H32   An Assessment of Biological Affinity in an Unmarked Cemetery From Nevada: The Importance of Context and Appropriate Reference Samples

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The goal of this presentation is to present the audience with an example of the use of craniometrics to assess biological affinity in an unknown historic population recovered from an unmarked cemetery.

This presentation will impact the forensic science community by highlighting the importance of contextual information, such as spatial distribution and artifactual evidence, and the use of appropriate reference samples when drawing conclusions of biological affinity.

This study presents an analysis of five of the nine individuals recovered in 2000 from an unmarked cemetery in Palisade, Nevada, a ghost town officially abandoned in 1961. The cemetery was discovered during a mining operation, which required removal of the burials. The remains and associated grave items were excavated by local law enforcement and were submitted to the Human Identification Laboratory at California State University, Chico for osteological analysis. These individuals were buried close by but segregated from the town's main cemetery. This information, coupled with associated grave goods and evidence of poor skeletal and dental health, led to the assertion that these individuals may have been socially marginalized during life. Because the population of Palisade, Nevada, was overwhelmingly White, it was further suggested that this social marginalization could, in part, be due to their ancestral background. Prior craniometric analysis, using the modern reference samples in FORDISC® 3.0, showed definitively that these individuals were of non-European ancestry.[1] The evidence for a particular non-European group or groups, however, was equivocal. This ambiguity may have been a product of inappropriate reference samples. This study tests that assertion by comparing these unknown individuals to known Native American groups from Nevada and other parts of North America.

Because of sample size limitations, males and females were grouped together and craniometric data were scaled using the geometric mean to control for sexual dimorphism. After scaling, craniometric data were aggregated by the group mean of each measurement. Hierarchical cluster based modeling was used to compare the unknown individuals to Great Basin and Western Plains Native American groups (n=43) provided by the Repatriation office, National Museum of Natural History (NMNH), Smithsonian Institution, and Native North Americans from the Howell's sample (n=279).[2]

The results of the hierarchical cluster analysis show two separate branches, with the unknown individuals being most similar to the Shoshone, followed by the Ute and Santa Cruz groups. The likeness of the unknown individuals with the Shoshone and Ute, who are part of the Northern Uto-Aztecan language family, is not surprising in light of the halpogroup similarities between the unknown individuals (haplogroups B = 50% and C = 50%) and Northern Uto-Aztecan speakers (haplogroups B, C, and D, 42%, 15%, and 43%, respectively; n=116).[3] The second branch contains the Paiute, Comanche, Gosiute, Eskimo, and Arikara groups. Given the linguistic and geographic similarities between the Shoshone and Ute and the Paiute and Gosiute, the craniometric difference between these Great Basin groups is surprising.

The results of the current study show that these unknown individuals compare favorably with Great Basin Native Americans, which is consistent with other forms of evidence. These results highlight the importance of contextual evidence and appropriate reference samples when assessing biological affinity. The equivocal FORDISC® 3.0 result from prior analysis appears to be the product of inappropriate reference samples in the Forensic Data Bank for this context. While the Forensic Data Bank contains a Native American sample, this sample consists of modern forensic cases from the American Southwest supplemented with 19th-century Native American remains of undisclosed geographic origin. The 19th-century Native American remains make up over two-thirds of the total Forensic Data Bank sample (44 males, 27 females from a total of 59 males and 32 females).[4] The fact that these unknown individuals compared more favorably with Great Basin Native Americans than the Forensic Data Bank sample, despite being contemporary with the latter, highlights the range of craniometric variation of North American native groups.

References:

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Ancestry, Craniometrics, FORDISC