



Physical Anthropology Section – 2005

H59 A Tale of Two Bodies: Separating Commingled Skeletal Remains With Similar Biological Profiles

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After attending this presentation, attendees will gain insight into how separation of two biologically similar commingled individuals can be achieved through meticulous examination, anatomical congruencies and differential weathering patterns.

This presentation will impact the forensic community and/or humanity by presenting two individuals recovered from a remote desert area. At the time of recovery, the skeletal remains were commingled and spread across a square mile. Careful examination of the condition of the remains, anatomical congruencies and radiographic analysis allowed the authors to successfully separate the remains and achieve positive identification on one individual. These results allow the investigators to more aggressively investigate the circumstances surrounding the deaths and the families to bury their loved ones.

Commingling of skeletal remains often confounds investigators attempting to discover the identity of unknown individuals. A recent case in Arizona highlights the difficulties with commingled remains and offers an example of how radiographs, condition of the remains and anatomical congruencies can assist in the separation of individuals in these types of cases.

On June 1, 2004, Sheriff's deputies from Maricopa County, Arizona convened in a remote desert area to recover skeletal remains allegedly discovered by a camper. The first author accompanied the detectives in order to assist with the recovery. Initial survey of the scene indicated that the skeletal remains represented at least two individuals. The anthropologist was able to quickly confirm these findings. Clothing and other artifacts from two individuals were also located during the search. The remains were documented according to standard scene processing protocols. The skeletal elements and clothing were bagged and transported to the Maricopa County Forensic Science Center for examination by the pathologist and anthropologist.

The skeletal remains were incomplete and had suffered from carnivore predation. In addition, one of the initial findings at the autopsy was that these two individuals were both males, very similar in age and height and had little to distinguish them from one another. However, the two skeletons had responded to the environment in very different ways, allowing a preliminary division that could then be verified by more scientific means. The coloration, degree of adherent tissue and overall texture and quality of bone was very different between the two men. The first author performed the initial partition and then the second author confirmed her findings.

After the separation, anatomical congruencies between the recovered elements were evaluated. These confirmed the findings based strictly on observed differences. At the end of this procedure, there were two phalanges, a fibula shaft and miscellaneous bone fragments that could not be assigned to either decedent.

Anthropological assessment based on sternal rib ends, pubic symphysis and epiphyseal closure revealed that the men were in their twenties at the time of death. Long bone lengths produced living stature estimates of 5 foot 10 inches and 5 foot 8 inches respectively. Ancestry could not be accurately assessed due to incomplete recovery. One of the males had bilateral septal apertures of the humeri, a non-metric trait with a frequency of between 4 and 13% based on assessment of known human skeletal series. The other male had a more robust skeletal structure, with heavier elements and more developed muscle attachment sites.

At the time of the autopsy, the case agent had delivered radiographs of a male missing from the area. The radiographs contained images of the thorax, abdomen and right arm. Comparison of the right arm in the antemortem radiographs to the anatomy of the recovered right arm from one of the skeletal remains revealed morphological similarities that supported a positive identification. The right arm in the antemortem and postmortem radiographs exhibited a large sternal aperture in the olecranon fossa of the humerus. Given the low frequency of this non-metric trait in human skeletal series, as well as its proclivity to manifest more often in females and on the left side, this supported the ten other morphological similarities identified between the films. Further investigation by the sheriff's office revealed that this man had gone missing with his close friend and neither had been seen for several months. These findings were in concordance with the condition of the remains.

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Skeletal Remains, Commingling, Radiographic Comparison