H64 Reconstructing Taphonomical History in Osseous Remains From the Korean War Using Histology

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After attending this presentation, attendees will have knowledge of how different taphonomical processes affect the preservation of bone. Additionally, the aim of this presentation is to show how these processes can be identified using bone histology and how this can contribute to reconstruct taphonomic history of bone.

This presentation will impact the forensic science community by contributing to knowledge on taphonomic processes affecting bone microstructure preservation and how this can help reconstruct taphonomic histories of bone.

Taphonomic processes can alter or destroy information available from skeletal remains. Much research has been done to evaluate bone preservation, to identify diagenetic pathways as well as develop methods to screen for sample quality. One of the research methods that can be used to identify type and extent of bone degradation is thin section histology. The different processes that influence bone preservation leave behind histological features that are preserved through time. This makes it possible to reconstruct taphonomical histories.[1,2] Factors that can be observed using histology are type and extent of microbial alteration, physical damage (cracking), and inclusion or infiltration of exogenous material. The latter can be very informative of the burial environment of the bone; for example, certain minerals only form under specific environmental conditions. Microbial alteration usually occurs relatively soon postmortem and is less dependent on environmental factors but seems to be influenced by deposition/burial methods. Certain types of microbial alteration are indicative for deposition in different (aquatic) environments or can indicate presence of oxygen in the environment (fungi). The presence or absence of bacterial degradation of bone has been linked in archaeological studies to differences in early postmortem treatment of remains.

As taphonomic signatures are preserved through time, information can be gained from their presence or absence. In this study, the taphonomy of remains from the Korean War, which come to the Joint POW/MIA Accounting Command-Central Identification Laboratory (JPAC-CIL) generally from three very different contexts, is characterized. Some of this material was recovered in the Democratic People's Republic of Korea (DPRK). Other samples come from a commingled assemblage of remains that were turned over by the DPRK to the United States government. A third category of samples comes from Korean War remains that have been buried shortly after the war as "unknowns" at the National Memorial Cemetery of the Pacific. Bone samples were examined from these three very different preservation scenarios using histology to identify diagenetic features. The main goal of the study is to characterize the effects of the different postmortem scenarios on bone preservation, and to elucidate the taphonomic history for these samples. Specifically, the effect of secondary burial on bone preservation will be discussed, and how this could be identified through patterns of taphonomic features.

References:

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2. Turner-Walker G, Jans MME. Reconstructing taphonomic histories using histological analysis. Palaeogeogr Palaeoclimatol Palaeoecol 2008;266;227-35.

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