because ‘animal movement’ can cover a huge range of spatial and temporal scales, and of degrees of human intervention: from habitual daily activities, through seasonal migrations, to one-off long-distance droving. As the editors argue in their opening chapter, the relationships between these scales are complex and worthy of more explicit attention, not to mention improved clarity in the vocabulary used.

Organising a coherent conference session can be a challenging task, and the resulting publication still more so. Quality can be hard to assure, and authors may shy away from publication in traditional conference volumes with their often limited reach, or may indeed be presenting



previously published work. Contributions may stray off topic, or else be concentrated in one well-trodden corner of the broad field marked out by the organisers. In this context, Salmi and Niinimäki are to be congratulated on assembling a varied and interesting collection of nine papers that run the gamut from daily foraging activities to continental-scale imports of breeding stock, while surprisingly steering largely clear of some of the more commonly covered facets of animal movement. A priori, one might have expected contributions to a conference session on animal movement to gravitate towards the larger-scale end of the perennial topics such as transhumance or ‘on-the-hoof’ food supply to urban settlements, but neither really features here. Transhumance in particular is only mentioned in passing in two of the nine articles, but then has been well covered in a previous EAA volume (Costello & Svensson 2018). While it is true that a couple of the papers in *Archaeologies of Animal Movement* are more peripherally tied

into the volume's theme than others, all remain valuable and complementary contributions.

In addition to varying scales, the nine chapters cover a range of taxa, periods, and methods. Geographical scope is largely limited to Europe, reasonably enough for an EAA volume, with the exception being Tekla Schmaus' study of Semirech'ye in Kazakhstan. Given the editors' own interests it is perhaps unsurprising that the volume is weighted towards Fennoscandia (four papers, with a further two on northern Europe) and reindeer (three papers), but most of the major Eurasian domesticates are also covered, with two papers each on cattle and on horse, one primarily concerning caprines, and one focusing on dogs and chicken. Methodologically the collection is impressively broad, with conventional zooarchaeology, pathological and enthesal change studies, stable isotopes, cementum annuli analysis, and historical sources all represented.

The opening chapter by Salmi and Niinimäki does an excellent job of articulating the editors' approach to animal movement through their own work on reindeer. Situating their research agenda within the idea of multispecies archaeology (see e.g., Pilaar Birch 2018) and the broader 'animal turn' within the humanities, they argue for the importance of appreciating the "bodily presence" (p. 2) of animals within human societies and the physical and personal nature of their interactions with humans. These are points with which it would be hard to disagree, but it is sometimes difficult to know how to bring such thinking to bear on zooarchaeological research in practice. Salmi's and Niinimäki's answer involves a focus on meeting points, an approach that helps to bridge the different scales of animal movement within their case study of northern reindeer herders, from day-to-day feeding and care to seasonal migrations. In the process, they provide some insights into concepts and processes of domestication that may be food for thought for researchers working on other herd animals.

This position statement from the editors represents a valuable perspective for studies of all extensively herded livestock species, but it is particularly useful in setting the scene for the two more detailed studies of reindeer in the volume. The first of these, by Emily Hull and colleagues (Chapter 4) explores pathology rates.

The paper starts with a primer on the historical and ecological differences between wild forest reindeer and potentially domestic tundra reindeer (*Rangifer tarandus fennicus* and *R. t. tarandus* respectively) in Fennoscandia – extremely useful to those of us working at more southerly latitudes, for whom reindeer are mostly encountered as occasional antler imports at most! Working from modern collections, the authors demonstrate a markedly higher rate of trauma in wild forest reindeer than in free-ranging domestic tundra reindeer, raising the possibility that pathology rates might in future be used as an indicator of subspecies and/or domestication status – although the authors recognise and discuss the complexity of possible causes, as well as potential biases inherent in their samples.

A second specialist chapter on reindeer assesses another under-explored potential indicator of domestication: Salmi and Niinimäki (Chapter 5) turn to enthesal changes, i.e., modifications to the structure of muscle and tendon attachments that might reflect different life histories and activity patterns. Since wild reindeer spend much of the winter digging for lichen, provision of winter fodder by humans might be expected to result in reduced forelimb activity and hence enthesal changes. In a very promising study, the authors demonstrate just such a difference between modern zoo-kept and free-ranging reindeer, in *Biceps brachii* attachments on the proximal radius. They go on to show that a small archaeological collection from the Sámi offering site of Unna Saiva, dated as early as AD 1200, diverges significantly from the free-ranging sample, and hence may represent managed individuals. The authors caution, however, that both age and body size are potential confounding factors. This note is picked up and developed further by Markku Niskanen and Marion Bindé (Chapter 2), who – in the most strictly methodological paper of the volume – explore the relationship between size and expected physical strain in horses. While much of the technical detail here may be beyond the typical reader of this volume, the implications are clear: strain increases with size and future studies of enthesal changes must take body size, as well as age and sex, into account.

The second horse-based study is at the opposite end of the spectrum in terms of methods

and scope: Daniel Makowiecki and colleagues (Chapter 3) present a broad overview of horse-human relationships in early medieval Poland. In some respects, this is the most traditionally zooarchaeological paper in the collection, making use of metrical, age-at-death, pathological, and contextual analyses. It also draws fairly heavily on historical evidence, although in very broad terms given the limited sources available in this period. The discussion of horse remains from the remarkable offering site of Żółte site 33 on Zarańsko Lake is a highlight here, albeit based on previously published work (Makowiecki & Makowiecka 2014). Giedrė Piličiauskienė (Chapter 9) also integrates historical and zooarchaeological data, in a rather more focused study on the import and breeding of improved Dutch cattle in post-medieval Lithuania. Alongside a detailed historical case study of early cattle breeding/improvement efforts by the Radziwill family in the late 17th century – against the backdrop of war with Sweden – Piličiauskienė uses metrical data from urban zooarchaeological assemblages to show that cattle overwhelmingly remained small until the 19th century, when a second wave of import and improvement efforts took hold. Her work underlines the importance of mixed methods: zooarchaeological data alone would have missed the historically significant 17th-century efforts, whereas reliance on historical sources in isolation might have overstated the impact on Lithuanian cattle as a whole. As with previous studies of livestock improvement in other regions (e.g., Thomas et al. 2013), there is also a potential mismatch between accounts of breeding efforts on rural estates and zooarchaeological assemblages that primarily reflect the subset of livestock reaching urban markets.

Perhaps surprisingly, only two of the papers apply stable isotopic methods – though again one might note that another fairly recent EAA volume has addressed a related theme (Kristiansen et al. 2017) – and they do so in very different ways. Aurora Grandal-d'Anglade and colleagues (Chapter 6) explore carbon and nitrogen isotopic values in bone collagen from dogs and chickens (and a range of comparanda) at eight Ukrainian sites dating from the 6th century BC to the late Kievan Rus' period (12th–13th century AD). The link specifically to animal movement here is more tenuous than for some

chapters, but the paper is a valuable contribution to understanding past management of these two omnivores in a region with little previous data. Overall, the conclusion is of remarkable dietary diversity, with high $\delta^{13}\text{C}$ values in many dogs and chickens indicating significant consumption of C_4 plants – reasonably assumed by the authors to represent millet. I was a little surprised that possible inputs from marine resources or diadromous fish weren't also considered, despite six of eight sites being close either to the coast or to the Dnieper. Marine consumption would conventionally be expected to elevate $\delta^{15}\text{N}$ values beyond those seen here, but this may not be true of Black Sea fish – which by analogy to both the Mediterranean and the Baltic are likely to have significantly lower $\delta^{15}\text{N}$. Clearly there is a pressing need for new marine baseline data from the region to assess this possibility.

The second isotopic study, by Karl-Göran Sjögren and colleagues (Chapter 7) tackles questions of animal movement more directly, using strontium isotope data from cattle teeth to infer patterns of movement in the Falbygden region of western Sweden during the Funnel Beaker Culture (TRB) period. Much of the data discussed is previously published (Sjögren & Price 2013), while some detail of new high-resolution sequential analyses is held back for a future publication. The previous bulk data demonstrate considerable movement between Falbygden and surrounding areas – more than half the cattle appear not to have been locally born – but most strikingly the new sequential data indicate remarkable variation in movement patterns between individuals. Seasonal transhumance is convincingly ruled out by the authors, who argue instead that this pattern of idiosyncratic “trajectories through the landscape” (p. 80) is best explained by generalised exchange between groups, presumably situated within systems of risk buffering, social transactions such as bride-wealth, and so on.

Chapter 8, by Tekla Schmaus, analyses growth rings in dental cementum to assess season-of-death, and by extension mobility, of caprine herds at several sites in Semirech'ye region, Kazakhstan spanning the Late Bronze to Iron Age transition. This method has seen surprisingly little attention within zooarchaeology since a landmark publication by Lieberman (1994)

almost 30 years ago, so it is good to see an effective application of it. Schmaus does not report new primary data here, but rather uses the space and flexible format of the conference volume to provide a summary and thorough discussion of detailed results published elsewhere (Schmaus et al. 2018; 2020). Having demonstrated a lack of clear change between Bronze and Iron Ages – site occupations appear more-or-less year-round in both periods, contrasting with previous models of highly mobile Bronze Age pastoralism – Schmaus discusses the possible implications for social organisation and particularly the impact (or lack thereof) of Scythian influence.

Taken as a whole, *Archaeologies of Animal Movement* doesn't quite fall into the category of a must-have for zooarchaeologists – with the exception of those particularly interested in reindeer! – but it certainly represents a valuable addition to libraries and bookshelves. The papers it contains are all well worth reading individually, and they come together to form a coherent and in places thought-provoking collection. There are relative gaps in thematic coverage – transhumance, driving – but as noted above these are precisely the topics most widely explored elsewhere; conversely, Salmi and Niinimäki have managed to produce a volume in which the conventionally less explored aspects of animal movement get the most attention, and that is surely a good thing.

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