

Study: The trials of the Cherokee were reflected in their skulls

April 16 2014, by Matt Shipman



Researchers from North Carolina State University and the University of Tennessee have found that environmental stressors – from the Trail of Tears to the Civil War – led to significant changes in the shape of skulls in the eastern and western bands of the Cherokee people. The findings highlight the role of environmental factors in shaping our physical characteristics.

"We wanted to look at these historically important events and further our understanding of the tangible human impacts they had on the Cherokee people," says Dr. Ann Ross, a professor of anthropology at NC State and co-author of a paper describing the work. "This work also adds to the body of literature on environmental effects on skull growth."

The researchers drew on historical data collected by Franz Boas in the late 19th century. Boas collected measurements of the length (front-to-back) and breadth of skulls for many Native American tribes, including hundreds of members of the eastern and western bands of Cherokee.

The researchers analyzed the data, looking only at adults and organizing the adults by year of birth, which ranged from 1783 to 1874. The year of birth, a critical piece of information, provided clues to stressors in an individual's life. For example, the western band of the Cherokee was subject to the Trail of Tears in 1838, intertribal warfare in the West, disease epidemics, and the U.S. Civil War from 1861 to 1865.

The researchers found that head length decreased over time in both bands, for males and females.

In the eastern band, there was a steady decline for males, but a sharp decline for females beginning in the late 1830s – coinciding with the Trail of Tears, when the eastern band fled into the Great Smoky Mountains to avoid forced evacuation to the West.

In the western band, males and females shared a similar pattern of decline: a sharp decline from the late 1820s to the 1850s, followed by a short increase, and then another sharp decline in the early 1860s with the onset of the Civil War.

"When times are tough, people have less access to adequate nutrition and are at greater risk of disease," Ross says. "This study demonstrates the impact that those difficult times had on the physical growth of the Cherokee people.

"The study also contributes to our understanding of how [environmental stressors](#) can influence skull measurements, which has value for helping us understand prehistoric cultures, historic populations, and the impact

of [environmental factors](#) on the health of current populations in the developing world."

More information: The paper, "Secular trends in Cherokee cranial morphology: Eastern vs Western bands," is published online in the *Annals of Human Biology*. [informahealthcare.com/doi/abs/ ...03014460.2014.902991](http://informahealthcare.com/doi/abs/...03014460.2014.902991)

Abstract

Background: The research objective was to examine if secular trends can be identified for cranial data commissioned by Boas in 1892, specifically for cranial breadth and cranial length of the Eastern and Western band Cherokee who experienced environmental hardships. **Materials and methods:** Multiple regression analysis was used to test the degree of relationship between each of the cranial measures: cranial length, cranial breadth and cephalic index, along with predictor variables (year-of-birth, location, sex, admixture); the model revealed a significant difference for all craniometric variables. Additional regression analysis was performed with smoothing Loess plots to observe cranial length and cranial breadth change over time (year-of-birth) separately for Eastern and Western Cherokee band females and males born between 1783–1874. **Results:** This revealed the Western and Eastern bands show a decrease in cranial length over time. Eastern band individuals maintain a relatively constant head breadth, while Western Band individuals show a sharp decline beginning around 1860. **Conclusions:** These findings support negative secular trend occurring for both Cherokee bands where the environment made a detrimental impact; this is especially marked with the Eastern Cherokee band.

Provided by North Carolina State University

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