



Physical Anthropology Section – 2003

H18 Resolution of Large-Scale Commingling Issues: Lessons From CILHI and ICMP

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The goal of this presentation is to introduce a new method of osteometric sorting of commingled skeletal remains.

Commingling of human skeletal remains can obstruct the process of forensic identification, especially when dealing with large numbers of deceased individuals. As the methods of forensic anthropology routinely require the compilation of information gleaned from multiple elements of the individual skeleton, commingling complicates the analysis. Furthermore, for humanitarian reasons alone it is the role of forensic experts to attempt to re-associate the largest amount of remains as possible for disposition to the next of kin.

Anthropologists at the U.S. Army Central Identification Laboratory, Hawaii (CILHI) routinely encounter commingled skeletal remains, as from aircraft crashes and battleground mass graves. Likewise, anthropologists of the International Commission on Missing Persons (ICMP) working in the former Yugoslavia are faced with identifying several thousand sets of remains, a large portion of which are commingled to some degree. Scientists of the two organizations are collaborating to develop innovative new approaches to solving this recurring problem. Solutions to the commingling problems at CILHI and ICMP involve the disciplined application of traditional anthropological methods (e.g., pair-matching and articulation), the development of new anthropological methods (e.g., osteometric sorting), and the judicious use of DNA sampling and profiling interpretation. Aside from these purely scientific considerations, solutions to the commingling problem at the scale encountered by these organizations must include the development of a laboratory operational plan that incorporates the latest methods while simultaneously overcoming a number of serious constraints (e.g., limited numbers of personnel, high personnel turnover, limited space, limited time, etc.). In some situations the large quantity of remains precludes the ability of analysts to visually assess all of the bones at one time, and a "virtual" analysis is proposed to assist in the re-association procedure.

A key component of the solution to the commingling problem advocated here is the method of osteometric sorting, a technique that has been developed by Byrd and Adams. Osteometric sorting works by testing the null hypothesis that two bones are of the correct size to have originated in the same individual. The linear statistical models employed are currently derived from a large reference data set developed by the CILHI. Since these data were taken from primarily American skeletons, existing models were tested against intact skeletal remains recovered in the former Yugoslavia. Test results confirm the applicability of the method to both populations. As a result, the data collected from the former Yugoslavia have been incorporated into the CILHI reference data set and new models are being generated for application by CILHI and ICMP anthropologists. Details concerning the resolution of commingling issues, including the incorporation of osteometric sorting into the laboratory operations at CILHI and ICMP, are presented.

Measurements, Commingling, Human Identification