



A66 The Importance of Sitewide Taphonomic Assessments for Highly Fragmented, Comingled, and Heat-Altered Remains From Mass Graves

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The goal of this presentation is to illustrate the importance of pairing a careful archaeological recovery with a detailed taphonomic analysis in forensic anthropology. Specifically, the case of a mass grave from Mexico where burn patterns of highly fragmented human remains were used to map relative levels of heat alteration across the entire site will be addressed. This analysis allowed for questions of site formation to be addressed, not only through examination of the site itself, but also of the human remains.

This presentation will impact the forensic science community by explaining how this case and method of site analysis are important in that they exemplify the importance of human remains in assessing the formation of a forensic scene. Examination of remains in forensic settings typically takes place at the level of the fragment, skeletal element, or individual; however, when methodically collected and catalogued, human remains can contribute to our understanding of the larger site as a whole.

A detailed taphonomic analysis is critical to any forensic anthropological investigation. Unlike other characteristics typically assessed by the forensic anthropologist, such as the biological profile, the amount of information gleaned from a taphonomic analysis is directly related to the resolution of the preceding archaeological recovery. Cases in which the context and association of each fragment are maintained and proveniences are known offer a unique opportunity to examine site-wide patterns of postmortem alteration.

Taphonomy is a relatively new field of research, its name dating back less than a century.¹ In the time since, some aspects of postmortem skeletal changes have become relatively well understood. In the case of heat modification, clear patterns to alteration have emerged, and the beginnings of standardized characteristics to catalog and interpret are coalescing.² Data concerning the level of heat alteration is typically used to identify the pattern of burning on one individual. This cannot always be conducted in highly fragmented and comingled cases; however, the site can be treated as a distinct entity of its own, with different levels of burning based on local hot spots or areas of longer duration heat exposure.

The case presented here involved analysis of thousands of fragments of heat altered human bone from a minimum of 20 individuals. Due to the insurmountable number of specimens, differential ability to identify anatomical location and side of each, and the inability to re-associate remains to individuals, a means for the analysis of site-wide patterns was required. A methodological archaeological recovery had been performed, conserving context of fragments by 1m x 1m square. Fragments were sorted by square and broad anatomical region, when possible. Each collection of specimens was then scored as a group for its level of heat alteration. Scores were based on the overall percentage of fragments that displayed calcination by visual inspection. These scores were mapped across the site to examine any patterns to the burning that may have shed light on the formation of the scene.

Two interesting patterns were clearly visible when considering levels of heat alteration across the site as a whole. First, different anatomical regions revealed different overall levels of heat alteration. The anatomical region demonstrating the most calcination was the cranium, while the pelvic region demonstrated the least. This is interestingly consistent with a normal burning pattern of fleshed remains.² A second pattern emerged with the examination of anatomical regions across the site. When mapped, each region displayed a broad U-shaped area of more intense calcination. Inside this area, there appeared an area of relative sparing of remains, containing considerably less calcination.

While the exact cause of these patterns is not determinable based solely on the analysis of the skeletal remains, they add an additional layer of information that can support other indicators of site formation. By combining taphonomic information with other evidence, questions concerning how many areas of burning may have been active, whether or not the remains were altered before, during, or after burning, if multiple distinct burning events have taken place, and why some skeletal elements may be less represented than others can be explored.

Reference(s):

1. Efremov, Ivan A. Taphonomy: A new branch of paleontology. *Pan-American Geologist*. 74, no. 2 (1940): 81-93.
2. Schmidt, Christopher W., and Steven A. Symes, eds. *The analysis of burned human remains*. Academic Press, 2015.

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