New Forensic Archaeological Recovery Protocols for Fatal Fire Scenes

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Victim remains at fatal fire scenes are typically difficult to detect, recover and handle. All of the burned material at the scene, including biological tissue, is often modified to a similar appearance and bones, in particular, become discolored, brittle, and highly fragmented. As a consequence, these remains are often missed, disturbed, altered, or even destroyed during scene processing with standard crime scene protocols. The added postmortem fracturing, fragmentation and bone loss resulting from these recovery techniques hinder the already difficult task of autopsy and laboratory analysis of burned human remains. This is especially problematic for bone trauma analysis, as its most immediate goal is distinguishing perimortem (forensically significant) trauma, from postmortem (not forensically significant) alteration. The substantial addition of trauma features created by fire and then recovery can result in a daunting analytical
task.

Lack of on-scene recordation of relevant information related to body positioning and contextual relationships of the remains as well as of other physical evidence at the scene, further complicate trauma analysis, biological profile estimation, and event reconstruction.

New scene recovery protocols drawn from forensic archaeological methods are described in this presentation. Six tests of specific scene recovery methodologies were conducted in the last two years in which evidence, including spent bullet cartridges, knives, and euthanized pigs, were placed in house structures that were then burned to the ground. Following a search for evidence by trained fire investigators, forensic archaeologists then excavated the burned matrix and carefully mapped the evidence found *in situ.* The method that yielded the most efficient and effective recovery involved the hands and knees “search/excavation” in which burned matrix was excavated using a “cake-cutting” (i.e., cutting a vertical face) technique working from the outer edges of the excavation corridor or room, inward. This process allowed for the rapid excavation of debris in areas where no significant evidence was located. The excavated debris was removed by buckets and placed on tarps, sorted by provenience unit, where it was quickly sorted by hand and discarded if no evidence was detected, or sieved. When evidence was discovered at the tarps or during the excavation, as well as when the excavation was conducted in the area in close proximity to the victim, the excavation process was slowed and extra precautions taken. The matrix from these areas bypassed the tarp hand sorting and was directly sent for careful screening on ¼ in mesh screens. The debris over the victim was removed via a “top-down” excavation method, thus exposing fully the remains. The remains were photographically documented *in situ*, and mapped both by hand and with electronic instrumentation such as a total station or survey-grade GPS units. Head, distal limbs and any other fragile body regions were protected with heavy-duty plastic wrap to maintain the integrity of the bone. The remains were then placed on a sheet of plywood in a body bag in efforts to reduce further disruption of the remains during transport.

These new protocols were demonstrated to: 1) improve evidence detection and recovery; 2) limit disturbance and further fragmentation of the remains during the recovery; and 3) provide precise and detailed information regarding the position and orientation of the body and related evidence, as well as on their contextual relationship at the scene. Further, these improvements are realized within an efficient timeline.

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