



Physical Anthropology Section – 2004

H38 Racial Variation in Palate Form and the Shape of the Transverse Palatine Suture

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After attending this presentation, attendees will have been presented for consideration of forensic and physical anthropologists the racial differences noted between Black, White, and Native Americans in palate shape and transverse palatine suture form.

This presentation will impact the forensic community and/or humanity by demonstrating that both palate form and transverse palatine suture shape differ significantly by major racial population and are, therefore, of value in assessing ancestry from skeletal remains. Palate form is shown to be of much greater utility in this regard than is palatine suture shape and can be seen from this study to be one of the very best areas of the skeleton for the attribution of race within *Homo sapiens*.

Regardless of the debate over the validity of race, the identification of ancestry through the quantification of observable racial characteristics has proven essential in forensic casework in order to help establish a victim's identity. This study defines two skeletal traits thought to be important to skeletal biologists and forensic anthropologists – the shape of the external bony palate and the form of the transverse palatine suture. The frequency of occurrence of both traits is determined for three North American skeletal population samples, which will be referred to here as Black American, Native American, and White American.

As early as 1916, physical anthropologists noted variations in palatal form. Earnest A. Hooton created a checklist for anthropology students at Harvard University to insure consistency in the research performed on various osteological specimens. On this list, Hooton noted shapes of palates. While these data were collected, they do not appear to have been compiled in any systematic scientific study. After the creation of the Harvard Checklist, palatal forms went virtually unnoticed until the latter half of the 20th century. Although researchers mention variation in palatal form, a comprehensive study of these forms was not performed until the early 1980s. Then, George W. Gill added palatal forms to the University of Wyoming's Osteology Checklist. Samples of Plains Indians and Pioneer Whites were examined from the University of Wyoming collections, as well as American Blacks from the Terry Collection of the Smithsonian Institution. After 15 years of collecting data on forensic and archaeological specimens, Gill noticed what he thought were clear patterns of palatal form variation. Gill also described palatal form trends within major geographic populations.

Masters student Patrick Chapman was asked, in the early 1990s, to begin compiling data on palatal forms. Chapman began to compile data for the study from additional records of the osteological repository at the University of Wyoming. This survey included specimens returned to law enforcement agencies, Native American groups, Peruvians, Polynesians, and others.

From these data, Chapman recorded the palatal forms he looked at in three basic categories outlined in the Harvard Checklist – triangular (parabolic), elliptic, and hyperbolic. Chapman further illustrated what Gill had suggested – that these palatal forms occurred in different frequencies within the various major geographic racial groups represented in the United States. According to Chapman's compilation, Black Americans frequently exhibit hyperbolic palatal forms, Native Americans and East Asians often show elliptic forms, and White Americans tend to display parabolic palatal forms. Chapman also worked with many specimens from Gill's research on Easter Island and in Peru, finding interesting correlations with these populations as well. However, the current study focuses solely on Black, Native, and White American groups.

Chapman also compiled research collected by Gill on transverse palatine suture forms. These sutures, Chapman noted, fit into four basic categories, which he defined as anterior curved, anterior jagged (jagged), posterior curved, and straight. While each of these suture forms exists within all North American populations, posterior curved sutures seem to rarely occur outside Polynesian peoples. Within the U.S. populations reviewed in Chapman's work, the following correlations between transverse palatine suture forms and races were made: Black Americans most often displayed anterior curved sutures, Native Americans and East Asians frequently exhibited straight sutures, and White Americans tended to show jagged sutures.

The current study began mainly as a way to expand the samples of the populations researched by Gill. Because the majority of the research on American specimens performed by Gill and compiled by Gill and by Chapman centered on the western United States, the present research investigates palatal forms and suture types on populations not explored in previous studies. This was done to determine whether the correlations between palatal forms, transverse palatine sutures, and race exist in populations throughout the United States. Of particular interest are Native American populations since the Chapman and Gill research centered primarily on Plains Indian populations.

The current study further performs statistical analysis of non-metric traits to determine the association, if any, between population and palatal form, as well as between population and transverse palatine suture shape. These statistical analyses are then compared to those of Chapman and Chapman and Gill. It evaluates palatal shapes and transverse palatine suture forms based on the visual criteria defined by Gill. The study makes



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three discrete observations, which are palatal form, palatine suture form, and a new method of palatine suture form classification.

Palate, Palatine Suture, Population Variability