



### **D14 Historical Human Remains Identification: Skeletal Analysis, Facial Reconstruction, and DNA Analysis of Alleged James- Younger Gang Member**

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After attending this presentation, the attendees will understand: (1) the use of skeletal analysis, forensic reconstruction and DNA testing for establishing personal identification in an historical case, and (2) the use of comparing published articles and newspaper accounts as documentation in the absence of antemortem medical records for establishing personal identification.

This presentation will impact the forensic community by demonstrating how case review, investigation of information, and evaluation of different identification methods can be used to establish personal identification of historical human skeletal remains.

An expanded investigation of a historic case was conducted in an attempt to identify human skeletal remains. The alleged skeletal remains of Charley Pitts, a James-Younger Gang member who participated in the 1876 bank raid in Northfield, Minnesota were donated to the Northfield Historical Society in 1981. In 1982, the remains were examined by a medical examiner from Hennepin County, Minnesota to determine if the skeletal remains could have been Pitts. In 2007, the Historical Society submitted the remains to Minnesota State University, Mankato for further investigative and forensic analysis in search of additional information about their identity.

An examination of historical records, articles, documents, and interviews was included in the investigation. A forensic analysis was also conducted which included an anthropological examination, a forensic facial reconstruction from a computer tomography (CT) scan of the skull, and DNA analysis by three labs; the Netherlands Forensic Institute Laboratory and two private laboratories in the United States.

Pitts' fatal injury was described as a gunshot wound between his 2<sup>nd</sup> and 3<sup>rd</sup> ribs approximately one inch to the left of the sternum. He suffered a buck shot injury in the right arm approximately five inches from the shoulder and another in the back, approximately five inches from the hip. He was described as 5'9 ¾" in height with straight black hair, a stubby mustache and short black beard. His body was transported to St. Paul, Minnesota and Dr. Frank Murphy, Surgeon General, embalmed the body. After its sojourn in the State Capitol for two days of public viewing, no verifiable evidence of the disposition of Pitts' remains has been located. Purportedly, medical students had the remains made into a medical study specimen. By the mid-1950s, the Stagecoach Museum in Shakopee, Minnesota displayed a skeleton alleged to be Pitts and in 1981 donated the skeleton to the Northfield Historical Society. However, some question the authenticity of the alleged Pitts skeleton since the Stagecoach Museum owner demonstrated creative showmanship skills in operating the reproduction western style town.

The general condition of the purported Pitts skeleton is the same as it was when the Northfield Historical Society received it as a donation. It is professionally assembled with wire and pins and some bones are connected with brass fittings. Approximately 95% of the skeleton is complete.

In the anthropological examination, gender determination was based on sexually dimorphic characteristics, overall size, and robusticity of elements. Based on the assessment of skeletal features, the skeleton exhibited male characteristics. The age, approximately 35-40, was estimated using the pubic symphysis, ectocranial suture closure, sternal rib end morphology, and auricular surface. Even though some of these methods are more accurate for estimating age, each was examined to arrive at an estimated age.

Ancestry was determined by examination of the skull and facial features. The skeleton's characteristics suggest primarily Caucasian ancestry with some Asian admixture. Stature was determined using the Trotter-Gleser technique. Measurement with the lowest error rate, that of the femur and tibia combined, was used to calculate the individual's height, which would have been approximately 5' 7". The skeleton was also examined for physical evidence of trauma and pathological conditions affecting the bones.

To produce a facial restoration, computer tomography (CT) files of the skull were converted to stereolithographic (STL) files. From the STL files, a copy of the skull was cast. Erasers indicating skin depths were attached on strategic anatomical landmarks and photographed on the Frankfort Horizontal Plane. Sketches were drawn and the skull was covered in modeling clay and sculpted for the finished forensic facial reconstruction.

For the DNA analysis, bone samples and three teeth were removed from the skeleton. A cross-sectional sample from the mid shaft left femur, weighing approximately 30g and one molar were submitted to the Netherlands Forensic Institute for DNA analysis. Also, two longitudinal sections of femur weighing approximately 30g each and a single molar were sent to each of the private laboratories.



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Descriptive data for Pitts was obtained from published articles, newspaper accounts, family interviews and postmortem photographs. In addition, the forensic facial reconstruction from the CT scan of the skull was compared to known photographs of Pitts to determine resemblance. In the identification process, the DNA extracted from the bone and teeth was compared to DNA from Pitts' great grandnephew. The analysis of the skeletal remains, facial reconstruction, and DNA were evaluated to establish whether the skeleton belongs to Charley Pitts or whether it should be eliminated.

### **Skeletal Analysis, Facial Reconstruction, DNA Analysis**