



Physical Anthropology Section - 2014

H70 Forensic Sciences and the Duty of Memory: Identification of Two Civilian Heroes From the Second World War

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The goal of this presentation is to provide attendees with an example of successful interdisciplinary collaboration to clarify the fate of a group of missing civilians involved in French resistance movements during World War II.

This presentation will impact the forensic science community by highlighting the strategy and methodologies developed to trigger identification of incomplete, degraded skeletal remains and the contribution of forensic science to bringing closure to the victims' families, who have been waiting for 70 years.

On July 27, 1944, a group of civilians linked to French resistance movements was executed by Nazi soldiers and buried in a small wood near Toulouse. Despite being severely injured, one of them managed to escape and informed the families. Three months later, once the Nazis departed, relatives recovered 15 bodies; 10 were identified by their families. The five remaining bodies were first buried in individual graves, but in 1990, the bodies were re-exhumed and re-buried in a single mass grave. Based on archival investigation, a list of possible identities was presented by historians and family relatives to a prosecutor who requested an exhumation.

In 2011, the mass grave was exhumed and human remains were transferred to a field forensic facility to be examined by a pathologist and an anthropologist. The first steps were to establish the minimum number of individuals (MNI=5) and to isolate the best samples for DNA analyses. Because of the incompleteness, fragmentary nature, and poor preservation of skeletal remains (the grave was regularly flooded), teeth were collected from two maxillae and three mandibles and the best preserved long bones (femur and tibia) were also sampled to increase the number of possible profiles to be extracted.

The results of anthropological examination were consistent with historical investigation by determining the presence of five males with ages ranging between 20 and 45 years who had sustained a number of peri-mortem ballistic injuries and showed evidence of blunt trauma with recent bone remodeling. Personal belongings found associated with the skeletal remains were also consistent with information given by relatives and cellmates.

The DNA extractions from the teeth and long bones were performed using protocols developed to enhance the retrieval of degraded DNA molecules from ancient remains. The analytical strategy adopted was then to replicate the analyses and to combine the use of multiple commercial multiplex kits (AmpFISTR® Identifier® Plus™, AmpFISTR® Minifiler™, Investigator® IDplex™, PowerPlex® 21 and PowerPlex® Y23) to obtain the most complete DNA profiles. Two full and two partial DNA profiles were obtained from the 15 skeletal elements sampled and were compared to those of the relatives. To improve the discrimination power of the analysis, this study also used a commercial kit containing twenty-three Y-STRs (Y-23) to establish Y-haplotypes and compare the male lineages. A partial Y haplotype was obtained and compared to the Y haplotype of the putative son.

Two of the men were positively identified via DNA. One was a Belgium former aviator who resigned in 1940 from his military position to join the Resistance where he created and led the Pyrenees Network. The second individual was leading a group of members of the resistance in the Toulouse region. The multidisciplinary work performed by historians, forensic anthropologists, pathologists, and biologists not only allows families to recover remains of their relatives but also to open the possibility for a national judicial investigation on war crimes. To date, historians are looking for the victim's descendants to be compared with the remaining profiles. More field research is ongoing in the same location to recover another group of missing civilians executed under the same conditions but without any witnesses.

Identification, DNA, Second World War