AUTOSOMAL AND Y-STR ANALYSIS OF DEGRADED DNA FROM THE 120-YEAR-OLD SKELETAL REMAINS OF EZEKIEL HARPER

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The 120-year-old skeletal remains of Confederate Civil War soldier Captain Ezekiel "Zeke" Harper were exhumed by court order in January 2011 for DNA analysis. The goal of the DNA testing was to support or refute whether Captain Harper had fathered a son (Earl J. Maxwell) with his Native American maid prior to his murder in 1892. Bones with adequate structural integrity (left tibia, right tibia, right femur, mandible, four teeth) were retrieved from the burial site and sent to the Institute of Applied Genetics in Fort Worth, Texas for analysis. Given the age and condition of the remains, three different extraction methods were used to maximize the probability of DNA recovery. The majority of the DNA isolates from over fifty separate bone sections yielded partial autosomal STR genotypes and partial Y-STR haplotypes. After comparing the partial results for concordance, consensus profiles were generated for comparison to reference samples from alleged family members. Considering the genetic recombination that occurs in autosomal DNA over the generations within a family, Y-STR analysis was determined to be the most appropriate and informative approach for determining potential kinship. Two of Earl J. Maxwell's grandsons submitted buccal samples for comparison. The Y-STR haplotypes obtained from both of these reference samples were identical to each other and to the alleles in Ezekiel Harper's consensus profile at all 17 loci examined. This Y-STR haplotype was not found in either of two major Y-STR population databases (U.S. Y-STR database and YHRD). The fact that the Y-STR haplotype obtained from Ezekiel's skeletal remains and Earl's grandsons is not found in either population database demonstrates its rarity and further supports a paternal lineage relationship among them. Results of the genetic analyses are consistent with the hypothesis that Earl J. Maxwell is the son of Ezekiel Harper.