

CASE REPORT

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Positive Identification of American Indian Skeletal Remains from Radiograph Comparison

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ABSTRACT: The case reported here documents how comparative data gleaned from study of museum collections enabled positive identification of an American Indian homicide victim through radiograph comparison. In particular, the shape of the lateral border of the scapula proved to be a unique anatomical feature, appropriate for establishing positive identification.

KEYWORDS: physical anthropology, human identification, X-ray analysis, musculoskeletal system, homicide

On 23 April 1984, the largely skeletonized remains of an adult male were found in a shallow grave on Pine Ridge Reservation, near Rapid City, South Dakota. The site of the discovery is a short distance from the home of John Leland Ten Fingers, a 30-year-old, local Sioux Indian reported missing on about 3 June 1983. The clothing found at the scene closely matched that last worn by Ten Fingers. Efforts to locate dental records of Ten Fingers were futile; however, five thoracic radiographs of Ten Fingers were located at the local Public Health Service Hospital. The skeletal remains and the recovered radiographs of Ten Fingers were sent to the author for study in July of 1984, through the FBI Laboratory in Washington, DC.

The remains consisted of the relatively complete skeleton, missing only the left humerus, both patellae, nine vertebrae, several ribs, and most of the small bones of the hands and feet. The bones were well preserved with considerable associated hair, desiccated soft tissue, adipocere, and soil. Some odor and feeding adult arthropods were present as well. The ends of some of the long bones showed evidence of gnawing by large carnivores (Fig. 1). Gnawing was especially apparent on the left pubis, right ischium, both proximal tibiae, both distal femora, both ends of the left fibula, proximal end of the left radius, distal end of the left ulna, and on several hand and foot bones. In addition to the bones described above that showed evidence of carnivore gnawing, one rib and the right scapula also displayed broken areas that probably were made postmortem. Eleven of the teeth present displayed dental restorations.

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FIG. 1—Evidence of carnivore gnawing on the ends of long bones.

Analysis of Remains

Analysis suggested the remains originated from an adult Mongoloid male between 30 and 46 years of age with a stature during life of about 172 cm (5 ft, 8 in.). The distal left fibula revealed a well-remodeled healed fracture. All of these characteristics approximate those of Leland Ten Fingers. Ten Fingers was a 30-year-old Oglala Sioux described as $\frac{3}{4}$ blood to full blood, between 5 ft, 9 in. and 5 ft, 10 in. (175 and 178 cm) in stature and weighing about 200 lbs (90 kg). He had suffered a fractured leg and elbow (Fig. 2) while in high school, 13 years before his disappearance. The estimated age was slightly higher than Ten Fingers' actual age largely as a result of well-developed osteophytosis on the lower vertebrae and arthritic changes in some of the joints. Most of his vault sutures were closed ectocranially and endocranially, and the ventral rampart was fully formed on the pubic symphysis.

The cranium showed considerable perimortem trauma. A fracture line extended through the right maxilla to the bottom of the right orbit (Fig. 3). The right temporal was separated from the sphenoid and parietal and was depressed at the junction with the zygomatic. The entire left side of the vault (Fig. 4) was broken, including all of the left temporal and part of the occipital and parietal. The fracture line at this site extended above the left orbit, where a section of bone 3 mm in length had been broken away. The pattern of fracture was compatible with blunt force trauma to the face and left side of the head.



FIG. 2—Arthritic changes at elbow joint.

Radiograph Comparison

As noted earlier, although the dentition displayed numerous restorations, efforts to locate dental records of Leland Ten Fingers were unsuccessful. Accordingly, radiographs were prepared of the postcranial skeleton and compared with the recovered radiographs of Ten Fingers. Comparison of radiographs, especially on the right scapula and the left femur, revealed many points of similarity and no points of dissimilarity (Figs. 5 and 6). In particular, the lateral border of the right scapula showed a well-developed extended notch in the inferior third that matched exactly with the lateral border of the right scapula in the radiograph of Leland Ten Fingers. The comparison matched so exactly that I positively identified the skeletal remains submitted as being those of Leland Ten Fingers.

To document that the skeletal details used in the comparison were in fact unique individual characteristics that could not be explained by chance combination, I compared the morphology of the lateral border of the recovered right scapula with the same feature in 100 right scapulae from the Smithsonian's Huntington Collection, an early 20th century dissecting room sample from New York, and 100 right scapulae from American Indian skeletons in our collections. The comparison revealed that the morphology of the lateral border of the recovered right scapula was in fact a unique feature, not shared with any of the other 200 scapulae.



FIG. 3—Frontal view of cranium.

Testimony

On 28 July 1984, I testified as expert witness in the murder trial *U.S.A. v. Gary Manuel Cheyenne*. The court accepted the identification of the remains as those of Leland Ten Fingers. Testimony by the defendant's brother Tom Cheyenne related that in early June 1983, following a period of heavy drinking, Tom Cheyenne, the defendant Gary Cheyenne, and the victim, Leland Ten Fingers, left the home of Vera Kills Small, supposedly to take Ten Fingers home. Instead, they stopped at a nearby isolated area near the White River and continued drinking. According to Tom Cheyenne, without provocation, Gary Cheyenne removed a tire jack from the trunk of the vehicle and struck Ten Fingers on the left side of the head, killing him instantly. The Cheyenne brothers then pitched the body off the nearby riverbank. Subsequently, they decided the body could easily be detected in the river but lacking tools, their attempt to dig a grave nearby with their hands was unsuccessful. After this futile effort they drove to a relative's house and returned with gloves, a shovel, rope, and a clothesline pole. They then tied the victim's hands to one end of the pole and his feet to the other. Each wearing one glove to protect their hands, they carried him approximately one-half mile (0.8 km) to a desolate area known as "The Badlands." Exhausted, they soon stopped to dig a shallow grave with the shovel and worked until the handle broke. Giving up the effort, they placed the victim's body in the shallow grave and covered it with soil. Based largely on this testimony and the physical evidence presented from the skeletal analysis, a jury convicted Gary Cheyenne of second degree murder on 29 April 1987. He was subsequently sentenced to life imprisonment.

Conclusion

According to the prosecuting attorney in this trial, Robert A. Mandel, Assistant United States Attorney, District of South Dakota, the case against Gary Cheyenne could not



FIG. 4—*Left lateral view of cranium.*



FIG. 6—Antemortem radiograph of right shoulder of Leland Ten Fingers.



FIG. 5—Postmortem radiograph of bones of right shoulder area.

have been prosecuted without the positive identification of the skeleton of Leland Ten Fingers. Clearly, the positive identification was secured through the comparative data on variability in scapula morphology among American Indians gleaned from my study of our museum collections of American Indian skeletal remains. The case documents not only the applicability of the lateral border of the scapula for positive identification, but also the importance to forensic science of long-term curation of museum collections of human remains.

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