



Pathology Biology Section – 2007

G65 Identifying the “Iceman”

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After attending this presentation, attendees will understand how the use of mtDNA can aid in the identification of missing service members from decades-old skeletal remains.

This presentation will impact the forensic community and/or humanity by providing the attendees with an example of the uses of mtDNA for the identification of human remains exposed to harsh environmental conditions.

The Armed Forces DNA Identification Laboratory (AFDIL) and the Joint POW/MIA Accounting Command-Central Identification Laboratory (JPAC-CIL) work in a combined effort to identify missing or unidentified personnel from past military conflicts. With the use of mitochondrial DNA (mtDNA) testing, skeletal remains are analyzed and compared to references from associated family members in order to make identifications. The following case study from World War II shows how the use of mtDNA can aid in the identification of missing service members from decades-old skeletal remains.

On November 18, 1942, 2d Lt. William Gamber and student Aviation Cadets John Mortenson, Ernest Munn and Leo Mustonen of the 41st School Squadron, departed Mather Field, California, for a 4-hour navigational training flight. Five hours after their departure, and with no communication from the AT-7 aircraft, search crews were sent out to locate the flight team. However, with no position reports during the flight, search crews did not know where to look in the mountainous terrain of the flight's route. After search parties found no remnants of the aircraft or its crew, the United States Army Air Forces (USAAF) abandoned its search. On November 9, 1943, the War Department officially declared all four men as dead.

Almost five years later, on September 24, 1947, two students found portions of an aircraft approximately 120 miles east of Los Banos, California. Search parties came upon widely scattered wreckage, including two engines, embedded in the ice. A data plate from one of the engines matched that from the missing AT-7 aircraft. Remains found at the site could not be identified and were interred in a group burial in the Golden Gate National Cemetery, San Bruno, California.

Decades later, on October 15, 2005, two hikers came upon a body, partially encased in ice in Mendel Glacier in Kings Canyon National Park. No evidence was found to immediately identify the body, but an un-deployed U.S. Army parachute was strapped to the body, indicating that of a military service member. The National Park Service then contacted the JPAC-CIL to assist in the recovery. JPAC-CIL removed the remains as well as some material evidence from the body. Historical evidence associated with the loss of the AT-7, and evidence recovered in 1947 and 2005, suggested that these remains were likely one of the four men aboard this aircraft when it was reported missing on November 18, 1942.

The remains arrived at the CIL in Honolulu, Hawaii where a thorough anthropological analysis was made. On November 3, 2005, a small portion of the left tibia was sent to the AFDIL, in Rockville, Maryland, for mtDNA analysis. Blood references from family members of missing service members were obtained and compared to the data obtained from the left tibia. Exclusionary results, along with evidence obtained from the site, concluded that the missing individual was Air Cadet Leo Mustonen from Brainerd, Minnesota.

The views expressed herein are those of the authors and not necessarily those of the Armed Forces Institute of Pathology, the U.S. Army Surgeon General, nor the U.S. Department of Defense.

Identification, mtDNA Analysis, Frozen Remains