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Fact Sheet

COMMISSIONER'S OFFICE

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Fact Sheet: Northwest Airlines Flight 4422

Identification of the remains recovered from Mount Sanford

Brief History:

Northwest Airlines flight 4422, a chartered DC-4, was destroyed by impact and fire when it hit the western face of Mount Sanford, Alaska, at 9:14 p.m. on March 12, 1948. The Civil Aeronautics Board declared that the wreckage was "inaccessible from either the ground or the air." Its twenty-four passengers were Merchant Mariners returning from China on the chartered flight after delivering the oil tanker SS Sunset. The six members of the aircrew and all passengers perished.

On the morning following the crash, a fighter pilot and a group of accident investigation officials spotted the burned wreckage of the plane. The debris was located in a small glacial cirque, the walls of which were avalanche slopes. Snow and ice were constantly falling into the cirque from an overhanging glacier. The wreckage, as identified by the Northwest Airlines insignia, was completely covered within a matter of days, and disappeared.

After a half-century of slow glacier movement, a decade of detailed research, and several exhaustive searches, two airline pilots, Kevin McGregor and Marc Millican, located the wreckage of the legendary Northwest aircraft. It had been hidden in the isolated Alaskan glacier for nearly 50 years.

In 1999, while recovering artifacts to identify the plane, the two pilots discovered a human arm and hand in the debris field. Three days later, NTSB investigator Scott Erickson, National Park historian Geoff Bleakley, and Alaska State Trooper Lt. Rodney Dial flew to the site with Alaska State Trooper helicopter pilot Bob Larson. Lt. Dial retrieved the arm and hand from the glacier. He also found a ring marked "Iran 1946."

It has taken nine years of dedicated research by a team of forensic specialists to identify the remains.

Investigation of the Arm and Hand

The arm and hand were flown from the crash site to Anchorage where the State's medical examiner Dr. Michael Probst obtained inked prints, and then had the remains embalmed.

Throughout 1999 and 2000, Alaska Department of Public Safety fingerprint operator Susan Blei attempted to match the fingerprints with numerous databases and the fingerprints included in each of the Merchant Mariner's personnel files. Although some of the sets of fingerprints were eliminated as matches based on gross differences, no match was obtained. The details of the fingerprints were not clear enough.

When Dr. Probst retired, Dr. Franc Fallico became Alaska's medical examiner. He sent a few small pieces of the arm to a commercial DNA laboratory. However, no data could be obtained. In 2002, the lab's chief researcher stated, "the biological material of the four samples has been degraded to a point where the DNA

strands are too small to get [legible] results. General weathering, especially moisture in older samples, causes the strands of DNA to break down into smaller pieces, making them unreadable."

In 2002, Randall Haslett, the son of flight 4422's purser, contacted paleo-DNA expert, Dr. Ryan Parr at Genesis Genomics in Thunder Bay, Canada. When Dr. Parr agreed to help, Dr. Fallico sent the arm and hand to him. Within a few months, Dr. Parr and his team had achieved limited success in extracting DNA from the arm and hand. But it was still necessary to locate family members related to the victims along a direct female line. These relatives were required for mitochondrial DNA (mtDNA) references with which to compare the remains.

In July 2006, Dr. Parr contacted Dr. Odile Loreille at the Armed Forces DNA Identification Laboratory (AFDIL) in Rockville, Md. for assistance. Dr. Loreille is a researcher at AFDIL developing techniques to extract DNA from the embalmed remains of unidentified U.S. soldiers from the Korean War. This presented a unique opportunity for the development of new DNA extraction techniques that would benefit Dr. Loreille's research on the soldiers while potentially identifying the arm and hand.

Over the next year, Dr. Loreille developed new methods that allowed her to read the arm and hand's mitochondrial DNA (mtDNA). Dr. Dongya Yang from Simon Frasier University verified the results. Although the pilots had been in contact with many of the victims' relatives, finding the appropriate family members for mtDNA testing proved to be a monumental task.

Dr. Colleen Fitzpatrick, a retired optical scientist and dedicated forensic genealogist, joined the team in April 2007. Her associate Andy Yeiser and a second forensic genealogist Chriss Lyon, worked with Dr. Fitzpatrick and Dr. Loreille in searching for relatives. By August 2007, they had located appropriate family members of 16 of the victims. However, none of the DNA samples collected matched the remains.

Mike Grimm Sr., a retired latent print examiner for the FBI and the State of Virginia, and his son Mike Grimm Jr. (both employed by Evident, Inc.), joined the flight 4422 team and worked directly with Professor Edward 'Ted' Robinson at George Washington University. Initially, they compared a copy of the original fingerprints obtained by Dr. Probst in 1999, to 17 sets of fingerprints archived at the National Maritime Center. With new imaging techniques not available in 1999, they narrowed the possibilities to four of flight 4422's Merchant Mariners. There were no fingerprints for the six aircrew members; however they had already been eliminated as matches by DNA analysis.

The two-pronged approach was working well when Prof. Robinson made several attempts to rehydrate the fingers in order to obtain new, identifiable fingerprints. By now, only the dermal layer lying below the outer epidermal layer remained, but it was almost smooth. Prof. Robinson used a newly developed rehydrating solution distributed by Evident, Inc. called "I.D. Enhancer Solution." All five fingers were soaked in this rehydration fluid throughout the day with hourly checks on progress. Amazingly, the technique produced recognizable prints in the dermis. Using two different casting methods, Prof. Robinson reproduced the resulting fingerprints in stone. Mike Grimm Sr. and Mike Grimm Jr. then used special imaging techniques to produce a complete set of fully legible fingerprints.

On Sept. 6, 2007, Prof. Robinson, Mike Grimm Sr., Mike Grimm Jr. and pilot Kevin McGregor met at the National Maritime Center in Arlington, Va. to re-examine four of the sets of fingerprints kept there. With the new fingerprint images created by Prof. Robinson's work with the ID Enhancer Solution and the Grimm's imaging techniques, they immediately discovered a match with one of the fingerprint records. As a professional forensic fingerprint examiner, Mike Grimm Sr. was able to state unequivocally "based on this subsequent examination, it has been concluded that the fingerprints obtained from the fingers of the recovered left hand are the fingerprints of Francis Joseph Van Zandt, to the exclusion of all other individuals."

Dr. Loreille soon obtained a sample of nuclear DNA from a nephew of Francis Joseph VanZandt. Meanwhile, Dr. Fitzpatrick located Maurice Conway, a possible relative of Van Zandt's exclusively female family line in Ireland whose mtDNA was a match to those of the remains. Subsequently, Maurice was also found to be a nuclear DNA match to Van Zandt's maternal grandfather's line of the family. The double match indicated that Maurice was related to both of Van Zandt's maternal grandparents. An exhaustive study of church documents confirmed that Maurice Conway was Frank Van Zandt's second cousin, twice removed, along the exclusively female line of his family.

The closest next of kin has decided to leave the arm and hand in the care of Dr. Odile Loreille for more scientific research. Based on the forensic data, Alaska's acting chief medical examiner, Dr. Stan Kessler, was able to officially establish the identification of the remains as Van Zandt's, and issue his death certificate.

Passengers who died in the crash of Flight 4422

Wilfred "Billy" Henry Beswick, Manchester, England	Morris "Max" Brooks, Bronx, NY
Eugene J. Adler, Fall River, MA	Howard A. Davidson, Bayonne, NJ
John R. Comshick, West Hazleton, PA	Arthur L. Eilertsen, New York, NY
Robert William " Billy" Delaney, Keyport, NJ	Eugene O. Foote, Kaplan, LA
John V. Elkins, Richmond, NY	John "Jackie" Joseph Jamele, Brooklyn, NY
Olan J. Jacobsen, Brooklyn, NY	August E. Koistinen, Toivola, WI
Everett W. Jenkins, Brazil, IN	Michael Marushak, Sewaren, NJ
James G. Lampman, Jersey City, NJ	James G. Mooney, Paterson, NJ
Travis M. McCall, Tifton, GA	Robert J. Rabich, Easton, PA
Edwin Mustra, Plainfield, NJ	Daniel C. Rice, Milwaukee, WI.
John W. Rapchinski, Bayonne, NJ	Frank J. Van Zandt, Roanoke, VA
Carl F. Sigmund, Poquonock Bridge, CT	
Stanley C. Wilkowski, Bayonne, NJ	

Northwest Airlines aircrew members who perished in the crash of Flight 4422:

Captain Robert Petry, pilot	Captain James Van Cleef, pilot
Jehu Stickel, co-pilot	Wayne Worsely, navigator
Donald Rector, flight mechanic	Robert Haslett, purser

The following agencies took part in this project:

AFDIL, Rockville, MD	George Washington University, Washington D.C.
National Transportation Safety Board	Department of Veterans Affairs
National Park Service	National Maritime Service Center
Genesis Genomics Thunder Bay, Ontario Canada	Simon Frasier University
Alaska Department of Public Safety	Alaska State Medical Examiner's Office
Andrew Yeiser and Associates	Evident, Inc.
Wrangell-St. Elias National Park	KDL Solutions, L.L.C.

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