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The postmortem exposure interval of an Iron Age human bone assemblage from Alken Enge, Denmark

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ABSTRACT

Periods of exposure of corpses are a well-known phenomenon associated with battlefields and other conflict-related contexts involving numerous individuals. The identification and characterisation of these periods of exposure are often central to the interpretation of the sites. As such, damage to the bones may be a valuable source of information in this respect.

The focus of this study is on estimating the exposure sequence of an Iron Age assemblage of 2335 human bones recovered from Alken Enge, Denmark, by examining the damage patterns caused by scavenging animals. The prehistoric deposition of these bones in the lake, in an anaerobic, non-corroding environment, has resulted in their preservation to an exceptional degree, allowing detailed taphonomic studies of the postmortem exposure interval prior to deposition. The anthropological analyses are supported by histological analysis of bone micromorphology.

Patterns of animal damage on the Alken Enge bones are consistent with gnawing on proximal and distal ends of long bones and fresh breaks caused by large scavenging animals such as wolves and domestic dogs. The lack of rodent gnawing, fractures in dry and weathered bones and the absence of evidence for bacterial attack, together with the presence of framboidal pyrite, suggest that the bones were subjected to limited subaerial exposure, dismembered and partly defleshed before being deposited in the lake in prehistory.

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1. Introduction

Conflict-related depositions of human remains are known from several European prehistoric sites (Stadler et al., 2004; Jantzen et al., 2011; Redfern and Chamberlain, 2011; Thorpe, 2013). Both practical and ritual aspects imply that these finds often have complex depositional histories, whereby the bodies of fallen warriors were subjected to varying periods of exposure and to various forms of treatment prior to final deposition. This applies in various ways to some of the largest Iron Age sites, such as Ribemont-sur-Ancre, Gournay-sur-Aronde both in France and the early Roman-period site of Kalkriese in Germany (Lejars, 2001, 2014; Brunaux et al., 2003; Grosskopf, 2007; Wilbers-Rost and Rost, 2009).

The Alken Enge site, in central Jutland, Denmark, represents a new, recently excavated example of the deposition of the remains of a large contingent of supposed warriors, where these remains appear to have a complex pre-depositional history. The bones have been radiocarbon-dated to the early 1st century CE (Holst et al., forthcoming) (Fig. 1).

The site was first noticed in the 1800s, when numerous disarticulated human bones were uncovered during peat digging and drainage work over a 40 ha area in the Alken Enge meadows (Fig. 1). Since 2009, an interdisciplinary research project has been engaged in the excavation and analysis of the human remains in the meadows, focusing on one of the presumed main concentrations within the complex. The wetlands were originally part of a lake, Mossø (extent today 2×10 km), and the finds are concentrated along the shores of the lake as they were in the Roman Iron Age, and particularly by a channel between two lake basins (Søe et al., forthcoming). This is also the area that has been the main target of the project's excavations.

A total of 2335 human bones or bone fragments have been recovered from the site, and the minimum number of individuals (MNI), based on the left femora, is 82. A range of established methodologies have been used to determine the sex and skeletal age of the individuals (Buikstra and Uberlaker, 1994; Bass, 1995; White and Folkens, 2000; Ubelaker, 1999). The Alken Enge assemblage appears to represent an entirely male population and most of the bones, 1613 in total, are of young adults and adults between 20 and 40 years of age. Subadults, less than 20 years of age, are represented by 106 bones, and mature individuals, between 40 and 60 years of age, are represented by 28 bones, whereas

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for 588 bones it was not possible to determine the age of the individual. Several of the bones show clear traces of injuries caused by weapons such as spears or lances, swords and axes; and weapons and fragments of weapons were also found scattered among the bones.

The sediments and the finds circumstances indicate that the bones have been subjected to limited redeposition in the water. Today, they are located under 2 m of sediment and up to 1 m below the present water table in a pH-neutral environment that has ensured very favourable preservation. This allows detailed characterisation of the taphonomic processes associated with the early stages of decomposition.

Based on the taphonomic evidence and finds circumstances, the bones are interpreted as representing the remains of a conflict, which resulted in the death of a large contingent of warriors. The corpses lay for some time exposed to animal activities on dry land, before the skeletonised and disarticulated bones and some articulated remains were collected and deposited in the lake, together with a few weapons. Following deposition, the human remains gradually became covered by lake sediments and the lake basin developed into a bog.

The finds recovered from Alken Enge, stratigraphically and in terms of the available dating evidence, appear to originate from a single episode, suggesting they are the result of a relatively large-scale conflict (Holst et al., forthcoming). Their date coincides with a tumultuous period in northern Europe, with the maximum northern expansion of the Roman Empire to a few hundred kilometres south of Alken Enge, and with ensuing conflicts among Germanic peoples (Burmeister, 2009). This is reflected in the archaeological record of Jutland by an increasing presence of martial aspects between the Pre-Roman Iron Age (1st century BCE) and the Roman Iron Age (1st–2nd centuries CE) in the form of weapon burials and defensive structures (Hedeager, 1992; Ethelberg, 2014).

The deposition of the human remains in the lake can be seen in relation to a ritual tradition of large-scale, post-conflict depositions of military equipment in wetlands in southern Scandinavia during the Pre-Roman and Roman Iron Ages. This tradition has its chronological apogee

between the 2nd and 5th centuries CE (with sites such as Ejsbøl, Illerup, Kragehul, Nydam, Thorsberg and Vimose), but a few sites date back into the Pre-Roman Iron Age, with the earliest occurrences in the 4th century BCE (Hjortspring, Krogsbølle) (Ilkjær and Lønstrup, 1982; Randsborg, 1995; Rau and Carnap-Bornheim, 2012). However, the Alken Enge site stands out due to its preponderance of human remains and only few weapons, in contrast to the exclusive focus on weapons and personal equipment in the great majority of other depositions.

This paper presents the taphonomic indications of a period of exposure prior to the final deposition of the human remains in the lake.

2. Material and methods

2.1. Damage to bones by scavenging animals

Macroscopic animal damage is classified into three categories: i) markers of carnivore gnawing, ii) bone breakage and destruction patterns and iii) missing bones, disarticulation sequences and consumption analysis. In cooperation with Scandinavian Wildlife Park, Djursland, Denmark, fresh wolf-bitten long bones of domestic calf, wild boar and adult red deer were examined and compared with the archaeological human bone assemblage from Alken Enge.

All available contexts were examined using a low-power hand lens for evidence of canid chewing, cut marks and perimortem trauma and breakage caused by human activity.

2.1.1. Markers of carnivore gnawing

The direct markers of damage from carnivore gnawing are classified into six main categories of tooth marks on the bones: pits, punctures, scoring, furrows, channelled bone and chipped edge (Binford, 1981; Haynes, 1983a; Haglund et al., 1988; Pokines, 2014; Pokines and Tersigni-Tarrant, 2013). Pits are indentations caused by the tips of the teeth as the animal bites down. They occur in cortical bone and are

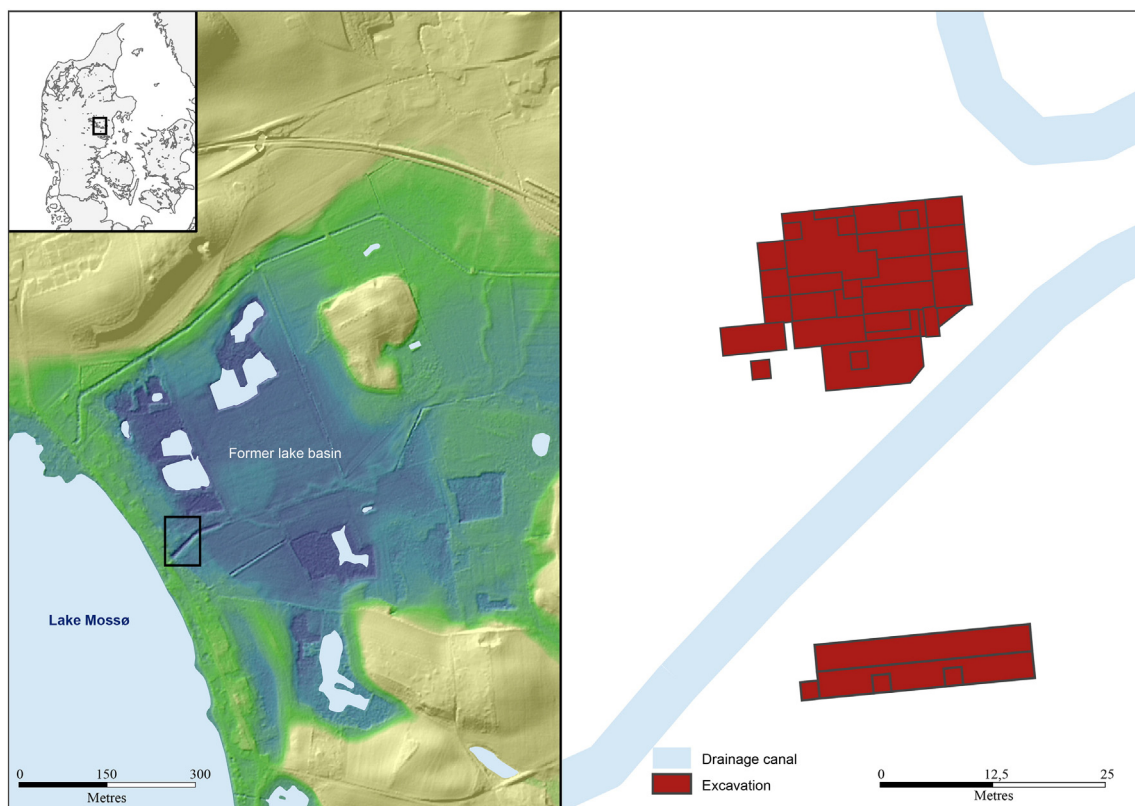


Fig. 1. Location of the Alken Enge site.
Graphics: Casper Skaaning Andersen, Moesgaard Museum.

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