H24 Two Miles and Nine Years From Home: The Taphonomy of Aqueous Environments

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The goal of this case study is to provide insight into how taphonomic factors can produce unusual wear patterns on human remains.

The recovery of human remains from aqueous environments remains a complex topic due to the dynamic nature of the environment. Important to the interpretation of the trauma on the bones is having information regarding: spatial orientation, water temperatures, pH levels, water currents, and abrasiveness of the submerged environment. Various taphonomic forces that affect human remains in water are only beginning to be understood, especially with regard to the estimation of the postmortem interval and bone erosion patterns.

On January 4, 2002, Louisiana State University Forensic Anthropology and Computer Enhancement Services (FACES) lab personnel were called to a small pond near a road in East Baton Rouge Parish. A concerned citizen observed what appeared to be the tail end of a car in the pond and phoned the police. Though various people had noticed the metal protruding from the water over the years, until that day, no one had informed law enforcement. Upon retrieval of the mud-filled car from the pond, human remains were found inside the mangled vehicle. The visible remains were taken to the LSU forensic anthropology laboratory for analysis. A few days later, LSU FACES lab personnel traveled to a local wrecker yard, the location of the retrieved car, in search of any additional remains. Due to the distorted nature of the vehicle, a thorough search of the car was impossible. Using the "jaws of life," local firemen removed the top of the vehicle. This provided the FACES lab personnel complete access to the interior of the car. Additional human remains and personal items were recovered. Through analysis and 19-year-old dental radiographs, which were provided by a retired orthodontist, the remains were positively identified as a man who had disappeared almost nine years earlier.

Other than one right intermediate phalanx of the foot, all bones below the waist were recovered. This was due to the spatial orientation of the lower legs. Various bones of the upper body were recovered. Since the windshield was destroyed, the elements of the body that were not present in the vehicle could have been lost through the windshield opening at the time of the accident or upon removal of the car from the pond. The dynamic environment of the pond also could have displaced some of the elements.

Spatial orientation enhances or impedes taphonomic agents from affecting particular bone surfaces. In this case, the lower legs were protected from abrasive agents in the water by the leather boots the decedent was wearing. The boots were too short to protect the proximal tibiae and fibulae. The proximal ends of the fibulae were completely worn down symmetrically. Both tibiae also exhibited an interesting wear pattern. Each tibial plateau was completely worn away with the exception of a small lateral portion of the plateau. Symmetrical erosion was also evident on the innominates. The innominates were both worn completely away from the iliac crest down to the iliac pillar. Both ischiopubic ramii were also missing. Symmetrical erosion of these elements was caused by a combination of abrasion and spatial orientation. Abrasive agents in the water moving through the vehicle over a period of almost nine years attributed to this phenomenon. Another possible factor in the symmetrical abrasion of the innominates was the spatial orientation of the bones rubbing against the fabric of the car seat.

All human remains recovered from the vehicle exhibited varying degrees of wear and erosion from the aqueous environment. The unique erosion that occurred in this case was a result of abrasion, spatial orientation, and dissolution. This case study demonstrates how an aqueous environment can uniquely alter bone. By understanding the effects that aqueous environments can have on human remains, the forensic anthropologist is able to more accurately interpret the trauma that is evident on bones. This microenvironment provides a distinctive look at the taphonomy that can affect remains in a submerged vehicle.

Taphonomy, Aqueous Environments, Forensic Anthropology

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