

## ABSTRACTS

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### **Biological Stress Indicators Among Historically Documented Populations (1913-1935): An analysis of Enteseal Changes and Degenerative Joint Disease**

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Recent studies about the American past have aimed to examine multiple lines of evidence from different disciplines in order to reanalyze the American lived experience. Despite this, there has been limited research conducted using techniques and methodologies from biological anthropology. The Hamann-Todd Osteological Collection (n=118) consisting of individuals who lived in Cleveland, Ohio and the surrounding county was utilized to understand how the American lived experience impacted the biological stresses of these individuals. The objective was to investigate enteseal changes and degenerative joint disease on the upper limb to reconstruct activity patterns and to test for possible disparities which may represent differing biological stress experiences. The prevalence and distribution (patterning) among site locations of both enteseal changes and degenerative joint disease was scored using standard methodology and interpreted as evidence of biological stress variability and possible changing or different types of activity patterns. Enteseal changes and degenerative joint disease were also analyzed using population sub-groups of sex and biological affinity ("race"). Results indicate that the majority, eighty percent, of prevalence and distribution in enteseal changes and degenerative joint disease between the sub-groups were similar. However, there are instances of particular site locations and muscle groups which demonstrate statistically significant differences and patterning between the sexes and biological affinities, indicative of different life experiences and stresses. This study contributes to biological anthropology as individuals from this collection are historically documented and demographically known samples and could be used as comparative research for other populations where demographic data is less clear.

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### **Combining Indirect and Direct Evidence for the Coevolution of Brain Size and Diet in Primates**

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Based on the premises that "bigger is better" and that brain tissue is too metabolically expensive to rapidly expand via neutral evolution, many social and ecological factors have been proposed to explain variation in encephalization within extant primates. The comparative approach presupposes that co-variation in an extant dataset indicates that changes in encephalization

occurred in tandem with shifts in ecological niche. However, the fossil record—the only "direct evidence" for primate brain evolution—demonstrates that relative brain size has persistently increased in parallel, both within and among multiple primate subgroups, a fact that is unaccounted for in analyses restricted to extant-only data. Morphological proxies for ecological behaviors, such as diet, are observable in the fossil record, allowing for a more direct analysis of co-evolution between brain size and ecology through geological time.

This study combines direct and indirect approaches to an analysis of co-variation between brain size and diet in primate evolution. Encephalization (residual endocranial volume from a PGLS regression of endocranial volume on body size proxy), body size (skull size, calculated as the first Principal Component of 14 cranio-dental dimensions), and diet category (assessed via molar shear quotient) were examined for correlated evolution in a dataset of 50 extant and 11 extinct primate species, covering a broad range of phylogenetic and ecological groups. The analysis suggests weak, but inconsistent support that brain size co-evolved with diet across primates. Disconnect between the extant-only and combined datasets are discussed in the context of the theoretical basis for analyses of brain evolution.

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### **Defining the "Outsiders": A Biodistance Analysis of Ottoman Communities in Hungary and Romania**

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Starting in the 14th century, the Ottoman Empire expanded its territory into southeastern Europe. Much debate persists on the roles of conversion and migration in shaping the demography of European Ottoman garrisons. We present here a biodistance analysis of cranial samples from multiple Ottoman cemeteries across Romania and Hungary, in order to assess the extent to which European Ottomans resemble other European or Anatolian populations.

Craniometric data were collected from three Ottoman skeletal series, one from Budapest, a location of high geopolitical importance during the Ottoman period, and two from more distant, hinterland communities. These samples were compared to two geographically-proximate medieval series and a sample from Anatolia. Principal component analyses and multidimensional scaling analysis of biodistance matrices based on size-adjusted craniometric data indicate several interesting results. First, the Ottoman samples do not share strong affinities with either the medieval or Anatolian groups. Second, the Ottoman sample from Budapest is distinct from the two

outlying Ottoman communities. The latter show a closer biological affinity with each other but are more distinctive from the Anatolian series than the group in Budapest. Lastly, in all three Ottoman series, statistical analyses comparing male and female biodistance indicate greater average shape differences between the sexes compared to the medieval and Anatolian series. Our results have implications for understanding the population dynamics of Ottoman expansion into southeastern Europe, an aspect of history rarely studied by archaeologists and biological anthropologists, but significant in light of modern sociopolitical issues relating to the history of Islam in Europe.

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### **Violence and Prostate Cancer Risk: Chronic Health Implications of the Challenge Hypothesis for the Southern American Culture of Honor**

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Recent data suggests that greater testosterone exposure across the lifespan predicts prostate cancer risk. Accumulating evidence also suggests that unconstrained energy availability, typical of Westernized diets, permits men's steroid physiology to operate at near maximal capacity. Accordingly, the highest rates of prostate cancer are found within developed regions of the world. However, even among well-nourished Westernized populations, considerable variation exists in testosterone values and prostate cancer rates. Formally known as the challenge hypothesis, among vertebrate species, testosterone production is predicted to rise with the intensity of male-male competition. Applied to human males, specifically those with nutritional status able to support chronically elevated testosterone, social environments that place a premium on dominance contests and competitive interactions are hypothesized to aggravate cancer risk. This hypothesis may be particularly salient for the aptly-termed Southern American "culture of honor". Relative to their Northern counterparts, Southern men, especially rural white Southerners, are more accepting of violence as an appropriate recourse to status affronts, exhibit higher homicide rates, and show more pronounced testosterone reactivity to male contests. Available county-level homicide rates (proxy for aggressive social environment) for white males, along with median household income, percentage of the population below the poverty line, percentage over 65 yrs., and rural/urban residence were collected for Northern and Southern states. These variables were regressed on county-level, age-adjusted rates of prostate cancer incidence for white men. Homicide and rural residence