folivores (*Gorilla gorilla*) or folivore-frugivores (*Papio ursinus*). Microwear scars were counted twice (and averaged) on the paracone of the second molar within a 0.4 mm by 0.4 mm ocular reticle using an external light source to manifest refractive small pits and fine scratches, non-refractive large pits and coarse scratches, trench-like hypercoarse scratches and crater-like puncture pits. ANOVA show that taxa can be differentiated on the basis of small pits and fine scratches. Although *Papio ursinus* and *Pan troglodytes* show moderate to high frequencies of fine scratches, these taxa are distinct in number of small pits with the former showing relatively fewer and the latter exhibiting a relatively greater frequency. *Oreopithecus* lies between these extremes and in this way is similar to *Cebus apella,* although differences between *Oreopithecus* and *Cebus* occur in relative frequency of fine scratches; *Cebus* exhibits relatively few and *Oreopithecus* exhibits moderate numbers. Principal components analysis of small pits, fine scratches, hypercoarse scratches and puncture pits separates *Oreopithecus* and *Papio* from *Gorilla*. Of the species sampled, the dental microwear of *Oreopithecus* most closely approximates the dietary signal derived from *Papio ursinus*.

Magnitude of the "wild effect" in tooth emergence in chimpanzees of the Taï and Gombe forests.

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Our primary tool for reading the fossil record of human life history is to compare dental maturation between extinct species and the living chimpanzee. Whereas previous comparisons depend on captive data, Zihlman, Bolter, and Boesch (PNAS 2004) recently conclude that wild chimpanzees erupt teeth much later than captives, bringing into question comparisons within the hominin fossil record. Here we reassess the magnitude of the "wild effect" in chimpanzee tooth emergence with the following approach: We add ten new cases to previous data (total N=30), standardize how age is counted, correct two field identification errors and analyze the data using logistic regression. We then examine sample morbidity and mortality. Results second the key finding of Zihlman et al. (2004) that teeth emerged late in these wild individuals, although at a more moderate level, with means shifted approximately -1 SD compared to captive distributions. A critical point, however, is that the sample is largely natural deaths, merging the effect of being wild with the effect of being dead. Three findings suggest that maturational delays are partly attributable to the latter: younger deaths (1) were more delayed than the older in tooth emergence, (2) were more often accompanied by disease or debilitation, and (3) have a higher occurrence of dental anomalies. Definitive ages of tooth emergence times in *living* wild chimpanzees must be established from the study of *living* animals. The fossil record, of course, does consist of many dead juveniles; present findings have implications for how we evaluate them. Supported by the MPI-EVA.

The peopling of Easter Island: A test of the single-wave *vs.* two-wave migration models using three-dimensional cranial morphology.

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The geographic origins of the native human inhabitants of Easter Island, the Rapanui, have been heavily debated. The single-wave migration model postulates that the first colonizers sailed directly to Easter Island from Polynesia. An alternative hypothesis, the two-wave migration model, argues that the earliest migrants initially detoured and stopped along the western coast of South America before continuing to Easter Island. In order to address the hypothesis of gene flow between indigenous South American populations and native Rapanui, the present study evaluated in the Rapanui the three-dimensional aspects of human cranial morphology that have been determined previously to reflect population history accurately. Specifically, in samples of skulls belonging to Rapanui, native Polynesians and South Americans, 37 landmarks were digitized, and craniometric data from 57 standard linear dimensions were compared. In Mahalanobis distances and on Multidimensional scaling plots, the three-dimensional cranial morphology and linear craniometric dimensions of Rapanui skulls were found to cluster closely with native Polynesians and were distinct from those of all other populations, including those from South America. In a Discriminant Function Analysis, the Rapanui crania were mostly likely to be classified as deriving from other Polynesian islands, but rarely as South Americans. These findings indicate that negligible gene flow has occurred between the indigenous populations of South America and Easter Island, supporting a single-wave migration model of Polynesian origin for the peopling of Easter Island. This finding also contributes broadly to a general understanding of the peopling of the Pacific. This study was funded by a collections study grant from the American Museum of Natural History, the National Science Foundation (BCS-0622570), the Wenner-Gren Foundation (Grant #7499), and Arizona State University's Graduate and Professional Students' Association.

Trabecular structure in the craniofacial skeleton of select anthropoid primates.

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Studies have shown that trabecular bone structure often corresponds with patterns of mechanical loading associated with the functional use of the skeleton. Most studies of primate trabecular function have focused on the mid-shaft and head of the femur, the calcaneous, and the vertebrae. Analyses of the mechanical properties of the cortical bone of primate faces suggest functional adaptations in properties, such as material orientations and elastic moduli, but comparable investigations of the trabecular regions of the craniofacial skeleton have yet to be explored. This study analyses mechanical characteristics of trabecular bone in the faces of a sample of four anthropoid genera, *Homo, Pan, Gorilla, and Papio*. We hypothesize that patterns in trabecular bone structure will most strongly reflect functional adaptations in regions of the craniofacial that experience the greatest amounts of mechanical loading. Browridge, zygomatic, and alveolar trabecular structure was studied by means of microCT scans of craniofacial skeletal segments of 16 individuals. The results suggests that statistically significant differences exist between and within regions, and between taxa in a variety of measures of trabecular structure. Assessments of the data do not show lesser amounts of trabecular anisotropy in low strain regions, such as the browridges, compared to high strained regions such as the alveolus, contrary to our intial hypothesis. This suggests the importance of a careful appraisal of loading patterns by specific craniofacial region using advanced modeling techniques to understand the importance of such variation. This study was funded by the National Science Foundation Physical Anthropology HOMINID program (NSF BCS 0725126).

The canary in the coal mine: Treponemal disease across subsistence, settlement patterning and sociopolitical changes in southern Appalachia.

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Treponemal disease is known to be ubiquitous in Late Prehistoric (after AD 1000) North America. This visibility co-associates with aggregate village settlement and the consequential poor community health. Much of the literature considering the pattern of treponematosis in the riverine interior Southeastern U.S. is case driven, affirming the presence of the disease. However, some recent literature suggests population density may influence disease visibility suggesting farmstead/hamlet settlement frequencies may differ from palisaded village frequencies. Taking this a step further, morbidity differences may also differ by status if that subgroup is socio-culturally isolated. To examine these scenarios in a specific regional context, eleven sites in lower East Tennessee from two different subsistence/settlement patterns across two time periods (Late Woodland/Early Mississippian, AD 900-1100, N = 268) and Late Mississippian AD 1300-1600, N = 770) were surveyed for evidence of treponemal disease. The results indicate a statistically significant higher