



Anthropology Section - 2016

A58 The Roaming Arm: A Literal Outlier

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After attending this presentation, attendees will better understand animal scattering of human remains, distances of transport, and how this may affect search and recovery planning.

This presentation will impact the forensic science community by presenting a case study of a suspected animal transport of a human arm for more than one mile, which exceeds previously documented scatter distances.

Per Haglund, regarding the taphonomy of human remains, dog and coyote scavenging results in consumption, disarticulation, modification of bone, and scattering of remains.¹ Having knowledge of the fauna, flora, seasonality, clothing, postmortem interval, topography, and environment could all impact the distance that human remains are scattered.²⁻⁴ This information is critically important when disarticulated human remains are located in an outdoor setting and recovery is required. In forensic contexts, following the initial discovery and reporting of human remains, it becomes the responsibility and jurisdiction of law enforcement, coroners, and medical examiners to search for any missing remains. Search parameters often are influenced by budgetary constraints; therefore, data on scatter patterns and distances will assist in pre-search planning.

On June 2, 2015, a group of hikers discovered a desiccated, articulated, skeletonized left arm (scapula, clavicle, humerus, radius, ulna, carpals, metacarpals, and most phalanges). These remains were reported to and recovered by the Park County Coroner and Park County Sheriff's Department. A subsequent search in the area by law enforcement, Colorado Forensic Canines, Search and Rescue Dogs of Colorado, Park County Search and Rescue, and Metropolitan State University of Denver Human Identification Laboratory personnel did not result in finding additional human remains.

On July 8, 2015, a hiker went off trail in Park County, CO, and discovered a desiccated, mostly articulated human skeleton. The left arm was missing. The body was exposed and on the ground surface. Underwear, jeans, socks, and boots, remained on the body; a shirt and jacket were nearby.

The body had a rope around the neck and presented as a suicide; body positioning and vegetation discoloration were all consistent in indicating that the remains were at their original deposition site. While it was suspected that the body and the previously discovered arm were from a single individual, the cases were processed separately. Subsequently, the body was positively identified as those of an 18-year-old male. The individual had been reported missing on October 22, 2014, his car was discovered at a Trailhead in Park County, CO, on October 24, 2014, and a suicide note was found inside the car; this initiated a search, but the individual was not found.

Subsequently, the arm was matched to the body (no overlapping remains, the bones were consistent in size, morphology, and degree of decomposition) and both displayed minimal carnivore gnawing and chewing.

When comparing the Global Positioning Coordinates of the body and left arm, it was found that they were separated by a straight-line distance of more than one mile (1,900 meters), which significantly exceeds the documented distances within the literature. Haglund states that, following scavenging, most skeletal elements are recovered within a 100-meter radius of where the body was found.¹ Haglund and others have documented maximum transport of remains at distances of 402, 291, 200, and fewer meters.⁵⁻⁷

A number of factors can play a role in the scatter of human remains including mammals, plants, topography, climate, clothing, and postmortem interval, among others. The remains were located 2,500 meters (8,200 feet) above sea level, in steep terrain with a mix of conifer trees, shrubs, and boulders, exposed to temperatures ranging from -23°C to 24°C (-10°F to 75°F) and monthly snowfall amounts ranged from 8-86 centimeters (3-34 inches) during the months of November 2014 through May 2015. It is important to document these variables to assist with subsequent search planning and briefings.



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Reference(s):

1. Haglund W.D. Sorg M.H., editors. *Forensic taphonomy: the postmortem fate of human remains*. Boca Raton: CRC Press, 2006:367-414.
 2. Kjorlién Y.P., Owen B.B., Arthur E.P. Scavenging activity can produce predictable patterns in surface skeletal remains scattering: observations and comments from two experiments. *Forensic Sc Int* 2009;188:103-6.
 3. Beck J., Sollish G., De Leon J. Animal scavenging and scattering and the implications for documenting the deaths of undocumented border crossers in the Sonoran Desert. *J Forensic Sci* 2015;60(S1):S11-20.
 4. Pokines J.T., Symes S.A., editors. *Manual of forensic taphonomy*. Boca Raton: CRC Press, 2014:201-48.
 5. Manheim M.H., Listi G.A., Leitner M. The application of geographic information systems and spatial analysis to assess dumped and subsequently scattered human remains. *J Forensic Sci* 2006 (May) 51(3):469-74.
 6. Moraitis K., Spiliopoulou C. Forensic implications of carnivore scavenging on human remains recovered from outdoor locations in Greece. *J Forensic Leg Med* 2010;17:298-303.
 7. Spradley M.K., Hamilton M.D., Giordano A. Spatial patterning of vulture scavenged human remains. *Forensic Sc Int* 2012;219:57-63.
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Scavenging, Scattered Remains, Searches