E113 What Forensic Archaeology and Forensic Taphonomy Can Offer to Medicolegal Death Investigation

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The goal of this presentation is to familiarize attendees with the principles, practices, and methods of forensic taphonomy and forensic archaeology, in particular the main advantages and types of information offered by the application of these disciplines at a variety of outdoor and fatal fire scenes.

Although relevant to all forensic specialists, the information and advantages discussed are particularly relevant to those professionals conducting postmortem examinations of human remains, such as forensic pathologists, since their tasks in determining cause and Manner Of Death (MOD) in these complex scenarios are compounded by the additional alteration and layers of information added by the postmortem exposure of the remains to an array of environmental processes and agents. This presentation will impact the forensic science community by illustrating how the correct application of forensic archaeology and the careful consideration of forensic taphonomy can help to improve coordination and information flow between scene and laboratory analysts.

Medicolegal death investigation is a complex multidisciplinary endeavor involving law enforcement, forensic pathologists, and other forensic scientists. The information required by each of these specialists to clarify the death event is obtained from evidence and contextual observations gathered from the body at autopsy, at the crime scene, and from police investigation of circumstances surrounding the event. MOD is presented after carefully piecing together all the information and evidence assembled by the diverse medicolegal investigation teams. The contextual and evidentiary information derived from the scene of the crime always provides one of the key pieces of the puzzle. Every question that relates to both cause and MOD requires some understanding of the physical context of the remains; thus, all members of the investigative team are justified in demanding that best practices be applied to gather this information at the crime scene. At the indoor scene, law enforcement collects and analyzes evidence through comprehensive and well-developed criminalistics protocols that produce robust, detailed descriptions of context, and hypotheses of whether and how evidence is associated to the death event. The goal is to reconstruct the events surrounding death, including who was involved and how long ago it happened; however, scenes such as outdoor ones, burials, or fire scenes pose complex challenges, as a longer or more intense exposure to natural processes and agents adds several layers of alteration and new information, which must be identified in order to strip it from the truly forensically significant layer. This complexity, and the difficulty of identifying and recording all of the relevant parameters at these scenes, often leads to lowered expectations regarding the amount and utility of evidence and information that can be collected at these scenarios, as compared to indoor scenes. This presentation argues and illustrates how the application of forensic archaeological principles, methods, and practices in the processing of these scenes, in conjunction with the guiding principles and framework provided by the discipline and approach of forensic taphonomy, serves to solve these problems, resulting in event reconstructions as comprehensive, reliable, and defendable in court as those from indoor scenes.

Forensic taphonomy has been defined as the study of what happens to a human body after death. Since most of what happens to the body (and evidence) at an outdoor scene is the result of alteration or modification by

natural agents, the recognition and documentation of the specific role played by each of these agents is critical to understanding and explaining evidence displacement, loss, or alteration, and ultimately providing hypotheses of the role humans play in altering a scene or evidence after the death event, representing one of two major assessments provided by forensic taphonomic investigations. The best way to collect this evidence is through the implementation of forensic archaeological practices that require exhaustive descriptions of context (location and immediate scene environmental, climatic and biotic characteristics), careful exposure of the remains while noting stratigraphic relationships, and detailed notation of the spatial distribution of the evidence through a variety of cartographic means, which, in turn, allows for robust hypotheses of association of the evidence to each other and to a particular event. The other primary assessment that a proper forensic taphonomic analysis provides is estimation of Postmortem Interval (PMI) and how long the body has been at this location. These estimates are obtained through careful analysis of context and consideration of biological tissues preservation, as well as temperature, climatic, and other exogenous factors, such as insect and animal predation and alteration. This presentation explains how information for these forensic taphonomic assessments are best acquired, analyzed, and interpreted at the outdoor scene.

Forensic Taphonomy, Forensic Archaeology, Outdooor Scene Recovery