H93 Analysis of Commingled Remains Using Archaeology, Anthropology, and DNA: A Case Study from North Korea

Alexander F. Christensen, PhD, and William R. Belcher, PhD*, Joint POW/MIA Accounting Command, Central Identification Laboratory, 310 Worchester Avenue, Hickam AFB, HI 96853; and*
Sarah Bettinger, MSFS, Armed Forces DNA Identification Laboratory, 1413 Research Boulevard, Building 101, Rockville, MD 20850

After attending this presentation attendees will learn how archaeological context, forensic anthropological analysis, and mtDNA analysis can be combined to understand the nature of a commingled skeletal assemblage and identify the individuals represented.

This presentation will impact the forensic community and/or humanity by demonstrating how commingled skeletal assemblages can be very difficult to interpret. Using multiple lines of evidence helps forensic anthropologists to understand assemblage formation processes, segregate the remains of different individuals, and identify the individuals present. This presentation will provide an example of how to understand a complex, commingled assemblage such as may result from a mass fatality event.

Teams from the Joint POW/MIA Accounting Command (JPAC) and its predecessor organization, the U.S. Army Central Identification Laboratory, Hawaii (CILHI) have excavated numerous archaeological sites in the Democratic People's Republic of Korea (D.P.R.K.) in search of the remains of U.S. servicemen who died during the Korean War (1950- 1953). Remains recovered by these teams are analyzed at JPAC, and osseous and dental samples are sent to the Armed Forces DNA Identification Laboratory (AFDIL) for mitochondrial DNA (mtDNA) sequence extraction and analysis. Remains have been encountered in many different depositional circumstances. Some are clearly primary, intact burials, whether of a single individual in a foxhole or eleven individuals in a mass grave. Others are secondary, with the bones of one or more individuals found out of anatomical position. Some of these secondary burials appear to be the result of recent activities by the Korean People's Army (K.P.A.), with whom JPAC teams collaborate. Others appear to be the result of battlefield clean-up activities in the 1950s, or reburial of remains disturbed by farmers at some point in the intervening decades. The authors report on an unusual secondary burial excavated by the CILHI in 2002. This recovery scene does not constitute a mass burial in the strictest sense of the term. None of the remains are articulated and there is a conspicuous absence of vertebrae, ribs, and hand and foot bones. The recovery scene is on a break in slope below a slight draw. Although the assemblage of bones appears similar to those found in obviously staged burials—primarily long bones, from at least nine individuals, with no apparent anatomical ordering—the archaeological context indicates that it is unlikely that the remains had been disturbed in the recent past. The eroded condition of the remains and the absence of smaller items suggest that these materials may have been deposited by flowing water. The apparent random orientation of the long bones suggests that the fluvial process was not linear. This pattern is consistent with the location of these remains in a supposed "eddy" against a bedrock depression. The angular sediment could be responsible for the extreme abrasion and lack of long bone epiphyses, especially in a fluvial environment. Although the remains appeared poorly preserved at a macroscopic level, mtDNA was comparatively well preserved, with sequence data obtained from all twenty samples initially submitted. This sequence data allows the calculation of the minimum number of individuals present (nine). Data has also been compared with that provided by family references for casualties known to have been lost in the vicinity of the recovery scene, indicating that the individuals represented are indeed American soldiers who died nearby in the fall of 1950.

Commingling, Archaeology, mtDNA

 ** Presenting Author*